Previous Exploration Work
&
Initial Reconnaissance
EL 18/2011
Minrex Resources

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UNITS

Physical units are in accordance with the international standard SI system of weights and measures.
All maps are based on AGD66, Zone 55, unless stated otherwise.

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1. Executive Summary

Derwent Geoscience was contracted by Minrex Resources NL to conduct an initial evaluation of exploration lease EL18/2011, a 44km^2 area located on the west coast of Tasmania within the Heemskirk Batholith between Trial Harbour and Granville Harbour. Work completed involved:

- Collation of Open File data from Mineral Resources Tasmania (MRT).
- Field work to locate and inspect historical workings and geology.
- Rock and sediment samples taken from various prospects in the area.

Historically, the area has contained many small but rich tin oxide bodies associated with various vein types found in the area. Activity within the lease area has been sporadic over the last century, with the Peripetatic Mine area receiving the most attention by previous explorers. Systematic regional exploration has not been conducted in modern times.

Field work succeeded in locating many workings marked by MRT, and also found two other unmarked workings. Vein hosted and replacement mineralisation was noted at the McGuinness and Iron Blow workings, and these have been identified as areas which warrant further inspection, following more accurate mapping of the boundaries of the lease. A large zone of sericitic alteration to the immediate west of South Gap Creek has been recognised as an area which may have the potential to be associated with a larger mineralised system.

Drilling on the Peripatetic Mine site by Geophoto Resources in 1970 indicates that tin mineralisation does not extend to depth, a fact often noted by previous workers in the area. Given this information, it is thought that future exploration activities should be concentrated on the McGuinness, Iron Blow and South Gap Creek areas and, pending assay results, be directed towards specific minerals and styles of mineralisation, such as tin, silver and molybdenum.

2. Location and access

Exploration lease EL18/2011 is a 44 square kilometre area located to the north of Trial Harbour on the west coast of Tasmania. It is approximately 300km, or 4 hours' drive from Hobart to Zeehan, followed by another 15 minutes on the Trial Harbour Road before reaching the signed Granville Harbour track (see Figure 1). Access to the southern, central and western parts of the lease is via the Granville Harbour track. The Granville Harbour track is a poorly maintained 4wd track crossing several creeks and streams up to Granite Creek, after which access is only by walking, quad or trail bike. It is approximately 1 hour from the start of the Granville Harbour track to Granite Creek.

North-eastern parts of the lease are best accessed from the north via Heemskirk Road and then turning onto an easy 4wd track at an easting of 348000m and driving onto the foothills of Mt Heemskirk.

North-western parts of the lease are best accessed via a 4wd track which turns off the Heemskirk Road to the immediate east of the Tasman River and heads past the St Dizier Alluvial workings and the St Dizier Mine. This track eventually passes by the Peripatetic Mine after going through several boggy sections which would be easily passed by quad bikes. There is also a quad bike track in generally good condition which appears to follow the old road from Corinna to Trial Harbour (Waterhouse, 1915) which crosses this track and heads up the valley between North Heemskirk and Mt Heemskirk.

In their present condition, the above tracks cannot carry large volumes of traffic, and the Granite Creek and St Dizier access routes would be impassable after significant rain due to creek crossings.

3. Scope

The scope of this report is to provide a brief overview of the lease area, access and historical exploration to provide initial recommendations for future work.

4. Sources of Information

This report is based on:

1. Field observations made by Chris Allen in the course of field work conducted between June 11 and 15, 2012.

2. Information collated from Open File reports collated by Derwent Geoscience.

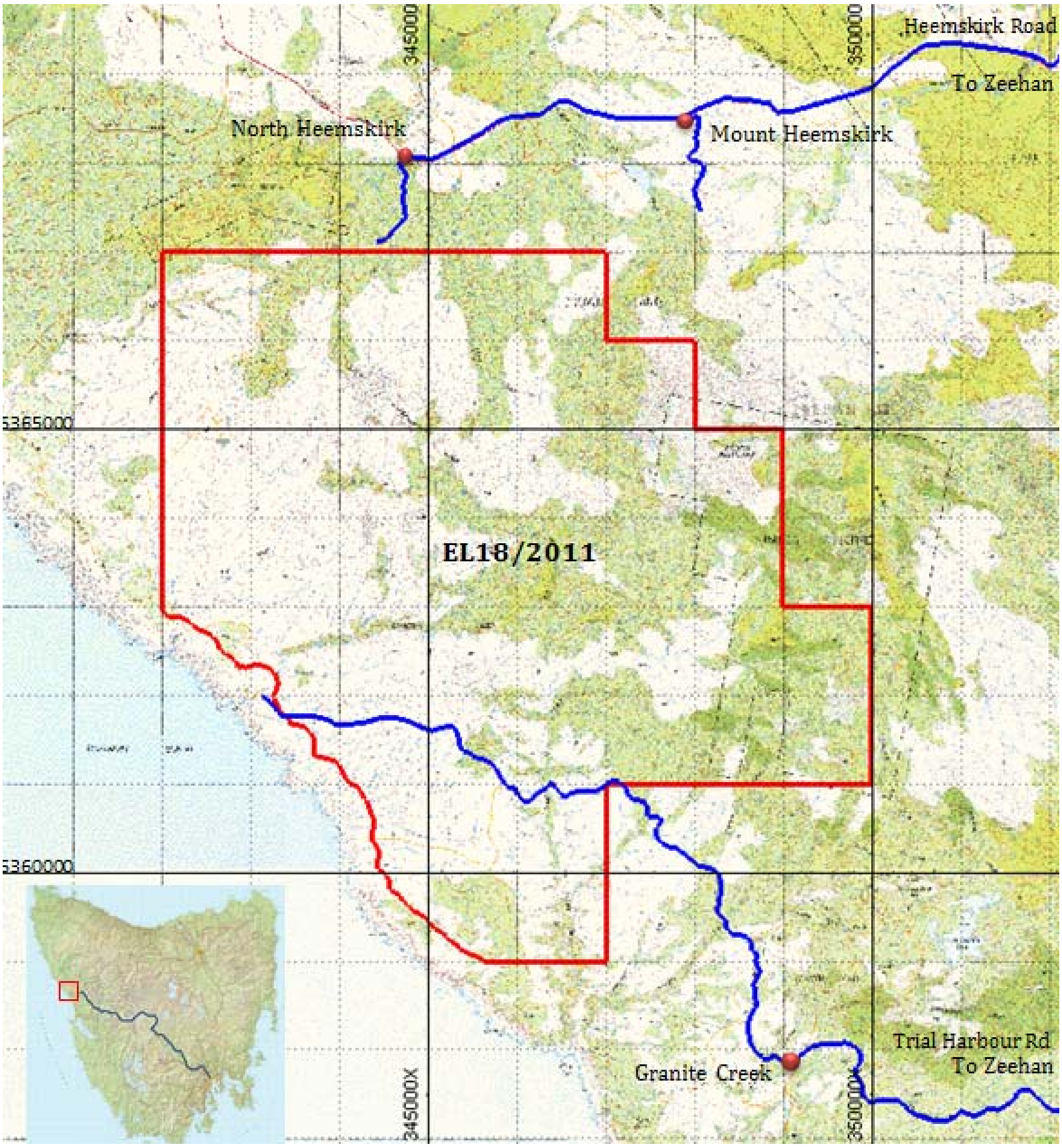

Figure 1: Access to EL18/2011. Labels indicate turns onto access tracks. Granite Creek and North Heemskirk require 4wd vehicles, while most of the track to Mt Heemskirk can be driven with 2wd vehicles after periods of dry weather.

