REPORT ON FIELD INVESTIGATIONS
WITHIN EXPLORATION LICENCE 4/61
WEST COAST, TASMANIA
SUMMER FIELD SEASON 1983-1984

BY

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INDUSTRIAL AND MINING INVESTIGATIONS PTY LIMITED
Incorporated in the A.C.T.

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A. GENERAL INFORMATION

During the period under review the field team was based at the company's house at the Savage River Township.

PERSONNEL

IMI's exploration personnel who were engaged on the licence during the period included:

Henry Shannon,	Senior Geologist
Bruce Penny	Project Geologist
Luke Vanzino	Field Geologist
Peter Cover	Field Foreman
Bonny Green	Field Assistant
Casual Field Assistants	

CONTRACTORS

Contractors engaged on the licence during the period included:

A.M.D.E.L.	- Assays
Analabs	- Assays
CSIRO, Division of Mineral Chemistry	- Mineralogical and geostatistical analyses
Diamond Laboratory Services Pty.Limited	- Heavy mineral content analysis
John Dart	- Line cutting
John Dicker Investments Pty. Limited	- Earthmoving and track clearance
Peter Forwood	- Consulting Geologist
Hookway Aviation	- Helicopter access

EXPLORATION STATISTICS

Reported expenditure (1.7.83 to 3.6.84)	- $223,836
Reported man years (1.7.83 to 30.6.84)	- 5.84
Track clearance	- 501 hours
Lines cut	- 20.1 kilometres
XRF Determinations	- 2,179
Noble metal Analyses	- 542
Geo-chemical determinations	- 7,349
Soil Samples	- 582
Stream Samples (H.M.)	- 306
Rock Samples	- 12

B. SUMMARY

The exploration licence area was rapidly appraised by heavy mineral/interstitial silt stream sediment sampling, followed by soil sampling as required. Soil sampling traverses were also conducted on magnetic anomalies and as a check on previous work.

A series of 20kg samples were taken over two areas suspected of being hosts to Kimberlitic intrusives to evaluate them for diamonds.

The programme was successful in providing sufficient, reliable data for the assessment of the exploration licence area.

As a result of this season's work, the following points can be made:

* Brown Plains - Little Plain is not considered a potentially viable tin, gold or other heavy mineral deposit.

* A significant stream sediment arsenic anomaly in the Rocky River area has been successfully followed up by soil sampling. Two significant soil sampling anomalies have been defined.

* A highly anomalous sample (H.M.112 Cu 245 ppm, Zn 410 ppm, As 730 ppm, Sn 222 ppm, W 222 ppm) at Supergrunt has not yet been successfully explained and more work is warranted.

* Gold was detected in Nine Mile Creek, and this may be the same stratigraphic horizon as the Rocky River arsenic anomaly, and may indicate a bedrock source of gold.

* Golden Ridge has been tested with a soil sampling traverse, resulting in the detection of two of the four zones mentioned in Twelvetrees 1903 report.

* Specimen Creek data has been re-evaluated with the possibility of a further auriferous zone emerging. This has not yet been tested. Drilling is recommended.

* A weak arsenic anomaly in Armstrong Creek may be stratigraphically related to the Rocky River arsenic - Nine Mile Creek - Golden ridge belt.

* Soil sampling in Timbs Creek detected high base metal and silver values. Follow up soil sampling failed to repeat the high silver value, but did indicate a possible Pb-Zn-Ag vein some 5° east of the strike of bedrock.

* The 1980 programme indicated Pb-Zn-Ag anomalism in Brown Plains. This may be similar to the Timbs Creek occurrence.

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1. INTRODUCTION

The work programme for the 1983-84 summer field season was constructed around a stream sediment survey, mainly directed at the southern two thirds of the exploration licence area. The programme involved a change in emphasis in response to new Mines Department guidelines which are expected to require the reduction of the area effectively from December 1984. Previously work by the company has always included a large component of detailed work on particular prospect areas (in recent seasons the Specimen Reef Gold and Main Creek magnesite areas).

Previous stream sediment work has been based on silt bank samples but for this season's programme, pan sampling of heavy minerals was included and as a natural extension of this change, interstitial fines from the gravels were collected in line with British Geological Survey practice. In addition, large samples of seived sand (20kg) were collected in an area considered prospective for diamonds.

Analyses that came to hand during the season indicated interesting results for arsenic, particularly in the fines. In response to this data received, material from earlier stream sediment samples in the north of the area are now being assayed for arsenic.

