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PROSPECT 7602

CSR LIMITED

MINERALS EXPLORATION AND DEVELOPMENT GROUP

PAST EXPLORATION

WITHIN THE AREA OF

EXPLORATION LICENCE 15/76

DUNDAS, TASMANIA

VOLUME I

EMR 73/87

<b>MINES</b>	
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KEYWORDS

TASMANIA

TIN

COPPER

ZINC

SILVER

EL 15/76

SK55-5

EXPLORATION

MINERALISATION

GOLD

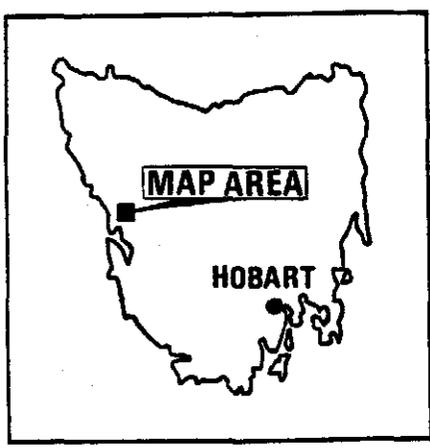
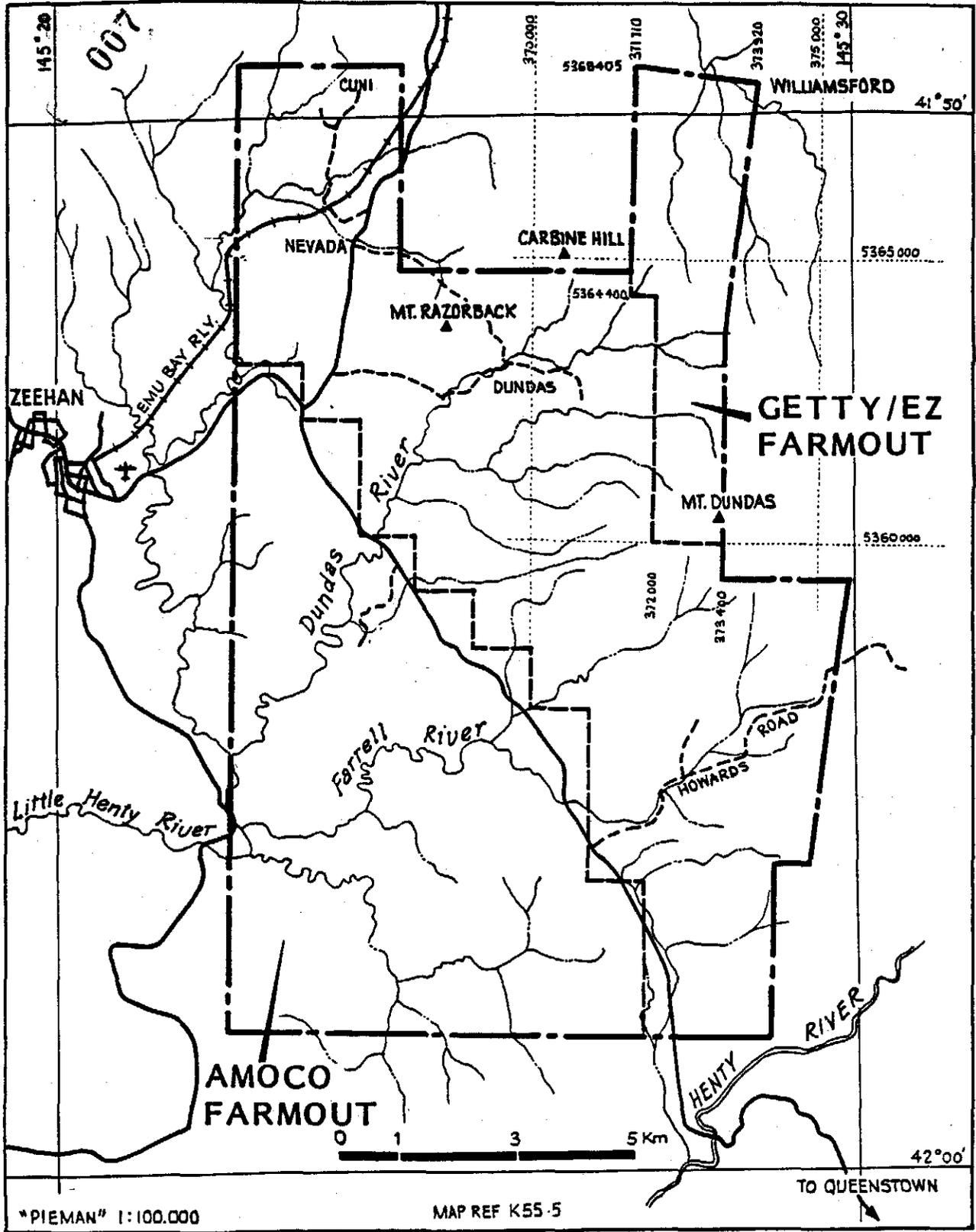
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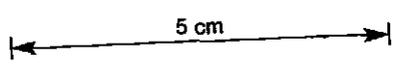
HISTORY

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**FIG. 1**  
**LOCATION MAP**

**GETTY/EZ**  
**FARMOUT**  
**AMOCO**  
**FARMOUT**



**E.L. 15/76 DUNDAS, TASMANIA**

## 1. INTRODUCTION

Exploration Licence 15/76 (EL 15/76) was granted to CSR Limited on 2nd August, 1976. This Licence covered an area of 145 km<sup>2</sup>, situated about 4 km east of Zeehan on the west coast of Tasmania (Figure 1). The Licence extends south from Melba Flats and Williamsford to the Henty River and west from Mt. Dundas to the Little Henty River. In August 1984, the Licence was reduced to 124 km<sup>2</sup> under the new Department of Mines Exploration Licence conditions.

This area contains small silver/lead/zinc deposits at Dundas (central), a small tin deposit at Mt. Razorback (central north), small copper/nickel shows at Cuni (northwest), small complex lead/antimony-bearing sulphides (with Sn, Ag, Bi, W) at Montezuma (northeast) and several small lead/zinc/fluorite shows at Mariposa (southwest). There are also possibilities of the occurrence of silver/lead/zinc with tin sulphides in the upper units of the Oonah Formation (Oonah Mine-type), copper/zinc/lead/silver/tin associations in the acid volcanics of the Dundas Group and Renison-type replacement tin deposits. Consequently, the area has been intensely prospected.

Since 1976, CSR Limited has undertaken exploration to evaluate the Licence. Prior to 1976, the area was held by many companies and individuals as well as being the subject of government research.

This report summarises all previous exploration data from the area covered by EL 15/76.

## 2. SUMMARY

A great quantity of exploration data are available for the area of EL 15/76.

Regional EM, magnetic, Afmag, and Turair EM surveys have been completed over most of the area. Some regional surveys had been completed on several occasions.

Local investigations of anomalous areas include ground EM, SP, magnetic, IP, Gun EM, Turam EM, gravity and soil stream and rock-chip geochemistry. Most of these investigations have concentrated on areas of previous mining although some surveys cover large areas away from all past activity. Many later surveys are repeats of the earlier surveys.

Results of past exploration are discouraging with no economic mineralisation suggested at or near the surface.

New exploration concepts are required if exploration of EL 15/76 is to continue. Such a technique could be trace element studies of drill core and rock outcrop to determine if geochemical haloes are present. These may outline a drill target for a deep-seated economic tin deposit.

### 3. LOCATION AND ACCESS

EL 15/76 is situated 4 km east of Zeehan (Figure 1) in the Land District of Montagu on the west coast of Tasmania. The sealed Murchinson Highway diagonally bisects the Licence from the Cuni area (northwest) to the southeast corner. A series of unsealed roads, tracks and old tramways give reasonable access to most areas of the Licence.

All but the northeast of the Licence is drained by tributaries of the westerly-flowing Little Henty River system. The northeastern corner is drained by the headwaters of the Ring River which flows into the westerly-draining Pieman River system. Most of the streams are small and steep; typically "young" streams. On the flat areas of the easily-eroded Gordon Limestone (southeast corner), the streams form swamps.

Apart from the Ordovician Gordon Limestone (10% of the Licence area), the southeast quarter of the Licence is underlain by Siluro-Devonian shales, siltstones, slates and quartzites of the Eldon Group. The remainder of the Licence is underlain by Upper Precambrian to Middle Cambrian mudstones, siltstones, sandstones, mud flow conglomerates, chert conglomerates and basic volcanics of the Success Creek and Dundas Groups and the Crimson Creek and Oonah Formations. In the north are major occurrences (5%) of gabbros, dolerites, serpentinites and pyroxenites of the Serpentine Hill ultramafic complex.

The vegetation cover in areas of the Silurian, Devonian and Ordovician rocks is generally buttongrass with local areas of dense ti-tree/sword grass/Bowrah scrub. The remainder of the Licence is covered by cool temperate rainforest with patches of dense "horizontal" scrub. Minor areas of open grasslands occur in the cleared areas at Dundas and Cuni.

#### 4. MINING HISTORY

##### 4.1 General

Traces of tin and gold were found at Mt. Heemskirk in 1876. Several leases were pegged before the first discovery of small vein tin stringers at South Heemskirk in 1879. This field collapsed in 1884 after it was found that the orebodies were small and widely scattered.

Meanwhile, exploratory work from the Heemskirk area had located traces of gold and argentiferous galena and a silver/lead orebody at Zeehan in 1882. Development around Zeehan was slow until 1887 when galena was discovered at the Silver Queen Mine. Intense prospecting and development followed leading to the discovery of the Dundas field in 1889 (galena) and the Cuni/Melba field in 1893 (copper/nickel). Tin (1890) and gold (1891) were found in the Ring River. Tin-bearing sulphide ore was discovered at Renison Bell about 1899 during the construction of the Emu Bay Railway.

Most mining in the Dundas and Zeehan fields ceased at the start of World War I. The Renison Bell tin sulphide deposit represents the only major development this century.

##### 4.2 Dundas Field

###### 4.2.1 Dundas

Within a year of the 1889 Dundas galena discovery, the area was covered by leases. Dundas township had been built by 1900 following the formation of several exploration and mining syndicates. Most mining activity ceased by 1913. Minor mining occurred at the South Comet Mine between 1927 and 1949 and in recent years. Local prospectors still produce crocoite,

cerussite and dundasite specimens from the Adelaide Mine area. The main mines in the area were:

- (a) Comet-Maestri (1.6 km east of Dundas) - worked between 1889 and 1913 (1907 underground) by Maestri Broken Hill Silver Mining Company and Comet Silver Mining Company. The old dumps have been reworked. Argentiferous galena, cerussite with siderite, sphalerite, iron, manganese and dolomite occurred as lenses along a north-northeast-trending shear zone in dark shales/siltstones of the Oonah Formation. Production totalled 183,000 tons of ore releasing 21,850 tons of lead and 1,510,000 ounces of silver.
- (b) South Comet Mine Area (2 km south of the Comet-Maestri Mine) - worked between 1911 and 1949 by a multitude of interests. Separate bands of galena and sphalerite with minor jamesonite, pyrite, chalcopyrite and siderite occur as steeply-dipping ( $65^{\circ}\text{W}$  to  $85^{\circ}\text{E}$ ) lenses along a north-northwest-trending transcurrent fault in breccia conglomerates, sandstones and siltstones of the Dundas Group. At least 27,718 ounces of silver, 428 tons of lead and 618 tons of zinc were produced.
- (c) Kosminsky Mine (between Comet Maestri and South Comet Mines) - worked between 1890 and 1940 by many groups and individuals. Mineralised lodes occur in two north-northwest trending faults in black graphitic slates of the Oonah Formation. To the south, lodes are terminated by a fault (along South Comet Creek). As the lodes have similar mineralogy to the South Comet Lodes, they probably represent South Comet faulted extensions. Production was small, totalling only

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20 tons of ore releasing 480 ounces of silver and 10 tons of lead.

- (d) Adelaide Mine (1.6 km south east of Dundas) including the Red Lead Mine and Anderson's Reward. Worked between 1890 and 1895, 1897 and 1915, 1917 and 1924, 1926 and 1930, and finally from 1957 (for crystal specimens). Three dipping lodes ( $60^{\circ}\text{E}$ ) occur along a surface gossan developed on the serpentinitised contact of an ultrabasic intruding Oonah Formation. The gossans average 10 m wide and extend for 130 m along the north-northwest contact zone. At the surface, the ferromanganese gossans contain crocoite, melanocroite, cerussite, dundasite and phosgenite changing at depth to galena, sphalerite, pyrite and jamesonite with mangano-siderite, dolomite and serpentinite. Production from the area totalled 8,561 tons of ore releasing 1,860 tons of lead and 186,000 ounces of silver.
- (e) West Comet Mine (1.4 km east of Dundas) - worked between 1888 and 1909 with later minor activity. The ferromanganese gossan lodes containing crocoite and rich shoots of silver, chlorite and galena occur in a puggy clay along the silicified contact of serpentinite intrusion into black Oonah Formation shales. About 60,500 tons of ore produced 2,700 tons of lead and 270,000 ounces of silver.

#### 4.2.2 Razorback

During exploration activity in 1909, alluvial cassiterite was located near Dundas. Its source was traced to a fissure replacement-type lode along the

faulted junction of serpentinitised ultrabasic pyroxenite with the shales, greywackes and conglomerates of the Middle Cambrian Dundas Group at Mt. Razorback.

The lode contains fine cassiterite with pyrrhotite, pyrite, arsenopyrite and chalcopyrite in manganese siderite and quartz. This lode is similar in mineralogy and style to the Renison Mine orebodies.

Mining of the lode occurred intermittently with a total production of 46 1/2 tons of metallic tin.

#### 4.2.3 North Dundas

Exploration activity around Dundas in 1891 located complex sulphide occurrences in the Northeast Dundas-Montezuma area. These sulphides occur in small fissure veins parallel to the north-northeast and north-northwest trend of tight folds and faulting in Cambrian shales, siltstones, greywackes and breccia conglomerates with interbedded andesitic/basaltic lavas and tuffs. Four vein types were noted:

- (i) Tetrahedrite and chalcopyrite with pyrite and possibly arsenopyrite, jamesonite, galena, sphalerite and bismuthinite in a gangue of siderite, and quartz. This vein type occurs at the Ring Valley-Fahlore Mine, Southwest Curtin-Davis, Curtin-Davis, No. 1 Curtin-Davis, Black Boz, Bonnie Dundee and Ramsdale.
- (ii) Galena, sphalerite and pyrite possibly with jamesonite and tetrahedrite in a gangue of siderite, dolomite and quartz. This type occurs at the Kapi, Melba and Great Northern Creek Mines.

- (iii) Calcopryrite, bismuthinite, and pyrite possibly with pyrrhotite, arsenopyrite and galena in a siderite gangue. This type occurs at the Hecla Mine.
- (iv) Pyrrhotite, arsenopyrite and cassiterite with chalcopryrite and pyrite occurs at the Frazer Mine.

These veins were worked intermittently between 1891 and 1920 at many small mines and prospects. The main mines within EL 15/76 were:

- (a) Curtin Davis - worked between 1893 and 1903 to produce 922 tons of ore with 32 tons of copper, 10 tons of lead and 27,000 ounces of silver.
- (b) Southwest Curtin Davis - worked between 1893 and 1902 to extract 600 tons of ore with 65 tons of copper and 90,000 ounces of silver.
- (c) South Curtin Davis - worked between 1893 and 1898 and from 1899 until 1902. 216 tons of fahl ore and galena were extracted to produce 35,000 ounces of silver, 35 tons of copper and 8 tons of lead during that latter period.
- (d) No. 1 Curtin Davis - worked between 1896 and 1900 to produce 37 tons of ore with 4,255 ounces of silver and 3.7 tons of copper.
- (e) Block 302/Block 291 - very poor grades with only 26 tons of ore being extracted to produce 2,211 ounces of silver and 1 ton of copper.
- (f) Ramsdale Prospect - studied briefly in 1925 and 1931 but not worked due to the small, irregular, low-grade nature of the veins.

- (g) Evenden Prospect - studied briefly in 1925 and found to be very low-grade.
- (h) Hecla Mine - worked by adit but abandoned prior to 1898. No production records are available but the deposit appears very low-grade.
- (i) Frazer Mine - worked between 1895 and 1922. About 1,000 tons of ore was extracted to produce 25 tons of copper and 170 tons of arsenic with minor silver and tin.

#### 4.3 Cuni Field

Copper and nickel rewards were awarded to prospectors of the Cuni Field in 1893. Further investigations also located the McKimmie lead/zinc mineralisation in 1893. Little development occurred until 1909 when mining of the copper/nickel deposits commenced and lead veins were located at Lead Blocks and Allen's Prospect.

##### 4.3.1 Copper/Nickel Deposits

Mining ceased at Cuni in 1914 when the war closed European markets. Between 1909 and 1914, about 3,476 tons of ore with 8-17% nickel and 4-14% copper was produced. Small-scale mining between 1928 and 1932 at North Cuni produced a further 204 tons of nickel ore. The Vaudeau workings were re-opened in 1938 and 1948 for short periods.

The area contains Lower/Middle Cambrian Crimson Creek Formation shales, siltstones and greywackes which have been intruded by serpentinitised gabbros and pyroxenites. The mineralisation occurs as shoots in, or adjacent to, the basic sills (metasomatised, fine to medium-grained dolerite). Two ore types have been recognised:

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- (i) nickel as pentlandite and violarite with pyrrhotite and up to 20% pyrite and chalcopyrite - occur at North and South Cuni.
- (ii) nickel as millerite intergrown with chalcopyrite and pyrite - occurs as a high-grade deposit at Nickel Reward and Deveraux's and as a low-grade deposit at North Cuni.

The main mines and prospects in the area are as follows:

- (a) Genet's Winze - only worked to a depth of 3 m in 1929-31. Drilling suggested about 15,000 tons of ore with 4-6% nickel and 2-3% copper, occurring to a depth of 30 m.
- (b) North Cuni - worked to a depth of 24 m in 1912-14 and 1929-32. A maximum of 3,500 tons of ore with 17% nickel and 6% copper could still exist.
- (c) South Cuni - worked to a depth of 22 m in 1909-14 with only minor ore still existing.
- (d) Blowfly - worked out 20 m long ore zone by 1914.
- (e) Mosquito - worked out by 1914.
- (f) Vaudeau - worked in 1912-14 and for short periods in 1938-1948. The ore extended to a depth of 37 m. All known lode was extracted.
- (g) Nickel Reward - small lodes of sub-economic ore were extracted until 1914. Drilling showed no economic ore even though SP surveys (see below) showed 7 or 8 orebodies extending to 30 m along strike and at unknown depth.

- (h) Devereaux Prospect - no production from a low-grade orebody of limited extent.

Apart from the above mining activity, this area has been studied intermittently in detail by various government bodies (see Section 5.1).

#### 4.3.2 Lead/Zinc Deposits

Lead/zinc mineralisation is parallel to but east of the copper/nickel mineralisation. Host rocks for the lead/zinc ore are black, grey, green and purple shales of the Cambrian Crimson Creek Formation. The galena and sphalerite veins, parallel to the north-south strike of the host rocks, are of Devonian age.

The main mines and prospects are:

- (a) Lead Blocks - five galena and sphalerite veins in a siderite and quartz gangue were worked in 1911-14. 2,136 tons of ore from depths to 44 m were extracted for a loss of £13,000. Small amounts of ore were extracted in 1915-16, 1935-36 and 1947. Total production was 2,180 tons of ore with 120,000 ounces of silver and 1,420 tons of lead.
- (b) Allen Prospect - south of Lead Blocks. Small galena veins petered out at a very shallow depth.
- (c) McKinnie - around 1896 two galena veins were worked by open trenching to a depth of 2 m and over a strike length of 3 m. A shaft was sunk but production ceased by 1902 due to small, low-grade ore shoot occurrences.

#### 4.4 Mariposa Area

In 1890, a line of silver/lead/zinc mineralisation in the Black Jacks-Mariposa area was located. Several small mines (Mariposa, Alameda, Martini, South Nevada and Black Jacks) were opened. All but the Mariposa closed by 1893. The Mariposa closed in 1901, but re-opened for short periods in 1905-11, 1923-24 and 1927-31.

The ore shoots were fissure lodes in the Ordovician Gordon Limestone near the contact with the Silurian Grotty Quartzite. East of the main mineralised zone is a quartz/pyrite line along the faulted contact of the Cambrian Dundas Group.

The Mariposa line mineralisation is dominantly galena with siderite and calcite. Limonite gossans with cerussite and galena occur on the surface.

Similar fault-controlled galena mineralisation occurs to the southeast at Sunny Corner and Bannockburn. Although small mines and workings existed in this area, no production records are available.

## 5. EXPLORATION HISTORY

Major mining and exploration companies became interested in the EL 15/76 area in 1959 when Rio Tinto obtained a large exploration licence covering most of northwest Tasmania. Between the period of active mining around 1900 and the start of large-scale exploration in 1959, small miners and government bodies conducted small localised exploration. Most of this small-scale exploration concentrated on increasing the ore reserves at old mines and prospects.

### 5.1 Government Exploration (including localised exploration by small companies)

#### 5.1.1 Dundas Field

##### (a) Dundas

In 1930, the Tasmanian Department of Mines drilled three holes designed to intersect the West Comet lode beneath the main workings (Paterson, 1970). The holes (sited in the western mine flank) were between 100-130 m long. Core recovery was poor but each hole appeared to intersect gossanous horizons. The drill logs (Paterson, 1970) showed lode horizons dipping west at 60-70°. No assays are available.

The Australian Mining and Smelting Company undertook a study of the Comet-Maestri mine in 1949 in order to negotiate an option over ML 75M/46. Finucane (1947) suggested five drill holes were required to test ore extensions at depth. However, this study also indicated many possible mining problems with the deposit. The option was not exercised.

North Broken Hill Pty. Ltd. followed Finucane's recommendations and attempted to drill three holes in 1952 (Discala, 1974). Two holes were abandoned after caving-in. The third hole reached 200 m, but no results are available.

In 1961, the Tasmanian Department of Mines further evaluated the Comet-Maestri mine and recommended three holes to test the northern extension of the Comet Lode in the Maestri siding area (MacLeod, 1962). These holes were drilled in 1962 (MacLeod, 1962). Core recovery was poor, but assays agreed with Finucane's surface sampling, showing less than 1 ounce of Ag and little or no Pb.

The Great South Comet mine was examined and evaluated by the Tasmanian Department of Mines (on behalf of the Lead and Nickel Company N.L.) in 1950. After surveying, mapping and sampling the underground workings, Taylor (1950) estimated reserves of 60,000 tons of ore containing 8% Pb, 7.4% Zn and 8 ounces/ton Ag.

(b) Razorback

The Tasmanian Department of Mines investigated and evaluated the Razorback/Grand Prize mine area (Taylor, 1951). Three drill holes were recommended near the Razorback Mine. These holes were drilled in 1958-59 by the Department of Mines (Blissett and Gulline, 1960). Although core recovery was poor, assays showed irregular fissure replacement mineralisation containing fine cassiterite with pyrrhotite, pyrite, arsenopyrite and chalcopyrite in quartz and manganiferous siderite.

Early in 1960, the Bureau of Mineral Resources located several anomalies during detailed electromagnetic, SP and magnetic surveys of the Mt. Razorback-Grand Prize mines area (Langron and Horvath, 1962). Several of these anomalies were drilled by the Mines Department (MacLeod and Jack, 1962). The magnetic anomalies were caused by magnetite veins, but no mineralisation to explain the Turam EM or SP anomalies was intersected.

#### 5.1.2 Cuni Area

The first recorded systematic exploration of the Cuni Cu/Ni or Pb/Zn fields was in 1928 when the Imperial Geophysical Experimental Survey made electrical (equipotential line, A.C. potential ratio and high frequency EM methods) and magnetic surveys over the northern section (Broughton-Edge and Laby, 1931). Resultant anomalies were tested by boreholes and trenches sunk by the Tasmanian Department of Mines in 1930 and 1939-40. Holes 2, 3 and 4 were to the northeast of Genet's Winze; holes 1, 5, 6, 7, and 8 were near the South Cuni Shelf; holes 9 and 19 were east of Genet's Winze and holes 11 to 17 were near Vaudeau's shaft (Taylor and Burger, 1952). This drilling showed the Cu/Ni ore occurred as shoots along the footwall (western) of the eastern basic intrusion. These shoots were 20 to 50 m long, up to 2 m wide, but less than 60 m in depth (Blake, 1952).

This increased potential for the area resulted in the BMR conducting self potential and electromagnetic surveys in 1952-53 around the Cuni North and Cuni South shafts. Five strong SP anomalies were located and recommended for further investigation (Keunecke, 1952). Eagle Metals and Industrial Products drilled four of

these anomalies (EM1 to EM4) in 1953 with inconclusive results due to poor core and sludge recovery. EM5 was abandoned and the option over the Montana Silver Lead N.L. leases was allowed to lapse.

Montana Silver Lead continued the evaluation of the geophysical anomalies by drilling 18 holes (M6 to M23, drilled by the Tasmanian Mines Department) and digging numerous trenches in 1955-57. Holes M6-M9 were drilled at North Cuni, M10-M12 at Deveraux Prospect, M13-M22 at Nickel Prospect and M23 in the serpentinite belt, south of Nickel Reward. This drilling and costeaning included the evaluation of several small to medium anomalies located by the BMR in a concurrent SP and EM survey over the southern Cuni area (Horvath and O'Connor, 1958).

The results of this geophysical and drilling evaluation of the North Cuni to Deveraux Prospect area confirmed earlier investigations. Only small, high-grade ore shoots occurred to a depth of 30 m along the footwall of a metasomatised dolerite dyke. Further drilling of geophysical targets was recommended (Horvath, 1957).

### 5.1.3 Mariposa Area

The first recorded systematic exploration of the Mariposa Mine area was by North Broken Hill in 1946-51. Records of this work are sketchy. After review of the old mine workings, North Broken Hill drilled 3 holes beneath the Mariposa Mine in 1947. A further 8 holes were drilled in the vicinity of the mine in 1950. This drilling showed the existence of a near vertical orebody 460 feet long and 5.6 feet wide, containing 9.2% Pb, 1.7% Zn and 4.7 ounces of silver. To the east of the southern part of this ore lens was a second narrow ore zone (Garretty, 1951).

TABLE 1 : PREVIOUS LICENCES WITHIN EL 15/76 BOUNDARIES

LICENCE NO.	LICENCE HOLDER	POSITION OF LICENCE RELATIVE TO EL 15/76	PERIOD OF LICENCE
EL 4/59 EL 5/63	Rio Tinto Costigan Mines then to Comstaff	All northwest Tasmania Southern part covered, central and northern part of EL 15/76. Reduced in area gradually	3/4/59 to 3/4/63 1963 to 1964 Comstaff 30/6/64 to 30/12/67 EL 7/68
SPL 406	Clutha then R.P.J. Weedon	Southern part covered, central northern part of EL 15/76	21/5/64 to 21/6/65 SPL 11
SPL 11	R.P.J. Weedon worked by Placer	As above	21/6/65 to 21/12/66 SPL 27
SPL 27	Renison	As above	19/1/67 to 19/7/73 part of SPL 120
SPL 120 (I)	Minops	As above	July 1973 to 15/6/75 reduced to Mining Lease
SPL 13	Placer	The far eastern section covered a small western part of EL 15/76	21/7/64 to 21/12/66 SPL 28
SPL 28	Renison	As above	19/1/67 to 19/7/67 included in EL 6/69 24/1/68
EL 2/67*	Utah	The northeastern corner covered a small part of the south of EL 15/76	
EL 12/65*	Pickands Mather	The northwestern corner covered a small part of the south of EL 15/76	21/12/68 - part EL 6/69
EL 6/69	A.R. Dobson	The eastern part covered the western and southern parts of EL 15/76	13/3/69 to 13/9/69 part to EL 44/70 and part to SPL 89
EL 44/70	A.R. Dobson	The eastern part covered the western edge of EL 15/76	3/11/70 to 3/11/72
SPL 89	Texins	Covered the southern part of EL 15/76	15/7/70? to 15/1/71 EL 7/68
SPL 46	McIntyre Mines	Covered the central part of EL	13/10/68 to 30/4/72 SPL 113
SPL 113	Texins	As above	22/6/72 to 22/12/72 EL 7/68
EL 7/68	Texins	Initially the western part covered the central part of EL 15/76. Then took in SPL 89 and SPL 113	23/8/68 to 23/2/74
SPL 20	Renison/Mt. Lyell	Covered the northeast corner of EL 15/76	19/8/66 to 16/2/71 SPL 99
SPL 99	I.M. Tucker	As above	28/10/71 to 28/10/12 part of SPL 120
SPL 120 (II)	Minops	As above	15/12/61 to 15/6/75 reduced to Mining Lease
EL 2/62	EZ	Southern part. Covered the northwest corner of EL 15/76	12/9/62 to 12/9/73 southern part to SPL 127
SPL 127	L.J.C. Say	Covered the northwest corner of EL 15/76	30/10/73 to 30/4/74
SPL 133	Minops	Covered the central northern part of EL 15/76 (south of SPL 120 (I))	28/6/74 to 28/6/75 reduced to part of Mining Lease

Concurrent with the drilling was a BMR magnetic and gravity survey in the vicinity of the Mariposa Mine (Loh, 1950). No definite magnetic anomalies were evident although disturbances near the shafts and along the inferred mineralised zone were noted. These disturbances may have been cultural. The gravity survey showed 7 anomalous zones (Loh, 1950). Zone 1 reflected the line of known mineralised lenses with Zone 2 being parallel, but about 30 m to the east and also representing a mineralised zone (drill hole 10). Anomalies 3, 4, and 5 appeared to relate to terrain correction problems while anomaly 6 could have represented mineralisation at a depth of 60-80 m on the sandstone/limestone contact. The negative Anomaly 7 possibly represented a cavity in the limestone.