5. Tenure

EL18/2011 is a 44km^2 category 1 exploration licence (metallic minerals and atomic substances) granted to Minrex Resources NL on 3 April 2012, and expires on 2 April 2017.

Many old prospects are located within the lease area, most of which were worked between 1876 and 1900, and have seen little activity since then.

6. Geology

The Heemskirk Batholith is a large granitic body occupying 117km^2 on the west coast of Tasmania near Zeehan. It has sharp, steep intrusive contacts with Precambrian metasedimentary rocks on all margins except for the northern margin, which dips more gently (McClenaghan, 2006). The local landscape is strongly controlled by past glaciation which has formed three major valleys in the area which are now occupied by the three main creeks: St Dizier, Granite and South Gap Creek. The regional geology is summarised in Figure 2.

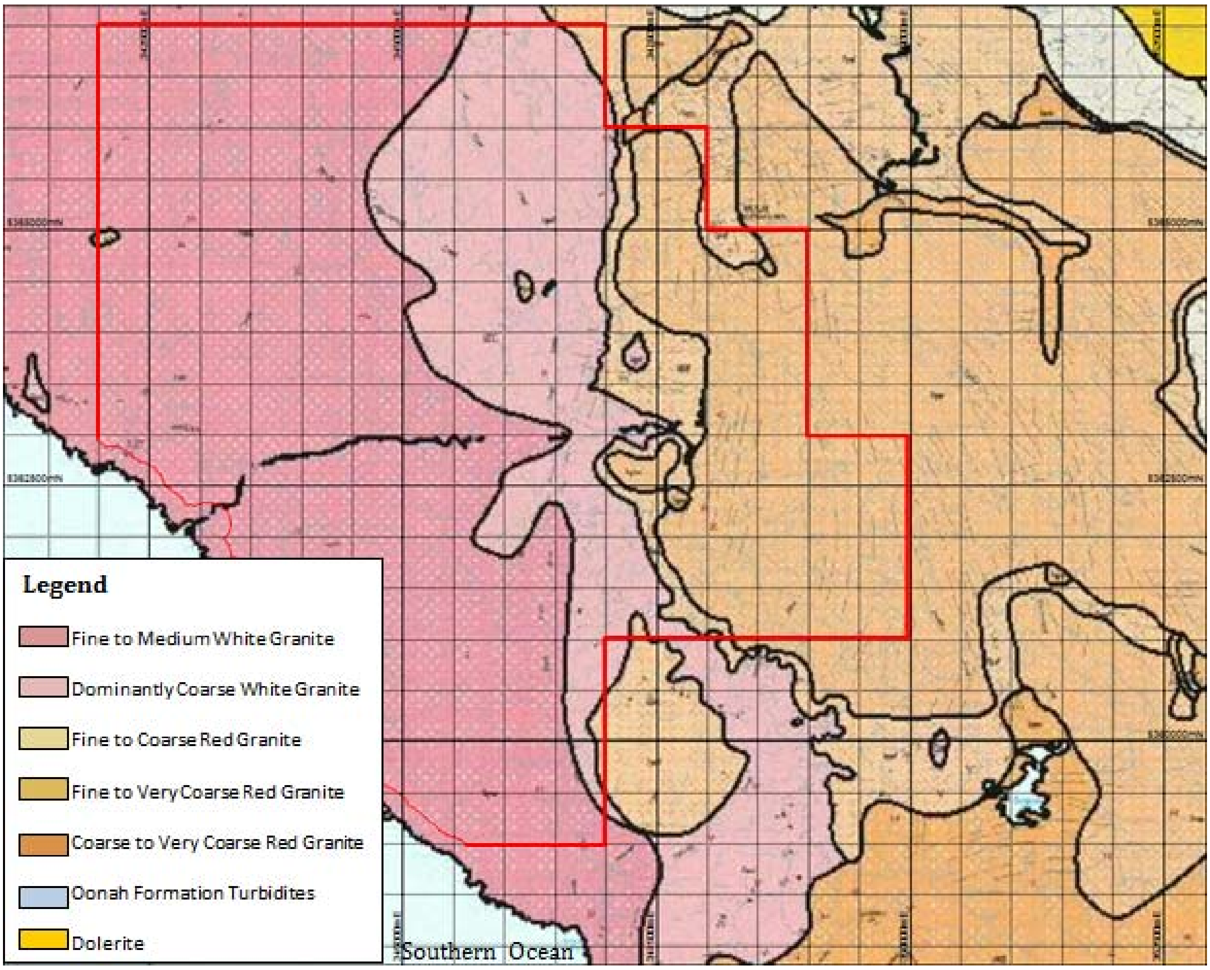

Figure 2: 1:40,000 Geology of the EL18/2011 area. Lease is completely underlain by red and white granites, with grain sizes varying from fine to coarse. Presented using GDA94 coordinate system (Image courtesy of www.theLIST.tas.gov.au).

Two types of granite are present: red and white. The red granite occupies the upper parts of the intrusion and has been intruded by the white granite, which outcrops to the west of the red granite. The contact is shallowly dipping and features large zones of mostly fine white granite with tourmaline phenocrysts. Isotopic dating shows that the two intrusions are of very similar age, with the red slightly older (McClenaghan, 2006). The dominant mineralogy of both granites is quartz, K-feldspar and plagioclase with varying amounts of biotite and tourmaline. An abundance of tourmaline in the white granite at the contact between red and white granites suggests the trapping of a fluid-rich phase (Klominsky, 1972). Nodules of quartz-tourmaline vary from <2cm to over 40cm, with larger nodules most often appearing associated with nearby quartz-tourmaline veins.

Geophysically, the Heemskirk Granite has a very uniform regional signature in gravity and magnetics. The only regional method which produces a differentiation between materials is radiometrics, which shows the red granite generally having a higher uranium content.

The area is known historically as a tin field, with silver a common secondary ore. Deposits are generally vein hosted, and do not disseminate into the country rock, forming small, high grade bodies less than 300m along strike, which are unable to support large operations. No other materials are known to have been economically removed from within the lease area.