Geological traverse work was limited by the priority given to the stream sediment work. However, some road and creek traverse data was collected mainly in the Rocky River area.

This report is designed to present and discuss this season's programme, and it is considered that previous reporting adequately covers topography access and vegetation.

2. TENEMENT STATUS

Under the new guidelines proclaimed by the Mines Department in April 1984, Exploration Licence 4/61 is to be reduced to 125 sq km on the first renewal date after 1 July 1984, ie, 23 February 1985. Further conditions apply, notably of three months notice of the area intended to be relinquished.

Areas to be retained out of the old exploration licence must consist of no more than four separate portions, each no smaller than 10 sq km and the portions to be retained are to be defined by the gridlines of the Australian Map Grid (A.M.G.), coastline, or National Park or other reserve boundaries. In effect, this means that the rim of ground between the existing boundary and the next grid line must be relinquished, and that retaining areas close to the Savage River Mines lease is extravagent in the use of the 125 sq km area allowance, since the unavailable portion of a grid square occupied by the existing lease must be counted in the area allowance. Also, the Pieman Scenic Reserve area and H.E.C. Reserve will be automatically excluded. The application for the renewal of the licence must be made one month before the expiry date, ie, on 23 January 1984 and must include "the licence document for endorsement, renewal fees, a full technical report on the past year's work, a proposed programme for the next 12 months, and a final report on the area to be relinquished."

"The final report on the area to be relinquished must contain full details of all exploration undertaken within the surrendered area during the previous five years, alternatively the licence holder may opt to release previously submitted annual reports which refer to the area."

3. WORK DONE

3.1 STREAM SEDIMENT SAMPLING

3.1.1. Metals

a) Previous stream sediment sampling in the Savage River area involved the collection of -80 mesh material from stream deposited silt banks. Unfortunately, although this method may be suitable for the detection of base metals, it is not suitable for the more erosion resistant minerals of tin, chrome, rare earths and precious metals.

Therefore, the programme was oriented towards collecting the heavy mineral portion of the sample (as a pan concentrate). In addition, a sludge (or fines) sample was collected as a more sophisticated (and reliable?) technique of obtaining a -80 mesh sample. In addition to base metals, very fine grained heavy minerals (particularly cassiterite, which is known to have a very fine grained component) are more likely to be detected in this fraction.

b) Method

An on the spot assessment is made of the drainage to determine the optimum sampling points (known as trapsites). Trapsites are essentially energy drop situations and are of the utmost importance in the obtaining of a correct sample. A suitable sample, in appearance, should contain all size ranges from clays and silts to large boulders.

c) Trapsite Criteria

In the determination of what constitutes a suitable trapsite, the following criteria (in order of decreasing desirability) are applicable:

I) Natural rock crevices in the drainage base, particularly where these oppose the water flow;
II) The downstream side of large boulders where eddy currents can be set up; and
III) Rocky creek beds, which essentially are a smaller version of II.

If at all possible, these criteria should be combined with:

i) The outwash side of a waterfall;
ii) The outer edge of the downstream side of a curve in the creek.

Heavy minerals, except in extreme energy situations, do not form part of the suspended load of a drainage. Movement is by "saltation", a process of bouncing along the base of the water flow. This process is more likely to occur during increased energy situations, i.e. flood periods. Therefore, when selecting a suitable trapsite for sampling, areas within the present drainage bed, but outside the current water flow, should not be ignored.

A complication about which it is impossible to do anything is the field of hydraulic equivalence. The surface area and the shape of the grain can affect its performance in being entrapped by a trapsite. Diamonds, for example, are well known for their erratic entrapment.

d) Factors Affecting Mineral Assemblage

Heavy minerals tend to gravitate to the base of a loose sedimentary pile. Obviously, a sample from the drainage base is not always possible, and so the presumption that there is a continuous input of heavy minerals from the source area is necessary. If this is so, then, provided a suitable trapsite is selected, a representative sample of the heavy mineral assemblage is possible.

Because of the variation in specific gravities of the heavy minerals, there is likely to be a downstream partitioning of the assemblage, ie, the lighter heavy minerals are more prone to further movement downstream, and less movement downwards through the sedimentary pile than the heavier minerals.