## 5.2 Exploration Companies

Between 1958 and 1976 (when EL 15/76 was pegged), a total of 22 Exploration Licences and Special Purpose Licences were held within the boundaries of EL 15/76 (Table 1). A summary of the work completed (DRG No. 7602-189) on each Licence and the results follow.

### 5.2.1 Rio Tinto Australia (EL 4/59)

EL 4/59, held by Rio Tinto Australia Pty. Ltd., covered most of northwest Tasmania (including EL 15/76). This area was traversed by airborne magnetic and electromagnetic surveys (McCarthy, 1957). Follow-up work of resultant anomalies led to the investigation (mapping) of the Comet, South Comet and Kosminsky mines (McKenna, 1958) and the southwest Mariposa mine area (Boniwell, 1959).

The Dundas/Comet investigations concluded that the only significant mineralisation was the 7,000 tons of 8.6% Pb, 19.1% Zn, 0.09% Cu and 5.7 ounce/ton Ag at

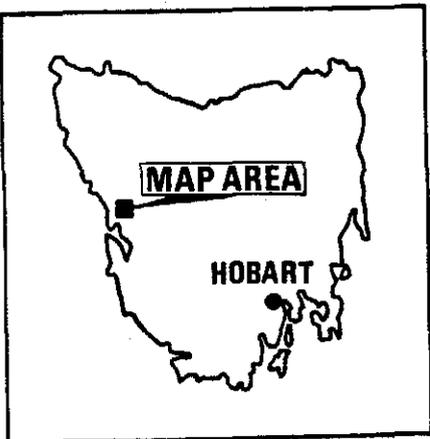
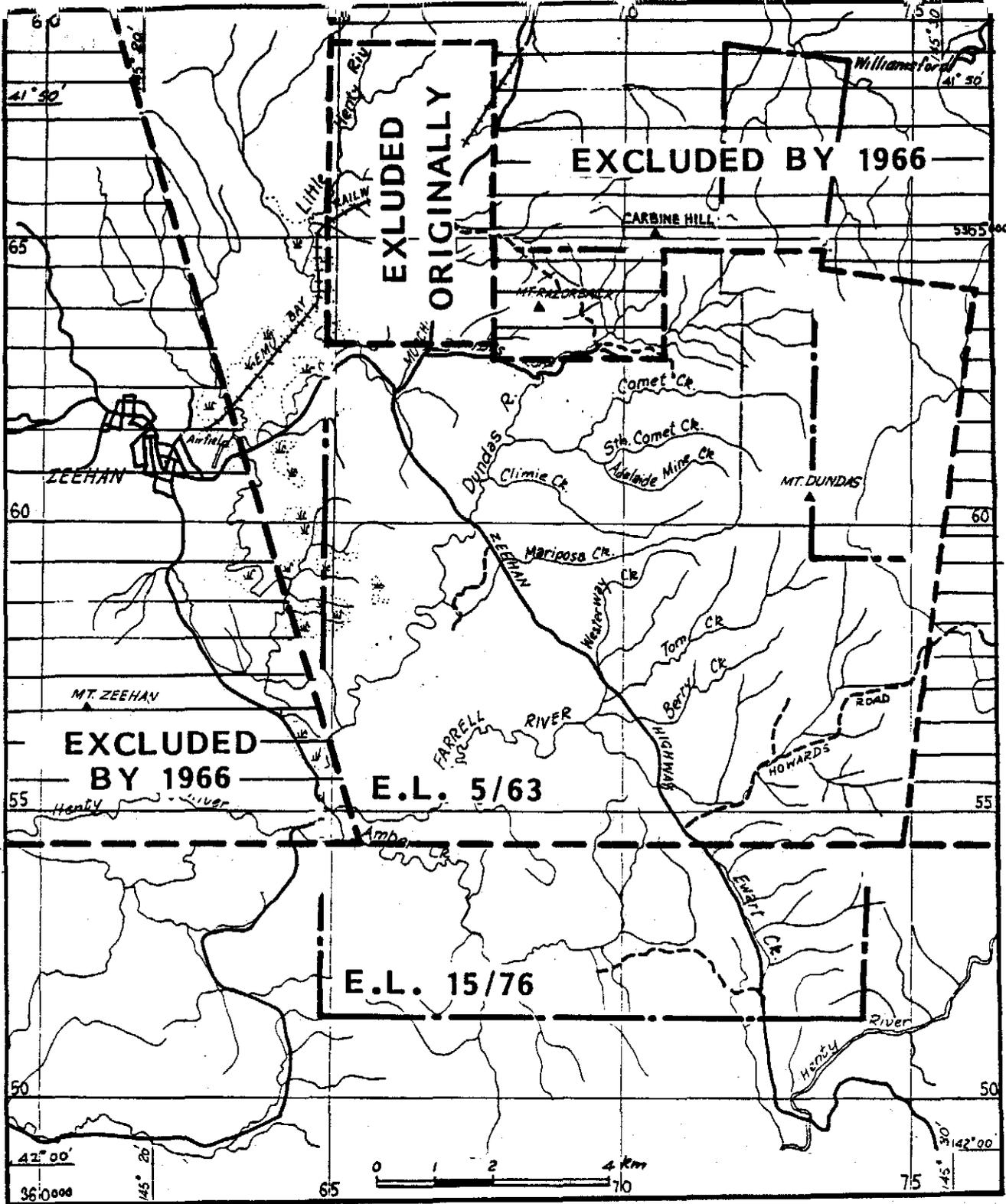
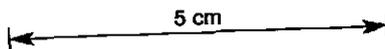


FIG. 2  
LOCATION MAP

E.L. 5/63



E.L. 15/76 DUNDAS, TASMANIA

027

the South Comet Mine (Gregory, 1959). This was considerably smaller than the 60,000 tons of 8% Pb, 7.4% Zn and 8 ounce/ton Ag ore estimated by the Tasmanian Department of Mines in 1950.

Investigations in the Mariposa area consisted of gridding the Sunny Corner mine area and traversing with ground magnetics, gravity and EM. Several weak to very weak anomalies were located. One coincident EM and magnetic anomaly (line 20N in the north of the grid) was recommended for follow-up geochemical investigation. No records of such an investigation are available.

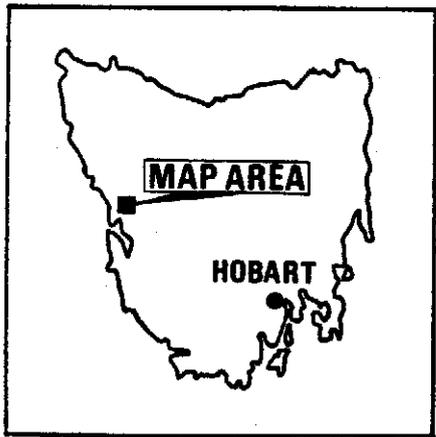
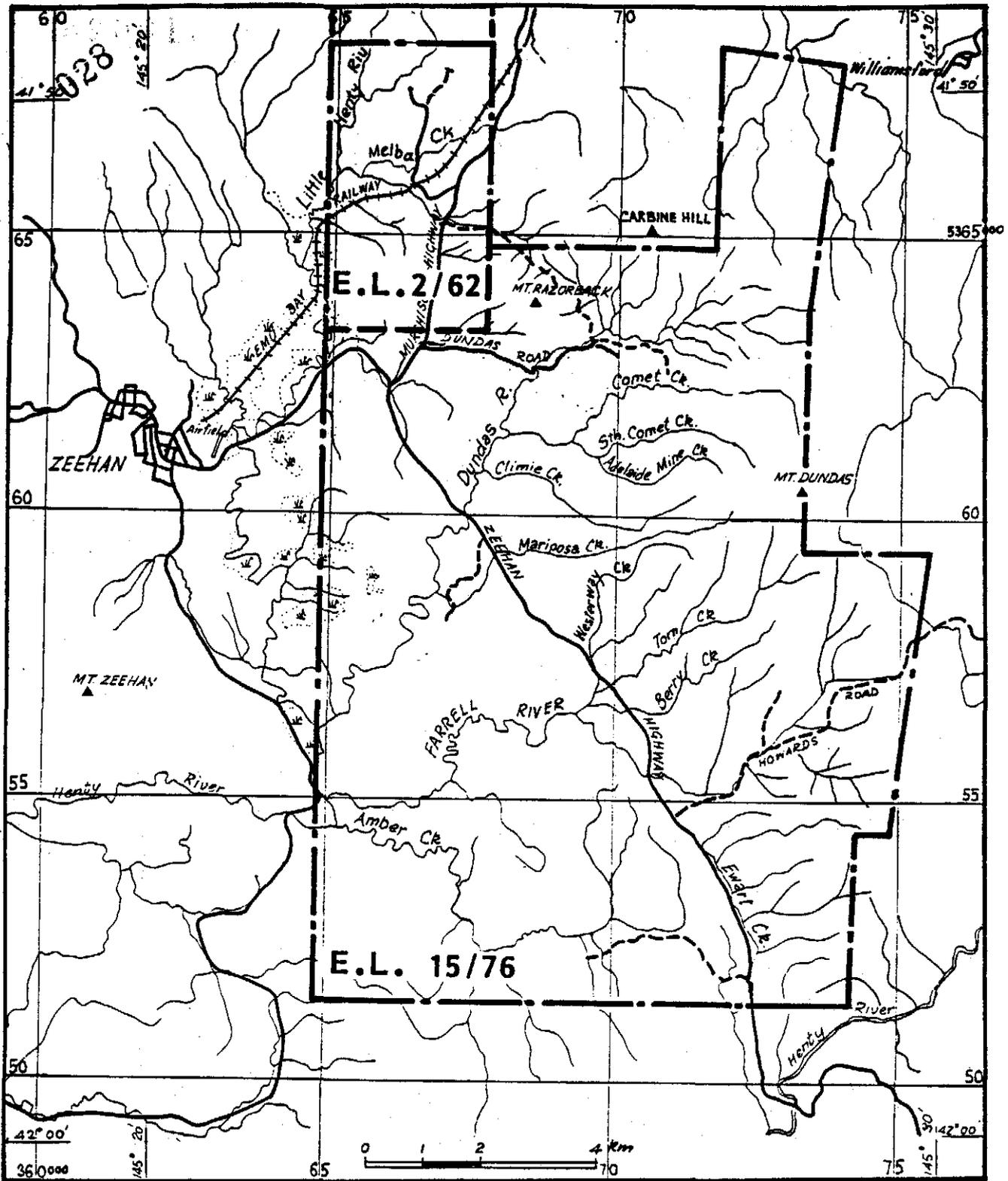
The only other recorded investigation within EL 15/76 boundaries by Rio Tinto was the production of a geological map. This map was produced by an air photograph interpretation (King, 1961) confirmed by some field examination of outcrops.

Rio Tinto allowed EL 4/59 to expire in April 1963 due to a lack of encouraging results.

#### 5.2.2 Costigan Mines/Comstaff (EL 5/63)

The central and northern part of EL 15/76 was obtained by Costigan Mines as EL 5/63 in 1963 (Figure 2). This licence covered most of the area from Dundas to Waratah. In 1964, this licence passed to Comstaff in a joint venture agreement. It was gradually reduced in area until it no longer covered any part of EL 15/76 in 1967.

The only investigations on EL 5/63 within the boundaries of EL 15/76 was an IP and soil geochemical (Sn, Cu, Pb, Zn, Co) survey over 13 lines in the Dundas/South Comet area in 1965 and an Afmag survey covering EL 5/63 in 1966. Major Cu, Pb, and Zn anomalies were



**FIG. 3**  
**LOCATION MAP**

**E.L. 2/62 (E.Z.)**  
**E.L. 15/76 (CSR)**

5 cm

**E.L. 15/76 DUNDAS, TASMANIA**

located along the northern extension of the South Comet/ Comet-Maestri line of mineralisation. This mineralised line also showed minor Sn and IP anomalies. Other minor Sn and IP anomalies were noted in the area west of the Razorback Mine.

Fifteen Afmag anomalies were shown in the vicinity of Mt. Dundas during the 1966 survey (Sutherland, 1966). Navigation problems during the survey resulted in insufficient details being obtained to accurately locate these anomalies. Furthermore, the reliability of the results was greatly reduced due to excessive air turbulence during the survey.

No follow-up of the IP, Afmag or soil geochemical anomalies was completed prior to the area within the area of EL 15/76 being relinquished from EL 5/63 in 1967. Reasons for the lack of anomaly follow-up and relinquishment were not given. It is known that a diamond drill hole, DS-1, was sunk to 710 feet in the area.

Most of the part of EL 5/63 within the boundaries of EL 15/76 was then pegged by Geophoto Resources Consultants as EL 7/68 (see below).

### 5.2.3 Electrolytic Zinc Company (EL 2/62)

EL 5/63 (Costigan Mines/Comstaff) covered most of the central and northern part of EL 15/76. The north-western corner was excluded from EL 5/63 as it had been pegged by EZ Co. as EL 2/62 in early 1962 (Figure 3). EL 2/62 extended several kms north of the EL 15/76 boundary.

From 1962 until 1967, EZ Co. concentrated most of their exploration of EL 2/62 in the area to the north of the EL 15/76 boundary. Only lines 135, 145, 155 and 165

of the North Melba grid and lines 30N, 33N, 36N, 39N, 42N and 45N of the East Melba grid were within the boundaries of EL 15/76 and investigated until 1967.

The East Melba lines covered the lead/zinc zone around the McKimmie mine area. These lines were traversed with an IP survey, the results of which were never interpreted. No follow-up work has been reported. The only reported investigation of this area by EZ Co. also showed the Lead Blocks area had been drilled with a series of 9 vertical holes (L1-L9). No record of the logs of these holes are available. Records on the Lead Blocks grid and area are included in Goudie (1970) as loose pages.

The four North Melba lines covered the area to the north of the North Cuni/Genet's Winze mineralisation. These lines (and those to the north outside EL 15/76 boundaries) were traversed with magnetics, IP and soil geochemistry Cu, Pb, Zn, Ni, Sn (Hackett, 1968). Resultant anomalies around the North Cuni/Genet's Winze area were investigated by 7 drill holes. This drilling showed the Cu/Ni mineralisation occurred as shallow, sporadic, high-grade lenses adjacent to, and in, a simple metadolerite intrusive sill (Griffith, 1968).

The lack of economic mineralisation intersections in this drilling resulted in EZ Co. reviewing previous drill data in 1969. This showed (Anon, 1969) the Cuni area to be extensively drilled with a total of 47 holes in the following areas:

North Cuni/Genet's Winze	- 22 holes - 4 separate companies
South Cuni	- 7 holes - 2 companies
Blowfly	- 2 holes - 1 company

Mosquito	- 2 holes - 1 company
Yaudeau	- 3 holes - 1 company
Nickel Reward	- 8 holes - 1 company
Devereaux	- 3 holes - 1 company

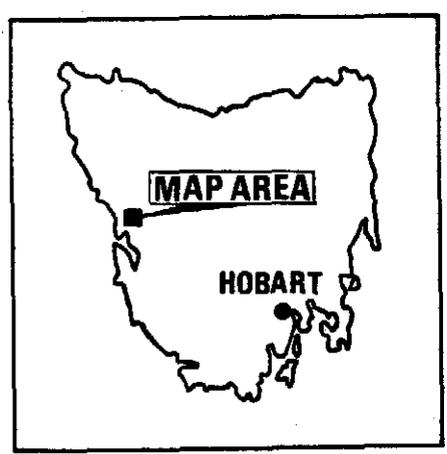
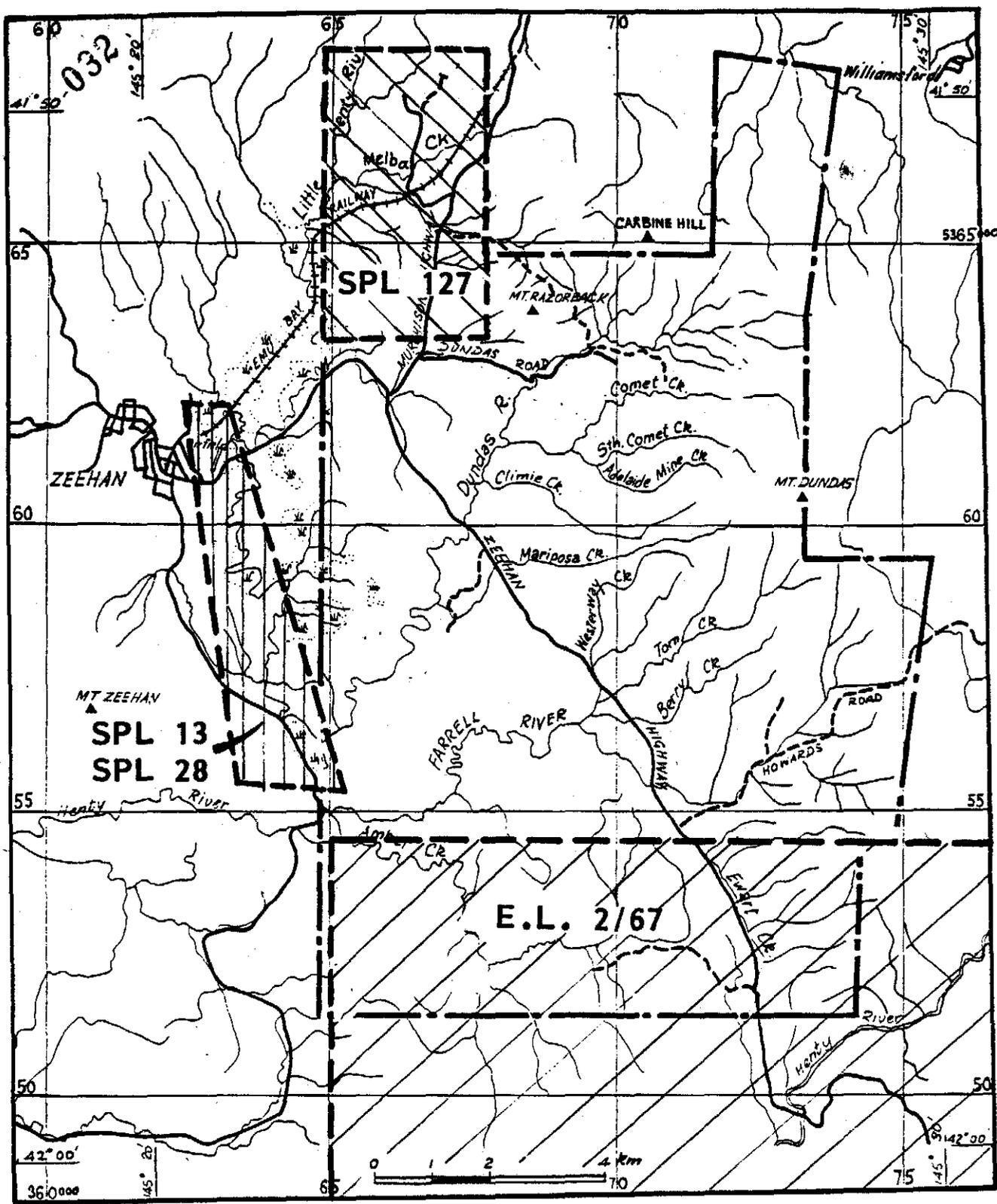
However, EZ Co. continued exploring the area, traversing (Burton 1971) the BMR's geophysical grid (see above) with magnetics and soil geochemistry (Cu, Pb, Zn, Ni, Co and some As). A Turam EM survey was also conducted over all but the Devereaux Prospect portion of the grid (Howland-Rose, 1971).

No anomalies were located in the Devereaux Prospect area. The Turam survey located 25 anomalies within 30 m of the surface on the Melba Grid. The soil geochemistry showed significant copper anomalies over known sulphide bodies. Nickel and zinc gave coincident but wider anomalies. Several, small, localised, previously unknown Cu/Ni anomalies were also delineated. Lead with coincident zinc gave anomalous values in areas of known Pb/Zn veins.

The area of strongest coincident EM and geochemical anomalies was the South Cuni-Cuni Rise-North Cuni-Genet's Winze area. This anomalous zone, parallel to a doleritic intrusion, was drilled. All other anomalies (EM and geochemical) were at very limited strike length and were of no economic interest.

The strong coincident Cu, Zn, Ni and EM anomaly at Genet's Winze was drilled in 1972/73 (Burton, 1973). All holes intersected dolerite but with only minor mineralisation. One intersection of 9 feet of 0.76% Cu and 0.94% Ni was located. Burton (1973) concluded further drilling of weaker anomalies was not justified.

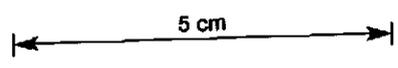
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**FIG. 4**  
**LOCATION MAP**

**E.L. 2/67 (UTAH)**  
**SPL 13 (PLACER) SPL 28 (RENISON)**  
**SPL 127 (L.J.C. SAY)**

**E.L. 15/76 DUNDAS, TASMANIA**



033

On completion of the 5 drill holes at Genet's Winze, EZ Co. re-examined all data within EL 2/62 (Lillicrap, 1973) and concluded there was no possibility of the existence of an economic mineral deposit in the southern part of the Licence. Minor work was required in the northern area (to the north of EL 15/76).

EL 2/62 was dropped by EZ Co. in 1973 and partially re-pegged by L.J.C. Say as SPL 127.

#### 5.2.4 L.J.C. Say (SPL 127)

SPL 127 covered the portion of EL 2/62 that was inside the present boundaries of EL 15/76 (Figure 4).

The only recorded investigation of SPL 127 was a brief historical review (excluding EZ Co. work) by Bell (1974). No field work was initiated. SPL 127 was forfeited on 30th April, 1974 and remained vacant until 1976 when it was included in EL 15/76.

*SPL 127  
was extensively  
explored (incl  
drilling) by  
Renison Limited*

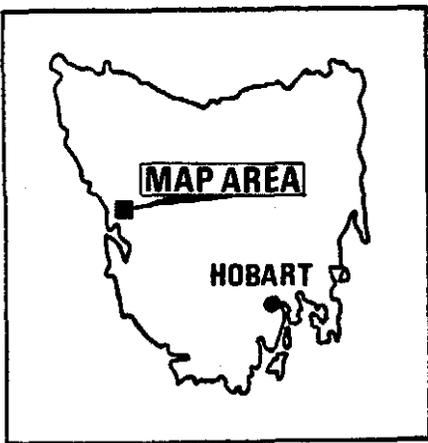
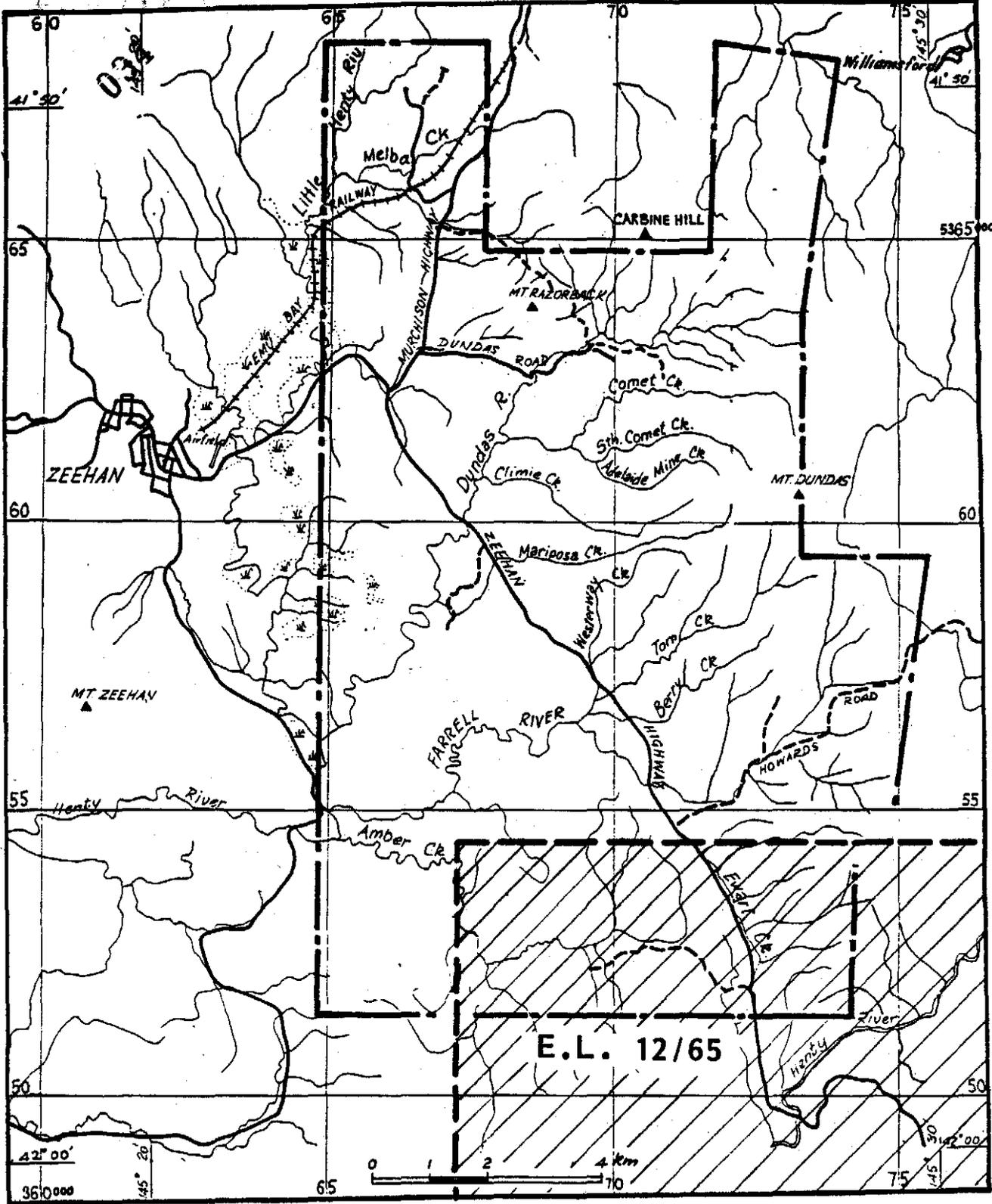
#### 5.2.5 Placer Prospecting Pty. Ltd. (SPL 13)

SPL 13 covered the strip to the east of Zeehan extending from Zeehan to the Little Henty River. Most of this strip was to the west of EL 15/76 (Figure 4).

During the term of this Licence from July 1964 to December 1966, no work was completed within the area of EL 15/76. Almost all of Placer Prospecting Pty. Ltd.'s work was around the Oonah and Oceania Mines.

#### 5.2.6 Renison Ltd. (SPL 28)

Renison Ltd. re-pegged the area of SPL 13 as SPL 28 in January 1967 (Figure 4). No work was completed within EL 15/76 boundaries during the term of SPL 28.



**FIG. 5**  
**LOCATION MAP**

5 cm

**E.L. 12/65 (PICKARDS MATHER)**

**E.L. 15/76 DUNDAS, TASMANIA**

Again, most of the investigations were concentrated around the Donah and Oceania Mines.

Renison Ltd. relinquished the area in July 1967. The area was included as part of EL 6/69 when it was re-pegged by A.R. Dobson in March 1969 (see below).

#### 5.2.7 Utah Development (EL 2/67)

EL 2/67 covered the area of EL 15/76, south of the Little Henty River (Figure 4). The only recorded investigation of this Licence was a geological review (Banks, 1968). This showed Utah were exploring for possible phosphate deposits.