Tin has been found in several vein environments, typically associated with tourmaline. Hajitaheri (1982) found there was a lack of correlation between colour, type or composition of tourmaline with the occurrence of tin, indicating that tin is not an original part of the tourmaline, rather emplaced during a late fluid stage along weaknesses within the granite, such as joints and lineaments. With the exception of two major faults (Gap Creek and the Tenth Legion), most faults within the granite are relatively small. Faults and joints, filled or otherwise, provided fluid paths for volatiles including tin until they encountered the red granite, which acted as a trap in most cases. Waterhouse (1915) describes three modes of cassiterite mineralisation:

1. Quartz-tourmaline veins, where a seam of black or green tourmaline is enclosed in an aggregate of quartz and tourmaline. Di Scala (1974) and Waterhouse (1916) notes that in this setting, tin is preferentially associated with green tourmaline.

2. Pyrite veins, with mostly microscopic cassiterite in a micaceous matrix.

3. Greisen veins. These are composed of quartz-muscovite-topaz and tourmaline, and may consist of two to four of these minerals. Sericite alteration occurred during later hydrothermal alteration of the greisens. Pyrite, arsenopyrite, cassiterite, monazite and zircon are generally found within this altered zone (Hajitaheri, 1982).

Di Scala (1974) notes that the most productive mines situated within the granite are proximal to the red-white granite contact or at high elevation. This statement ignores several workings described by Thureau (1881), who describes several coastal workings within ‘a bed of greyish white porphyry’ which hosted rich mineralisation, albeit in a band only 2m in width. Wells (1978) gives a graphical interpretation of alteration and mineralisation within the granite developed from observations mostly from around the nearby Federation Mine in Figure 3. This diagram also agrees with field observations of more abundant tourmaline nodules in the vicinity of tourmaline-rich veins and the presence of tourmaline phenocrysts within fine white granites close to the contact with the red granite.

Other economic materials which have been found within the Heemskirk granite include silver, bismuthinite (bismuth), molybdenite, wolframite (tungsten), chalcopyrite (copper), galena (lead) and sphalerite (zinc), although these are more rare than tin and to date have only been found in discrete locations. Molybdenum has historically been noted around the Montague Mine (south of the lease area), but a clast containing a high percentage of molybdenite was recently found in Granite Creek (Basil Beamish, *pers comms. 2012)*, while sporadic occurrences of copper have been recorded near the margins of the granite towards the northern end of the lease, although exact quantities are unknown. Bismuthinite, galena and sphalerite have been found to the south of the lease area, but no mention of them has been found for workings within the lease area.

Radioactive minerals have also been reported in the area, but none were subsequently found by Taylor and Burger (1950) during a search dedicated to locating radioactive minerals.

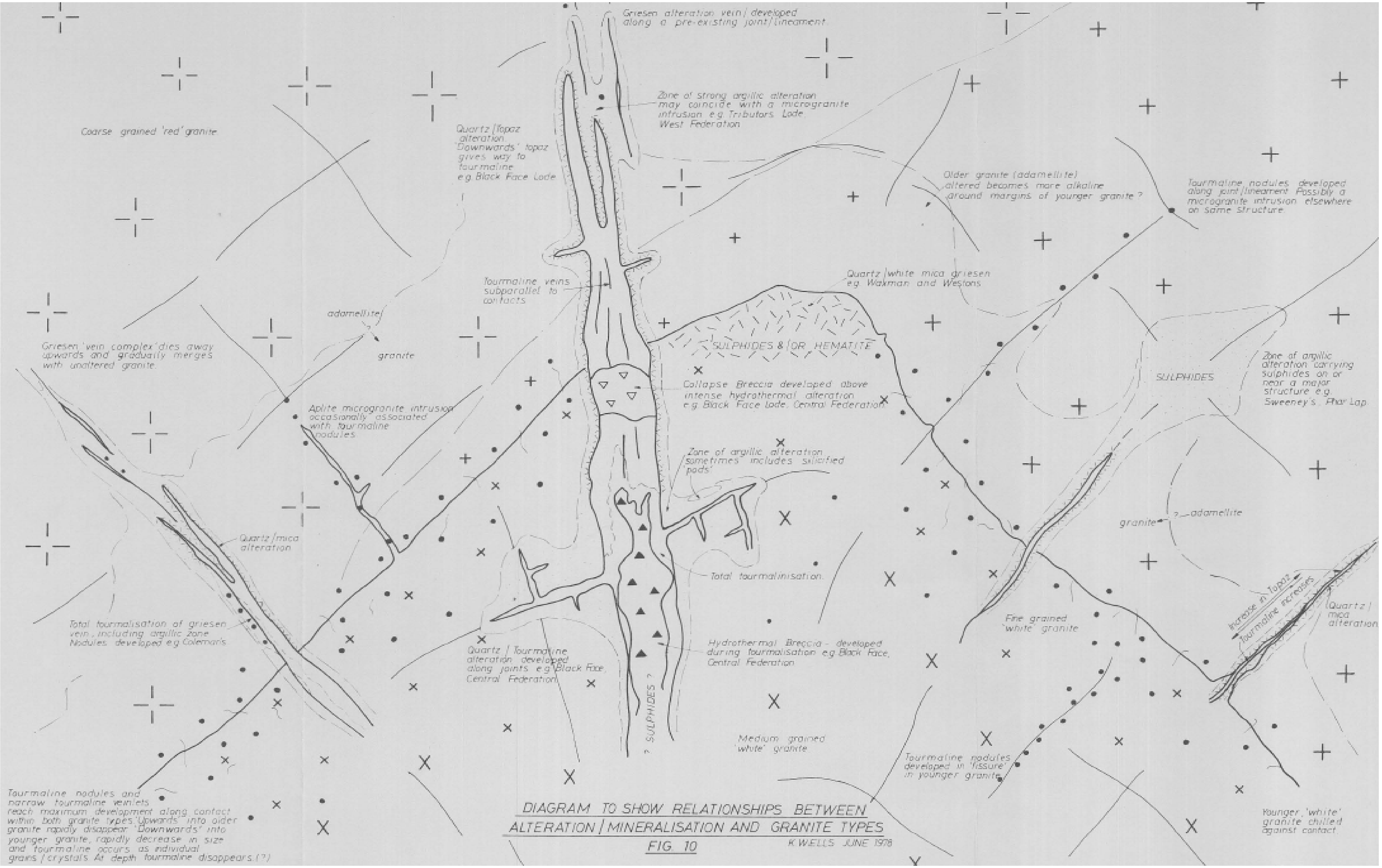

Figure 3: Wells' (1978) interpretation of the veining and mineralisation system at Mt Heemskirk based mostly on observations near the Federation Mine. This interpretation would place the Iron Blow at the top of the white granite intrusion.