Bearing this in mind, other factors which may affect the mineral assemblage are:

I) The distance from the heavy mineral source(s).
II) The number of trapsites between the sample site and the source(s). Trapsites closer to the source are more likely to contain a higher heavy mineral content.
III) The slope of the drainage. The steeper the slope, the more likely the heavy minerals will travel further.

e) Sampling Technique

Once a suitable sample site was selected, the interstitial gravel was collected with a bog shovel with some boulders being moved by hand. The gravel was heaped in a 5 litre capacity prospector's panning dish to approximately 10cm. It was then worked with a little water to remove stones down to about 3cm diameter, at the same time releasing the associated fines. This thin mud was then decanted into a large plastic bag in order to settle. Where the gravel sample ceased to produce copious muddy water it was cleaned with an excess of water and panned down to produce a rough heavy mineral concentrate which was collected for laboratory examination. Normally two panning dishes provided sufficient material for the fines sample. When the mud was allowed to stand it separated out into a sand layer, a sludge layer, and a supernatent fluid of muddy water with a distinct boundary with the sludge. This fluid was carefully decanted, then the sludge layer was collected taking care to reject the sand.

Both sludge and heavy mineral concentrates were carried out in sealable plastic bags. At base the sludge was allowed to stand again, then the dense sludge was transferred to a kraft paper bag and dried. Early experimentation showed that sludge samples collected in this manner contained virtually only -80 mesh material so subsequent samples were not seived. The sample was then sent away for analysis.

Fifteen pannings per sample was initially deemed sufficient to provide an adequate heavy mineral sample. This number of pannings was determined on the basis of laboratory requirements for quantitative assessment of the sample if required.

Where only minor drainages or limited sample material zones were selected for sampling, three pan samples were taken. However, towards the end of the field season, it became apparent that three pan sample generally provide sufficient material for identification and correlation with other samples. Consequently, all subsequent samples were taken this way.

In the panning process, a quantity of quartz was retained in the pan concentrate. This is unavoidable as some of the heavy minerals have a specific gravity not greatly in excess of that of quartz, and so, to prevent loss of these, some quartz (and light material) was retained.

This quartz is currently being removed by heavy media separation (tetrabromoethane) and then the heavy mineral concentrate will be re-examined, and analysed if required. A brief field examination is made on the spot and notes made if required (e.g. if gold is present, etc).

f) Potential Difficulties

Possible problems that may affect the sampling (apart from the malevolent nature of the vegetation) are:

I) Some drainages are too deep and too rapidly flowing to permit adequate sampling. Apart from personal danger in such situations, the sample tends to wash off the shovel before the sample can be transferred to the pan.

II) The technique is a once only method at each spot. Naturally, sampling depletes the heavy mineral content of a sample site and subsequent samples would be unrepresentative. (There is a certain amount of regeneration of sample sites but the length of time to totally restore the site is unknown - likely to be many years.) This is particularly important to realise when panning creeks which have been panned in previous years by prospectors.

III) In excessively steep valleyed creeks, the influx of scree material can make the obtainable sample meaningless, as the material will only come from a limited sample area.

IV) If mining operations have been conducted upstream of the sample site, then the heavy mineral assemblage may be altered by the tailings from the mining operation. The same can be said of road-making operations.

V) It was sometimes necessary to transport sample material to larger drainages as some of the smaller creeks became water deficient later in the season.

VI) Excessive clay content or partial cementation causes the panning to be both time consuming and arduous.

VII) Very fine heavy minerals may tend to be washed out with lighter material. In theory, this should be overcome by the collection of the silt sample.

VIII) Some heavy minerals, particularly those which:
- i) Are very fine
- ii) Are very light
- iii) Are flattened and have a very large surface area (includes gold) tend to float if permitted to dry during panning. If this does occur, the addition of a small amount of detergent (to overcome surface tension) will solve the problem.

3.1.2 Diamonds

Diamond search depends on identification of indicator minerals in heavy mineral (H.M.) suites. These indicators are typically scarce, hence large volume samples are required. Trapsite selection criteria are essentially the same as for routine heavy mineral sampling save that some care has to be taken in avoiding very energetic sites in which the less dense heavy minerals will be flushed out, e.g., diamond and chrome diopside. Also, the large volume required causes some otherwise good sites to be avoided.

In practice, sites in the lee of a large boulder some metres downstream from a cascade were usually selected. In a few cases it was possible to find a deep pothole associated with a cascade. In practically all cases some specks of gold were found in panning the H.M. series samples taken in association with the diamond samples and this was considered an adequate field test of trapsite suitability, though in general terms it was felt at the time that ideal sites were not occurring. It was rare to find a site which could be excavated down to bedrock.