Utah relinquished the area on 24th January, 1968 when it was shown (Banks, 1968) there were no possibilities for the existence of economic phosphate deposits within the Licence.

#### 5.2.8 Pickands Mather (EL 12/65)

EL 12/65 covered a similar area to Utah's EL 2/67 phosphate licence although extending further west (Figure 5).

Initial drainage geochemistry by Pickands Mather showed several anomalies in the Basin Lake area to the south of EL 15/76. All work was thus concentrated in the anomalous area (Wuerch, 1971). No further work was recorded within the area of EL 15/76 prior to the relinquishment of EL 12/65 in late 1968.

A.R. Dobson re-pegged this relinquished portion of EL 12/65 (within EL 15/76) as part of EL 6/69. The remainder of EL 12/65 was relinquished in December 1971.

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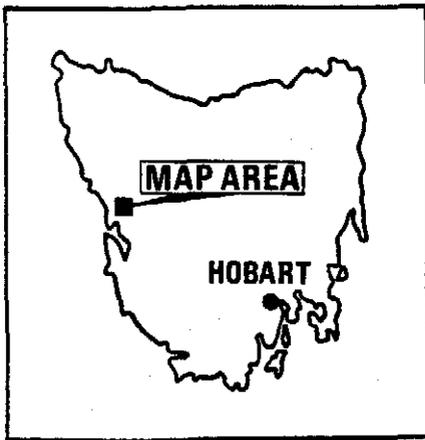
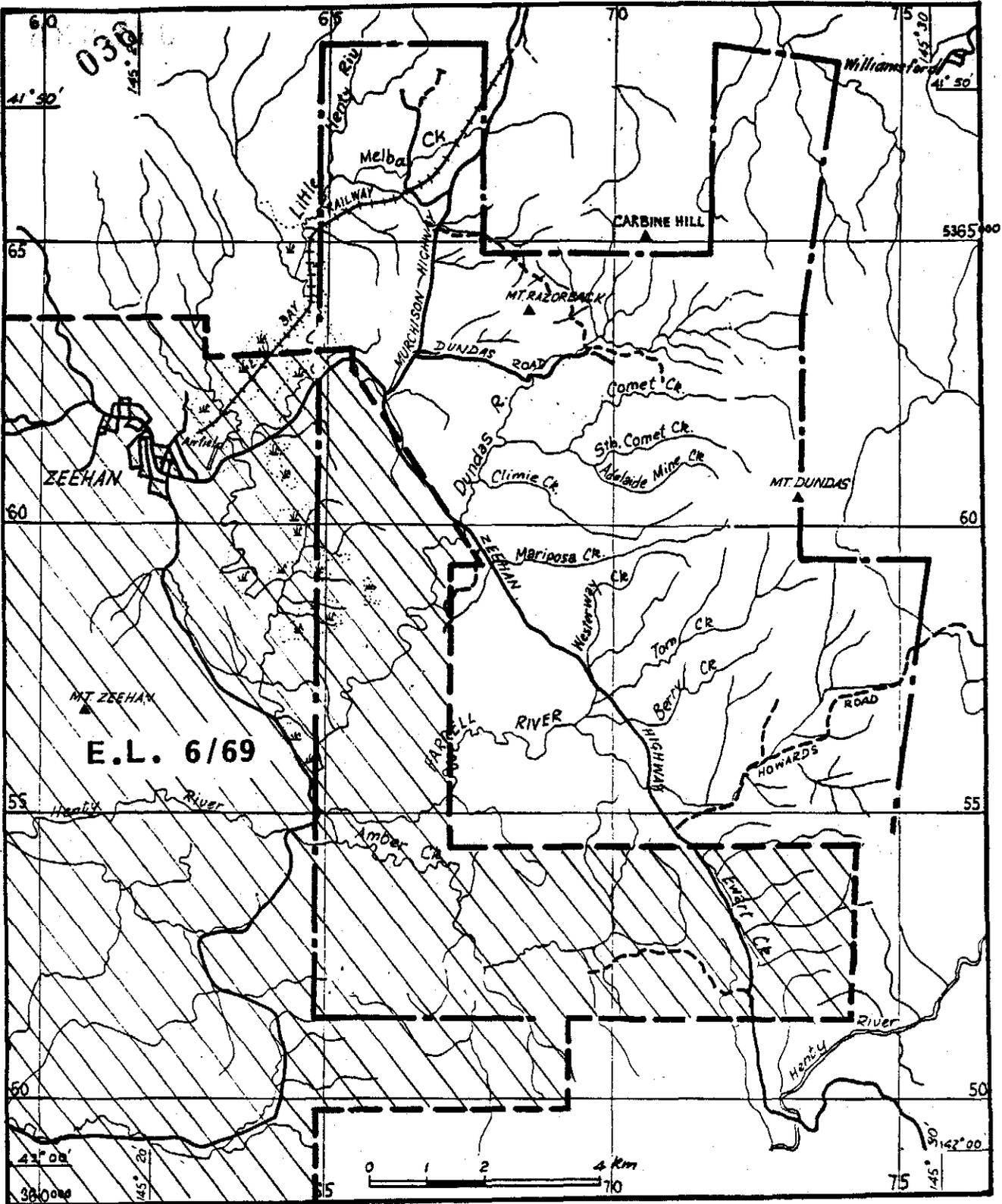


FIG. 6  
LOCATION MAP

5 cm

E.L. 6/69 (A.R. DOBSON)

E.L. 15/76 DUNDAS, TASMANIA

037

### 5.2.9 A.R. Dobson (EL 6/69)

EL 6/69 covered the southern (south of the Little Henty River) and western (west of the Mariposa Mine) portions of EL 15/76 (Figure 6). Most of this area is underlain by the Ordovician Gordon Limestone and Siluro-Devonian sediments.

No exploration was initiated within the present EL 15/76 boundaries. Most of the work within EL 6/69 was concentrated around the Oonah, Spray and Oceania Mines area.

The Licence expired in late 1969 and was replaced in early 1970 by two separate licences. The eastern part of EL 6/69 (southern portion of EL 15/76) was pegged by Texins (Geophoto Resources Consultants) as SPL 89 (Figure 7) which was later amalgamated with EL 7/68 (Geophoto). The western portion of EL 6/69 (covering the western edge and areas west of EL 15/76) was re-pegged by A.R. Dobson as EL 44/70 (Figure 7).

### 5.2.10 A.R. Dobson (EL 44/70)

As with EL 6/69, most of the work initiated by Dobson within EL 44/70 was around the Oonah, Spray and Oceania Mines and thus outside the boundaries of EL 15/76. However, part of the Licence was optioned to Tenneco.

Initial Tenneco interest was confined to the known mineralisation at the Spray, Oonah and Oceania Mines (Besley, 1971a, b). Interest gradually extended to the study of dumps at all zones of known mineralisation (Besley, 1971c), and finally to regional studies of all limestone areas. This regional study consisted of an airborne (helicopter) electromagnetic

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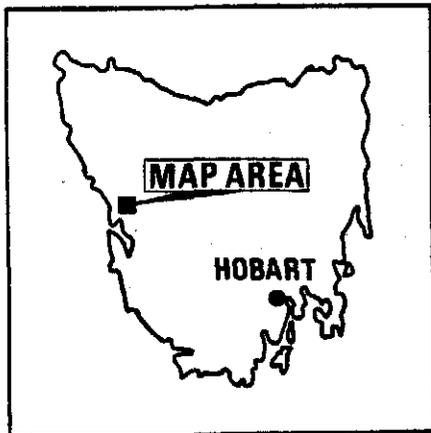
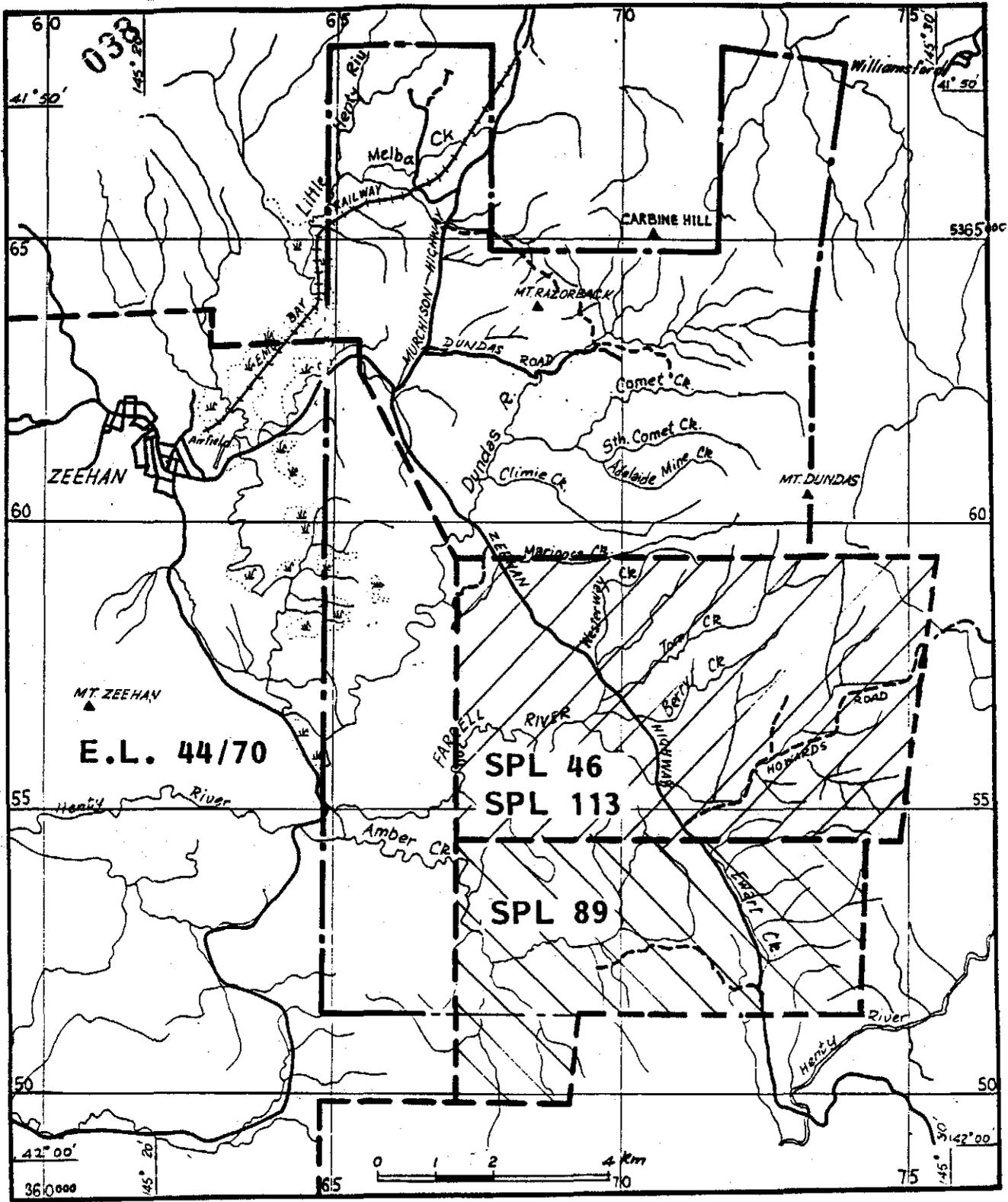


FIG. 7  
LOCATION MAP

- E.L. 44/70 (A.R.DOBSON)
- S.P.L. 89 (TEKINS)
- S.P.L. 46 (McINTYRE)
- S.P.L. 113 (TEKINS)

E.L. 15/76 DUNDAS, TASMANIA

5 cm

039

and magnetic survey and covered the Black Jack's to Bannockburn area of EL 15/76 (Besley, 1972). Significant, but weak, conductor axes were noted in the Black Jacks area.

These EM anomalies were followed-up by ground EM and SP surveys along cut grids. Results of these surveys showed four north to north-northwest trending shallow but weak conductors. SP and EM anomaly correlations were poor.

A follow-up gravity traverse on Line 8S (Rugg, 1972) showed no anomalies coincident with the SP or EM anomalies. Tenneco concluded that there was no economic mineralisation in that portion of EL 44/70 now within EL 15/76 boundaries.

Dobson allowed EL 44/70 to expire on 3rd November, 1972.

#### 5.2.11 McIntyre Mines (SPL 46)

In October 1968, McIntyre Mines (Australia) Pty. Ltd. pegged the central part of the present EL 15/76 as SPL 46. This covered the area to the east of (and included) the Mariposa Mine and between the South Comet mine and the Little Henty River. Most of the Farrell River drainage was included in this area (Figure 7).

Initial work by McIntyre involved sampling most of the drainage within the licence at 200 foot intervals (Sharwood, 1969). Each stream sediment sample was analysed for Cu, Pb, Zn and Sn (DRG No. K555-35). No anomalous tin values were observed although two separate anomalous areas (with associated Cu/Pb/Zn) were noted:

040

Anomaly 1 - in the northeast of the area immediately south of the South Comet mine zone. This was a dominantly Pb anomaly.

Anomaly 2 - in the southeast, to the south of Howards Road, about 3 km east of the Murchison Highway, was a dominantly Cu anomaly.

The weak and scattered nature of Anomaly 2 resulted in the southeast corner of the Licence being resampled. Analyses of this stream sediment resampling showed unrepeatably weak and localised Cu, Pb and Zn anomalies. McIntyre Mines initiated no further work on this area (Bates, 1972).

The strong Anomaly 1 area was covered with a grid soil geochemistry (Cu, Pb, Zn) sampling, magnetics, Gun EM, IP and SP programmes (Pollock, 1970 and Darling, 1971). The soil geochemistry showed a significant Pb anomaly (to 600 ppm Pb) extending about 400 feet along strike (north-south) in the northeastern part of the grid. This was paralleled by a slightly offset magnetic anomaly. Field examination of the anomalous zone showed the geochemical and magnetic fluctuations were related to a narrow zone of thin Pb-rich veins.

The SP survey showed no anomalies. However, it is doubted whether the SP technique worked as there were no anomalies indicated over the known deposits at the Mariposa Mine (2,600 x 1,800 feet grid) during a simultaneous SP survey (Omnes, 1971).

Further work on the Mariposa grid was a soil geochemistry programme which confirmed the Cu, Pb, Zn anomaly in the vicinity of, and to the south of, the mine. The southern anomaly extension was traversed with IP. Results showed a strong anomaly extending south

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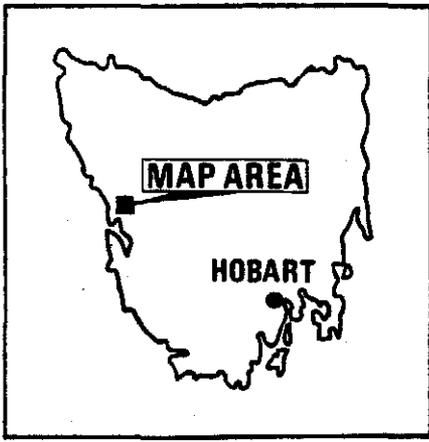
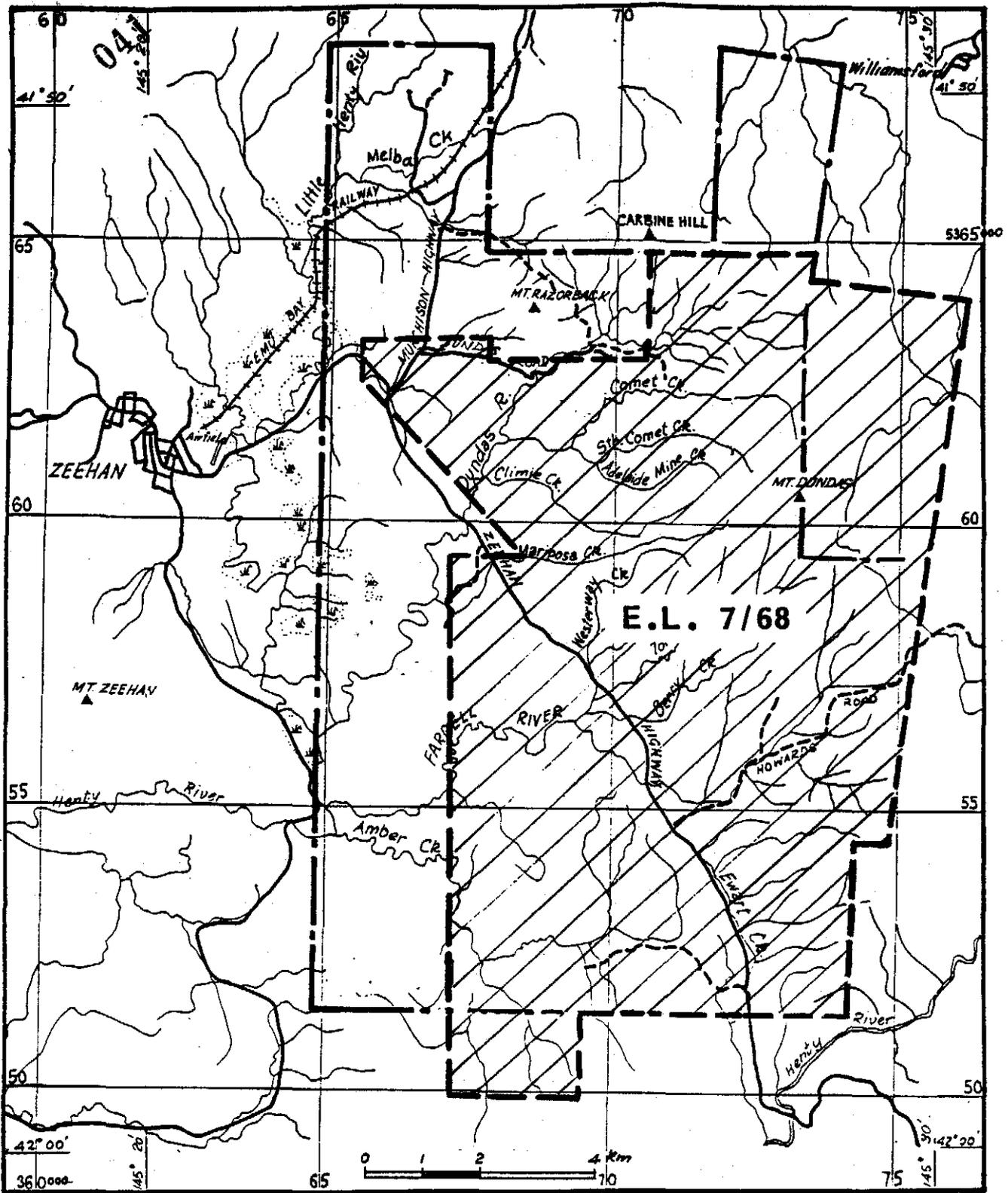


FIG. 8  
LOCATION MAP

5 cm

E.L. 7/68 (GEOPHOTO)

E.L. 15/76 DUNDAS, TASMANIA

042

from the mine area. This was tested by four drill holes which intersected only minor mineralisation.

SPL 46 was allowed to expire on 30th April, 1972 after McIntyre re-evaluated the area and concluded there was no economic potential (Bates, 1972). Both Anomaly 1 and the Mariposa area showed only small-tonnage, low-grade deposits.

The area of SPL 46 was re-pegged as SPL 113 by Texins (Geophoto Resources Consultants). This was later incorporated in Geophoto's EL 7/68.

**5.2.12 Geophoto Resources Consultants (EL 7/68  
Incorporating SPLs 113 and 89)**

EL 7/68 covered most of EL 15/76, south of the Razorback mine. The only part of EL 15/76 not held by Geophoto was the western edge (west of the Mariposa Mine) and the northwestern corner (Cuni Area). EL 7/68 also included the area to the northeast of Mt. Dundas held by EZ Co. as SPL 132 and subsequently included into EL 1/62 (Figure 8).

Geophoto investigated EL 7/68 in three major zones:

- (a) Amber Creek - the southern area initially held as SPL 89 by Geophoto;
- (b) McIntyre - the central area held by McIntyre Mines as SPL 46 and then as SPL 113 by Geophoto.
- (c) Dundas - the area of EL 7/68 north of the South Comet mine.

(a) Amber Creek

The buttongrass, swamp-covered Gordon Limestone is the dominant rock type in this area. It was traversed with VLF-EM, magnetics and soil geochemistry (samples from shallow depths analysed for Cu, Pb, Zn, Co, Ni and Ag) along 14,000 feet of surveyed grid lines. A pit orientation survey (Discala, 1972) showed the 3 feet sample depth gave the best geochemical responses. The entire area of EL 7/68 was also traversed with Turair EM (Howland-Rose, 1973).

Several VLF-EM anomalies, 2 low-contrast lead anomalies (not associated with the VLF-EM anomalies) and 2 Turair EM anomalies (Nos. 21 and 26) were located (DRG No. 7602-189). The areas of these geochemical and geophysical anomalies were then geochemically resampled at 50 ft depths, using a selective down-hole sampler on an air-trax type drilling rig to obtain weathered bedrock samples (Discala, 1973). The analyses of these samples showed several Cu/Pb/Zn anomalies.

Follow-up grain size distribution and chemistry (Johnston, 1974) suggested the coincident deep-seated Cu/Pb/Zn anomalies were related to alluvial outwash fans, rather than in-situ anomalies related to the Gordon Limestone.

No further work was considered warranted in a review (Johnston, 1974). The area was relinquished in 1974 before being re-pegged by CSR as EL 15/76 in 1976.

(b) McIntyre

Geophoto pegged SPL 113 (McIntyre) in order to study the intersection of the Montezuma fault with an air photograph interpreted extension of the South Comet/Kosminsky fracture (Johnston, 1973).

044

This fault/fracture intersection (adjacent to the McIntyre Anomaly 1 grid) was gridded (Geophoto Grid) and traversed with rock and soil geochemistry (Cu, Ni, Co, Pb, Zn and Ag), VLF-EM and geological mapping. The VLF-EM survey was also extended to cover the Anomaly 1 grid.

The regional Turair EM survey showed two primary anomalies (7 and 8) within the Geophoto Grid area. These anomalies showed no supporting VLF-EM or soil geochemistry anomalies. The soil geochemistry defined a very broad lead anomaly along the Comet-Kosminsky fracture and parallel to the lithology. However, the strongest geochemical anomaly was in the northeast of the McIntyre Anomaly 1 Grid. Mapping of a costean across the peak of this anomaly showed a series of small mineralised veins caused the anomaly.

A review of the above work (Johnston, 1973) concluded the Geophoto/Anomaly 1 grids area contained no possibility for economic mineralisation. No further work was completed on these grids.

Three other primary Turair EM anomalies (32A, B and C) occurred within the McIntyre area. A grid was cut (Howards Grid) over these anomalies and traversed with EM and soil geochemistry for Cu, Pb, Zn, Ni. No significant geochemical anomaly was observed.

The review of this work (Johnston, 1973) concluded the McIntyre area contained no economic mineralisation. Geophoto relinquished the area in 1974 with no further work being initiated. The area was vacant until it was re-pegged by CSR as EL 15/76.

(c) Dundas

The Dundas area was obtained by Geophoto (along with the Heemskirk area to the west of Zeehan) in 1968 as EL 7/68. Geophoto's interest in this area was the presence of significant lead/zinc/silver mineralisation along the Comet-Kominsky line of mines.

For exploration purposes the area was sub-divided into three zones:

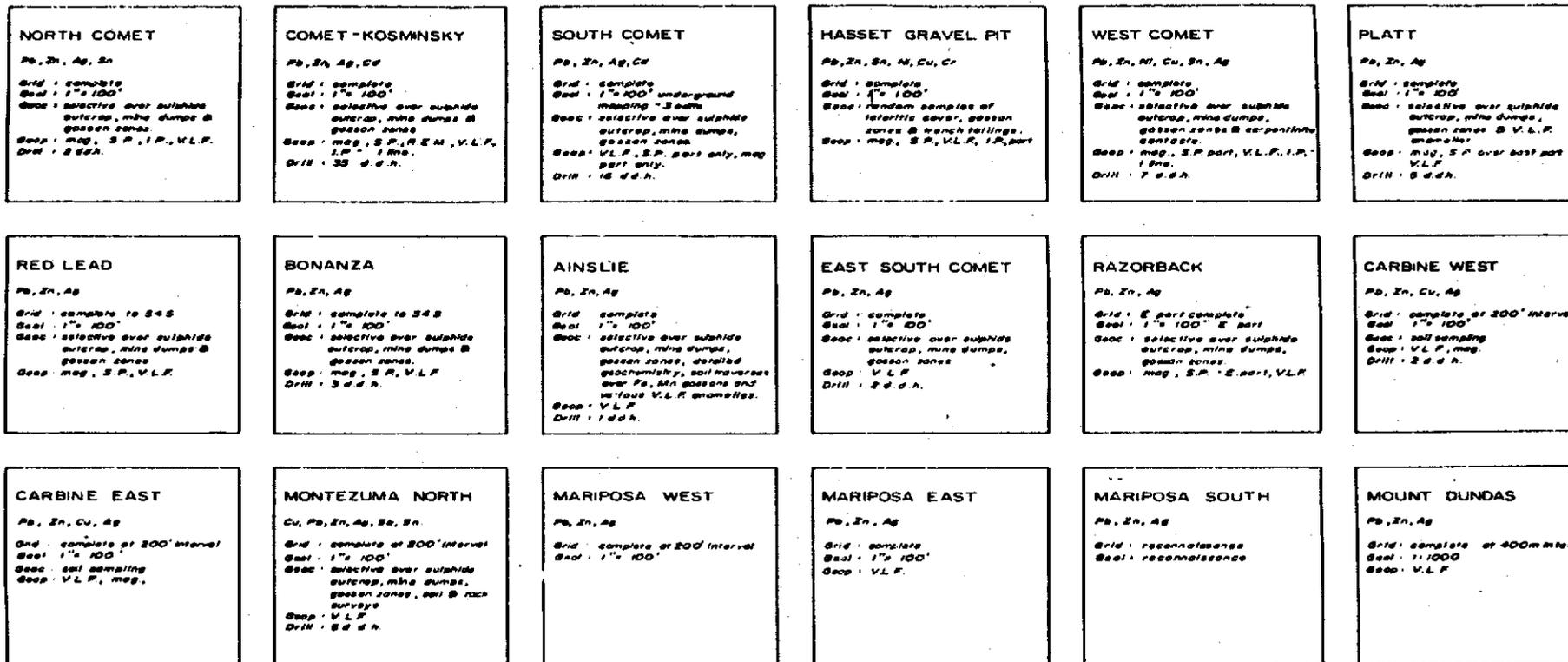
- (i) West Dundas - the area west of the Dundas mine. During reconnaissance mapping (Rattigan, 1969) of this area, all old mine dumps, gossan zones and sulphide zones were rock-chip sampled. The samples were analysed for Pb, Zn and Ag with one Ag anomaly being delineated. This anomaly was gridded (Silver Grid) and traversed with soil geochemistry analysed for Ag, Pb, and Zn. All mine dumps, gossan and sulphides were also sampled and analysed.

This work showed the Ag anomaly reflected cerargyrite and secondary silver minerals associated with Fe-Mn gossans. These narrow discontinuous gossans were inferred to be southern extension of minor mineralisation trends in the Red Lead grid area. Large tonnages of Ag-rich gossans near surface were discounted (Discala, 1974).

No further work was initiated in the West Dundas area before Geophoto relinquished it in 1974 or prior to CSR re-pegging it as part of EL 15/76.

- (ii) Northeast Dundas - north and east of Mt. Dundas. Reconnaissance mapping of the area with associated stream sediment sampling, selective

CENTRAL DUNDAS



NORTH EAST DUNDAS

**NORTH EAST DUNDAS**  
 Pb, Zn, Ag  
 Geol: reconnaissance 1:10000  
 Geoc: stream sediment, rock sampling

WEST DUNDAS

**WEST DUNDAS**  
 Pb, Zn, Ag  
 Geol: reconnaissance 1" x 300'  
 Geoc: selective over sulphide outcrop, mine dumps & gossan zones

**SILVER**  
 Pb, Zn, Ag  
 Grid: complete  
 Geoc: selective over sulphide outcrop, mine dumps & gossan zones & soil survey

REFER FIG. 57 for grid locations

FIG. 9 GEOPHOTO EXPLORATION SUMMARY OF DUNDAS DISTRICT

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rock-ship sampling and a routine regional Turair EM survey failed to give any indication of mineralisation. No further work was undertaken.

Most of this area was to the east of EL 15/76.

- (iii) Central Dundas - between Mt. Dundas and the Adelaide Mine. This was the area of concentrated Geophoto exploration. Within this area, all work, except the investigations of the North and South Montezuma grids, was around the Comet-Kosminsky-Maestri mineralised zone (Figure 9).