7. Previous Work

There has been much activity in the Heemskirk area since tin ore was first identified there in 1876 by the surveyor C. Sprent, however very little documented work has been conducted within 18M/2011. Most documented work has been broad-scale mapping in an effort to define the nature of the granite and its' mineralisation. While it was historically recognised as an area hosting rich tin ores, lode discontinuity, pyrite content and cost of processing the ore contributed to the failure of operations, even in the presence of the richest ores (Waterhouse, 1915). Most mines and prospects in the area were pegged in the 1880's, with only a few of these active beyond 1890. Only mines in the Cumberland- Mt Agnew area, such as the Federation Mine to the south of EL18/2011, are known to have been in operation beyond 1900. Figure 4 shows the locations of known workings within or very near EL18/2011.

The Peripatetic Mine is the only prospect in the lease area which has received significant attention with several attempts made at re-opening the mine, including 3 diamond drilholes in 1970 by Geophoto Minerals. The mine lies approximately 10km to the NW of Trial Harbour, and was one of the original tin workings in the region. Waller (1902) gives assays of over 10% tin for some samples, with grades within lodes often in excess of 4% and a chip sample from along the adit wall outside the main vein returning assays of 0.93% tin. The amount of ore removed from the original mine is unknown. Drilling by Geophoto Resources was designed to test the continuity of lodes with depth, based on the assumption that greisens dipped to the NW, although Waller (1902) speculates that in addition to a NW dipping dyke, another sub-horizontal aplite sheet/dyke exists. Three holes oriented to 130^0 were drilled, with only one hole intersecting very minor mineralisation at 65.8-67.4m and 108.5-111.6m in hole 1 (Figure 5), although sericitic greisen was intersected several times in hole 1A, which Roberts (1984) interpreted as a continuation of the lode. Geophoto Resources also conducted a sediment sampling program over their lease in 1968, testing for Cu, Pb, Zn, Ag, Bi and Mo over most drainages in the area. Detection limits of the instrument used are unknown, but results for these elements were generally not promising, and the reason for not assaying for tin is unknown.

Gold Fields Exploration explored the area in 1981, with a conceptual target of mineralisation occurring as up to 3m wide high grade lodes dipping steeply to the NW within strongly argillised coarse granite. Sampling by Gold Fields around the Peripatetic Mine returned assays suggesting the lodes were narrow & discontinuous and contained tin at around 1% levels, much lower than that reported by Waller (1902). The lease was relinquished in 1984 with the conclusion that the potential for a major tin ore body at the mine was low.

Figure 4: 1:40,000 map showing locations of old workings within EL18/2011. Long's Iron Blow is marked as just outside the area. A more accurate survey of its' position is required to confirm its' setting in relation to the lease boundary.

Long's Iron Blow is located very close to the NE boundary of the lease, with the Morrisby, McGuinness and Eastern and Western St Dizier workings also in the area. Little information is available on any of these workings, apart from Long's Iron Blow, which is located on the northern slopes of Mt Heemskirk. MRT mapping shows the prospect as inside the lease boundary, but field work shows it just outside. More accurate surveying is required to determine its' exact position. It appears to have been worked in the late 1870's, and varies from others in the area in that haematite is abundant, along with tourmaline and quartz. Tin is present in the outcrop, but samples taken by Waterhouse assayed at only 0.29%. The rock here was also noticed to be moderately magnetic (Waterhouse, 1915).

Other workings within 18M/2011 are reported in Waller (1902) as at the head of St. Clair Creek, where samples from three veins striking N-S assayed at 9.5% tin, another near the coast to the immediate north of Granite Creek, where he reports a small lode 75cm in width and striking to the NW containing 23% tin. Alluvial workings were also observed at this site and in the vicinity of the Peripatetic Mine. Prospects mapped by MRT throughout the lease as 'Unnamed' have an unknown history, with tenement maps provided by Waller (1902) and Waterhouse (1915) having incomplete lists of tenement holders.

Details of several small scale workings, including extractions, located at the southern end of the lease in close proximity to the coast is provided in Waterhouse (1916).

No geophysics of note has been undertaken within the lease area, but IP surveys have been conducted within the granite to the south of the lease, appearing to successfully identify greisen zones.