The trapsite gravels were excavated by removal of associated boulders by hand and shovelling out the finer gravel which was then passed through a sieve of 1/8" mesh (approx. 3mm) and the oversize portion was dumped. The sand passing the sieve was collected in a panning dish, and transferred to a standard sized bag for which a 20kg mark had been determined previously. This sample was carried out.

After a trial batch of samples had been examined after separating the heavy mineral fraction by heavy liquid only, it was considered safe to reduce the remainder of the samples by panning to a rough concentrate of 20-25% of the original before separating the remainder by tetrabromoethane.

The extent of grain loss can be deduced by comparing the first batch (LSD 7, 18, 26) with the remainder of the samples.

The diamond sampling program was conditioned by the historic records of diamonds from the area originally termed Badger Plain and the detection on the air photos of a cluster of large and well defined vegetation anomalies in the licence area which could conceivably be kimberlites. The programme was directed towards testing these features as possible diamond sources.

Further examination of the literature revealed an unexpected problem with nomenclature in the Badger Plains area, not helped by modern name changes. In particular, although the term Mt Donaldson is used often enough there is no early mention of the Longback

and Longback Creek, and it is possible that Mt Donaldson is confused with the Longback. A map in Reid (1921) places the names of Badger Creek and Harvey's Creek in positions which can be identified with (a) modern Savage Creek, and (b) the bushmens first left hand tributary of the Little Savage River respectively, but shows no other creeks, and as Reid himself specifically denies having gone to the area, it is all too probable that there has been a round robin effect with the creek names, and so the location data for the old diamond records are not reliable.

Reid was, however, in contact with the three astute and observant prospectors responsible for the original diamond reports, and he considered that diamonds could easily be more abundant in the area simply because most prospectors were not bothering to look for them.

The distribution of the diamonds reported shows that, on all the reasonable possibilities for the original reports, some if not all the diamonds could have come from Tertiary gravel deposits (Brown Plains Formation and/or later alluvial deposits). This possibility applies most to the occurrence near the Pieman River, and least to the Harvey's Creek occurrence.

3.2 SOIL SAMPLING

Bedrock mineralisation is generally reflected in residual soils, and therefore soil sampling is probably the quickest and easiest way to locate this mineralisation. Generally this technique is used as a follow up to more regionally orientated exploration programmes.

In textbook circumstances the typical soil of humid temperate climates is the podsol, which is characterised by layers termed A, B and C which describe a leached zone (A), an "enriched" zone (B) in which iron and clay minerals accumulate, and (C), a zone in which weathering occurs without significant enrichment of clay minerals from higher up, and gradational into parent rock. The soils present around Savage River are nearly always complicated by the presence of a transported layer of gravel which overlies a truncated soil profile, and itself shows evidence of pedogenic differentiation. In the following discussion the term "B" horizon is applied to the gravel layer, and the term "C" horizon to material from below this layer (which on occasions may contain structureless clays that are actually the B horizon of the lower soil). The usual practice adopted for sampling was to collect the first material containing softened but recognisable bedrock textures. Hard chips of rock associated with structureless clay are considered "B" horizon. In general the "C" horizon samples are genuine C horizon material, but "B" horizon is not true B horizon in the pedologists strict sense.

To determine the optimum horizon for sampling, orientation surveys were conducted.

a) In the Rocky River arsenic anomaly area, there is a layer of angular gravels directly overlying "C" horizon. Samples of the interstitial material from these gravels were taken and the analytical results compared to "C" horizon analytical results.

   The indications of this are that if there was a very large value for an element from "C" horizon, then it was weakly anomalous in the interstitial material. Lower order anomalism was not detected.

b) At Specimen Creek, a soil sampling programme was conducted in 1980. For various reasons, this was suspected to be "B" horizon rather than "C" horizon sampling. A check traverse was run to verify this hypothesis.

   The results of this indicate that the original arsenic values were reasonable, but other elements, although containing detectable anomalism, were subdued in the earlier programme. The results are presented as Appendix 2, and Plate No. 1.

   The conclusion to be reached from these surveys is that where "B" horizon is present, "C" horizon is the preferable zone to sample, and where the angular gravels directly overlie "C" horizon, "C" horizon is still the preferable zone to sample. Therefore "C" horizon was selected for the soil sampling programme.

Hand augers were used for the soil sampling as the nature of the terrain and vegetation necessitate the use of light, portable equipment.

In areas where the angular gravels do not exist, obtaining a "C" horizon sample is generally not difficult, although depth may be an occasional problem. However, in areas covered by the angular gravels, real problems in terms of penetration can be encountered.