The Montezuma area was gridded, mapped in detail and traversed with VLF-EM and soil geochemistry (Turner, 1971). All mine dumps, sulphide and/or gossan zones and rock outcrop were selectively rock-chip sampled. All soil and rock-chip samples were analysed for Cu, Pb, Zn, Ag and Ni, with some being analysed for Co, As, Sb and Sn. Several significant Cu/Pb/Zn/Ag anomalies adjacent to the Montezuma Fault zone and several other separate minor Sb/Ag anomalies were defined. In the north of the grid, several north-westerly trending VLF-EM anomalies (DRG No. K555-37) were outlined (Turner, 1971).

These anomalies were tested by a programme of 6 diamond drill holes. MzN1 and MzN3 tested VLF-EM anomalies; MzN2 tested a larger quartz/limonite gossanous zone; MzN4, MzN5 and MzN6 tested VLF-EM anomalies associated with the mineralisation in the Montezuma Adit Nos. 5 and 6. Only minor mineralisation was intersected in any of these holes.

Geophoto concluded (Discala, 1974) that the previously mined, high-grade tetrahedrite lodes and the jamesonite/pyrite veins in the Montezuma area were narrow and discontinuous, both along strike and down dip. Also, there was considered to be no evidence for the existence of massive tin-rich pyrite/pyrrhotite orebodies. Rather the anomalous tin geochemistry represented disseminated cassiterite in pyrite veins intruding black shales.

No further work was initiated by Geophoto in the Montezuma area.

Initial investigation of the Dundas area by Geophoto was an examination and sampling of all known workings and dumps (Rattigan, 1968). This investigation showed many of the Dundas lead/zinc deposits had significant silver contents. Further work was initiated on seven prospect areas:

- West Comet - Hasset Gravel Pit, Razorback, West Comet, Platt and Bonanza Grids.
- Comet - North Comet and Comet-Kosminsky Grids
- Kosminsky-South Comet - Comet-Kosminsky, East South Comet, South Comet, Mariposa East and Mt. Dundas Grids.
- Kosminsky Hill West - part of Comet and Platt Grids
- Kosminsky Hill East - Ainslie and part of Comet-Kosminsky Grids
- Adelaide - Adelaide and Red Lead Grids

- Carbine - Carbine East and Carbine West Grids.

**West Comet Prospect.** Targets in the West Comet prospect were West Comet-type lead/zinc lodes and nickel/chromium mineralisation within serpentinite (Rattigan & Paterson, 1969). Detailed geology over 118,300 feet of grid line was compiled. Soil and rock sampling was completed as follows:

- (a) **Hassett Gravel Pit Grid** - 728 soil samples were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr, and of these, 443 were analysed for Pt.
- (b) **Razorback Grid** - 309 samples from lines 6N, 8N, 10N and 12N were analysed for Cu, Pb, Zn, Ni, and Ag.
- (c) **West Comet Grid** - 317 rock and soil samples from a traverse between 6E/13.5S and 10W/8.0S were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr with some analysed for Pt, Sn and As.  
  
150 rock and soil samples from a traverse between 2E/20.0S and 10W/13.45 were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr.  
  
50 rock and soil samples from Broken Hill line 28S and 170 samples from line 00 were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr. 230 soil samples from lines 4N, 8N, and 10N were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr.
- (d) **Platt Grid** - 192 soil samples from lines 2S and 4S were analysed for Pb, Zn, Ni, Ag, Cr and Sn.
- (e) **Bonanza Grid** - 400 rock and soil samples from lines KHW-4S and KHW-4N were analysed for Cu, Pb, Zn, Ni, Co, Ag and Cr.

Anomalies in these geological, geochemical and geophysical surveys (DRG No. K555-37) resulted in the drilling of 7 diamond holes (WC1-7) in the West Comet grid and 1 hole (P1) in the Platt grid. Drilling results were disappointing. a minor intersection of low-grade mineralisation in one hole from each grid led to a low-priority recommendation for possible further drilling. This was not initiated.

No further work was considered to be warranted on the West Comet Prospect.

**Comet Prospect.** The target in the Comet Prospect was lead/zinc lodes similar to the Comet mineralisation (Rattigan & Paterson, 1969). Detailed geology was completed over 32,800 feet of grid lines. Outcrop on these lines and at old dumps around North Comet were sampled (66 rock samples) and analysed for Cu, Pb, Zn, Ni, Co, Ag, Cr and Sn. A further 100 rock samples from the Comet-Kosminsky Mine area were collected and analysed for Cu, Pb, Zn, Co, Ag, Sn and Mn. No soil samples were collected due to the significant zone of contamination around the old workings.

Self-potential, magnetic and VLF-EM surveys were completed over all grids in this prospect (DRG No. K555-37). The results of the South Broken Hill IP survey were also studied and plotted.

Anomalies in these geological, geochemical and, more particularly, geophysical surveys resulted in the drilling of two holes adjacent to the Comet Mine (C1-2) and two holes in the North Comet grid (NC1-2). The North Comet drilling was very disappointing with no significant mineralisation being intersected. Although the results of the Comet Mine drilling were disappointing, the loss of core in dolomitic (possibly

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mineralised) zones caused the drilling to be inconclusive. Further drilling to test the dolomitic horizons around the Comet Mine was recommended.

No further work was considered warranted on the Comet Prospect.

**Kosminsky-South Comet Prospect.** The target in the Kosminsky-South Comet Prospect was a continuation and enlargement of the Kosminsky-South Comet lead/zinc mineralisation. This prospect was the area of Geophoto's initial and most concentrated interest during the term of EL 7/68 (Rattigan and Paterson, 1969).

Initial work comprised detailed mapping along 177,500 feet of grid lines during the collection of 190 soil samples from line 20S, and 196 samples from line 26S of the Comet-Kosminsky grid. These were analysed for Cu, Pb, Zn, Ni, Co, Ag and Sn. Rock samples from old dumps and outcrops in the Comet-Kosminsky (80) and South Comet (200) areas were analysed for Cu, Pb, Zn, Ni, Co and Ag with selected samples analysed for Cr.

Later, 36 soil samples from a traverse along the surface projection of DDH-SC2 were analysed for Cu, Pb, Zn, Ni, Co, Ag, Cr and Sn, and 100 soil samples from South Comet lines 34S, 36S, 38S, 40S, 42S, 44S, 48S, 50S and 52S were analysed for Zn and Hg. This latter group were in preparation for a mercury sniffer survey of lines 40S, 44S and 50S in the East South Comet area. Only minor Hg was observed requiring no further investigations.

The South Comet Mine was channel sampled at 5 feet intervals. 367 samples (342 from the adit and 25 from the cross-cut) were analysed for Pb and Zn with selected Ag and Cd analyses (Discala, 1974).

246 samples collected by S. Gatehouse (Honours thesis) from trenches and auger holes along lines from DDH-SC10 and DDH-KH7 were analysed for Cu, Pb, Zn, Ag, Fe and Mn.

Self-potential, magnetic and REM surveys were completed over the Comet-Kosminsky and South Comet grids. A VLF-EM survey was run over the Comet-Kosminsky South Comet, Mariposa East, Mt. Dundas and part of the East South Comet grids (DRG No. K555-37). Line 26S on the Comet-Kosminsky grid was traversed with a brief IP survey.

Anomalies in these geological, geochemical and geophysical surveys resulted in the drilling of 20 holes at South Comet (SC19 and SC21) and 23 holes at Kosminsky Hill (KH1-23). SC14 and SC15 were logged with down-hole IP and resistivity. Drilling results were promising although reducing reserves to only 45,800 short tons of 10% Zn or 13% combined Pb,Zn ore along the old known mineralised zone of the South Comet-Kosminsky Mine.

**Kosminsky Hill West Prospect.** The target in the Kosminsky Hill West Prospect was the northwest-trending inferred offset south branch of the West Comet lead/zinc mineralisation. This mineralisation was 300 m west of the Kosminsky-South Comet line. This prospect developed as a sub-project from the geochemical evaluation of the West Comet Prospect.

The geochemical and geophysical evaluation of the area resulted in the drilling of eight holes. These showed (Thigpen, 1972) only minor erratic lead/zinc with Fe gossans related to serpentinites.

**Kosminsky Hill East-Ainslie Prospect.** The target in the Kosminsky Hill East-Ainslie Prospect was a series of lead/zinc anomalies to the east of the Kosminsky-

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South Comet zone and inferred to be the offset south extension of the Comet zone. This prospect developed as a sub-project from the geological, geochemical and geophysical evaluation of the Kosminsky-South Comet Prospect.

79,290 feet of extension gridding (Ainslie) was mapped with 615 soil samples being taken from lines 2S, 4S, 6S, 12S, 14S, 16S, 22S, 24S and 28S. These were analysed for Cu, Pb, Zn, Ni and Ag, while 40 gossan samples were analysed for Cu, Pb, Zn, Ni, Co, Ag, Mo, Cd and selectively for Sb.

The earlier VLF-EM survey was extended over the Ainslie grid.

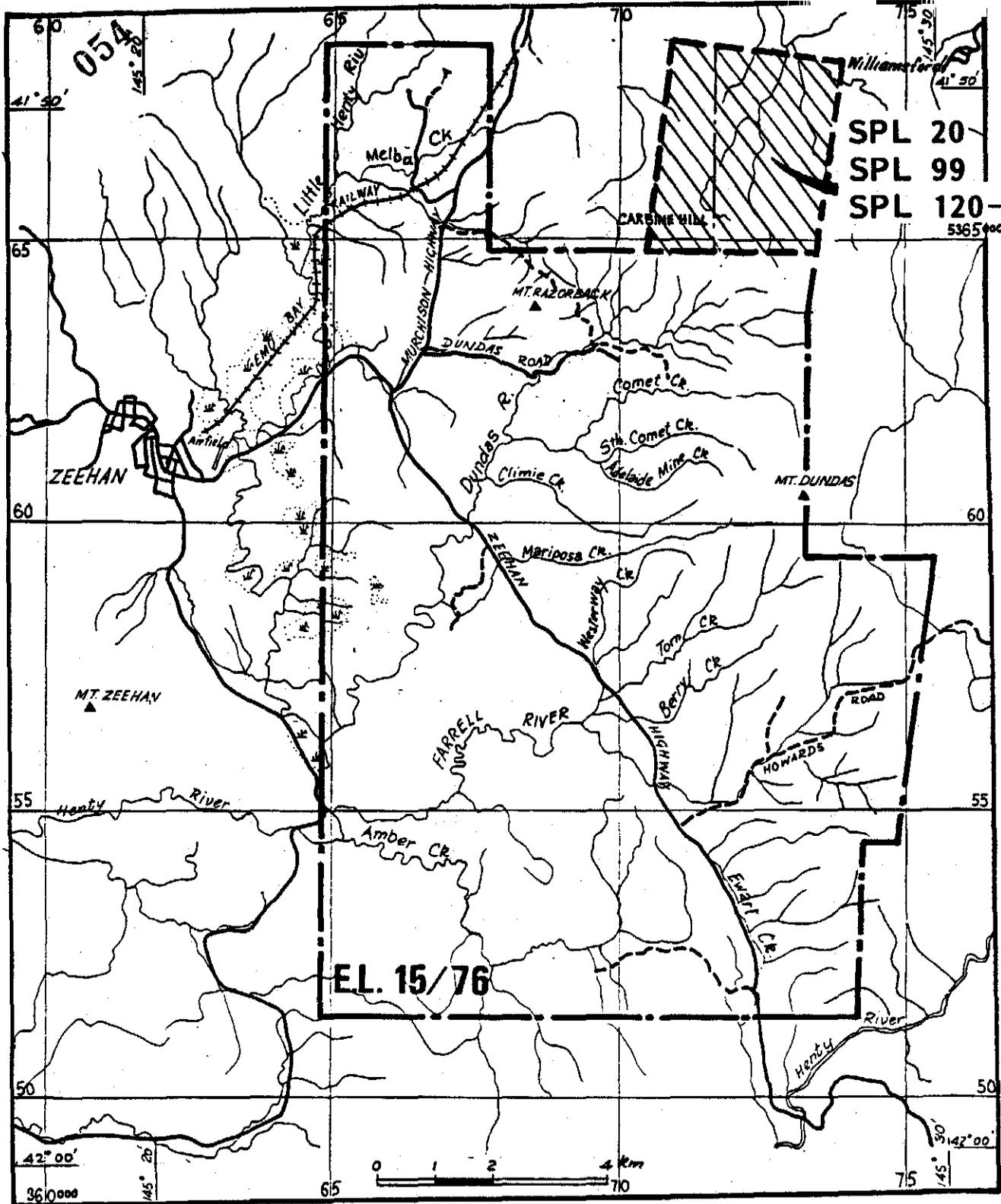
Evaluation of the geological, geochemical and geophysical surveys resulted in the drilling of 7 holes on Kosminsky Hill East (DDH KHE1-7) and 1 hole in the Ainslie grid (DDH-A1). These holes were inconclusive, but tended to favour further investigation.

No further work was completed due to the overall small tonnages of ore in the whole Licence area.

**Adelaide Prospect.** Extensions of the north-northwest-trending Adelaide Mine lodes were the targets in the Adelaide Prospect. These were marked by jasper-limonite gossans at surface.

During preliminary mapping (no detailed mapping) of 67,000 feet of grids, 126 rock samples were collected from the Red Lead area. These were analysed for Cu, Pb, Zn, Ni, Co and Si.

Self potential, magnetic and VLF-EM were extended over the prospect. Minor VLF-EM anomalies were followed-up by extending the Adelaide grid to the north. Results were discouraging (Discala, 1972).



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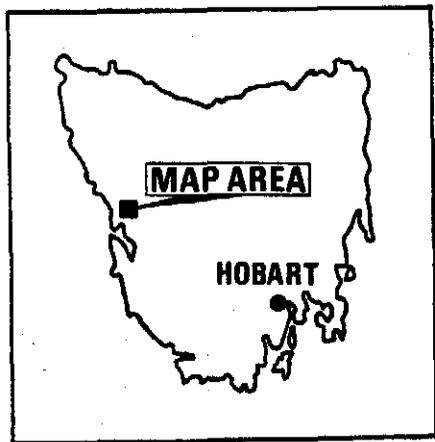
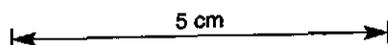


FIG. 10  
LOCATION MAP

- S.P.L. 20 (RENISON)
- S.P.L. 99 (I.M.TUCKER)
- S.P.L. 120-II (MINOPS)

E.L. 15/76 DUNDAS, TASMANIA



**Carbine Prospect.** The target in the Carbine Prospect was a series of lead/zinc trends.

115,000 feet of grids were mapped in detail while an orientation soil sampling survey of 48 samples was being conducted. These soil samples were sized and analysed for Cu, Pb, Zn, Ni, Co, Ag. 1,816 soil samples and 71 rock samples of dumps and outcrops were then obtained from the Carbine East and West grids. All were analysed for Cu, Pb, Zn, Ni, Co and Ag.

Anomalous lead and zinc values were observed in the west of the grid.

Magnetic and VLF-EM surveys were completed (DRG No. K555-37).

A VLF-EM anomaly on line 52N and 13W and the geochemical anomaly on line 46N at 13-17W were tested by two diamond drill holes (CW1-2). Results were disappointing with no significant mineralisation intersected.

Geophoto Resources Consultants concluded that the area covered by EL 7/68 contained only the Kosminsky-South Comet zone of mineralisation. Extractable ore was only 45,800 short tons of 10% Zn or 13% combined Pb/Zn. The Licence was allowed to expire.

#### 5.2.13 Renison Ltd./Mt. Lyell (CGFA), (SPL 20)

Renison and Mt. Lyell (as CGFA) pegged the area to the north of Geophoto's Montezuma grid (BE EL 15/76) in August 1966 and SPL 20 (Figure 10). The area was gridded, mapped and traversed with magnetics and deep soil geochemistry for Cu, Pb, Zn, Ag, Sn, Ni, As and Sb (Elders, 1969 and Forsythe, 1968 and 1969).

Ten magnetic and/or tin anomalies were defined as well as several weaker lead/silver anomalies. The largest and strongest tin anomaly (Anomaly A) had coincident Cu and As anomalies and a high magnetic response. This area was resampled (soil) in much finer detail prior to being trenched, mapped in detail and rock-chip sampled. Tin values up to 1200 ppm Sn were obtained in zones of sulphide-rich joints adjacent to a mineralised shear.

Infill grid lines were cut across possible extensions of the shear zone. These lines were mapped in detail and traversed with magnetics and auger soil geochemistry for Cu, Pb, Zn, Sn and As.

A 9-12 cm thick vein of arsenopyrite, pyrrhotite, quartz and chalcopyrite was found paralleling the Frazer Mine ore lens (Ferguson, 1970). This mineralised shear extended from Line 3 to 1600N. A strongly mineralised extensive shear zone had no tin association. The tin mineralisation suggested was a weak disseminated type.

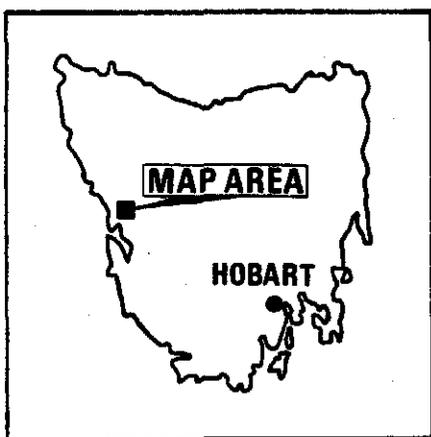
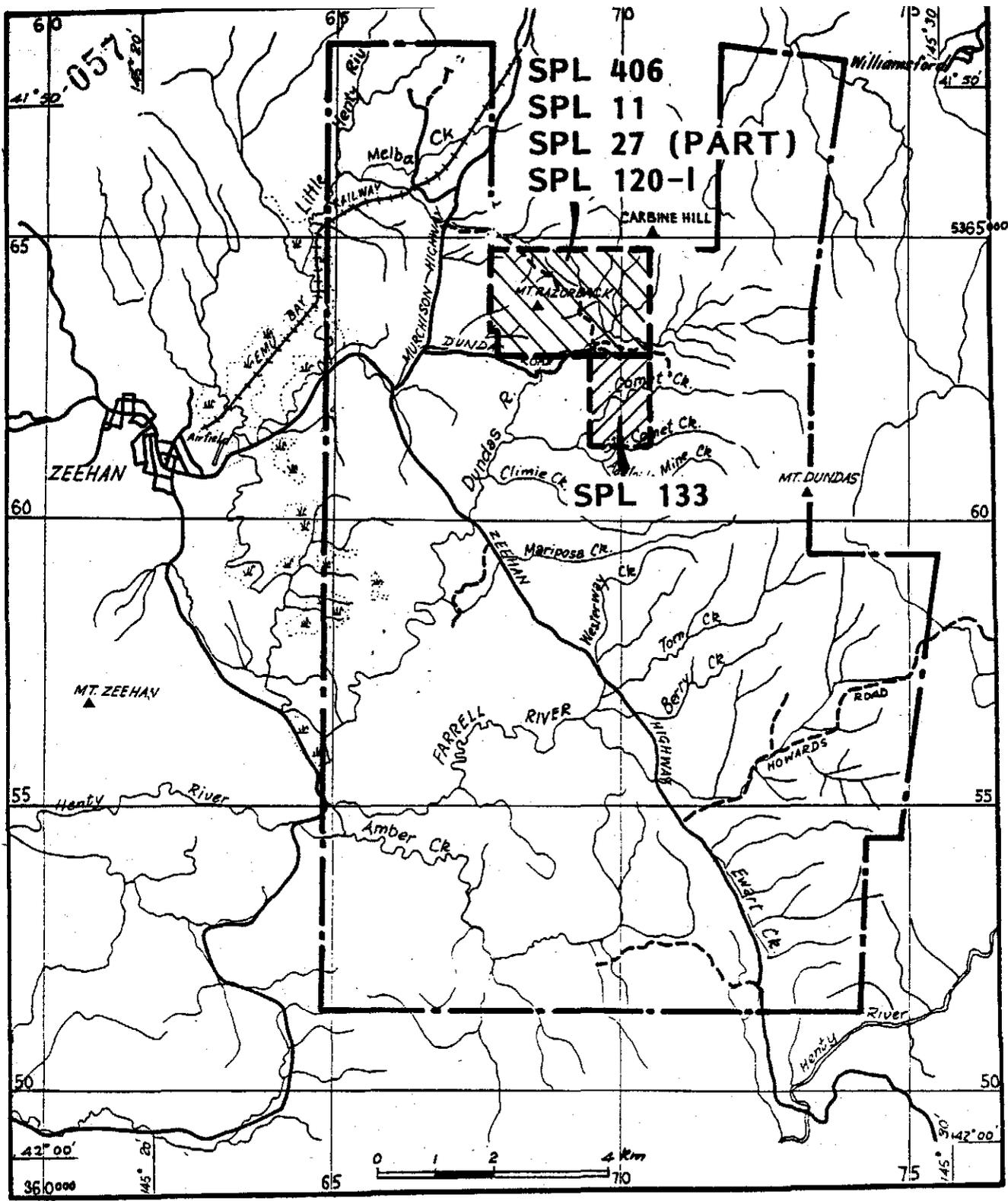
This work concluded that there was little possibility for the existence of an economic tin deposit in the Licence. SPL 20 was allowed to expire in February 1971.

#### 5.2.14 I.M. Tucker (SPL 99)

In November 1971, the area of SPL 20 was re-pegged by I.M. Tucker as SPL 99. Longreach Metals N.L. concentrated costeaning, mapping and sampling on CGFA's Anomaly A on Line 1.

The mapping showed the main structure to be a south-plunging syncline in the Brewery Junction Formation. High Sn values were related to dolomitic

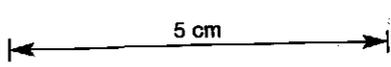
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**FIG 11  
LOCATION MAP**

- SPL 133
- SPL 406 (CLUTHA)
- SPL 11 (R.P.J. WEEDON)
- SPL 27 (RENISON)
- SPL 120-II (MINOPS)

**E.L. 15/76 DUNDAS, TASMANIA**



shales (Clare, 1972) with shears and faults controlling tin introduction. The highest tin value was a 3 m section of disseminated mineralisation averaging 0.33% Sn. Ten other 3 m sections contained +1,000 ppm Sn.

The Licence was forfeited in November 1972.

#### 5.2.15 Minops (SPL 120 - II)

The area of SPL 20 and SPL 99 was re-pegged by Minops and included as part of SPL 120. Minops concentrated exploration around CGFA's Anomaly A.

Costeaming and an IP survey over the Anomaly A mineralised zone defined two drill targets (Layden, 1974). This drilling was inconclusive due to core recovery problems. However, the area of greatest interest is a north-northwest trending shear zone containing tin in quartz veins.

This area (to the north of Frazer Mine) was re-pegged as a Mining Lease by Minops. The remainder of SPL 120 - II was relinquished to be re-pegged by CSR as part of EL 15/76.

#### 5.2.16 Clutha (SPL 406)/R.P.J. Weedon (SPL 11)

The only other area of exploration within the present boundaries of EL 15/76 was the central northern zone around the Razorback Mine. Clutha pegged this area as SPL 406 in June 1966 (Figure 11). Although it is believed that Clutha completed a drilling programme in the 12 month period of the Licence, this has not been recorded.

The area of SPL 406 then passed to R.P.J. Weedon as SPL 11 for a period of 18 months. Most of the exploration was completed by Placer Exploration through a joint venture agreement.

Placer's main interests were the Razorback and Grand Prize mines. These mines were mapped and then drilled with generally disappointing results. Most of this work was confined to the area still held as an independent (although joint ventured to CRA) Mining Lease and is thus excluded from EL 15/76.

#### 5.2.17 Renison Ltd. (SPL 27)

On relinquishment, the area of SPL 11 was re-pegged by Renison Ltd. as SPL 127.

Renison gridded the area and traversed the grid with geological mapping, magnetics, IP, SP and soil geochemistry for Sn, Cu, Pb, Ni and As (Ferguson, 1970 and Webb, 1971). The following anomalies were identified:

- (a) A series of magnetic anomalies along the serpentinite contacts were found to be caused by a concentration of magnetite adjacent to shears (Webb, 1971).
- (b) A tin anomaly adjacent to the Razorback mine was inspected after a review of Placer's SPL 11 exploration.
- (c) A series of coincident SP and IP anomalies associated with high copper and nickel values were drilled. This drilling showed these geochemical and geophysical anomalies were caused by the alteration of sub-horizontal layers within the serpentinite bodies.

During this geochemical evaluation of the Licence, some asbestos fibres were observed in parts of the serpentinite intrusion. Renison became interested

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in SPL 27 as an asbestos prospect. An initial asbestos investigation showed significant quantities of serpentinite containing asbestos (Newnham, 1971). A detailed study of the fibres showed that, unless high-quality fibres could be located, there was little prospect of a viable asbestos industry in the Pine Hill/Razorback area (Newnham, 1972). CSR Limited had a pilot mill operating in the area in 1943-45.

In 1973, after attempting to locate high-quality fibres, Renison concluded no economic mineral deposit existed in the area south of the Grand Prize Mine. The southern portion of SPL 27 (inside EL 15/76 present boundaries) was relinquished in 1973.

#### 5.2.18 Minops (SPL 120 - I)

The area of SPL 27 was repegged by Minops as part of SPL 120. The past work was reviewed briefly before the Licence was reduced, then re-peged as a Mining Lease. The retained area was the zone around the Razorback.

No exploratory work was completed and reported for the area of SPL 120 - I.

#### 5.2.19 Minops (SPL 133)

The only other Licence within the boundaries of EL 15/76 was Minop's SPL 133 adjacent to the southern boundary of SPL 120 - I (Figure 11). Again, no exploration was reported on this Licence prior to the Licence being reduced in area and re-peged as part of the Razorback Mine Mining Lease.

The only piece of valuable information reported was that Minops held at least some of Geophoto's diamond drill core.



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5.3 CSR Limited

Initial work by CSR Limited in 1977-78 was a wide-spaced drainage sampling programme (Macnamara, 1979). Over 600 active stream sediment samples were analysed for Sn, Cu, Pb, Zn, Bi, Ni, Co, Au, Cr and Ag with selected analyses for Mn, Mo, W, As and Fe (DRG Nos. K555-8 and K555-9). These analyses outlined seven main anomalous areas (Figure 12).

Area 1 in the northeast of the Licence showed strong anomalous tin (to 4000 ppm) in some sediment samples and anomalous tin, tungsten and antimony in some heavy mineral concentrates (+10,000 ppm Sn, +10,000 ppm Sb, 2000 ppm W).

Area 2 in the northwest of the Licence showed anomalous tin in the sediment samples. This tin may be derived from the Grand Prize mine area.

Area 3 in the central north of EL 15/76 showed anomalous lead (to 1800 ppm) and zinc (to 450 ppm). Anomalous Sn-Sb-W values occurred in some heavy mineral samples from areas adjacent to the carbonate rocks of the Dundas Group. This area was investigated as the Carbine Prospect by Geophoto Resources Consultants.

Anomalous Ag and Sb in the panned concentrates defined Area 4. This area was to the south of Areas 1 and 3, and to the north of Geophoto's Dundas area.

Area 5, adjacent to the Mining Leases over the Comet-Kosminsky line of mines, showed anomalous Pb-Zn sediment and heavy concentrate samples. Geophoto had investigated this area thoroughly during their Dundas exploration.

Area 6, along a tributary of Climie Creek, showed anomalous Sn (to 500 ppm), Sb (to 2000 ppm) and W (to 200 ppm) in panned concentrate samples.