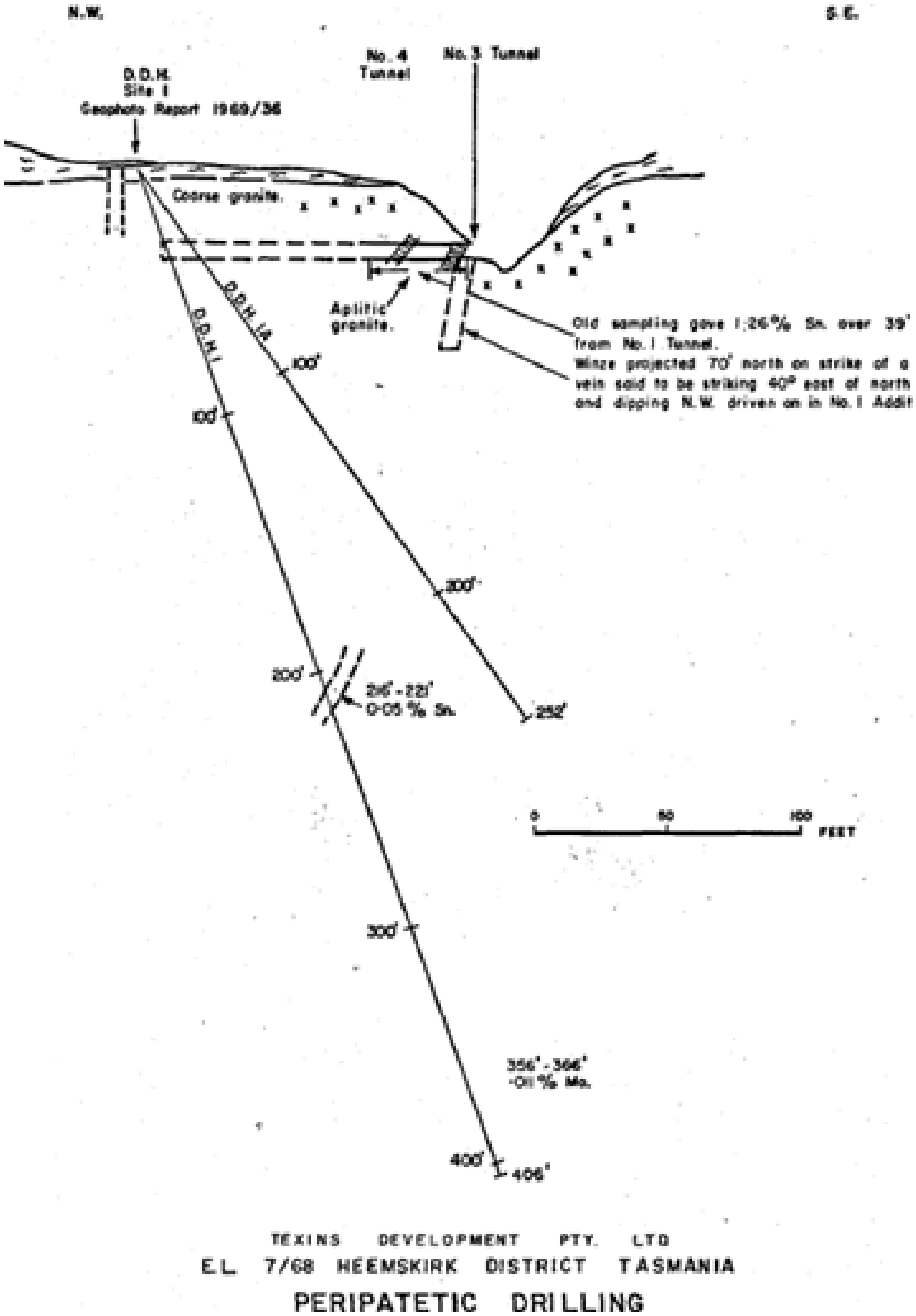

Figure 5: Geophoto drilling results from the Peripatetic Mine for DDH 1 and 1A, showing a lack of significant mineralisation at depth (Image from Rattington, 1970).

8. Field work

Five days were spent in the field, during which 14 old workings and their surrounds were inspected, with alteration and trends of any mineralisation noted. Four of the marked workings were not located, while two workings that were not marked by MRT were located in addition to several costeans and other man-made features in the general vicinity of the McGuinness working. Thirteen rock chip samples were collected, in addition to ten sediment samples using 2mm mesh, chosen because sulfides were most often noted in larger grains. As this was not intended to be a comprehensive exploration program, not all drainages were sampled. The margins of North Heemskirk Spur were traversed along with the upper parts of the St Dizier catchment. The catchment of Granite Creek was also inspected to follow up on a report of a clast containing molybdenite near the mouth of the creek. The findings from each of the prospects and areas are given below, with locations shown in Figure 4.

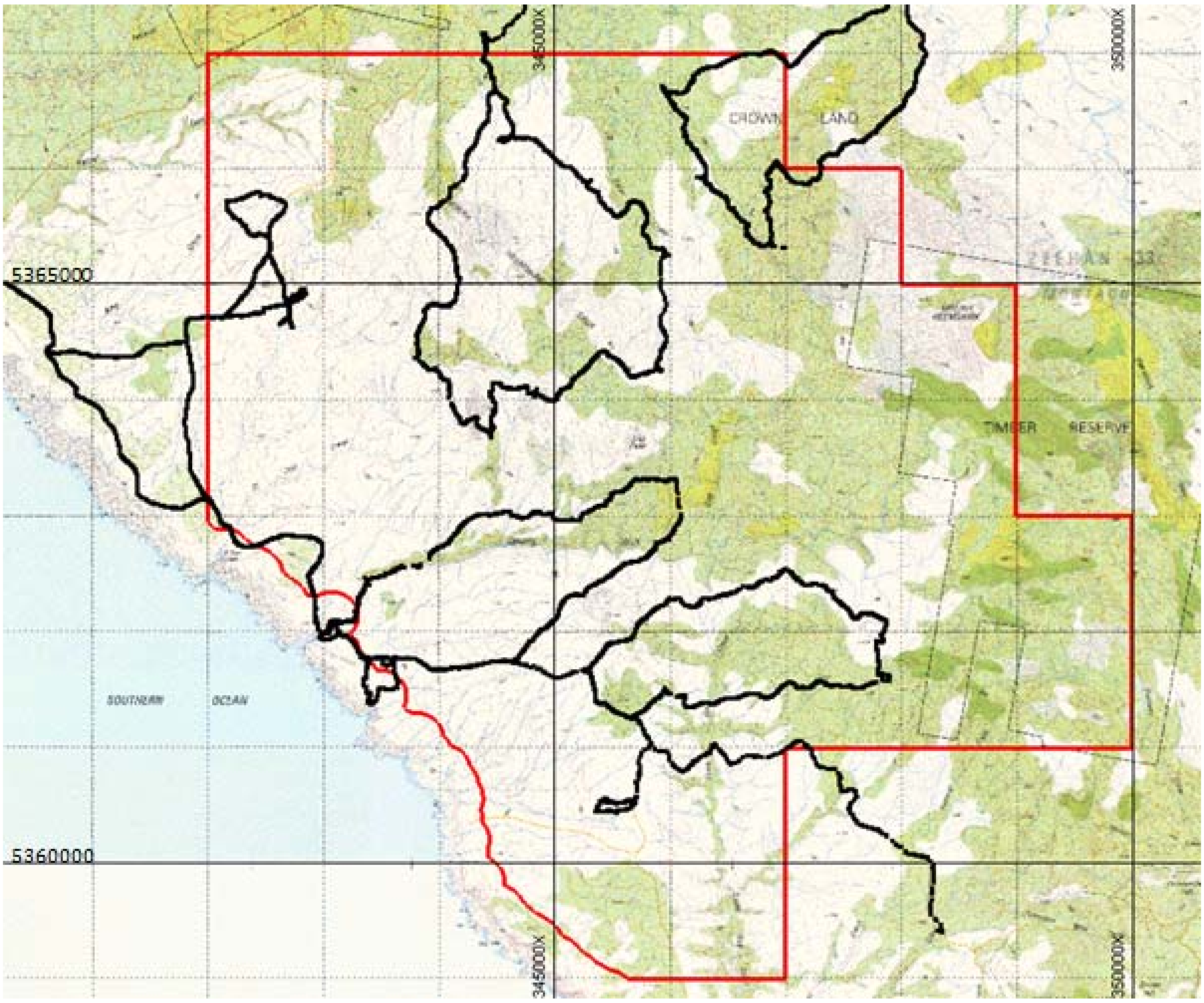

Figure 6: Areas covered during June field reconnaissance. Tracks recorded using handheld GPS.

8.1 Peripatetic Mine (GREF: 342935E, 5365085N)

The old Peripatetic Mine is located on a small hill to the immediate north-west of a confluence of creeks, made obvious by tracks put in for the 1970 drilling program. The collar used for DDH 1 and 1A, oriented to 130^0 and inclined at 70^0 and 55^0 respectively was located as an open hole, but DDH 2 was not found. The holes are sited on top of the hill into which original prospecting activities were concentrated. Old workings located included three adits, one shaft and a general stripped area in front of the workings. The adits are all oriented in different directions, and lack obvious signs of the steeply dipping tourmaline veins oriented to around 040^0 which were noted by Waterhouse (1915) around which mineralisation was originally found.