To overcome these problems, a 4" post hole auger was used for the gravel penetration, followed by a 2" shell auger for the actual sample collection. Occasionally, a crow bar was necessary to assist in the gravel penetration.

In some areas "C" horizon samples were not possible because of bedrock outcrops (rarely). In this circumstance, rock chip samples were taken and the results incorporated with the soil sample programme.

By the use of these methods, very few "C" horizon samples were unobtainable. However, where this circumstance did arise "B" horizon, or interstitial fines from gravels, samples were taken from the auger hole at its maximum depth.

The rationale behind the selection of areas for soil sampling this season is for the one of the following reasons:

I) To follow up stream sediment anomalies;
II) To follow up magnetic anomalies;
III) To follow up soil sample anomalies (determined this season);
IV) To check areas of old gold mining operations; and
V) As a check on previous soil sample programmes.

Sampling was generally conducted at a spacing of 25m, although in some circumstances 5m and 10m spacings were also used. Where more than one line was used for the survey the line spacing was either 400m or 200m, although 50m was used to test the Timbs Creek anomaly.

Records of the early prospectors indicated that the technique of loaming was successful in gold exploration, particularly in the Golden Ridge area. This technique was therefore tried with both the Rocky River arsenic anomaly and the Golden Ridge area.

This method involved collecting the excavated gravel material and then passing this material down to collect a pan concentrate. Only one or two specks of gold were observed in the Rocky River area and none from Golden Ridge.

In Golden Ridge the old reports suggest that this type of approach was used to locate outcrop of gold bearing veins. Gold traces were followed by digging pits in the gravel until the source was reached further up the hillside.

Pan concentrates from the loaming are currently being processed through heavy media separation, and will be analysed when this is done. An assessment of the merit of the technique will then be made.

3.3 GEOLOGY

Observations on geology were made in passing during the sampling programme rather than as systematic traverses intended to serve as a base for a mapping programme. Nevertheless, it would now be possible to produce a photo interpretation map with the data available with the aid of data loaned by N. Turner of the Mines Department.

Specific problems received greater attention, particularly the Tertiary Gravels. Actual traverse mapping was confined to a traverse from the Whyte guaging station to the end of the Rocky River and Specimen Creek. Details of observations are given in section 4.4.

The geochemical sampling by soil auger proved incidentally to be a useful tool in picking unit boundaries.

Work on the Tertiary rocks of the area is advanced enough for a final description, but for the Precambrian further revisions are likely, so an outline only is given below.

3.3.1 Precambrian

It is considered that the bulk of the area is occupied by a simple eastward facing rock sequence which unconformably overlies the Rocky Cape Group and is truncated by the Meredith Granite. In the upper exposed portions there are rocks assignable to the Oonah Formation (N. Turner pers. comm.). Rocky Cape Group outcrop occurs mainly to the west of the exploration licence area although it is present in the north west section. The basal unconformity is adequately established at Mt Donaldson (N. Turner pers. comm.). Rock fabrics give abundant evidence of superimposed folding, but the aeromagnetic trends, which are considered to be stratigraphically controlled, indicate an orderly structure except where the trends converge near Main Creek. In this area the trends are crossed by a major NNE trending fault with right lateral displacement, and re-emerge in the north of the exploration licence area where the fault has been mapped previously. The fault can also be traced south to the coast at Ahrberg Bay.

Dips are normally steep and to the east. Most westward dips are thought to be overturned. Although thinbedded sandstone beds considered to be turbidites with original graded bedding are common, the grain size is mostly too uniform to allow facing to be determined from them.

The sequence can be divided into five units, with further subdivisions possible.

1. A unit of slaty mudstone and quartzwacke turbidite with conglomerate at the base.

2. A unit consisting of dolomite, volcanics and dark grey slate. The slate becomes predominant in the north.

3. A unit of generally schistose turbidites and greenstones interpreted as basic metavolcanics, possibly largely pyroclastic. At the top is a member containing the magnesite and magnetite ore. There is minor slaty mudstone and carbonate.

4. A unit of generally schistose quartzwacke turbidites, grey slate, and graphitic slate. Also with some green tuffs.

5. A unit of grey and red-brown mudstone (not exposed in E.L. 4/61).

3.3.2 Tertiary

The Tertiary rocks comprise sheet or channel filling gravel, sand or clay generally in ridge top situations, basalt as flows and possibly plugs, and are included in some, if not all, of the "circular anomaly" features of the area, some at least of which are sinkhole fillings of Tertiary sediments, although others would be of igneous origin and not necessarily of Tertiary age. The elevation of the Tertiary alluvial and erruptive rocks tends to be lower in the south, and could reflect warping of the area. However, a undeformed series of stepped erosion surfaces seems adequate to explain the height distribution of the Tertiary rocks.