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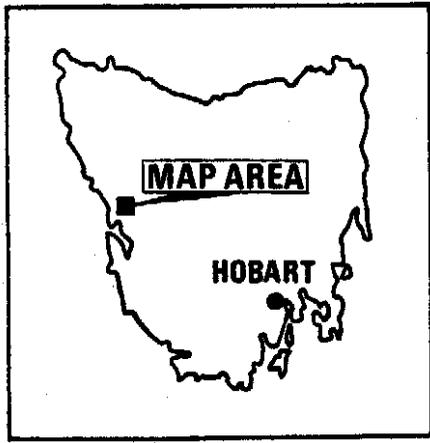
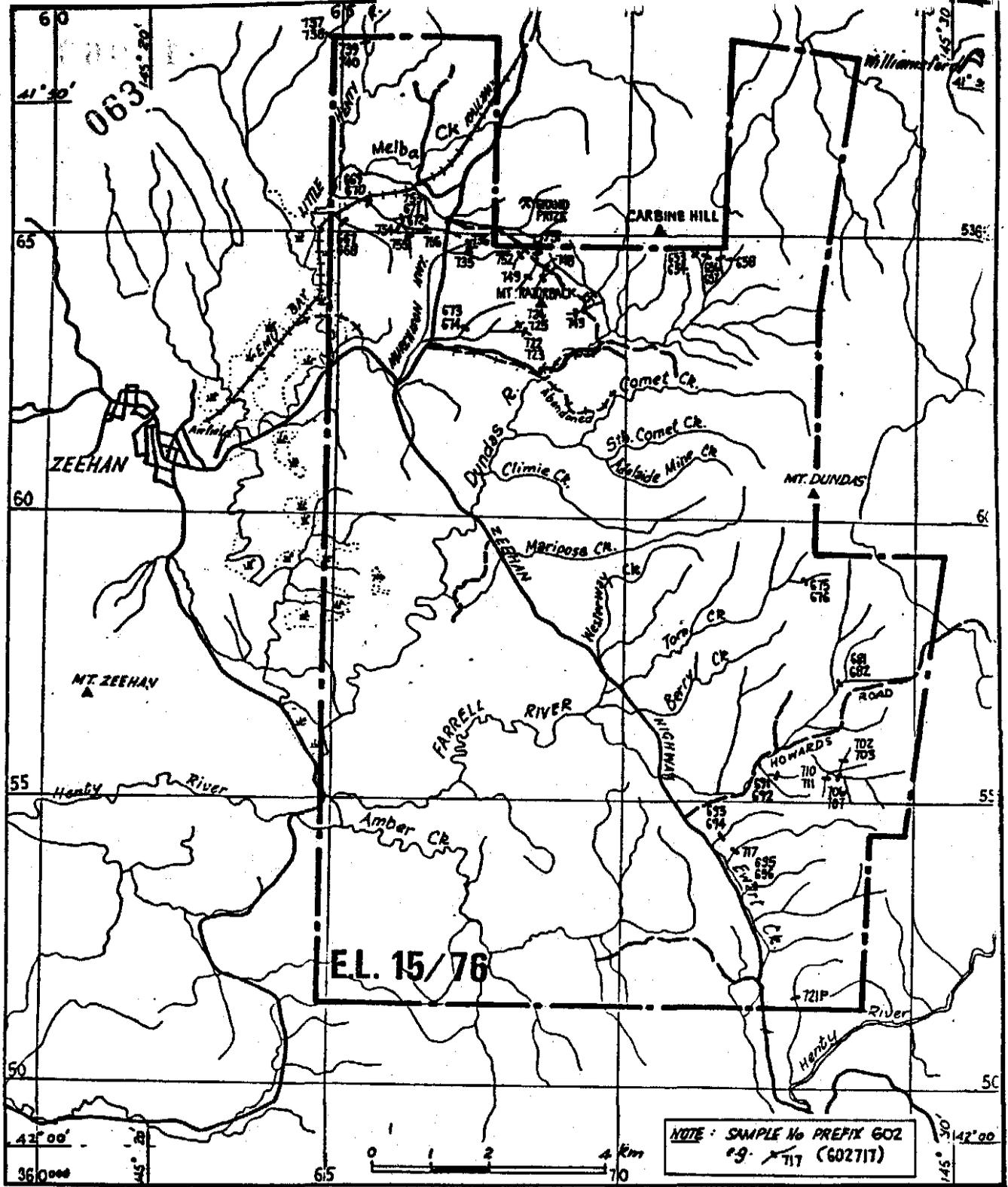


FIG. 13

ANOMALOUS DRAINAGE AREAS  
AND SAMPLE LOCATIONS  
1979 SURVEY  
E.L. 15/76 DUNDAS, TASMANIA

5 cm

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Area 7, covering the area of SPL 46, east of the Murchison Highway, showed anomalous Sn (to 300 ppm), Sb (to 3000 ppm), W (to 1000 ppm), Ag (60 20 ppm) and Cr (+1000 ppm). McIntyre Mines sediment sampled all streams in this area at 200 feet intervals. Analyses for Cu, Pb, Zn and Sn showed only minor weak Pb-Zn-Cu anomalies. Further work by McIntyre Mines in these anomalous areas failed to locate any significant mineralisation.

Further drainage sampling was completed by CSR in 1979 (Macnamara, 1980). The analyses of these samples for Sn, Cu, Zn, Pb, Bi, Ag, Au, Ni, Co and Cr and selected Mn, Mo, W, As and Fe showed anomalous Ag in the Cuni area (Area 2), Sn and Pb anomalies around the Razorback mine area and Au anomalies in the Howards Road (Area 7) area (Figure 13).

Drainage sampling of EL 15/76 was completed in 1981-82. Several tin and low-order gold anomalies were defined. Most anomalies were either isolated samples or in areas of anomalous geochemistry defined in 1977-79. Analyses of these samples for base metals were not available at the time of writing, but it is expected that these will confirm earlier work by other exploration companies.

Access problems during the attempted detailed evaluation of the Area 1 anomaly in 1978/79 resulted in only one of the CFGA lines being re-cleared, soil augered and traversed with magnetics (Frazer Grid). Soil geochemistry on this line (Line 13 of CGFA and Line 4493N of CSR) confirmed the CGFA tin and lead anomaly (Macnamara, 1979).

This area was then joint ventured to EZI/Getty (see below).

Follow-up investigations of anomalous Area 2 (Macnamara, 1980) consisted of 16 lines (DRG No. 7602-189) being traversed with magnetics, VLF-EM and about 1850 auger soil samples. Several localised anomalous zones were defined:

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- (a) Line 8221N between 6630 and 8900E had anomalous Cu (to 2300 ppm), Zn (to 2400 ppm), Pb (to 2300 ppm), Ag (to 16 ppm), Ni (to 430 ppm) and Co (to 770 ppm).
- (b) Lead Blocks area with anomalous Sn, Cu, Zn, Pb, Ag, Ni and Co. These anomalies were tested by diamond drilling (CG1-2) in 1980 (Macnamara, 1981). Only several small (less than 1 m) zones of Pb/Zn/Ag were intersected.
- (c) The Nevada grid had several areas of anomalous Cu (to 670 ppm), Zn (to 2800 ppm), Pb (to 1240 ppm), Au (to 1500 ppb), Ni (to 6200 ppm), Co (to 560 ppm) and Cr (to 15.3%). These were associated with ultramafics along the Razorback Conglomerate/Hodge Slate contact.

Further grid soil geochemistry, magnetics and VLF-EM was completed on the Cuni, Nevada and Howards Road grids in 1981/82 (DRG No. 7602-189). These geochemical results showed several anomalous zones most of which are in areas of intense previous investigations.

A strong Sn drainage anomaly in the South Nevada Creek was confirmed and investigated (1983-85) by gridding, soil sampling, mapping, magnetics and VLF-EM. This work showed the Sn was associated with thin veins.

In 1978, four airborne input/magnetic test lines were flown over the Licence (DRG No. 7602-189). Six magnetic or EM anomalies were located. Three of these on Line 1SE over the Cuni area (MG 181.85, MH 183.45 and EM 183.15) related to stratigraphic or cultural features (Macnamara, 1981). These were examined during the Cuni soil sampling programme with negative results. MH 193.10 on Line 3S and MH 208.20 on Line 4NE were thought to represent gabbro/dolerite dykes. The area of EM 196.69 on Line 3SW in the Amber Creek area was investigated in detail by Geophoto Resources Consultants with negative results.

A Dighem survey flown in 1981/82 located 35 initial anomalies. Examination of previous investigations of the areas of these anomalies resulted in only 5 anomalies requiring further investigation. Ground traversing of these 5 EM anomalies showed one to be caused by old mining equipment and two to be due to major faults. The Carbine anomaly and the Dundas Road/Murchison Highway area have been further investigated.

The Carbine anomaly was traversed with magnetics, VLF-EM and some soil geochemistry which defined a north-northeasterly trending anomalous zone near the baseline. A gradient array IP survey showed a very conductive zone adjacent to the baseline. A re-examination and logging of the Geophoto drill core showed this conductive zone to be due to the presence of a graphitic shale unit. Samples from the drill core showed minor sphalerite/galena, sufficient to explain the soil geochemical anomalies.

In 1983, all mineralised sections of drill core (and adjacent host rocks) were sampled and analysed for a wide range of trace elements. Computer statistical manipulation of the results failed to show any zoning, possibly due to a lack of detailed geological knowledge. P. Kitto undertook detailed mapping as a Ph.D. study (1984-85). Further statistical manipulation of the geochemistry with the detailed geology again failed to show any significant trends.

In 1984-86, the large aeromagnetic high feature in the Cuni area was investigated by ground magnetic traverses and then by a low-level, closely-spaced aeromagnetic survey. Anomalous areas were ground located and drilled. This drilling showed that in the Nevada, Dundas Road, Murchison Highway and Pine Plantation areas, the magnetic anomalies were caused by horizons of magnetic rock fragments within the conglomeratic horizons of the Dundas Group sediments. At North and South Cuni, the magnetic anomalies were due to

remanence magnetism in pyrrhotitic/pyritic zones of Crimson Creek Group sediments. No significant mineralisation was observed.

In 1985-86, the areas of Gordon Limestone at Ewarts Creek and Razorback West were gridded and traversed with magnetics and deep soil geochemistry (bedrock). Although minor Pb/Zn anomalies were observed on the Razorback West lines, no further work was warranted (most other limestone areas were joint ventured to Amoco/Cyprus, whose work showed the Razorback West anomalies were not significant for the location of mineralisation - see below).

In 1986-87, an aeromagnetic feature in the Misery Hill area was ground traversed. This suggested the source was a 500 m thick ultramafic body.

In late 1981, the southwestern portion of the Licence (southwest of the Murchison Highway) was joint ventured to Amoco Minerals Australia Ltd. (later changed to Cyprus), while in early 1982, the northeastern portion (Montezuma area) was joint ventured to EZI and Getty Australia (later EZI and Little River Goldfields).

In the 1982-84 period, Amoco completed a drainage sampling programme and a structural airphoto geological interpretation and gridded the Mariposa, Blackjacks and Bannockburn areas. These grids were traversed with "wacker" bedrock sampling and minor magnetics, EM and gravity surveys. Geochemical anomalies were confirmed and defined by costeans prior to diamond drilling in 1984-85. Drilling results were disappointing with some mineralisation being located only in the vicinity of the old Mariposa workings.

In 1985-86, Cyprus Minerals completed reconnaissance gridding and sampling of the Leatherwood, Amber Creek, Pyramid and Berry Creek limestone areas with disappointing

results. An Irish-devised hydrocarbon analysis showed the areas of possible interest to be areas previously investigated and discarded (e.g. Mariposa). A further structural analysis suggested the main mineralisation in the limestone is pre-Devonian, but that post mineralisation structural upgrading is important to the formation of economic deposits.

In 1986-87, CSR investigated a magnetic anomaly with associated Sn drainage anomalies as a possible Queen Hill style of mineralisation within the JV area. This soil geochemistry, mapping, magnetics survey, west of the Bannockburn grid, showed the magnetic anomaly represented a change to the Dundas Group sediments from the Silurian sediments.

In 1982-83, EZI re-opened and extended the CGFA grid and completed mapping, soil geochemistry, magnetics and Genie EM surveys. Costeans and pit sampling led to the drilling of 5 diamond holes. Three holes in the Line 18/19 area were tested for Renison-style replacement of the Maestries Dolomitic Conglomerate, adjacent to a possible feeder zone (leaking Sn) - the Montezuma Fault. The two holes in the Line 9/10 area tested a zone of enhanced Sn geochemistry. Results were disappointing. Although a deep hole in the Line 18/19 area was proposed, no further work was undertaken.

## 6. CONCLUSIONS

A great quantity of exploration data are available for the area covered by, and adjacent to, EL 15/76. The results of this exploration have been summarised in this report. Details of all investigations are in easily retrievable form in reports held by the Tasmanian Department of Mines.

The surface evaluation of EL 15/76 has been completed with very discouraging results. Regional investigations have included EM, magnetic, Afmag and Turair EM surveys. Some of these have been repeats of earlier surveys. Almost all anomalies defined by these regional surveys have been investigated with ground techniques. These include EM, SP, magnetic IP, Gun EM, Turam EM, gravity and soil, drainage and rock-chip geochemistry.

These investigations (many repeats of older investigations) failed to give any indication of the presence of a near-surface economic tin and/or base metal deposit. Further investigations should not be directed at locating near-surface deposits.

A new exploration technique is required for further investigation of the area of EL 15/76. Such a technique could be an analysis of trends visible in past geological, geochemical and geophysical surveys to determine any concentration of trends. This would define areas of highest potential for further detailed investigation. Another technique is a trace element study of all available drill core and rock outcrop to determine the presence of any halo effects. These haloes may define deep-seated drill targets for economic tin deposits. These targets could be at depths to 1000 m.

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Dighem Ltd. Rpt. No. 355 (unpubl.)

PDE/SGL  
MAY 1987

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APPENDIX I

P.R. GIDLEY - REVIEW OF GEOPHYSICAL REPORTS

RELATING TO EL 15/76

**Minerals Exploration And Development Group**

TO P D ELLIS REFERENCE PRG/BW.24.74:7602  
FROM P R GIDLEY DATE 20 August, 1985

**REVIEW OF GEOPHYSICAL REPORTS RELATING TO EL15/76, DUNDAS, TASMANIA**

A detailed review of reports contained on open file in the Tasmanian Department of Mines (Hobart) relating to geophysical ground and airborne techniques was undertaken between 12/8/85 and 16/8/85. Additionally, joint venture and closed file material were also reviewed. This review aimed at critically assessing the geophysical coverage of the tenement and so make recommendations for additional or supplementary work to be undertaken.

Similar reviewing procedure has been undertaken previously (by Ellis, 1984, as an internal CSR report) but not with a critical assessment of the geophysical work. Geophysical survey reviews have been made for parts of the area (e.g. J Bishop for AMOCO in 1983 and 1985 referencing Bannockburn, Blackjacks and Mariposa grids) but not the complete Dundas EL 15/76.

**Geophysical Coverage**

The geophysical coverage for the tenement is complete in a regional sense. Comprehensive coverage on a detailed, local grid approach is available and will be discussed later. This latter coverage is shown on map .....

Regionally the area has been completely covered by CSR/Tasmanian government flying. The survey had 250m line separation and was flown east-west by fix-wing aircraft collecting only aeromagnetic data. This data set, although

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complete, has been shown by reprocessing to be lacking in adequate recovery control and data quality over much of the tenement. Coverage gaps up to 5-600m are evident in critical areas of the data with additional presentation difficulties being provided by inappropriately placed line terminations and inadequate data levelling. Nevertheless, this data does provide a regional coverage of the whole tenement, and is therefore, one of the most significant. Other regional data surveys reviewed are summarised below.

Regional Dundas Surveys

1. Report on Helicopter AFMAG survey, North Western Tasmania (1966)

by McPhar Geophysics Pty. Ltd.  
for Mines Exploration Pty. Ltd.

Tasmanian Dept. Mines Ref. Q44/19

- Survey used Bell Ranger helicopter outfitted with AFMAG equipment using frequencies of 140 and 510 Hz.
- Four discreet areas in Western Tasmania were surveyed of which one, Area D covers the west side of EL 15/76.
- Flight lines east-west at 1/8 mile separation (200m).
- Topographic relief of survey area caused considerable flying and navigation difficulties. This has had a serious effect on traces obtained. In some instances geologically inferred sources are obviously topographic effects. Weak secondary signals only evident. Survey did not define known areas of surficial sulphide deposits or graphitic shales where determined by other ground based techniques.

2. Report on Turair airborne electro-magnetic surveys in the Zeehan area. (May 1973)

by A Howland-Rose (Scintrex)  
for Geophoto - Texins Development Pty. Ltd.

Tasmanian Dept. Mines Ref. Q50/120

Razorback required a detailed appraisal of the work previously undertaken (i.e. pole-dipole IP) and perhaps some additional magnetics to detail serpentinites etc.

Carbine work currently available (CSR VLF and ground magnetics) should enable outlining of specific follow-up areas for geological control.

Dundas requires a detailed geological examination rather than geophysical, as discussed.



P R GIDLEY

cc R E Williams  
R J Fountain  
DJC/File

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- 471 kilometres of Turair and aeromagnetics. Flown east-west with flight separation of 200m. Sensor-bird height of 30m(EM) and 75m(magnetics). A 400Hz primary field signal was used with surveying undertaken within a 2 x 2 mile loop (3.4 x 3.4 km). A 15 kWatt generator was used to drive signal into the loop at between 4-10 amperes. The plans contained in the report do not indicate the positioning of the transmitter loops so no information is provided on the coupling of signal to conductors detected.
- No EM or magnetic anomalies detected appear to warrant follow-up. Surficial conductors only appear to have been determined e.g. creeks, swamps.

3. R.T.A.E. (Rio Tinto) and E-Z exploration programme  
geophysical survey in North-Western Tasmania to 31st May, 1957.

by E McCarthy (12-6-1957)

for Rio Tinto (Australasia) Exploration

Tasmanian Dept. Mines Ref. Q50/4

- Aeromagnetics survey is very extensive and, for the time of acquisition, of high quality. It was flown east-west at 1/5 mile separation (350m). These results largely replaced by more recent government regional flying of area.

4. Report on operations for the 6 months to May 3, 1972, and  
proposed work programme to November 3, 1972.

by A Dobson

for Tenneco Pty. Ltd.

Tasmanian Dept. Mines Ref. Q50/58

- Report details a HEM-701 helicopter-borne, frequency-domain electromagnetic survey over Bannockburn, Mariposa and Blackjacks grids.

Work was undertaken by Scintrex and acquired 181 line miles (290 kilometres) of data along lines 660 feet (200m) apart with a sensor bird at 100 feet (30m). A frequency of 1600 Hz was used for a shallow massive sulphide target.

- Results and quality of work appear fair to good but no significant anomalies were detected. Those anomalies which were defined are weak and have no quantitative treatment.

5. Dighem II Survey of Zeehan Area, Tasmania  
by W S Peters and D Fraser  
for CSR Limited

Closed file CSR Internal Report

- The regional Dundas coverage using the DIGHEM II helicopter system was collected with a line spacing of about 200m and bird height of 36m.
- The data quality is high with good recovery (+ 50m) and good equipment.
- Absence of conductors in large areas of the southern portion of the survey is useful in dismissing this area as having only low potential.
- Depth of investigation should be about 50-60m but will require moderately conductive sulphides (conductivity - thickness in excess of 8-10 mhos) to be detectable at this depth.
- This technique is most likely of all undertaken to have found a massive target with significance in the area if it exists. Follow-up of all Dighem anomalies is recommended.

#### Detailed Dundas Surveys

Detailed surveys are numerous and extremely variable in data quality, data collection density, and success. In many instances, various generations of surveys are not correlatable, e.g. vertical field magnetometry and later acquired total field data. Often a

poor, or inadequate appreciation of target, and associated physical properties is obvious in the reports. An indication of this is the application of some techniques (e.g. TURAM) for targets of lead-zinc deposits where high resistivities as evidenced by IP exist.

Similarly, an immense amount of work has been undertaken in areas of glacial overburden (e.g. at Bannockburn, Amber Creek etc. using techniques of SP and VLF-EM where the known depth of effective penetration (10-15m) is less than the known thickness of overburden.

On the positive aspects of work undertaken some excellent IP results (Razorback - EZ), SP/Magnetics (Cuni-BMR, etc.) These and others are detailed below.

#### GROUND SURVEY WORK

NOTE: The index number occurring at the top of each report review refers to the brief description accompanying the grid positions shown in map ....

4. Report on operations for the 6 months to May 3, 1972, and proposed work programme to November 3, 1972.

by A Dodson  
for Tenneco Pty Ltd

Tasmanian Dept. Mines Ref. Q50/58

- Work accompanies description of airborne EM survey undertaken by Scintrex. Additional ground survey results refer only to Bannockburn, Mariposa and Blackjacks grids.
- TURAM: Undertaken at Blackjacks grid only. Although four conductors were defined, their character and correlation with other techniques suggest a surface, lithological interpretation only. Low conductivity - thickness products

also suggest low sulphide content of determined conductors. Work undertaken by Scintrex.

- SP: Work undertaken internally by Tenneco. Results show reasonable correlation with TURAM data but appear as sporadic, discontinuous anomalies. Surficial response inferred.

6. Geological and Geophysical Survey EL 7/68, Amber Creek, West Tasmania (Oct. 1972)

by L DiScala

for Geophoto - Texins Development Pty. Ltd.

Tasmanian Dept. Mines Ref. Q50/80.

- Within the Amber Creek grid a Pb-Zn target was sought as a replacement deposit within Gordon Limestone.
- VLF-EM: 400 feet (120m) line separation with 50 feet reading intervals.

Although data quality appears reasonable, depth of detection remains limited to 10-15m.

It appears that anomalies relate to thickness variations of overburden over the Gordon Limestone. Some graphitic shale response is also possible as detailed geological mapping indicates.

Magnetics: Broad sampling (alternate lines of VLF and grid only were read). No significant anomalies detected.

7. Final Report on Special Prospecting Licence No. 46 Zeehan, West Tasmania. (April 1972)

by T Bates

for McIntyre Mines Pty. Ltd.

Tasmanian Dept. Mines Ref. Q50/50

- Report comprises geology, geophysics and geochemistry which defines two prime target areas - Anomaly 1 and Mariposa.

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- Anomaly 1 - This grid, despite very difficult early access was surveyed for magnetics, SP and limited IP by CGG (Compagnie Generale de Geophysique).
- No significant anomalies were determined during this work.
  
- Mariposa - EM, SP and IP were applied. EM (frequency domain, two loop nulling system) and SP were found unsuitable and not effective.
- CGG dipole-dipole array IP was effective in determining mineralisation associated with the Mariposa workings plus three other conductors/IP polarizable zones which when drill tested revealed weak and patchy pyrite/minor galena at the Crotty Quartzite/Gordon Limestone contact, graphitic shales and minor pyrite.
- The work undertaken was technically sound and evidenced a successful application at Mariposa.
  
- 8. Report on magnetometer survey at Melba Flat  
by S Webster (1967)  
for Electrolytic- Zinc
  
- This report documents a magnetometer survey over six lines at Melba Flat using a vertical field magnetometer.
- Results are well treated quantitatively and qualitatively but profiles and contour plans are not presented. Quantitatively a steep dipping ( $80^{\circ}$  NE) plate model is used with a modelled magnetic susceptibility of 0.008-0.01 cgs units.
- Drill holes (two) are proposed but no results of drilling are presented. These results should be acquired if possible.

092

9. Interim report on Exploration at Melba Flats, Tasmania  
(Dec. 1968).

by D O'n Hackett  
for Electrolytic-Zinc

Tasmanian Dept. Mines Ref. Q50/84

- This report is of very limited use since, magnetometer data is said to be acquired but no results or data are presented. The report recommends additional EM work be undertaken.

10. Melba Flat - Exploration work completed during 1970/71  
(Oct. 1971)

by C. Burton  
for Electrolytic-Zinc

- Report details work at Cuni and Deverau grids referring to TURAM and magnetometer surveys without presenting data. TURAM results included in 12 below. Drilling was proposed and aimed at testing a number of sulphide pods of high concentration over long north-south strike extent.

11. Report on the IP and Resistivity Survey at Melba Flat,  
Tasmania (Jan, 1970).

by McPhar Geophysics  
for Electrolytic-Zinc

Tasmanian Dept. Mines Ref. Q50/17D

- Data for only two traverses (Lines 14S and 10S) are presented from dipole-dipole array IP.
- Data quality is high but anomalous zones are narrow, and therefore not adequately resolved by the 100m dipoles used. Correlation with geochemistry is good.
- Some additional dipole-dipole IP survey work undertaken by E-Z(?) is also present (lines 42-30N) and interpretation of these indicates good line-to-line correlation. Anomalous zones are narrow however and again, not well resolved.

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12. Report on a TURAM EM survey, Cuni, Rosebery, Northwest Tasmania (March, 1971)

by A Howland-Rose  
for Electrolytic-Zinc

Tasmanian Dept. Mines Ref. Q50/92

- Aim of survey was to extend nickel sulphide deposits associated with dolerite dykes known in the area.
- Maximum depth of search calculated to be 120 feet (40m). Twenty-four lithological and sulphide related conductors were determined.
- Correlation between TURAM and geochemistry was good. Results suggest discontinuous sulphides along dolerite contacts. No transmitter loop/wire locations are shown. Short, well defined conductors appear to correlate well with ore zones.

13. Zeehan Base Metal Prospect, March 1971 Report

by McIntyre Mines (anon.) (March 1971)

Tasmanian Dept. Mines Ref. Q47/48

- A summary report of review presented as 7. above.
- Summarizes work on Anomaly 1 and Mariposa grids only.

14. Geophysical survey near Zeehan, Tasmania

by Compagnie Generale de Geophysique (CGG)  
for McIntyre Mines Pty. Ltd.

- Detailed data presentation of surveys summarised in 7 and 13 above.
- Anomaly 1: IP and EM undertaken. No significant anomalies determined.

094

- Mariposa : IP gradient array used with a Scintrex 25 Watt generator using 50 feet (15m) dipoles. Bedrock at this grid was approximately less than 30 feet (10m) deep through an overburden with resistivity in excess of 100  $\Omega$ -m. This therefore does not present signal difficulties in detecting polarizable zones in bedrock. As described in 7 above the IP was successful over the Mariposa workings and in other non-mineralised situations.  
EM and SP were not felt useful.

15. Geophysical Surveys in the Mariposa area, Tasmania  
by J Boniwell (Jan. 1959)  
for Rio Tinto

Tasmanian Dept. Mines Ref. Q50/44

- A somewhat superficial treatment of five lines at 400 feet (120m) spacings sampled at 100 feet (30m) stations.
- EM - frequency-domain two-loop data with only one anomaly determined and probably due to overburden.
- Magnetics - data very sparse with no correlatable results.
- Gravity - inadequately sampled or corrected. Anomalies detected are likely due to inhomogeneities in Gordon Limestone density and overburden thickness.
- Little useful information presented.

16. The Mariposa Mine, Zeehan, Tasmania.

by W. Cadwallender

with Appendix by R. Loh (BMR) (1957)

- Magnetics - vertical force magnetometry with no significant anomalies other than those believed due to mine and drilling equipment near the Mariposa mine site.

- Gravity - data quality is very detailed and appears of reasonably good standard. Some discreet anomalies suggest mine extensions and drilling was recommended. Terrain corrections were made and appear warranted. A Bouguer density of 2.5 gm/cc was used.

17. Progress report on North Dundas project (SPL No. 20) Tas.  
for 1968-69 Field Season (Q50/41)  
for 1967-68 Field Season (Q50/40)  
by D Forsythe  
for New Consolidated Goldfields Pty. Ltd.

- Only vertical magnetics undertaken but results correlate well with known pyrrhotite occurrences.  
Readings at 50 ft. intervals.
- Survey is broad but useful for geological mapping of units corresponding with elevated levels of pyrrhotite content. Some known and extensions of arsenopyrite-chalcopyrite-cassiterite veining noted and mapped by the magnetic response.

18. Report on Exploration activities  
for period 15 December, 1972 to 15 June, 1974.  
by C Laydon  
for Minops Pty. Ltd.

Tasmanian Dept Mines Ref. Q50/83

- Mapping, reconnaissance grab samples, costeaning and limited gradient array IP were acquired at Anomaly A.
- Gradient array IP was collected by Scintrex using time domain IPR-8 equipment with 50 feet potential dipoles. 2000 feet (650m) current electrodes used.
- Results are too limited in data to be of use. IP appears to have been coupling with geological conductors however.

19. Lease SPL20 - North Dundas  
by J Elders  
for Renison Ltd.

Tasmanian Dept. Mines Ref. Q50/39

- No geophysical results contained but magnetics and additional IP proposed.

20. Report on Follow-up work done in 1969-70 field season  
by K Ferguson  
for New Consolidated Gold Fields (A'sia) Pty. Ltd.

Tasmanian Dept. Mines Ref. Q50/42

- No geophysics presented. Magnetics referenced but not included. Results contained in 17 above.

21. Geophysical investigation of the Copper-Nickel deposits,  
North Dundas field, near Zeehan, Tasmania.

by O. <sup>K. Kev</sup>Warnecke<sup>?</sup>

for Bureau of Mineral Resources (Geology & Geophysics)  
BMR Record 1953/82

- work undertaken over Cuni grid. Methods involved:

SP:

- 100 feet E-W lines sampled at 25 feet intervals.
- results appear fair/good with care used in the acquisition. Results indicate a number of short strike (north-south) length anomalies many of which coincide with known orebodies. Trenching of resultant anomalies showed sources of:

- i) Cu-Ni mineralisation
- ii) pyritised shear zones
- iii) traces of galena in shears
- iv) Fe-manganese lode in shales/graphitic shales

Results indicate near surface responses only with topographic effects present.