The hill is composed of highly altered granite where feldspars have mostly decomposed to clayey material, leaving remnant quartz crystals and quartz-tourmaline nodules. The surface appearance is generally of a pale brown clayey material with a granitic texture. Many quartz crystals in the groundmass are sub-angular, suggesting heated fluids altered the granite, with these fluids moving along fault planes. Small sub-vertical faults were also found near the adits, striking approximately 310^0. Several hard quartz-tourmaline veins were noted in the stripped area of the mine, with dips and strikes varying from $84/120^0$ to 75/1080. These appear to be late stage veins, and would appear not to carry mineralisation.

A chip sample (#550655) was taken of highly altered outcrop from near the mouth adit 2 to confirm tin contents reported by previous parties.

Figure 7: Discontinuous quartz-tourmaline veins and abundant nodules exposed at the Peripatetic Mine, to the immediate south of adits 1, 2 and 3.

8.2 Peripatetic Alluvial Workings (GREF: 342747E, 5364846N)

No details are known on the life of this working. It was not located directly, but the confluence of creeks about 200m downstream from the mine appeared un-naturally deep, with indistinct mounds nearby that could represent sluiced materials. Extremely thick vegetation in the area prevented further observation of workings here, and a sediment sample (#550605) was taken from approximately 20m downstream of the confluence.

8.3 Amy Creek Alluvial (GREF: 342292E, 5365902N)

This working was located on a major elbow of Amy Creek. No prior information was known about this prospect other than its' location, but disturbance in the immediate vicinity was obvious, with a small pile of large waste rock to the west of the creek, and a partially excavated area to the east. The creek itself is incised up to 1.8 metres and partially undercuts its' banks, but no trace of extraction or processing equipment remains on site.

A sediment sample (#550606) was taken from the elbow of the creek, with sieved sediments having a slightly darker appearance than the sample taken from the Peripatetic Alluvial Workings.

8.4 'Unnamed 1' (GREF: 344743E, 5366477N)

This working was not marked on maps used in field work, and is located on an isolated high point with a quad bike track following the old Corinna-Trial Harbour track passing it. Waste rock consists mostly of quartz or granite with less than 15% tourmaline. Granite is variably silicified and chloritised. Other rubble in the area typically has higher tourmaline content, suggesting that it has been removed from this working. One rock sample (#550656) was collected from the altered waste rock to give a rough representation of the rock types. No other workings are visible in the area.

8.5 Fischer and Smith's Section (GREF: 344598E, 5364105N)

Details on this working are given in Waterhouse (1915). A quad bike track from St Dizier mine can be used to access this site from the north of the lease. Two shafts were located during this work, separated by approximately 100m and sunk on the same sub-vertical fine-grained quartz-tourmaline vein. Both shafts are now filled with water. The vein is about 80cm wide and striking 204^0 at shaft 1, but is seen to be of variable width in shaft 2, changing from 30 to 60cm over the distance of the 3m wide shaft. Wall rocks within the waste rock pile are of sericite altered granite, with other materials being coarse grained massive quartz containing coarse, radiating tourmaline crystals up to 4cm in length. Minor green tourmaline was also observed.

A rock sample (#550657) containing wall rock and vein material was taken from the waste rock. Minor green tourmaline was noted in the sample.

8.6 'Unnamed 2' (GREF: 343926E, 5364740N)

No information is known about this working. The creek below it was initially thought to be the site of the working due to the presence of a quartz-tourmaline vein and multiple elbows in the incised creek. The working consists of a vertical shaft sunk into a 1 metre wide sub-vertical quartz-tourmaline vein striking 179^0, with another vein of similar width intersecting the shaft from a westerly direction. This does not appear to continue to the east of the main vein. These veins consist of bands of a 50:50 mix of fine quartz and tourmaline crystals along with coarser, quartz-rich material. Wall rocks are altered granite, with feldspars weathering towards clay with some Fe-staining also present.

A rock sample (#550659) containing altered wall rock and vein material was taken from the waste rock.

8.7 Long's Iron Blow (GREF: 347400E, 5366237N)

This feature appears as a massive, dark grey to black outcrop approximately 20 metres in diameter on top of a small ridge within the red granite. It is Fe-rich rock with bands of tourmaline and haematite, with about 15% occasionally vuggy quartz veins. On a brief inspection, around 60% of the rock is tourmaline and quartz, with the remainder haematite and 3% magnetite, making the rock slightly magnetic. About one quarter of the haematite is oxidised to a red colour, this presumably being mistaken for cassiterite by original prospectors. One shaft has been dug to the NW of the outcrop, which is now filled with water to 6m. Waste rock is mostly highly sericitised and chloritised granitic country rock with patches of iron staining. Some feldspar crystals in the granite have been rounded and altered to clay. As shown in Figure 8, the outcrop appears to be part deformed, but as no contact between the Iron Blow and the granite is visible, it is uncertain whether this occurred during emplacement or if the rock is in fact a previously deformed xenolith which has seen extensive replacement by tourmaline and haematite. Another outcrop similar to the Iron Blow but half the size was seen approximately 150m to the NE.

One rock sample (#550661) was taken from the Iron Blow rock, and another from the waste rock pile (#550662), composed of altered granitic material.

Figure 8: Deformation of haematite bands within the Iron Blow outcrop, possibly indicating it is a deformed sedimentary xenolith which has undergone replacement, and not the cupola of the white granite.

8.8 McGuinness (GREF: 347019E, 5365508N)

Details on material extracted from this working are unknown. It is located a short distance above a confluence of creeks, and has a large unvegetated and highly visible waste rock pile in front of the main adit. The adit has been cut following the strike of a 1.5m wide quartz-tourmaline vein which runs at 80/322^0. The wall rock is extremely altered and weathered granite, being a loose, pale brown clayey material with remnant quartz and tourmaline crystals. Vein rock at the opening of the main adit forms bands, with more quartz-rich bands hosting approximately 5% arsenopyrite and minor green tourmaline crystals. A second adit/shaft is located in thick scrub below the base of the waste rock pile and immediately above the creek, but was inaccessible.

A rock chip sample (#550660) was taken from the mouth of the main adit composed of arsenopyrite and green tourmaline bearing vein, and wall rock material.

8.9 Morrisby (GREF: 346935E, 5365972N)

No information is available on the production or nature of this working, and all shafts or adits in the area are now filled in and serves as a wombat warren. No waste rock piles were located, but granitic material from the sides of burrows appears altered in the same manner as that in the McGuinness working.

8.10 'Unnamed 3' (GREF: 346240E, 5366493N)

This working was found at the top of a small rise and consisted of a shaft/adit which had been mostly infilled. No obvious waste rock piles were seen in the immediate area. Granite in the vicinity was highly weathered in the same fashion as at the McGuinness working. No quartz-tourmaline veining was observed, but quartz boulders were found on the adjacent hill.