The heavy mineral content of the gravels was examined to assess (a) its potential as a placer deposit of tin, gold, etc and (b) its contribution as a contaminant of heavy mineral suites from creeks in the area generally. In the process an acceptable reconstruction of the Tertiary history of the area was arrived at.

Rock units and commentaries for the Tertiary deposits are as follows:

1. "Bullocks Head Gravel"

This unit is a polymictic cobble gravel confined in general to channels and best developed in the town of Savage River but also present at Brown Plains. It occurs at more than one level and is overlain by basalt, thus its deposition ranges from pre basalt into the period of basalt eruption.

Clast range up to boulders of 0.5m diameter, though mostly clasts are in the cobble size range. The rock types represented include quartzwacke sandstone, vein quartz, quartz tourmaline rock, greisen, and rarely leached volcanics resembling dykes in the town area. The associated sand is of granite wash aspect and includes quartz, feldspar and tourmaline.

The heavy minerals indentified in the field comprised:

tourmaline .
monazite and/or topaz
garnet
nodular pyrite (not universal)
fine grained magnetite (not universal)

The proportious varied quite widely between different occurrence areas, and are attributed to an original drainage pattern directed outwards from the Meredith Range in which each channel collected sediments from a separate, small area.

2. Basalt

Basalt outcrops are rare south of the mine area. Basalt overlies gravel in the mine area itself near "B" Dump. There are accessible outcrops at 505035, and at 445902 on the Corinna road. But the drainage pattern of the Whyte, Savage and Donaldson Rivers is readily explained as an incised drainage developed on a sloping basalt surface, since the rivers are broadly parallel and the Whyte and Donaldson are fixed where the flows would have abutted against high ground.

3. "Brown Plains Formation"

This unit is an oligomictic pebble gravel occurring as a sheet deposit capping well preserved areas of plateau surface, and rarely more than 4m thick. It is best developed at Brown Plains along the Whyte River guaging station track. Beneath the gravel there are sometimes sand and clay beds which are probably part of the same formation. Certain of the clays are well bedded and rest directly on a planated bedrock surface and are presumably lacustrine.

The gravel consists dominantly of subrounded clasts of vein quartz up to 10cm with some quartz tourmaline rock and greisen, and very rarely some quartzwacke sandstone.

The gravel also exists at Badger Plain and in one or two spots in the Savage River town area. At a gravel pit on Heazlewood Cresent this gravel occurs on a surface substantially higher than nearby outcrops of "Bullocks Head Gravel". It has not been observed overlying basalt directly, but since it is intimately related to erosion surfaces that apparently truncate the basalt, a post basalt age is probable.

The heavy mineral content was diverse and relatively constant. It included the following (field identifications):

- tourmaline
- garnet
- monazite and/or topaz
- red cassiterite
- magnetite
- chromite and/or spinel
- gold (minor)

Concentration of these minerals occurred in creeks draining the gravel area.

Discussion

The presence of chromite and cassiterite proved a useful diagnostic tool but the problem of source is made more difficult because the Whyte River lies between the Brown Plains area and the serpentinite and granite margin areas considered the likely sources for the chromite and cassiterite respectively.

The gravel deposit could be accounted for as a beach deposit from a lake on a coastal plain which would allow longshore currents to act on material from a variety of sources.

The limiting factor is the degree of rounding of the gravel clasts which is compatible with wave action in sheltered water, but not of existing rivers or seacoast gravel.

A possible mechanism which allows the prior drainage to be re-established after the erosion surface episode is completed starts with erosion of drainage followed by rise in sea level to produce a ria coastline. Ria coasts tend to mature into barrier beach-lagoon coasts with coastal processes tending to bevel away the interfluve areas. The coast of New South Wales, for example, shows a diverse collection of forms all presumably developed from a ria coast existing at the close of the Flandrian transgression in which the floors of large lagoons, such as Tuggerah Lake, presumably consist of filled deep valleys and shallow planated platforms with sediment veneer. If the sea level returns to its former level or below it the original drainage would tend to be completely re-excavated while sediments would be more probably preserved on the bevelled interfluve areas.