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EM:

- limited coverage with frequency domain two loop system. Results not definitive with only very shallow response.

MAGNETICS:

- Vertical field results only but not all of grid traversed at equal density.
- Results failed to record basic sills nor offer significant anomalies.

22. Dundas IP Survey Lines  
by Comstaff 1963-65

Tasmanian Dept. Mines Ref. Q50/36

- No text, dipole-dipole IP lines only. 300 feet (100m) dipoles.
- Results appear correlatable from line to line and in most instances have detected known mineralisation at e.g. South Comet.

23. Geologic, geochemical and geophysical surveys in Montezuma,  
North area, E.L.7/68, Dundas

by Geophoto - N. Turner (Dec. 1971)  
for Texins Development Pty Ltd

Tasmanian Dept. Mines Ref. Q50/78

- VLF-EM survey using 200 feet (80m) spaced east-west lines and 50 foot (15m) station spacings. cross-faulting evidenced. Additionally Crimson Creek/Oonah Formation contact is well defined. Surficial response only but useful geological mapping.

24. Kosminsky-South Comet Geological Report

by R. Paterson  
for Geophoto - Texins Development Pty Ltd (1970)

Tasmanian Dept. Mines Ref. Q50/74

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- Used magnetics, SP, EM and VLF for mapping and extensions of known mineralisation.

- MAGNETICS:

Used a McPhar MF-1 fluxgate magnetometer to define the ultrabasic and known pyrrhotite ore. Known Pb-Zn deposits traversed proved not to be significantly magnetic.

- EM

Two-loop frequency domain, roving EM (REM) system. Topography and 'non-line of sight' made orientation difficult with noise being introduced greater than expected source signals. Non-repeatability of readings indicated not a successful application of the method.

- VLF

Results obtained by BMR (1970). Surface correlation of mapped geology is good.

- SP

Results appear fair with good correlation between SP and VLF. Anomalies due to topography, groundwater, graphitic and pyritic shales.

26. The West Kosminsky Project EL7/68 - West Tasmania.

by R. Paterson

for Geophoto - Texins Development Pty Ltd (1970)

Tasmanian Dept. Mines Ref. Q50/84

- Results as for 25 above plus one test line of dipole IP. Chargeability anomaly coincides with gossan and known mineralisation. Recommendation for more work to be done.

27. Summary Report on West Comet Mine area and extensions EL7/68

by R. Paterson (Oct 1970)

for Geophoto - Texins Development Pty Ltd

Tasmanian Dept. Mines Ref. Q50/89

- Vertical magnetics acquired primarily to obtain dip direction for drill-targetting. Some structure apparent in data hence successful in application.
  - SP used extensively but results badly affected by topography. Results show poor correlation with geochemistry. Unreliable results are noted.
28. Carbine Hill Preliminary Report EL 7/68 - West Tasmania  
by A Johnston (1971)  
for Geophoto-Texins Development Pty Ltd
- Carbine Hill grids covered by vertical field magnetics and VLF.
  - Magnetics used primarily to isolate ferromagnesian gossans and serpentinite tonguing. This was largely successful although only two anomalous zones defined.
  - VLF - readings every 50 ft. (16m) with no observable correlation to gossans. No data is included.
29. SPL 27 - South Dundas - 1971-72 Annual Report  
by L Newnham  
for Renison Ltd.
- Good results were obtained using IP and magnetics.
  - Detailed pole-dipole IP was undertaken and defined polarizable bodies correlating well with SP and geochemistry at Razorback.
  - Magnetics using a McPhar MF-1 fluxgate gave good structural information with strong and noisy response over serpentine margins.
30. Progress Report - July 1984 to June 1985. AMOCO/CSR Joint Venture Part Exploration Licence 15/76, Dundas, Tasmania  
by G Kary  
for AMOCO/CSR

- Target was a large, economic Irish-style carbonate hosted Pb-Zn-Ag deposit.
- On fifteen holes drilled downhole PEM work was undertaken at Blackjacks, Mariposa and Sunny Corner grids. Only one significant anomaly at Mariposa was defined.
- Blackjacks grid:
  - VLF done and corresponds well to geochemistry. Suggest from results that mineralisation occurs along fractures only.
- Mariposa grid:
  - VLF - 12.5m sampling gives a strong response over Mariposa workings plus a weak response from mineralised eastern fault zone.
  - EM-37 - what was originally thought to be an anomaly was later shown to be loop effects resulting in no significant anomalies being defined.
  - IP - dipole-dipole work undertaken by Geoterrex in 1984 resulted in no significant anomalies.
  - gravity work at 50m spacing detailed only a coarse response over higher detail work of BMR.
  - Results of all techniques indicate good quality work generally with no significant anomalies being defined due to major mineralisation. Recommendations for additional work unwarranted since current data would have given some indication of major mineralisation if present and within top 40 metres.
- Bannockburn and Sunny Corner:
  - VLF-EM undertaken at 12.5m intervals. No significant anomalies defined.
- Overall report is good with high technical standard. It is felt any large geophysically detectable source would have been indicated by amount of work presented.

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31. Montezuma Joint Venture

Report for period 9 ended 8th March, 1983

by R Sainty

for Electrolytic - Zinc/Getty/CSR

- Used Scintrex Genie EM moving loop system which appears to have worked well and correlated with DIGHEM II anomalies. Some disparity of anomaly grades reported between the two techniques.

Genie results defined Montezuma fault well and some graphitic slates/shales. Response appears fairly near surface with no major additional anomalies.

- Magnetics undertaken defined no anomalies additional to DIGHEM II work.

32. Evaluation of the geophysical survey carried out within EL 4/78 and part of EL 15/76, prior to 1978 for AMOCO Minerals Aust. Co.

by J Bishop

for AMOCO

- A good review of all existing data with recommendations for additional magnetics at Mariposa, Bannockburn and Blackjacks grids.
- Downgrades SP and VLF due to surface responses being inappropriate over glacial overburden.
- EM not effective for Oceana style ore deposits as model is not conductive.
- IP hindered by swamp conditions.

This completes those geophysical reports reviewed. It must be remembered that the Dundas tenement has a multitude of mineralisation-styles or theorised as targets associated with it. Known deposits of Pb-Zn (Renison-style replacement), Irish base metal (Mariposa), Cu-Ni (Cuni), Nickel (ultramafic hosted), and deep (to 600m) massive pyrrhotite occurrences (as recently

drilled by Renison Ltd.) exist. A consequence of these styles, is the difficulty of choosing a suitable, geophysical technique. This is exacerbated by extremely rugged terrain over much of the tenement and difficult climatic conditions. The final result, historically appears to be that very few geophysical applications have been successful in detecting in excess of 15 metres below surface. The outcome of this, is a relatively poor understanding of the geology as assisted in its definition by geophysics, and a poor record of determining the presence or absence of a 'deep' (greater than 55-60m) base metal or tin-related target.

It would appear however, that a broad, total coverage by deep looking techniques (e.g. UTEM, CSAMT wide dipole IP) is not viable due to the high expense, and the need for costly line cutting. The solution therefore, appears to lie in a new approach. I suggest, from the regional information we have currently available (i.e. aeromagnetism and DIGHEM), plus geological input a series of 3-4 small areas only be concentrated on. These areas should be those we have discussed, viz:

- a) Cuni - because
- i) a known amount of mineralisation exists locally.
  - ii) topographically flat therefore accessible and navigable by air.
  - iii) suspected intrusive lies about 7-800m deep from gravity and magnetic evidence.
  - iv) limestones lie proximally.
  - v) lies on Queen Hill-Renison structural corridor.
  - vi) some unexplained aeromagnetic anomalism.

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b) Razorback

- because i) unexplained DIGHEM anomalies.
- ii) on line with recent Renison deep drilling and pyrrhotite discovery.
- iii) successful pole-dipole IP survey results available.
- iv) some favourable geochemical results.

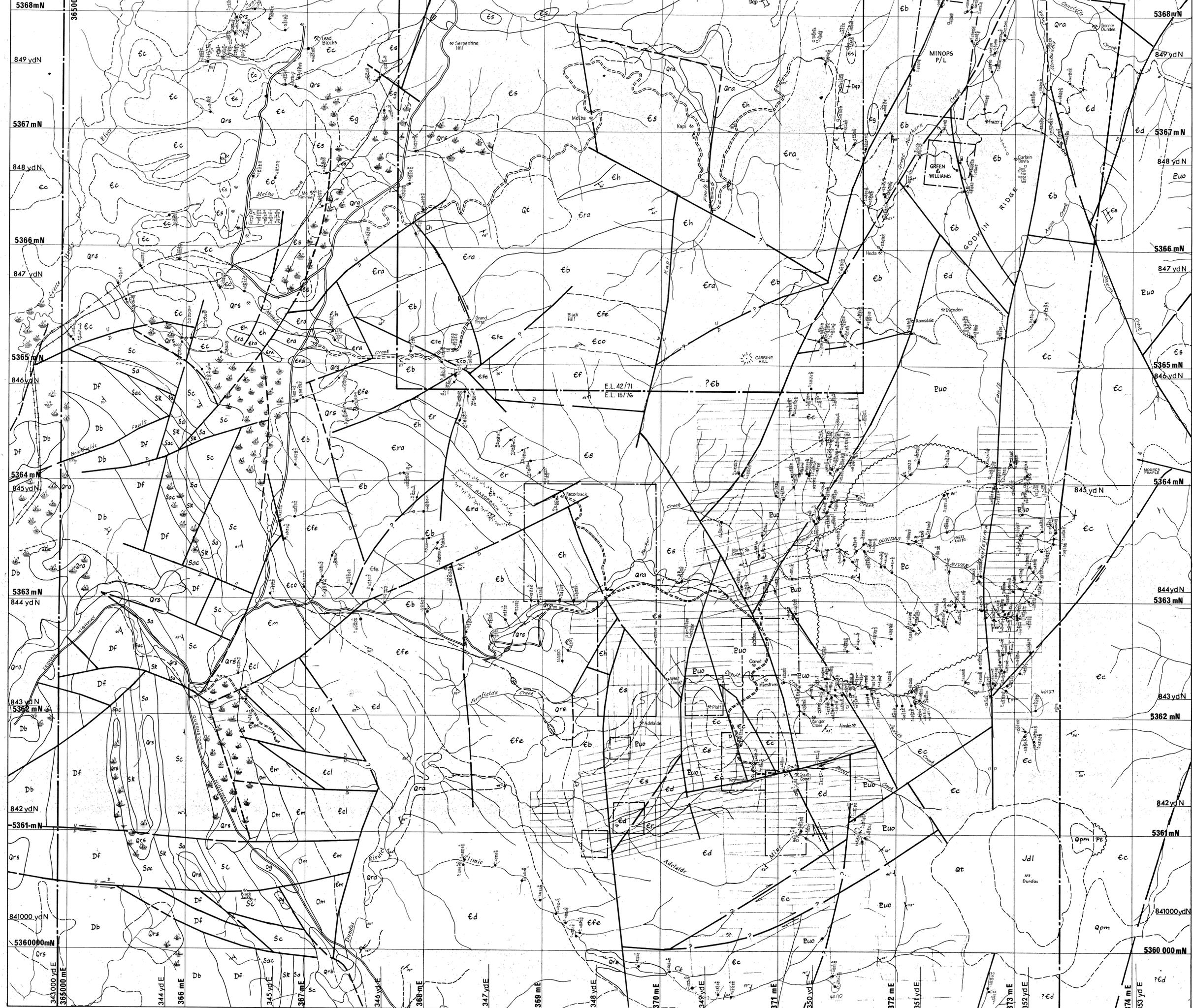
c) Carbine - because

- i) unexplained DIGHEM anomalies.
- ii) shallow (50-60m) unexplained magnetic anomalies.
- iii) evidence of conduction associated with a VLF/magnetically anomalous dolerite dyke.

d) Dundas area

- because i) primarily geological grounds based on complexity and structural influence.
- ii) area has an absence of geophysical anomalies on a regional basis but is not well investigated by detailed surveys.

A new approach applied to the Cuni area may involve an ultra-detailed aeromagnetic coverage. This would provide magnetic targets and good geological information without the expense of costly line cutting. Some minor ground magnetics would then be applied to define a drill target. No line cutting would be envisaged for this work. Fortunately, the Cuni area is topographically favourable for fixed-wing surveying and therefore offers cheap coverage. Line spacing would be planned for 75-100m east-west flying with 300m north-south tie-lines for high quality data levelling. Discussions will have to be held with contractors on specific requirements and timing.



Q	Qc	Conglomerate talus	QUATERNARY
Q	Qt	Dolerite talus	
Q	Qrs	Older alluvium marsh deposits downwash etc.	
Q	Qpf	Fluvioglacial & lacustrine deposits	
Q	Qm	Moraine	
P	Pz	Zeehan Glacial Formation	DEVONIAN PERMIAN
D	Db	Bell Shale	
D	Df	Florence Quartzite	
S	Sac	Austral Creek Siltstone	SILURIAN
S	Sk	Keel Quartzite	
S	So	Amber Slate	
S	Sc	Crotty Quartzite	
S	S	Unassigned	
O	Og	Gordon Limestone	ORDOVICIAN
O	Om	Mona Sandstone	
O	Oz	Mt. Zeehan Conglomerate	
E	Em	Misery Conglomerate	CAMBRIAN
E	Ecl	Climo Formation	
E	Ef	Ferntlow Formation	
E	Eco	Comet Formation	
E	Efe	Ferntfields Formation	
E	Eb	Brewary Junction Formation	
E	Era	Razorback Conglomerate	
E	Eh	Hodge Slate	
E	Er	Red Lead Conglomerate	
E	Ed	Dundas Group unassigned	
E	Ec	Crimson Creek Formation	
E	E	Cambrian unassigned	
P	Puo	Oorah Quartzite & Slate	PROTEROZOIC
P	Pc	Concord Schist	
P	Pw	Whyte Schist	

- Stream sediment (M) (-80 mesh)
  - Panned concentrate (P)
  - Rock chip, flat (R, F)
  - Limonite (L)
- Sequence of values (p.p.m.)
- Sn  
Cu  
Zn  
Pb  
Bi  
Ag

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5cm

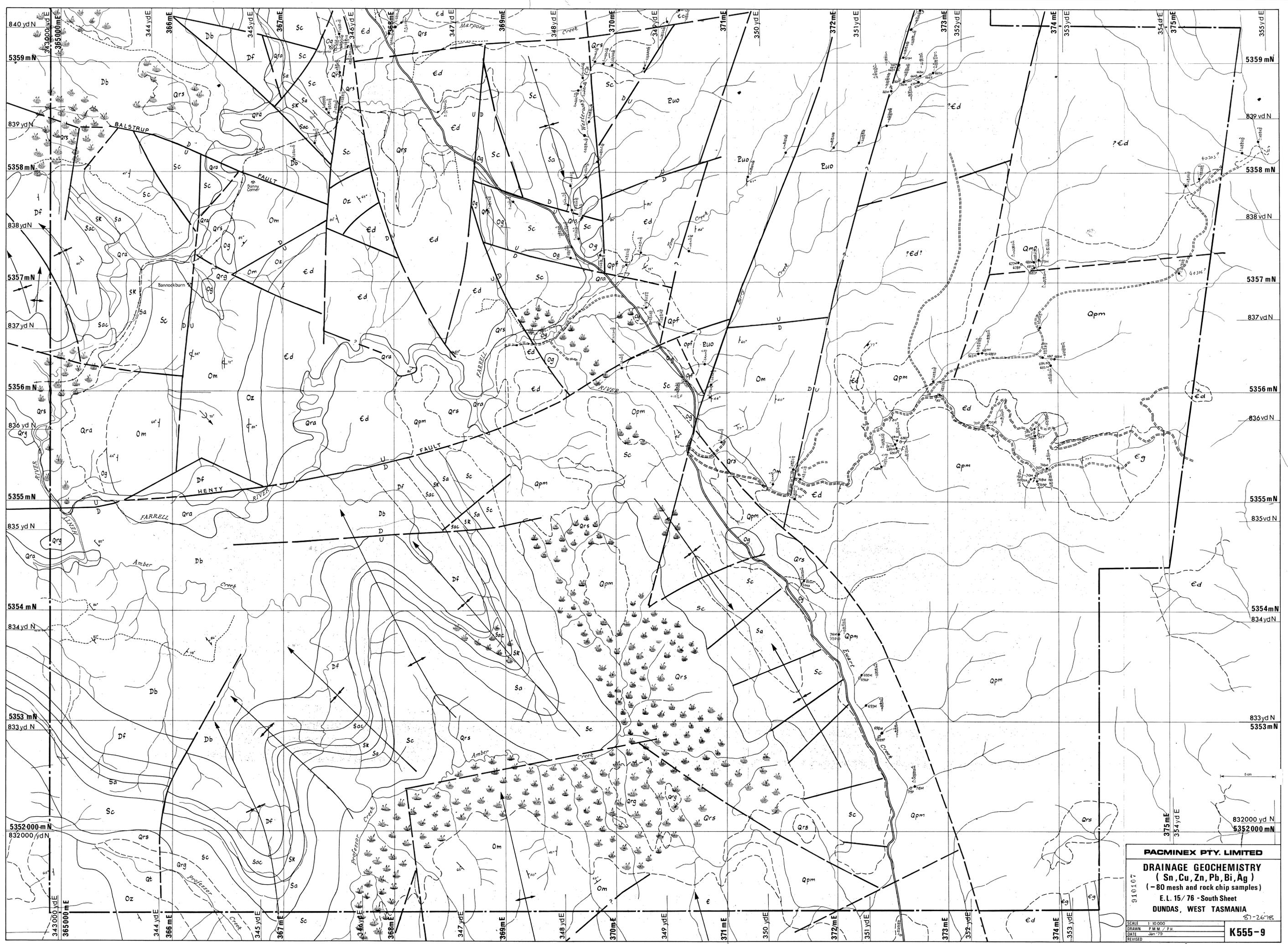
**PACMINEX PTY. LIMITED**

**DRAINAGE GEOCHEMISTRY**  
( Sn, Cu, Zn, Pb, Bi, Ag )  
( -80 mesh and rock chip samples )  
E. L. 15/76 - North Sheet  
DUNDAS, WEST TASMANIA

SCALE 1:10,000  
DRAWN P.M.M./P.H.  
DATE Jan '79  
REVISION

K555-8





**PACMINEX PTY. LIMITED**  
**DRAINAGE GEOCHEMISTRY**  
 ( Sn, Cu, Zn, Pb, Bi, Ag )  
 (- 80 mesh and rock chip samples )  
 E. L. 15/ 76 - South Sheet  
 DUNDAS, WEST TASMANIA

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 DATE Jan '79  
 REVISED

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834 yd N  
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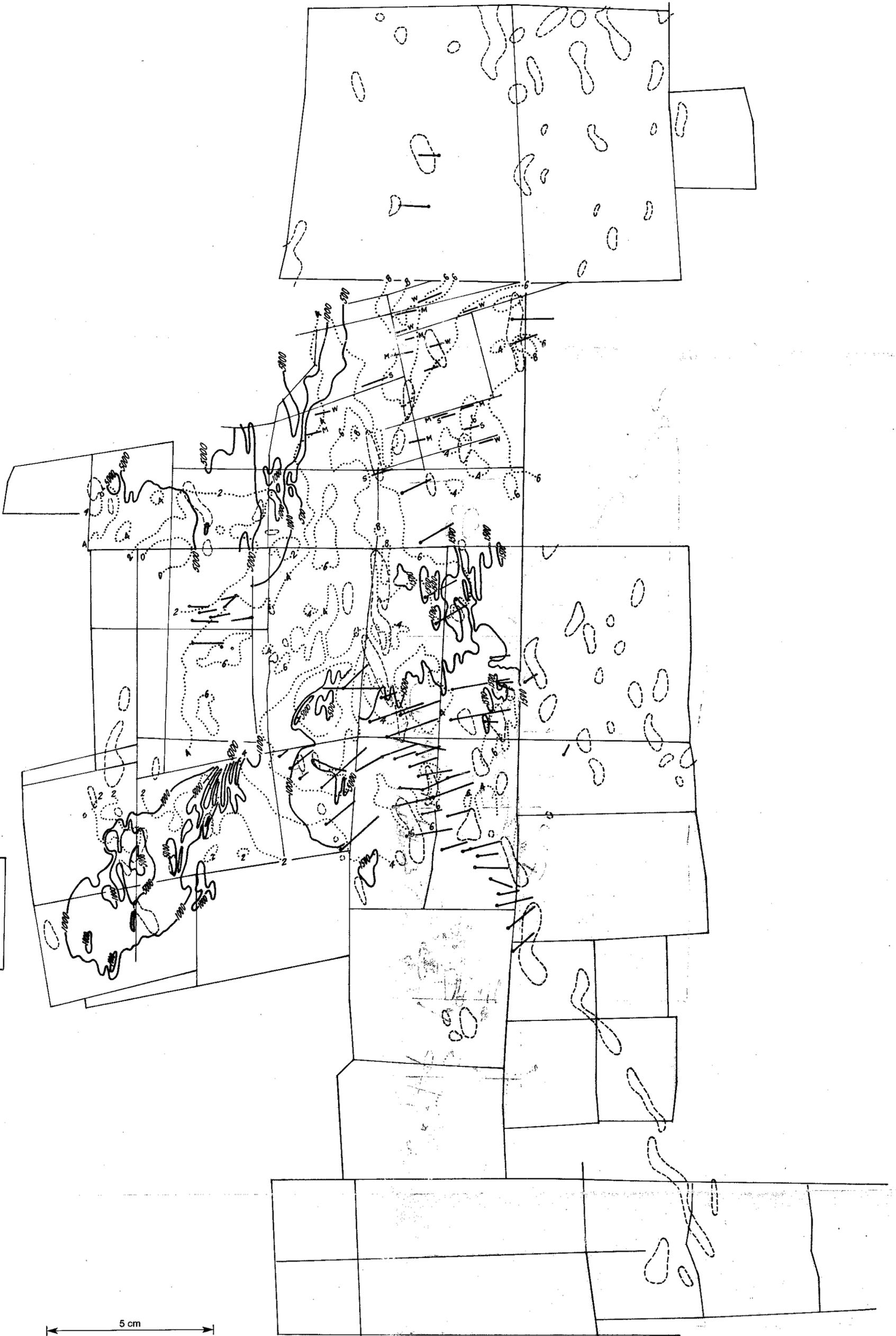
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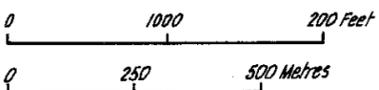
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87-2678

REFERENCE

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- I.P. SURVEY (w weak, m mod., s strong)

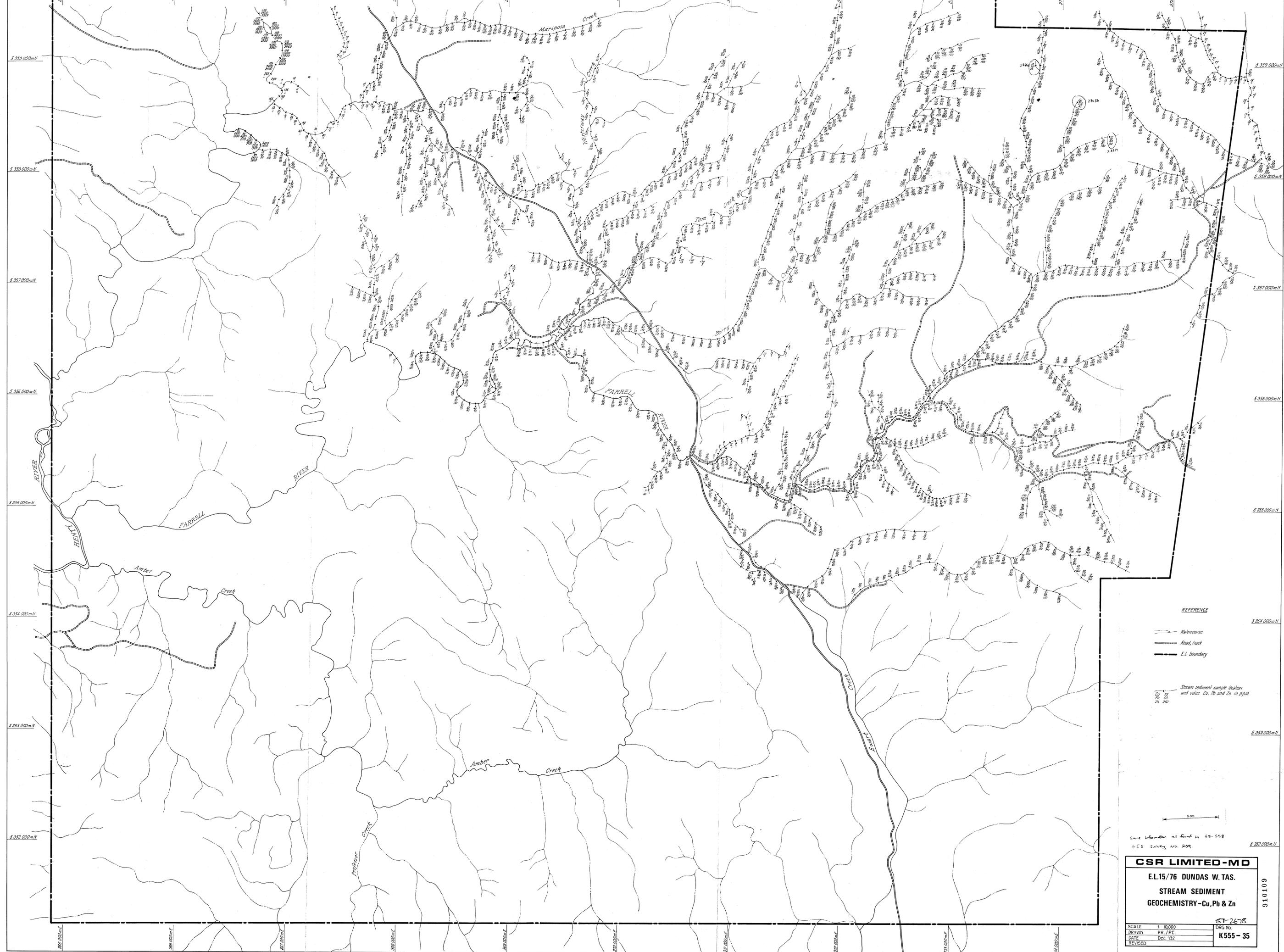


VLF-EM, SP, MAGNETIC & IP ANOMALIES  
GEOPHOTO GRIDS  
CENTRAL DUNDAS AREA TAS.