8.11 Eastern Upper St Dizier Creek Workings (GREF: 346316E, 5366964N)

No details are known about the amount of ore extracted from this working, although from the volume of waste material on the inside of the elbow from which material was extracted during operations and the apparent redirecting of the creek, it was a significant operation. These materials are invariably greater than 20mm in diameter and range from angular to rounded quartz and quartz-tourmaline. Very few granitic rocks were seen in the waste piles.

8.12 Western Upper St Dizier Creek Workings (GREF: 346035E, 5366896N)

This working is situated in the same setting as the eastern working on the next elbow downstream. A quartz-tourmaline vein forms a narrow ridgeline behind which is swampy ground. The vein does not appear to have been worked, as all waste rock piles observed at the very thickly overgrown end of the ridge contained only sub-angular to rounded rocks similar to those in the eastern working. It appears to have been a smaller operation than the operation upstream, but no details on ore extracted are known. A sediment sample (#550609) was taken from the main elbow.

8.13 'Unnamed 4' (approx. GREF: 345550E, 5360650N)

No details were available on this working. The site was not found, although a quartz-tourmaline vein up to 40cm in width and around 20m long was located in the approximate location marked for the working. A very dense sample of quartz and tourmaline was picked up about 120m to the south of the marked prospect, but otherwise the area showed little promise.

8.14 'Unnamed 5' (approx. GREF: 346050E, 5361600N)

No details were known about this working, and it was not located. Many small surface disturbances were observed in the area, but none seemed to justify labelling this area as a working. The slight rise immediately to the east of here has an abundance of angular quartz-tourmaline rubble, but the source of these was not located. The rock under this rubble is granite which has been strongly weathered towards an Fe-rich clay in which sub-angular to angular quartz crystals are preserved, in a similar fashion to that seen at the Peripatetic Mine.

8.15 'Unnamed 6' (GREF: 347890E, 5361900N)

This working is mapped as being located at the head of a small creek, and is within the 'red' granite. Due to the presumed age (over 100 years) and size of the working, it was difficult to locate. A small drop in very thick scrub appeared to have been excavated, with much medium to coarse grained quartz sand in the creek immediately downstream. No significant works were completed, and it is thought this was the site of a 'scratching', where promising surface material was located, but did not extend to depth.

8.16 'Unnamed 7' (approx. GREF: 347850E, 5362100N)

Traversing of the area marked for this working failed to find any trace of disturbance. It is thought that it was a minor alluvial operation due to the proximity of an elbow in the creek, combined with a marshy area with potential to hold large amounts of sediment.

8.17 'Unnamed 8' (approx. GREF: 346250E, 5363300N)

This prospect was not located. Heavy revegetation after fires hampered the search despite the presence of lines oriented N-S cut through the vegetation within the last 3 years by an unknown party.

8.18 Carn Brea (approx. GREF: 343800E, 5361850N)

This prospect was not located after a brief search. Details of previous operations here are also unknown, although Waterhouse (1916) notes there was once a 10-head battery here, and that very minor amounts of molybdenite were also found here. Minor sulfides (possibly molybdenite) were found in a small creek a short distance to the south of the marked location. Rock float (#550650) and sediment (#550601) samples were taken from this creek.

8.19 Other Workings/Features

Other potential workings observed did not appear to go beyond scratchings. These were mostly observed around the base of Mt Heemskirk, most notably near the McGuinness working. Several shallow costeans were encountered, these typically being around 40cm deep and extending across hills for 10's of metres. Their original depths are not considered likely to have been much greater than present, and were most likely attempting to find continuations of veining or alterations within the granite. A man-made mound consisting mostly of angular white quartz fragments was found on top of a broad rise downhill from the McGuinness and Morrisby workings, but no trace of any other workings were found in the vicinity.

9. Discussion

Erosional processes have removed granite from many parts of the Heemskirk batholith, with the landscape dominated by glacial features. The largest of these is the valley between Mt Heemskirk and North Heemskirk Spur, and the most successful alluvial operations in the area (St Dizier and the currently operating Laffer's) are found a short distance outside the lease near the end of this valley. Presuming Di Scala (1974) is correct, glacial action may have carved much of the tin-bearing rock away to be deposited in alluvial settings such as the plains to the north of Mt Heemskirk. As noted by others, ore not removed by glaciations has only been found in appreciable quantities near surface, particularly in areas not covered by red granite. There is a possibility that other stanniferous deposits may occur in areas overlain by red granite and have no surface signature. Such deposits might be found using detailed ground electromagnetic and magnetic surveys, and the generally open terrain is suited to such activities. Detailed aerial geophysics data sets from MRT may also indicate places of interest.

Wells (1978) claims that tin-bearing granite in the area tends to also host small amounts of magnetite, which is absent in non-tin bearing rocks. However as discussed earlier, individual tin lodes have proven to be quite small, and the costs associated with exploration and extraction would likely make any non-alluvial tin mining operation uneconomic. In the case of greisen veins, the IP and self-potential methods are known to have reasonable success. An additional difficulty in locating mineralised zones is the apparent lack of any trend for mineralisation, which mostly occurs within randomly oriented joints and fractures within the granite.

Other metals which have been found within the lease area are silver and molybdenum. The mode of occurrence of silver is unknown, with old reports simply mentioning quantities of silver removed.

However, all mention of silver has been associated with tin deposits, and hence the same reasoning as for tin would apply for the viability of a silver project.

Molybdenum has only been recorded in two locations within the lease, both near the western margin of the lease, and in alluvial settings. There is a possibility that the source of this varies from that of tin, and this is something that should be investigated in greater detail.

Zones of alteration within the granite should be mapped out in detail, as it was noted that the alteration around the Peripatetic Mine was similar to that observed in the vicinity of the 'Unnamed 5' working to the west of South Gap Creek, with this trend of alteration extending to the south-east, crossing the 4wd track and continuing for an unknown distance. Apart from the working which was not found, no exploration work is known to have been undertaken in this area.

The presence of radioactive minerals such as monazite remains possible, with Geoscience Australia radiometric data showing high surface uranium activity within the red granite, particularly to the east of St Dizier Creek and South Gap Creek. However, McKay & Meizitis (2001) note that uranium deposits within intrusive bodies are dominantly large, low grade bodies.

Given that two workings were found which are not noted on MRT maps, it is likely that there are many more within the lease area. Some of these workings could contain valuable information on the general distribution of mineralisation within the lease area. Aside from greisens, which are weathered relatively easily, it is likely that the majority of workings are located on or near ridges of some description, as the most common quartz-tourmaline vein hosts are more resistant to weathering than the granitic country rock.