Pipe Structure Occurrences

It is thought that infillings of subjacent collapse dolines account for the presence of Brown Plains Formation style pebble gravel in some paradoxical situations, in which direct derivation from an erosion surface related gravel sheet does not seem possible.

Examples include many tributaries of the Little Savage in which no erosion surface remmants survive but suspected in situ pipe filling gravel occurrences were found only at 483069 and by the Savage River road at Alford's Creek 551051. The Alford's Creek occurrence consists of "granite wash", coarse sand and granule gravel but contains chromite in its heavy manual assemblage. It is well exposed in a road cutting.

3.3.3 Quaternary

1. Alluvium

Alluvium is present along the beds and margins of most streams in the area. High terrace gravels are also common. Deposits are not extensive.

2. Residual Gravel

Angular quartz gravel is common, up to 1.5 m thick in places overlying the Brown Plains, and Bullocks Head gravels and also any areas underlain by Precambrian rocks rich in quartz veins. Parts of the gravel are cemented. Where Brown Plains gravel occurs, rounded pebbles may be found in the residual gravel but normally such pebbles are broken, which provides a usable criterion for distinguishing the gravels in the field. The gravel is a superficial deposit.

The heavy mineral content was related to the particular source of the gravel. Garnet is common where it is residual on Oonah Formation.

3.4 ANALYSIS

Samples were collected at 404 soil sample locations and 306 stream sample locations. In some instances more than one sample was collected at a particular site.

All samples collected were pre-dried with the soil samples being sieved to -80 mesh prior to despatch and analysis to Analabs, Burnie. The oversize fractions were retained at Savage River.

Twelve rock samples were also collected (84/0001 - 84/0012) which were crushed, split and pulverised by Analabs prior to analysis.

Set out below is a table outlining the elements assayed for, the analytical method used, and Analabs relevant Code number.

Elements	Analytical Technique	Code
Cu,Pb,Zn, Ag,Ni,Co,Bi (5)(5)(5)(.5)(5)(5)(5)	Preparation by perchloric acid digestion and analysis by atomic absorption spectrophotometry (5) denotes detection limit claimed in parts per million	101
Mo (2)	X-ray Fluoroscence Spectroscopy	102
As (1)	Vapour hydride generation A.A.S.	114
Ba (stream sediments (5) HM 5-180)	Special acid digestion A.A.S.	120
Ba (Soil and stream (10) sediments HM 181-306)	X-ray Fluorescence Spectroscopy	401
Au (0.032) or (0.1)	Aqua Regia Digestion	301
W, Te, Sb (10) (3) (3)	X-ray Fluorescence Spectroscopy	401
Sn (3)	X-ray Fluorescence Spectroscopy	402

On one particular area of interest, the Waterfall Creek Magnetic Anomaly, AMDEL Laboratory Services were utilised (see table below).

Elements	Analytical Technique	Code
Cu, Zn, Co, N (2) (2) (5) (5)	Perchloric Acid digestion and A.A.S. (2) denotes detection limit claimed	C1/C2
Au (0.05)	Aqua regia digestion and A.A.S.	C3/1
Ba, As,Pb, Bi,Sn,U (10)(2)(2)(4)(4)(10)	X-ray Fluorescence	B/3

In conjunction with the stream sediment programme, 297 heavy mineral concentrates were also collected. At the time of writing, Analabs are conducting heavy mineral separations on the samples (code 1610).

Special Analytical methods used include: -

- Mineral scan by X-ray diffraction, Code 1650 (Samples HM 35, 36, 65, 66, 68)

- Qualitative examination of heavy mineral grain concentrates, Code 1615 (HM 7)

4. RESULTS AND DISCUSSION

4.1 STREAM SEDIMENT SAMPLING - METALS

A total of 306 heavy mineral and fine samples with the prefix H.M. (heavy mineral) were taken during the course of the season. Of these 297 were taken from current drainages, 7 were from quarries or other exposures of the Tertiary gravels. One sample was taken from a coarse sandy infilled structure at Alfords Creek and one sample (three parts) from the fossil creek exposure on the Corinna Road near Eight Mile Creek.

In addition to these, several samples (heavy mineral only) were obtained from fossil creeks in the Savage River township and from the various gold prospectors operating in the area.

All heavy mineral samples were examined in a field sense, and where time permitted, in a more detailed fashion with a small microscope. Although this proved useful in delineating the broad mineral assemblage, several of the more obscure minerals escaped definition. All of these samples have since been dispatched to Analabs for a tetrabromoethane (TBE) separation to remove any remaining quartz left in the pan concentrate. When this has been done the magnetic portion should be removed and if there remains sufficient sample, this should be split and one portion analysed.