6491

910108

DRG. No. K555-37



**REFERENCE**

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- Road, track
- - - E.L. boundary

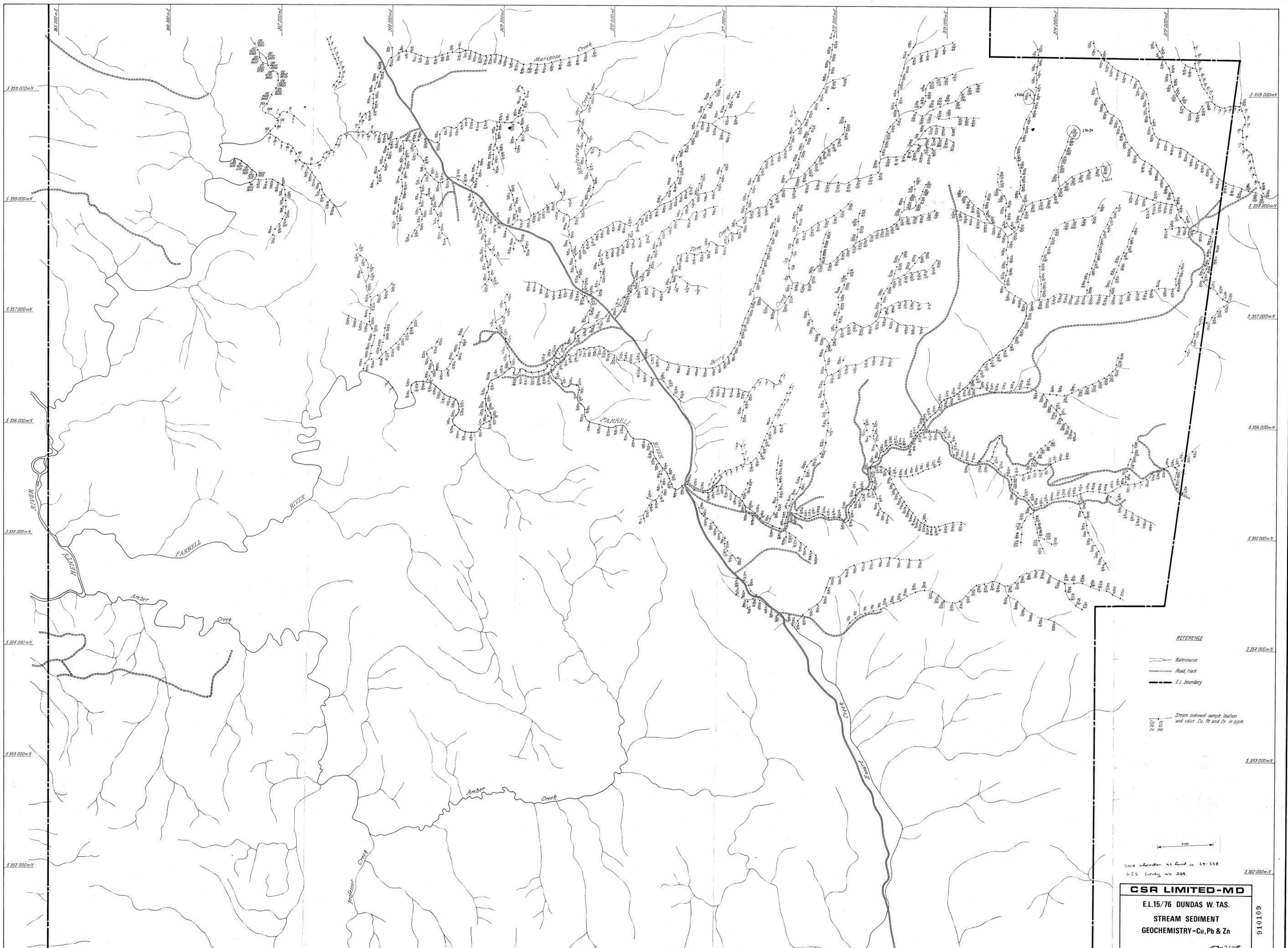
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Cu  
Pb  
Zn

0m

Site information as found in 69-558  
GIS Survey No. 209

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E.L.15/76 DUNDAS W. TAS.	
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GEOCHEMISTRY-Cu, Pb & Zn	
ST-2678	
SCALE	1:10,000
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DATE	Dec '82
REVISED	
DRG No.	K555-35



REFERENCE

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- Road, track
- E.I. boundary

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Pb  
Zn

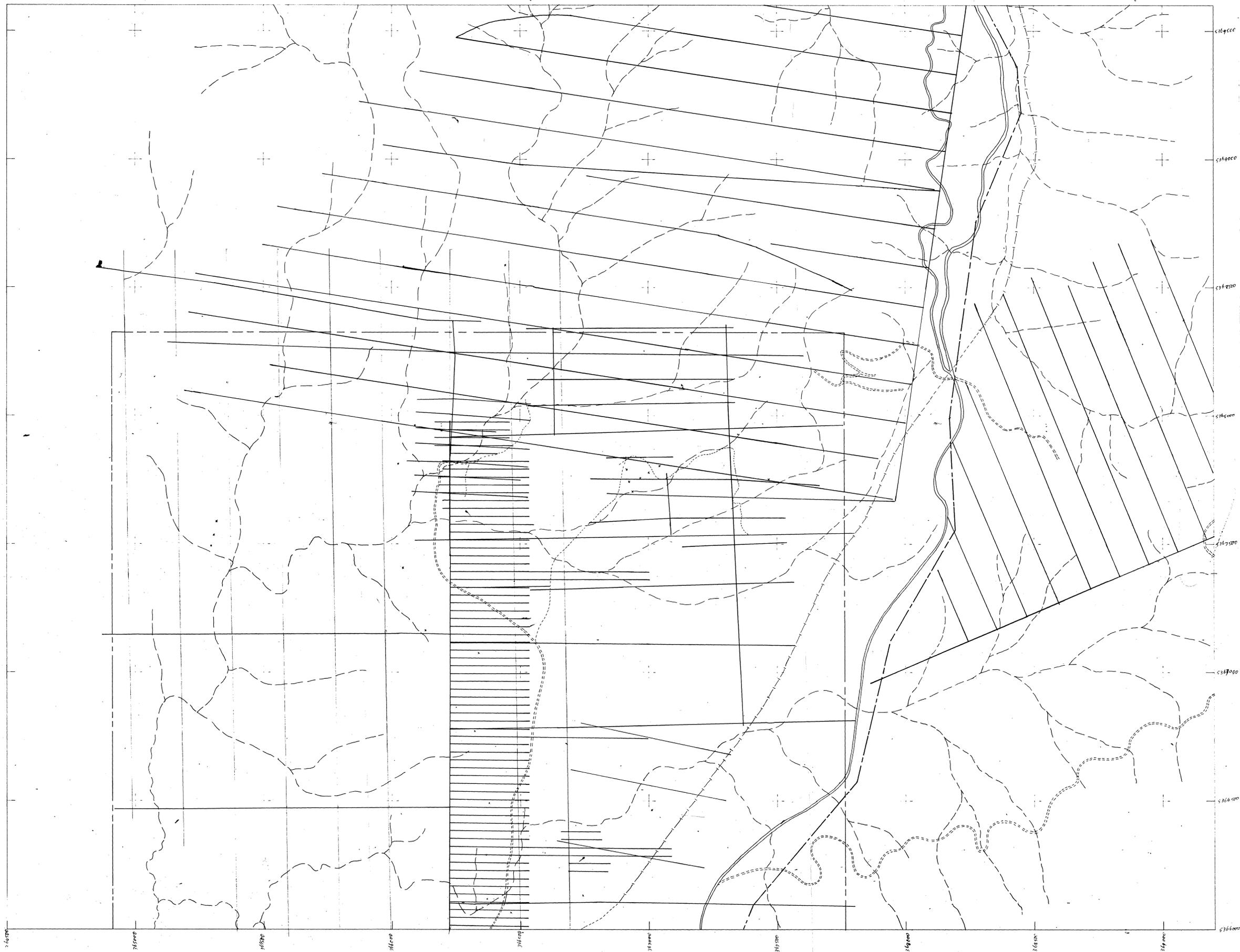
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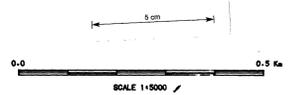
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STREAM SEDIMENT  
GEOCHEMISTRY-Cu,Pb & Zn

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 Railway - 1st Tunnel  
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 Track  
 Walking Track  
 River  
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 Grid Line  
 Transmission Line  
 License Boundary  
 Joint Venture Area  
 6M77  
 Conts  
 Mining Lease Number



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87-2678 Vol.1

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SERPENTINE BASE PLAN	
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DATE:	22-JAN-85 PLAN NO. 7602-21

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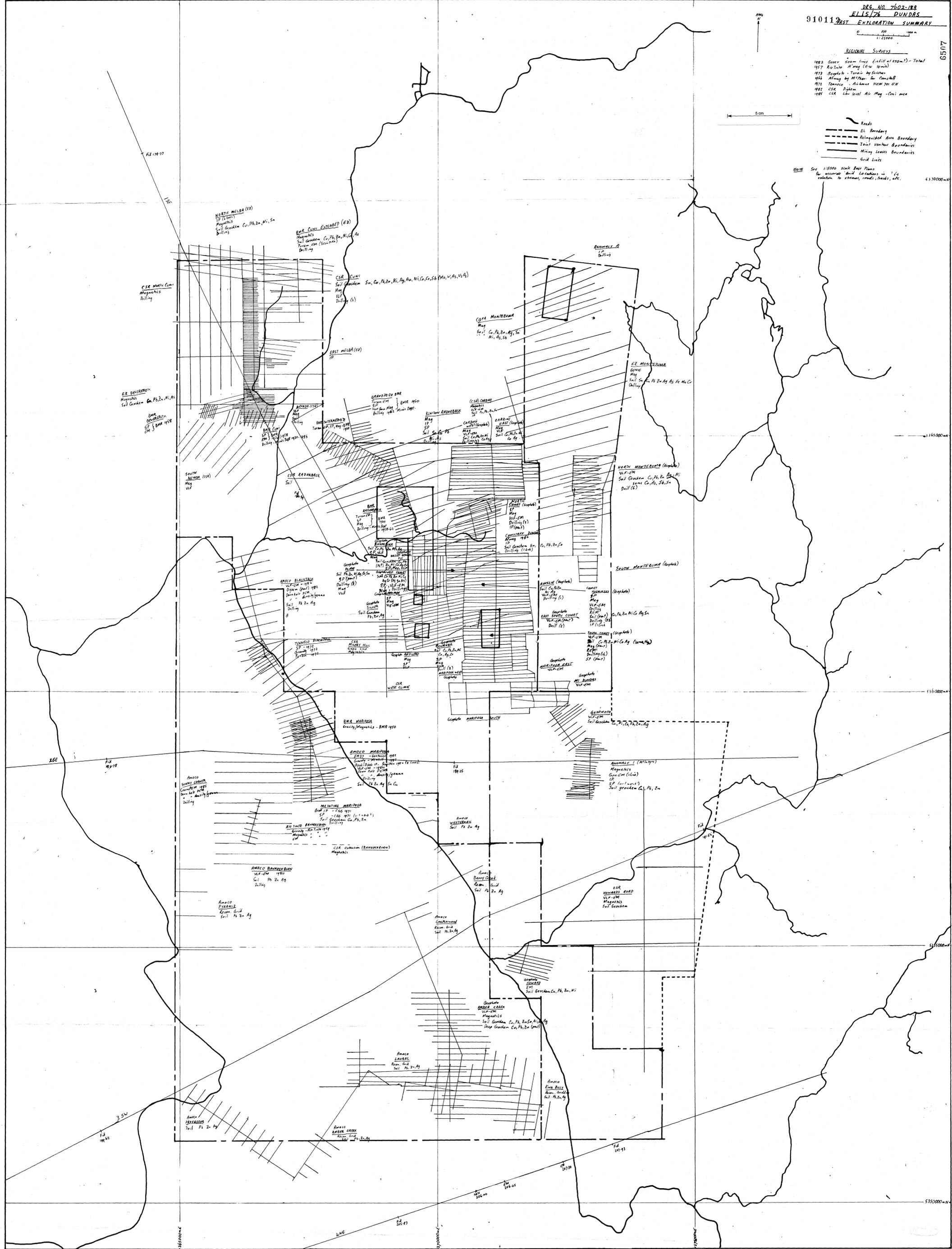
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- 1937 500m lines (1:25000)
- 1973 Geop. 500m - Turner by Smith
- 1974 Magnet. by M.P. for Com. Staff
- 1972 Topog. - Airphoto from Com. Staff
- 1982 CSA Pattern
- 1985 CSA 1:25000 Air Mag. - Cont. area

5cm

- Roads
- EL Boundary
- Relinquished Area Boundary
- Joint Venture Boundaries
- Mining Leases Boundaries
- Grid Lines

NOTE: See 1:50000 scale Base Plans for accurate grid locations in 1/4 section to streams, roads, tracks, etc.



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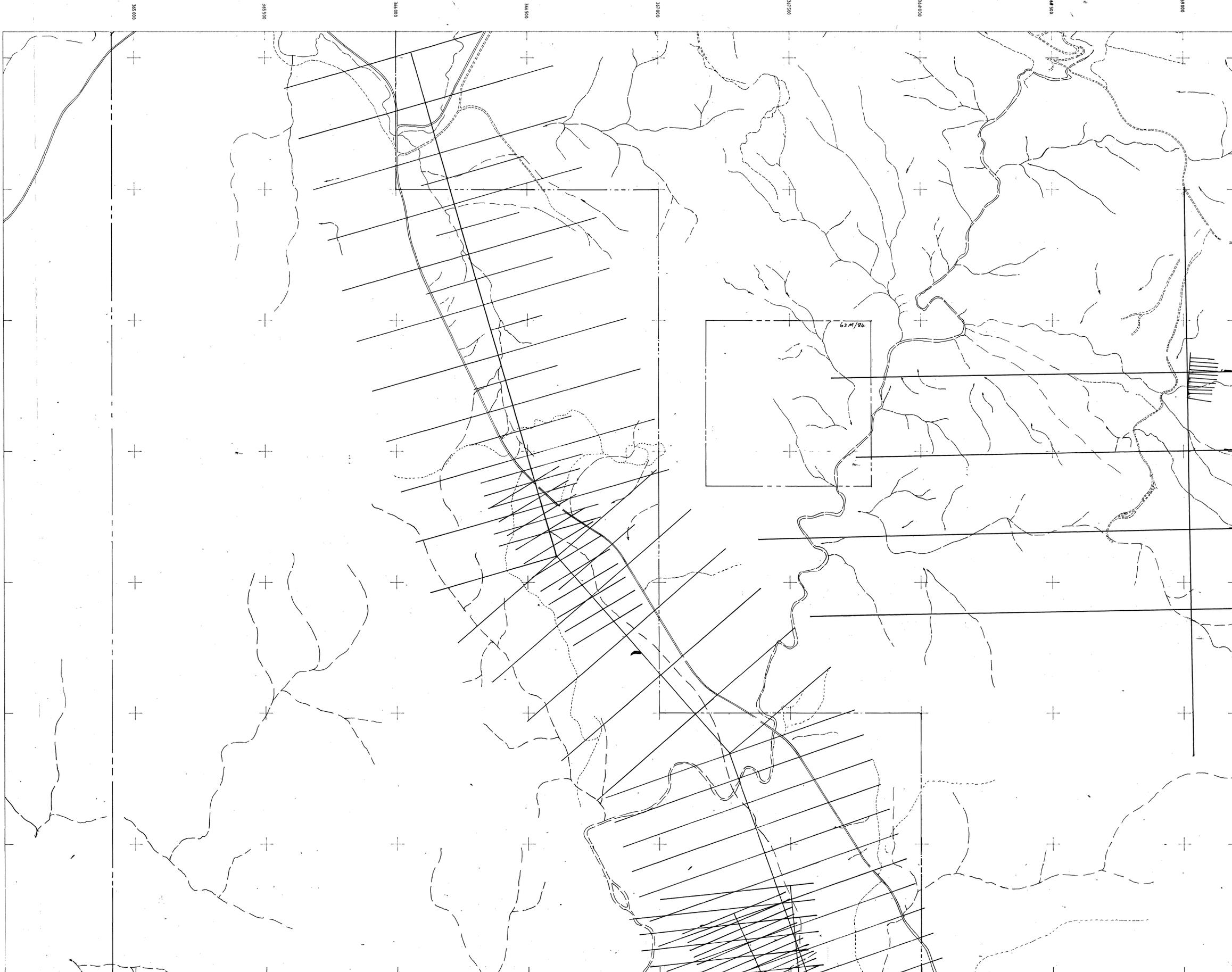
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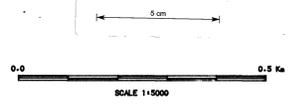
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- Roads
- Tracks
- Walking Tracks
- Rivers
- Streams
- Grid Lines
- Licence Boundary
- Joint Venture Boundary
- Mining Lease Number



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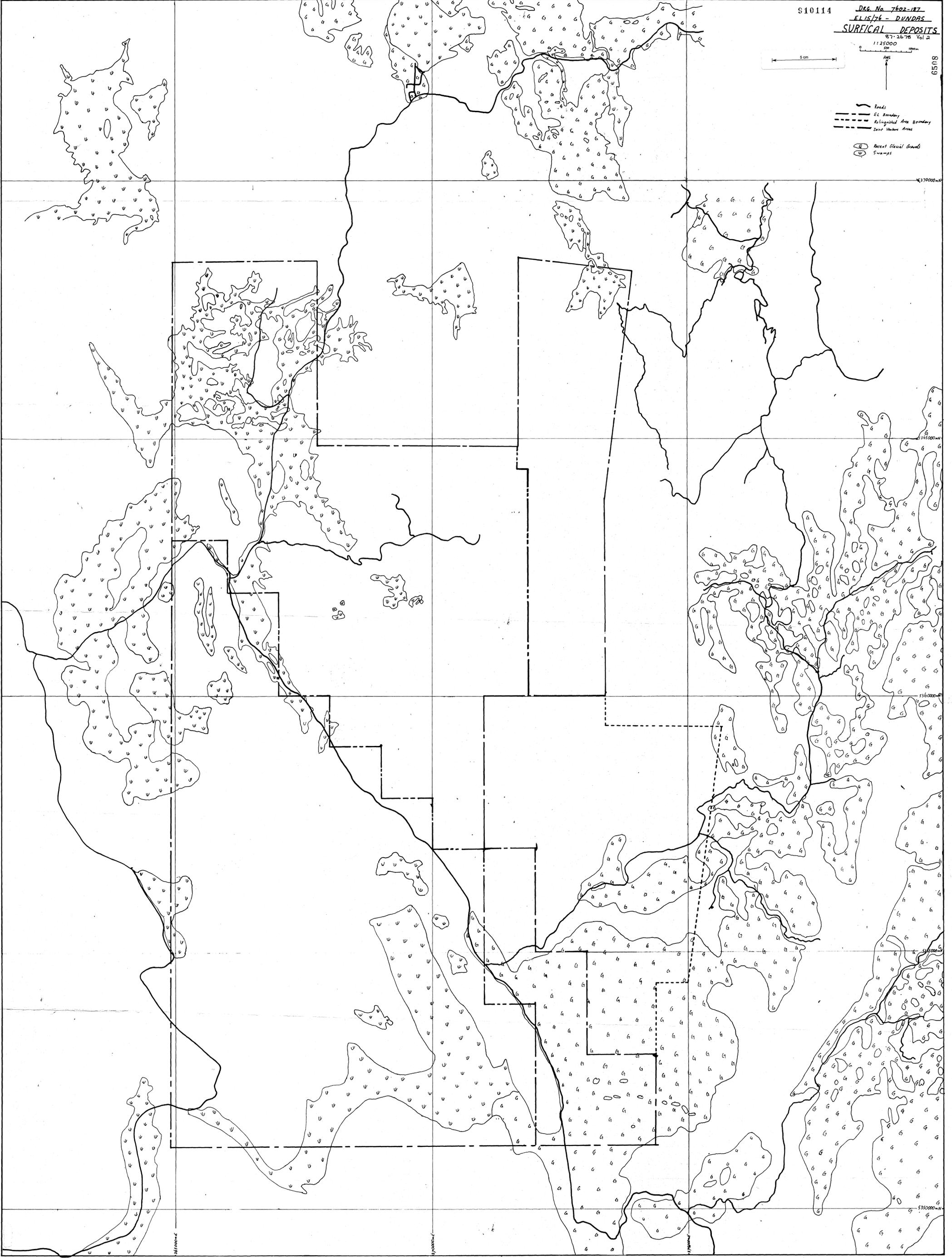
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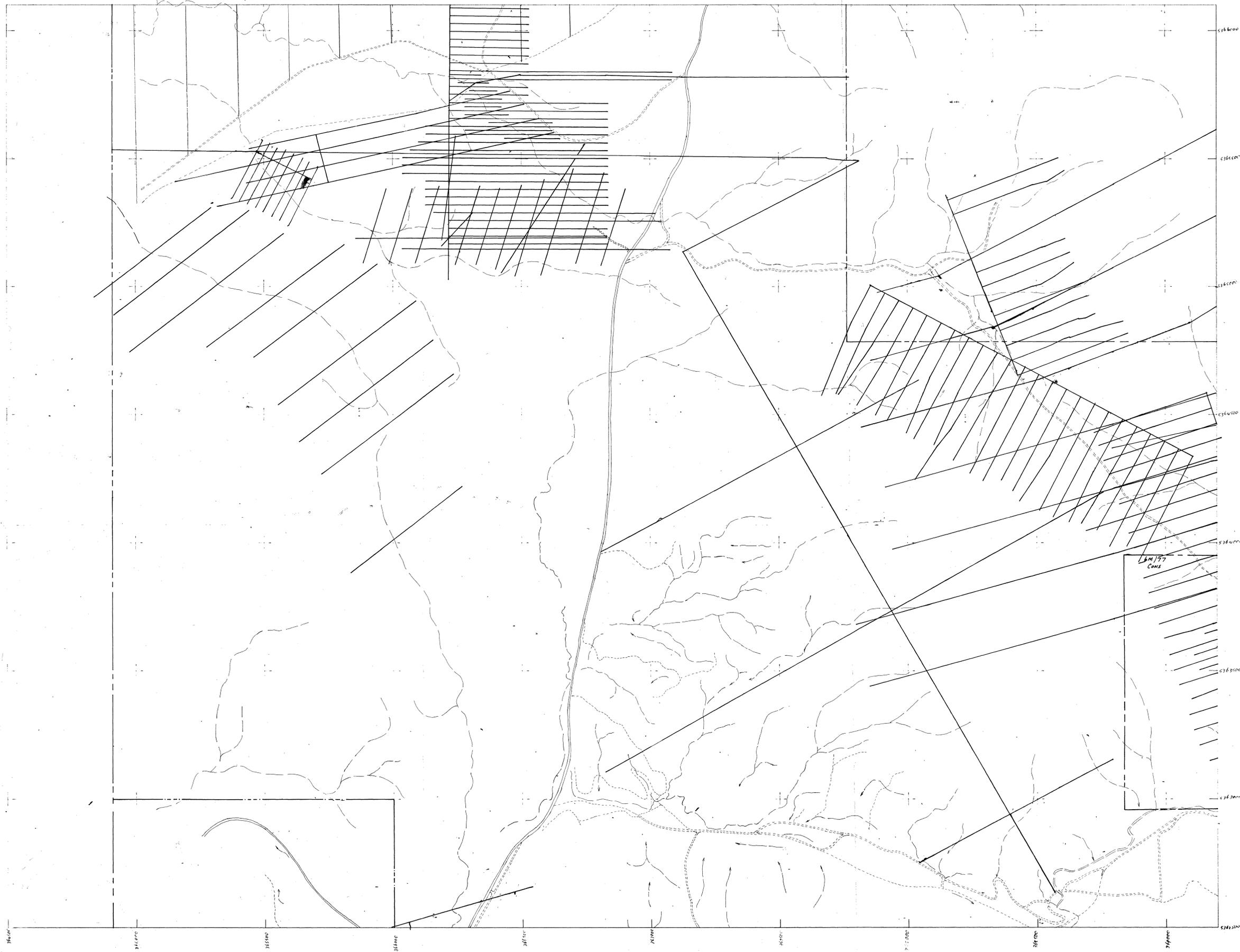
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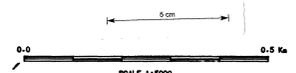
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- - - - - EL Boundary  
- - - - - Relinquished Area Boundary  
- - - - - Joint Venture Areas  
⊙ Recent Glacial Grounds  
⊙ Swamps







- Roads
- - - Tracks
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- - - Joint Venture Area
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6493

CSR LIMITED

MINERALS EXPLORATION AND DEVELOPMENT GROUP

PAST EXPLORATION

WITHIN THE AREA OF

EXPLORATION LICENCE 15/76

DUNDAS, TASMANIA

VOLUME II

EMR 73/87

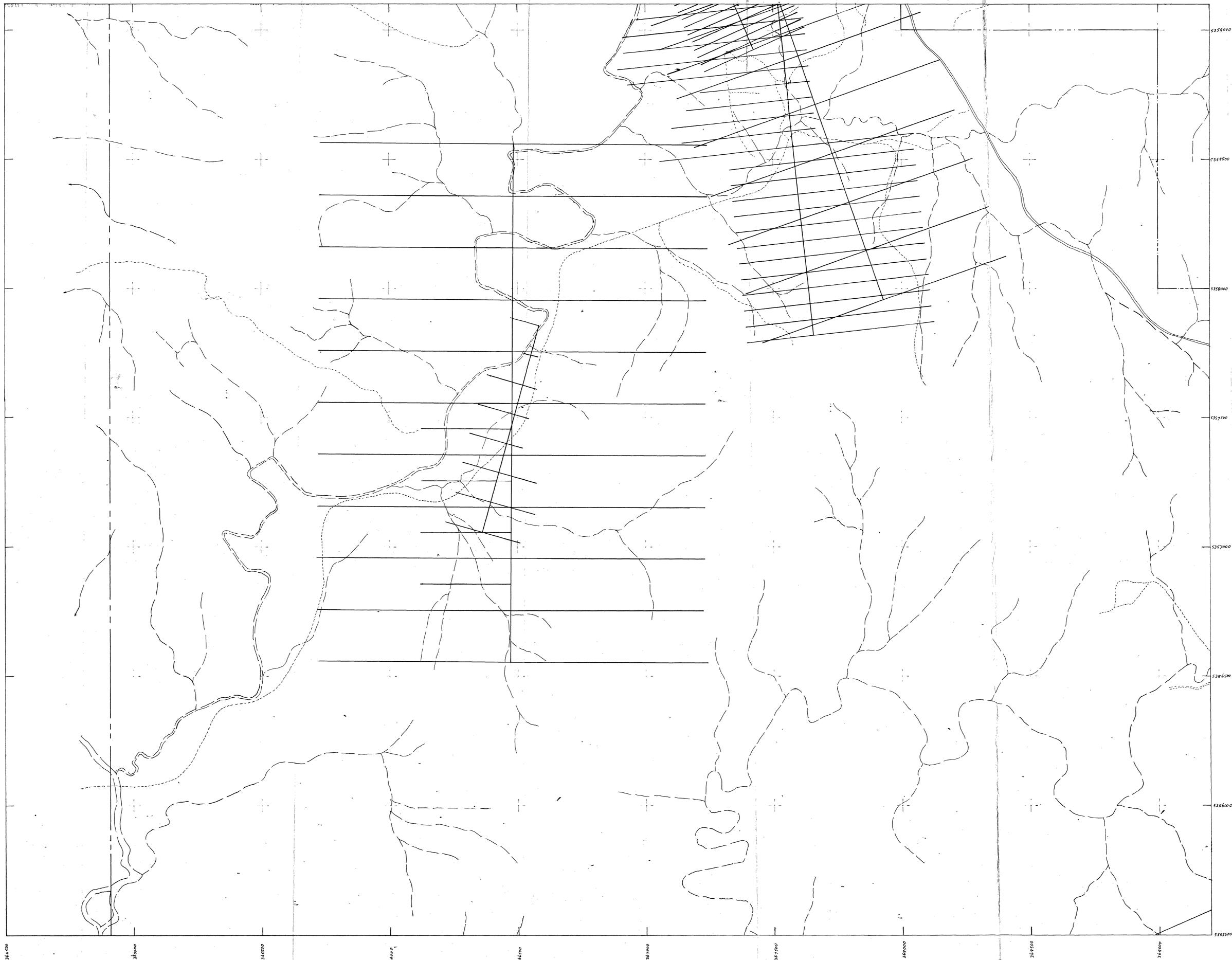
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<b>20 JUL 1987</b>	
Doc. Ref.	
Action Officer	Initials
<b>LETTER</b>	
<b>17. 7. '87</b>	
<b>REFERS</b>	
Resubmit to	Date

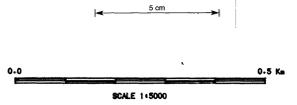
OPEN FILE

HOBART  
MAY 1987

P.D. ELLIS



- Roads
- Tracks
- Walking Tracks
- Rivers
- Streams
- Grid Lines
- Licence Boundary
- Site Venture Boundary