Out of the workings inspected, the McGuinness and Iron Blow workings were the only ones that showed strong mineralisation. No information is known about quantity or grades extracted from these workings, apart from a mention in Waterhouse (1916) that 1.5 tonnes of 'tin' ore was sent to Hobart from the Iron Blow, only to be later found that it was titaniferous iron ore. If Wells' (1978) assumptions are correct, it is possible that the Iron Blow could represent the cupola of the white granite intrusion, and it is unknown if the original miners reached the base of the haematitic body. Also, titanium grades from the extracted ore are unknown. Observations during field work have raised the possibility that it may be a large xenolith which has been largely replaced with haematite and tourmaline.

It is unknown if work ceased at the McGuinness working because the lode ended, or because of poor economics.

Quartz-tourmaline pods and veins which were noted during the course of field work are certain to have been picked over by original prospectors to the area, with all of these having the appearance of being sampled or broken, so few of these were sampled.

10. Conclusions

The Mt Heemskirk area was, for a short period in the late 19th century, a centre for Tasmanian mining. This changed when the generally small size of lodes became apparent, and has since seen little activity, particularly within the area of EL18/2011. During a 5 day reconnaissance of the area many old workings in the area were inspected, little new information was gained.

A more extensive search on zones of alteration similar to that observed at the Peripatetic Mine, especially around the South Gap Creek area, is warranted as activity in the area for the last 80+ years has been concentrated almost solely on the Peripatetic Mine. Sediment samples should not be heavily relied on, as old prospectors conducted extensive sluicing operations throughout the area, although anomalous results should still be expected for any real shows.

The McGuinness working contains significant mineralisation, and on surface observations would appear the most promising working in the area, but ore grades are not known.

The Iron Blow is of major interest, with high potential for mineralisation in the vicinity in addition to the potential of titanium hosted by the haematitic rock if it is the cupola of the white granite.

Minor amounts of green tourmaline were noted at several of the workings, as were small amounts of a sulfide which could be molybdenite a short distance to the south of Granite Creek.

No signs of copper, bismuth or uranium minerals were observed, but given the short timeframe to cover such a large area, little time was spent searching in specific areas.

11. Recommendations

Several recommendations can be made for future work:

1. Purchase of MRT detailed magnetic and radiometric data.

2. Further investigation of the extensive argillic alteration system to the west of South Gap Creek.

3. Thorough investigation of the Iron Blow and its' general vicinity to attempt to define whether it is the white granite cupola of a large xenolith.

4. A stream sediment sampling program of all drainages in the area would provide an initial regional geochemical dataset.

No other recommendations can be made prior to receiving results from sampling, for which analyses for base metals, gold, silver, platinum, titanium and tungsten are advised. Upon receiving these results, a decision should be made in regards to target commodities to enable a more specific exploration program.

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Appendix 1: Sample Record Sheets

Sample	Easting	Northing	Type	Comment
550601	343411.3	5361452	Sediment	Below creek confluence. Quartz and tourmaline sediment. Moderate sulfide in grey feldspathic clasts >4mm.
550602	343323.3	5362302	Sediment	Elbow of creek at base of large sediment bank
550603	345865.3	5362723	Sediment	Much pink feldspar, little tourmaline
550604	346343.3	5360962	Sediment	South Gap Creek sediment sample. Taken immediately upstream of crossing
550605	342635.3	5364661	Sediment	Sediment sample from immediately below Peripatetic Alluvial working.
550606	342180.3	5365718	Sediment	Amy Creek alluvial working, located on sharp elbow of creek, deeply incised, minor waste rock piles. Sample on elbow, darker than Peripatetic Creek sample.
550607	345918.3	5364696	Sediment	Sediment sample Gap Creek. To immediate north of track crossing.
550608	343802.3	5364358	Sediment	Sediment sample on second elbow, 10m downstream from quartz-tourmaline vein.
550609	345922.3	5366711	Sediment	Western Upper St Dizier Creek Workings. Very overgrown, same setting as Eastern working. Alluvium removed from near elbow. Sediment sample at elbow.
550610	346652.3	5365422	Sediment	Sample downstream of McGuinness working. Much chloritised rock, generally sub-angular.
550650	343411.3	5361452	Rock	Below creek confluence. Moderate sulfide (molybdenum?) in grey feldspathic clasts >4mm.
550651	343282.3	5362124	Rock	Aplite dyke with fine tourmaline striking 314 degrees. Altered, slightly clayey margins. 10% fine tourmaline in dyke.
550652	343813.3	5362554	Rock	Float. Coarse granite, highly sericite altered, with tourmaline
550653	345460.3	5361886	Rock	Much quartz-tourmaline rubble. Very fine to coarse tourmaline and quartz crystals.
550654	345922.3	5362217	Rock	Randomly striking, vertically dipping aplite veins <10cm, variably replaced by quartz and tourmaline. Granite groundmass fine to medium, slightly altered.
550655	342822.3	5364900	Rock	Peripatetic Mine. Sub-vertical fault oriented approx 324. Chip sample from mouth of adit 2. Extremely altered rock, feldspar decomposed to white clay.
550656	345772.3	5365650	Rock	Shaft of unmarked working. Rock sample from waste rock pile. Variable silicification, chloritisation. Partly vuggy. Little feldspar in waste, less tourmaline than surrounding rubble.
550657	344453.3	5363849	Rock	Fisher and Smith working. Shaft flooded, cut directly into 0.8m wide quartz-tourmaline vein striking 84/204. Approx 50% fine tourmaline in vein. Waste rock pile contains coarse quartz and tourmaline, some green. Sericite alteration of granite. Sample representative of all rocks.

550658	344454.3	5363676	Rock	Fisher and Smith working. Second shaft located on same vein. Variable width to 60cm. Same rock and sample composition as 550657.
550659	343814.3	5364556	Rock	Unnamed' working. Shaft on vertical quartz-tourmaline vein striking 179. Banded, repetitive. 1.5m vein intersecting from west, not continuing to the east. Waste rock mostly quartz-tourmaline. Wall rock altered, feldspar weathering to clay. Some Fe-stain. Sample from waste rock pile, mostly sericite altered wall rock.
550660	346907.3	5365324	Rock	McGuinness working. Adit striking approx 322 degrees along quartz-tourmaline vein dipping 80. Some vein hosting much arsenopyrite, minor green tourmaline. Wall rock highly altered granite: Loose, brown clayey material with remnant quartz, tourmaline crystals. Sample from mouth of adit containing 50% pyritic vein, 50% argillised wall rock.
550661	347295.3	5366032	Rock	Iron Blow. Massive black/dark grey rock, a mix of tourmaline, tourmaline-quartz and haematite bands. Some vuggy quartz. 3% magnetite, 37% haematite, 40% tourmaline, 20% quartz. Representative chip sample.
550662	347287.3	5366052	Rock	Iron Blow shaft. Highly chloritised and sericitised granitic waste rock. Some feldspar rounded, altered to clay. Approx 20% tourmaline, 50% quartz, 30% feldspar and clay. Sample from waste rock pile, argillised, sericitised wall rock.

Appendix 2 (digital): MRT Reports