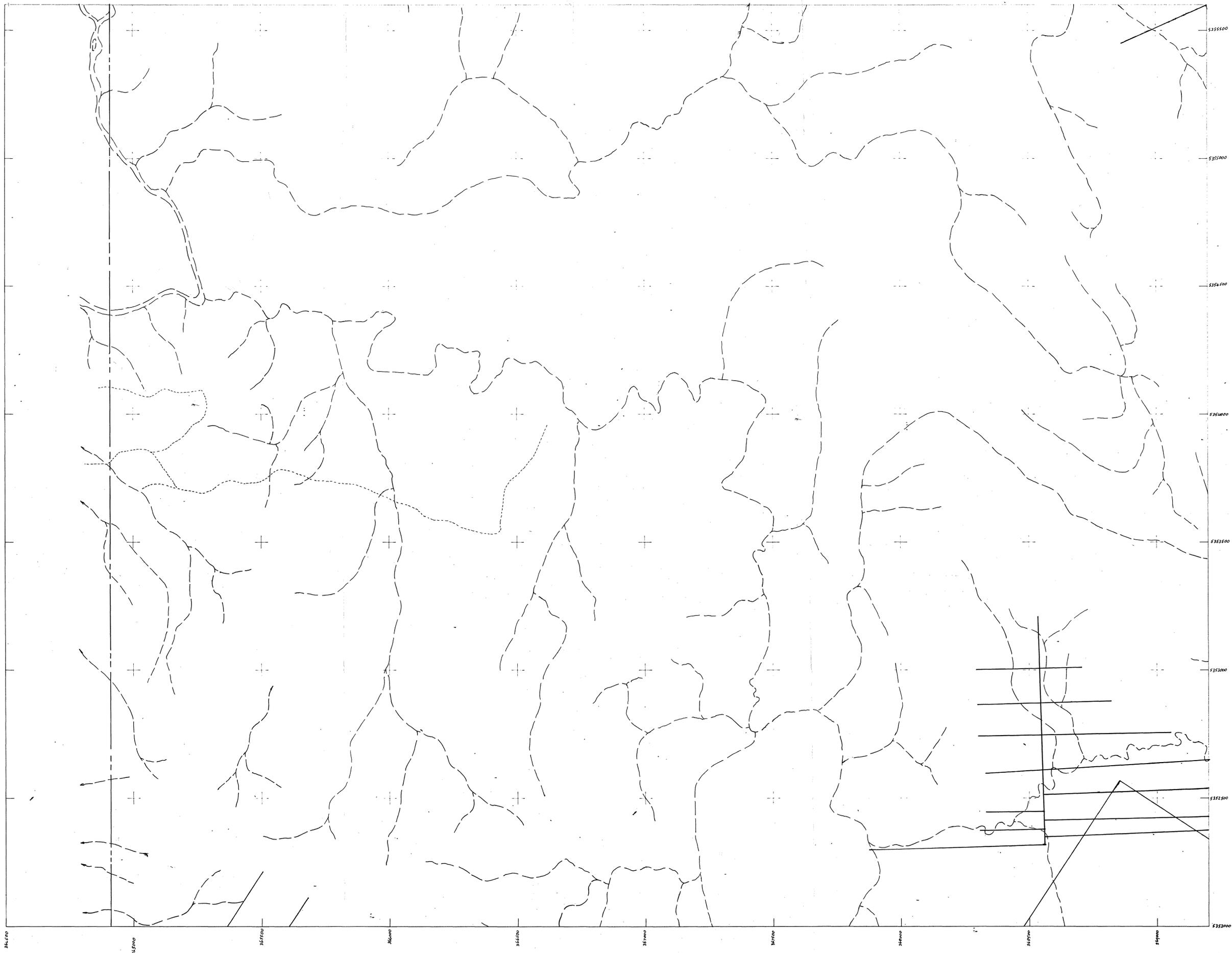
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CSR LIMITED - AM & C DIVISION

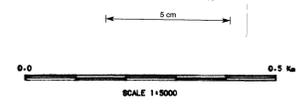
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DATE: 22-JAN-85 PLAN NO. 7602-73

6496



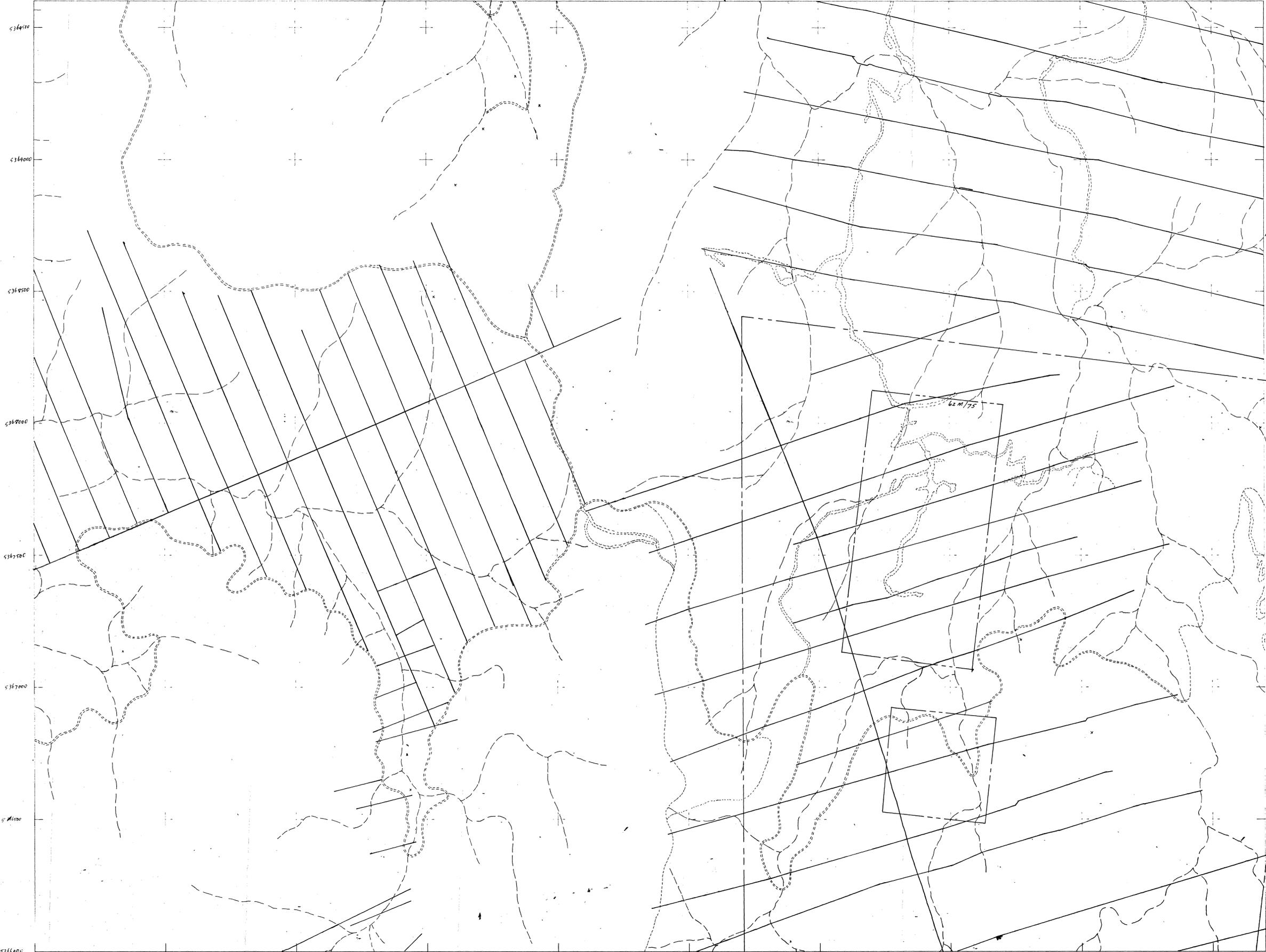
- Roads
- Tracks
- Walking Tracks
- Rivers
- Streams
- Grid Lines
- Licence Boundary
- Soil Venture Boundary



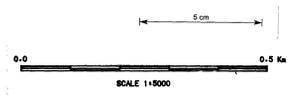
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CSR LIMITED -- AM & C DIVISION	
AMBER	
DATE	22-JAN-85 PLAN NO. 7602-91

6495





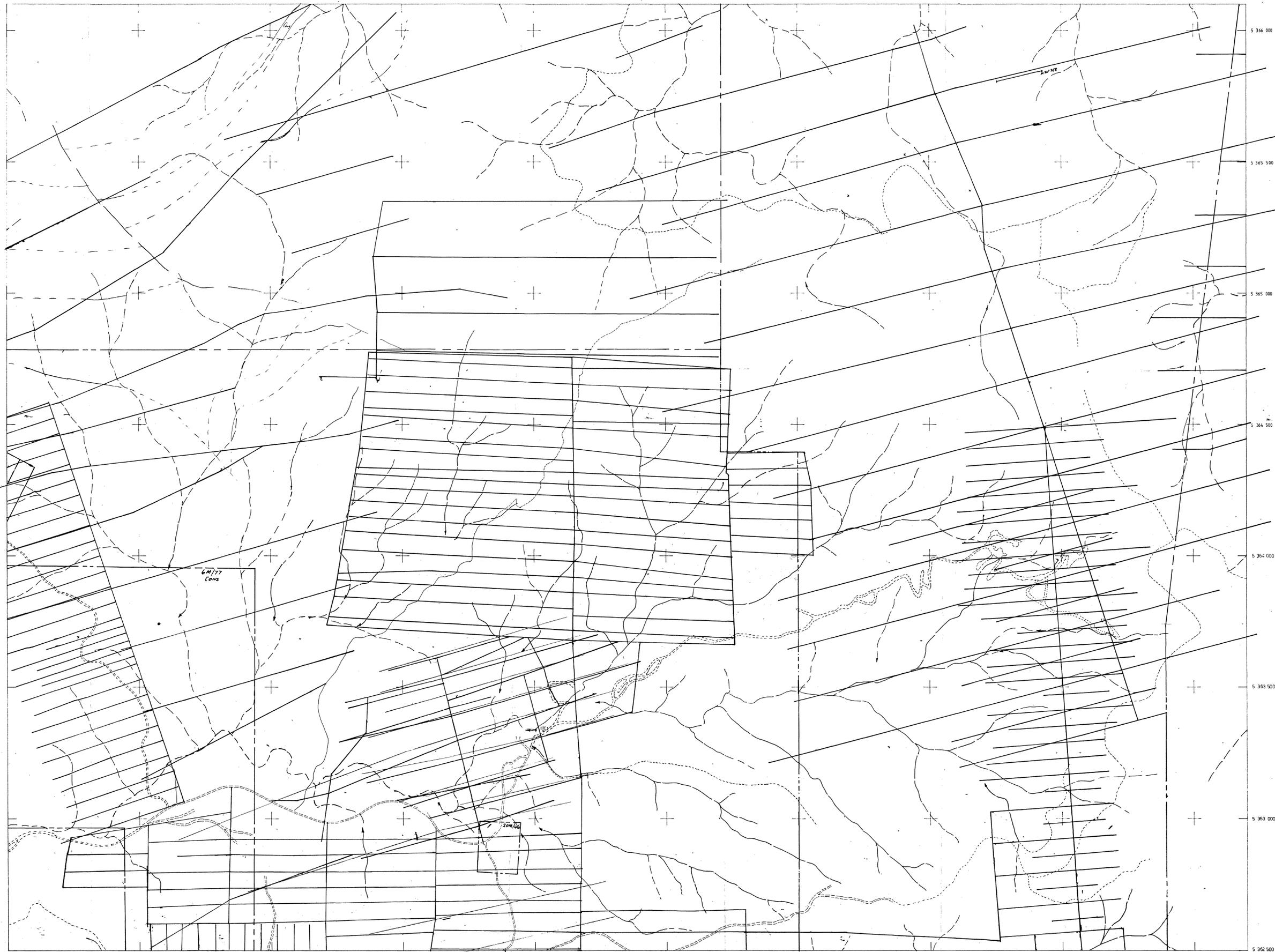
- Road
- Trial Volume Boundary
- License Boundary
- Grid Line
- Stream
- River
- Walking Trails
- Mine Workings
- 62 M/75 Mining Lease Number



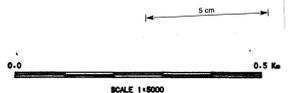
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87-2678 Vol. 1	
CSR LIMITED - AM & C DIVISION	
EL 15/76	DUNDAS
PINE	910120
BASE PLAN	6498
DATE: 22-JAN-85   PLAN NO. 7602-109	

6498



- Roads
- Tracks
- Walking Tracks
- Rivers
- Streams
- Grid Lines
- Licence Boundary
- Tool Work Boundary
- Mining Lease Number
- x Mineral Occurrence



910121  
97-2676 Vol. 2

CSR LIMITED - AM & C DIVISION

EL15/76 DUNDAS

CARBINE

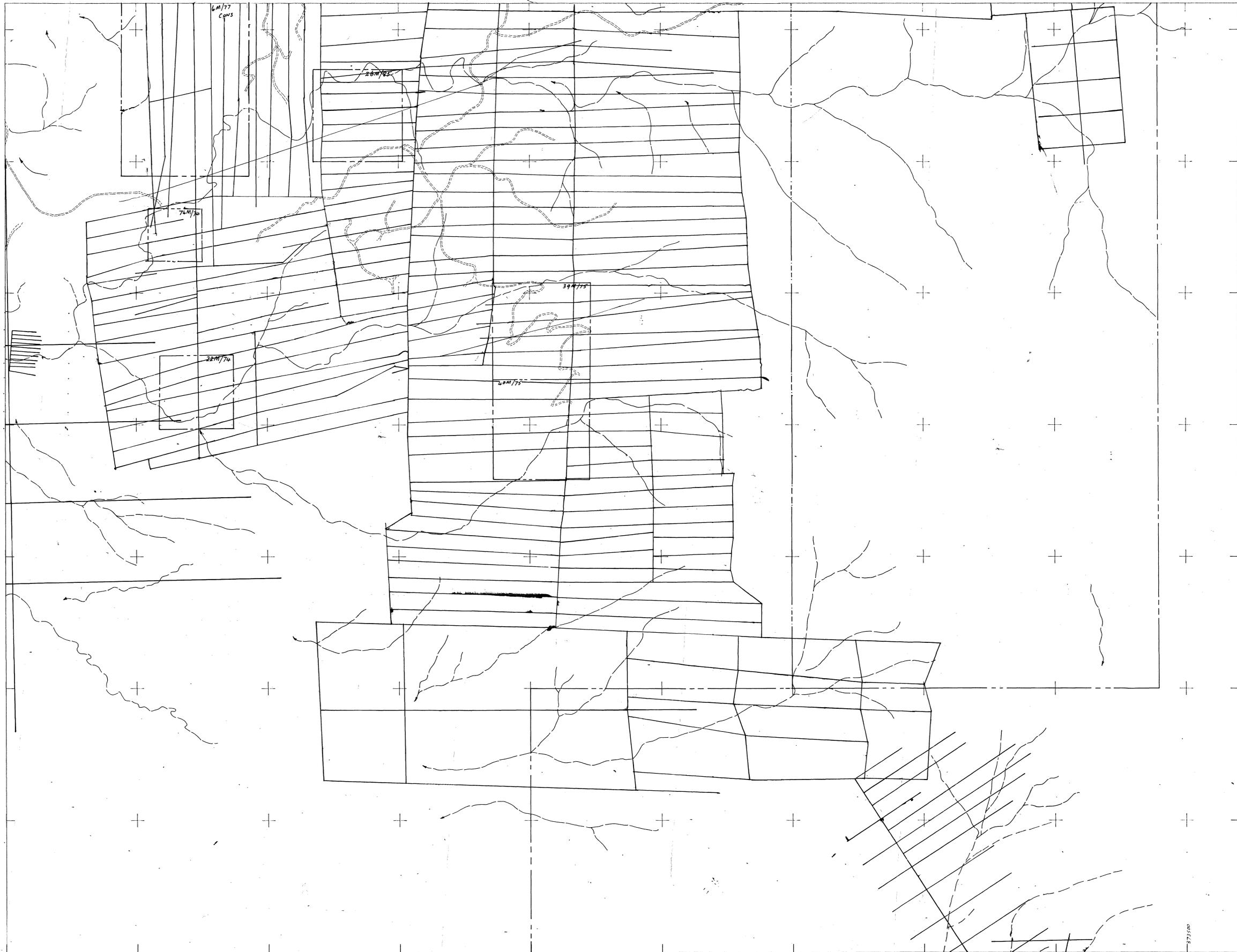
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6491

DATE: 22-JAN-85 PLAN NO. 7602-123

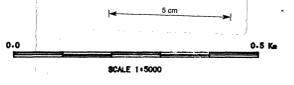
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6500

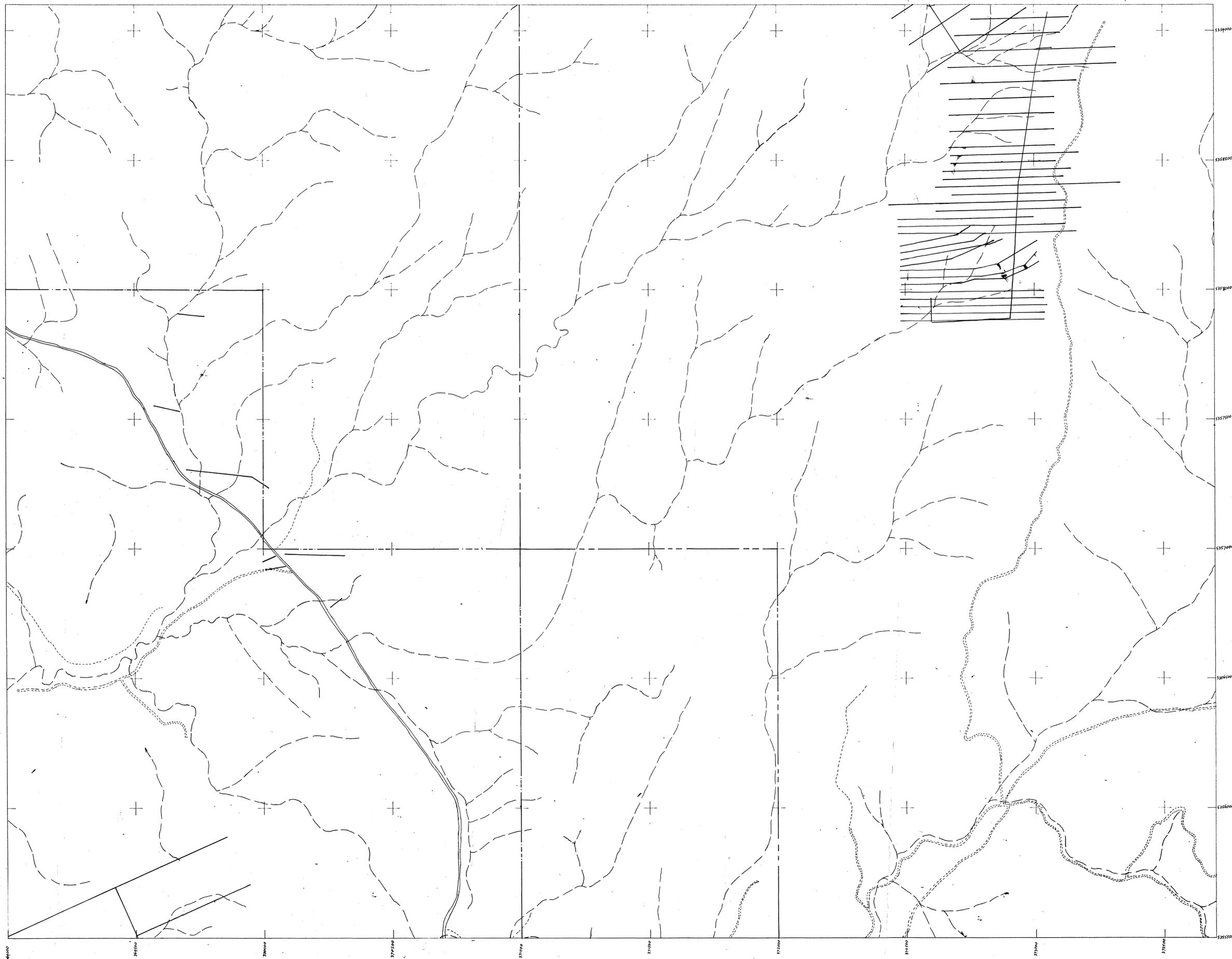


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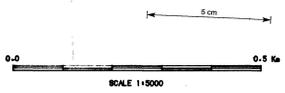
- Roads
- Tracks
- Walking Tracks
- Rivers
- Streams
- Grid Limit
- E1 Boundary
- Titled Water Boundary
- 26M/75 Mining Lease Number



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CSR LIMITED - AM & C DIVISION	
E.L.15/76 DUNDAS	
DUNDAS	910122
BASE PLAN	6590
DATE:	22-JAN-85   PLAN NO. 7602-142

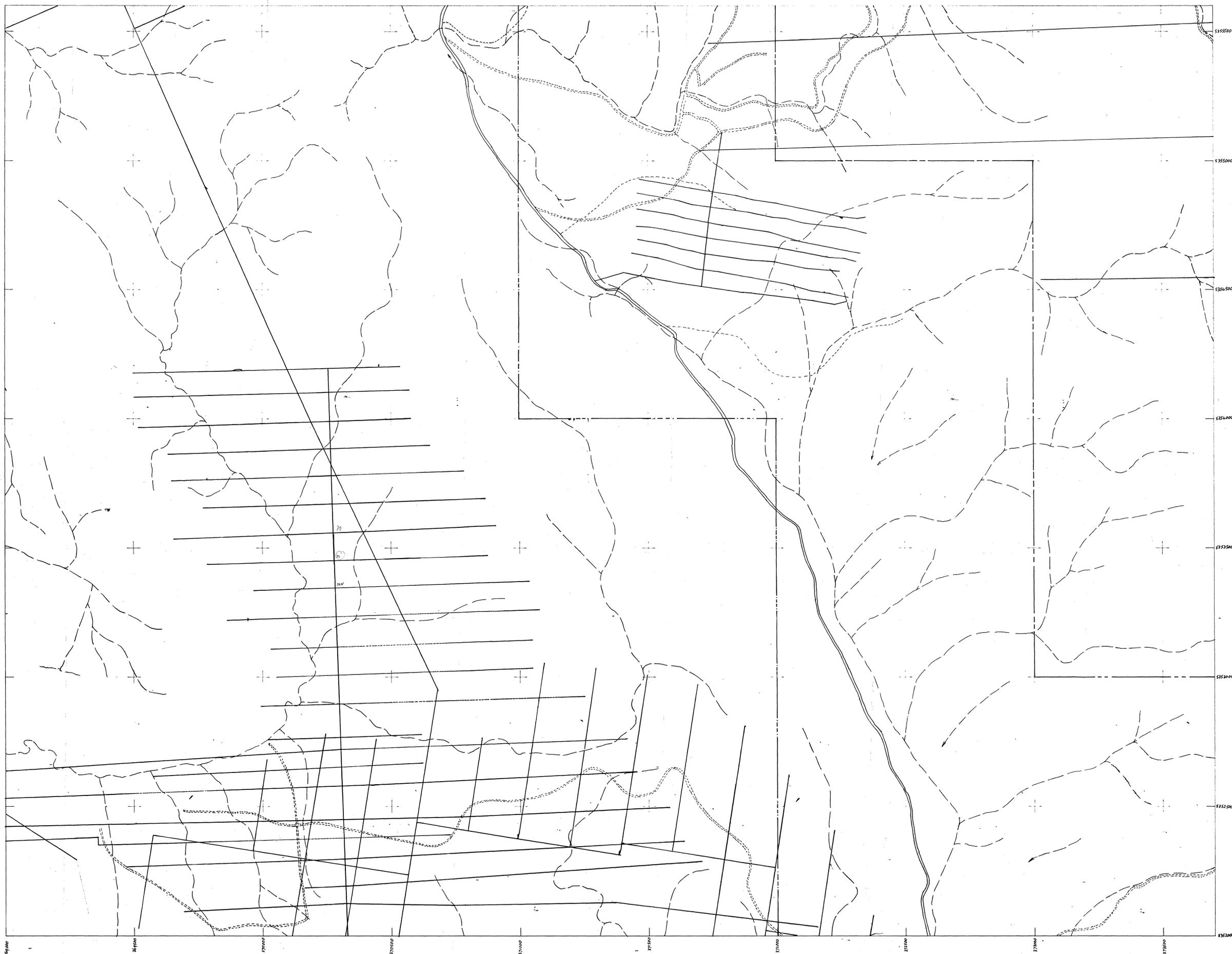


- Roads
- Tracks
- - - Walking Tracks
- Rivers
- Streams
- Grid Lines
- - - License Boundary
- - - Joint Venture Boundary

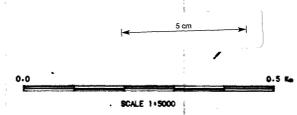


<small>97-26-78 Vol. 2</small> CSR LIMITED - AM & C DIVISION	
EL15/76 DUNDAS	
HOWARDS BASE PLAN	910123 6501
DATE: 22-JAN-85	PLAN NO. 7602-157

6501



- Roads
- Tracks
- Walking Tracks
- Rivers
- Swamps
- Grid Lines
- Licence Boundary
- Joint Venture Boundary



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910124  
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CSR LIMITED - AM & C DIVISION

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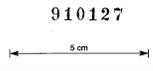
EWART  
BASE PLAN

6592

DATE: 22-JAN-85 PLAN NO. 7602-169

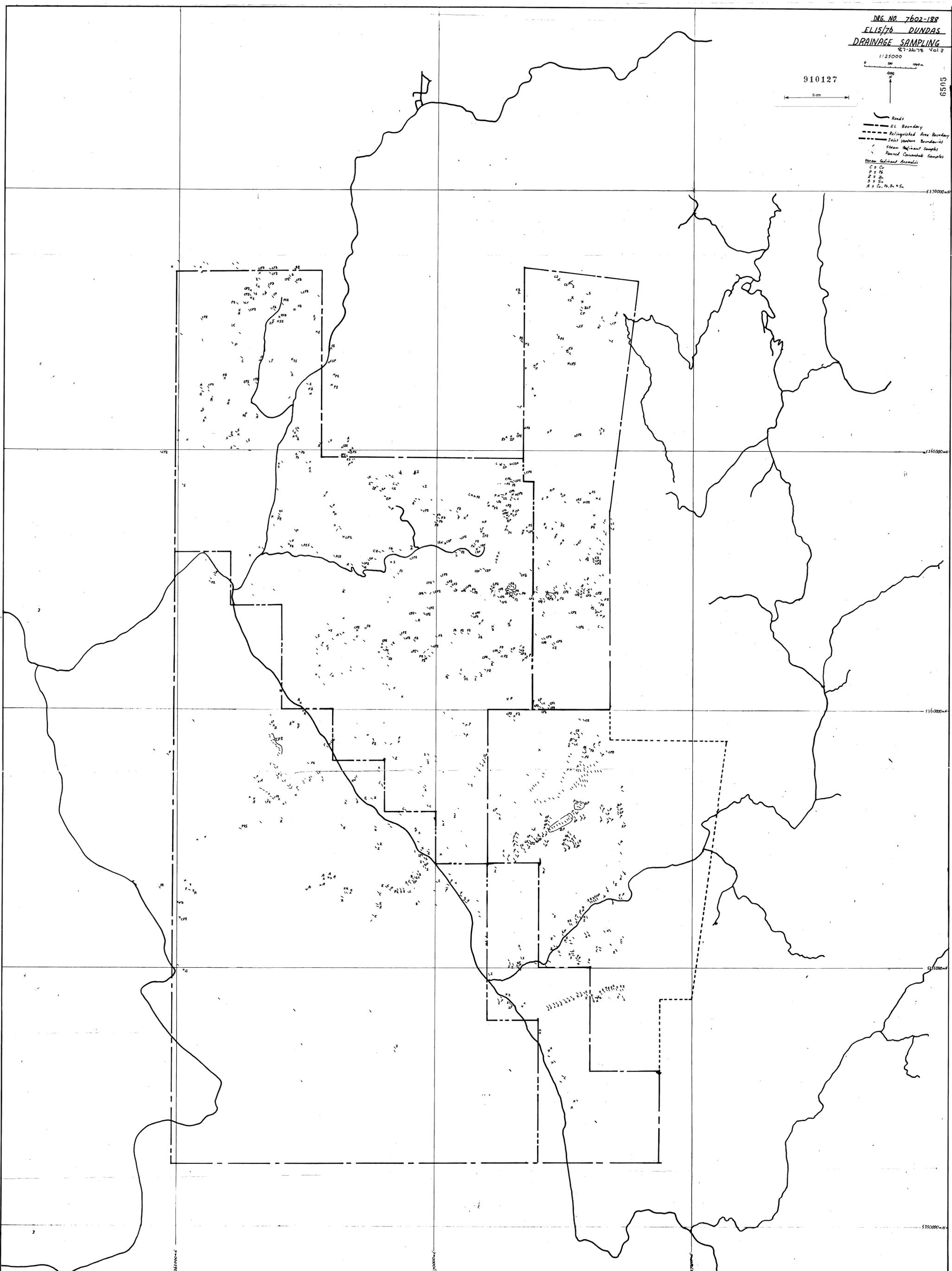
6502





- Roads
  - - - EL Boundary
  - - - Relinquished Area Boundary
  - - - Joint Venture Boundary
  - - - Stream Outflow Samples
  - - - Planned Contaminant Samples
  - - - Stream Relinquish Assesses
- C = Cu  
P = Pb  
Z = Zn  
S = Sn  
A = Cd, Ni, Ba, + S.

6505





- Roads
- - - Tracks
- - - Walking Tracks
- ~ ~ ~ Streams
- Grid Lines
- - - Licence Boundary

0 0.5 Km

SCALE 1:5000

CSL

910125

97-2678 Vol. 2

CSR LIMITED - AM & C DIVISION

EL15/76 DUNDAS

HENTY

BASE PLAN

6503

DATE: 22-JAN-85 PLAN NO. 7602-15C

6503