Although these pan concentrates were mainly examined for their economic potential, they also proved useful as a mapping tool. The main example of this was the presence of a persistent zone of epidote, originally detected in the Timbs Creek area, which could be traced along strike for 9 km. In a greenschist facies, this normally represents a metabasic volcanic.

The fines samples were dispatched for analysis as a matter of course during the season, and consequently all results have now been received and evaluated. In addition, samples of stream sediments taken in previous years from the Specimen Creek area (86 samples) and the northern area been re-submitted for specific analysis (mainly arsenic) to complete the overall picture.

Because of the variation in lithologies, statistical treatment of the data was not warranted. Anomalism has been defined on an "eyeball" estimate only. Anomalies thus detected are discussed in the following pages. All results and analytical report numbers are tabulated and presented in the appendices.

As part of the programme, samples were taken in Main Creek, Heazlewood River and Whyte River. All of these are anomalous but since their catchments contain mine workings they are probably related to mine workings upstream. The anomalism cannot be properly assessed and so these are not discussed further.

4.1.1 Brown Plains - Little Plain

These areas are topographic highs and drainages emanating from these have a specific heavy mineral assemblage. As no anomalies of significance were detected in the fines from the stream sediment sampling, these areas are considered for their heavy mineral potential. Further, anomalous lead was detected in a 1980 auger drilling programme, and for convenience, this is considered here also.

The area contains a channel of "Bullocks Head Gravel" well exposed at a cutting on the Corinna Road at 443917 and about 10m wide at this point. Other examples of this gravel occur in the area of modern workings and old adits and shafts at 440915 (see section on gold below). The later Brown Plains Formation gravel is more extensive and dominates heavy mineral assemblages in the creeks of the area. Also, the Quarternary superficial gravel is widespread.

The presence of all of these units complicates exploration targeted on bedrock, both by introducing an overburden problem into soil sampling work and by contamination of the heavy mineral suites of the modern drainage.

One exploration attempt (1980) succeeded in penetrating through the gravels and obtaining anomalous Pb, Ag values. Therefore, the potential of the area can be considered in terms of:

I	Gold	from the Brown Plains Formation
II	Tin	" " " " "
III	Monazite	" " " " "
IV	Chromite	" " " " "
V	Pb/Ag	from the underlying strata.

I Gold

Numerous stream sediment samples have been obtained from creeks which drain this area and all have a mineral assemblage identical to the Brown Plains Formation unit including gold. This heavy mineral content is often concentrated in suitable trapsites.

Gold prospectors have been active in the area for at least 100 years (on and off) with some workings still in progress, albeit illegally. Mostly these are working the creek alluvials to obtain gold from the re-concentrated heavy minerals derived from the sheetwash gravels. Reports by those who have exploited gold in the area consider the gold to be sporadic and only within the alluvials.

However, there is physical evidence, though no written record, of attempts to ascertain the gold potential of the deep lead system. This takes the form of adits and a shaft. The excavated material from these workings contains a large number of rounded pebbles, but it is uncertain whether these are derived from the deep lead or the sheetwash gravels.

It is not known whether any of these underground workings were successful in winning gold from the deep lead system or not. It is possible that these mining efforts were exploratory.

If these workings were successful, the question arises as to why the workings are not more extensive. Although no attempts have been made to enter these workings, they appear to be in good condition and do not appear to drain significant amounts of water. This does not preclude excessive water and/or cave in from being possible problems but it is more likely to be a lack of gold which is responsible for the cessation of these underground workings. The proper lighting and safety equipment should be obtained and these workings examined in more detail.

Because of the lack of exposure of the deep lead system and the fact that gold has been detected in the sheetwash gravels, the source for the gold in the recent creek alluvials is concluded to be the Brown Plains Formation. Nevertheless, perhaps some effort ought to be directed towards more properly examining the deep lead system.

II Tin (Cassiterite)

An attempt was made in 1980 to assess the tin/gold potential of the Brown Plains Formation. The programme involved a grid based auger survey (auger type not recorded). In this programme it appears the complications of the gravel stratigraphy were not taken into account. A brief examination of some of the auger sites suggests the possibility that the overlying surficial gravels were not penetrated. In this circumstance a low result was almost guaranteed.

No significant gold values were obtained, although values of up to 7,300 ppm tin were obtained. A follow-up auger programme of the more interesting results was disappointing. Several costeans through the gravels were excavated, also with disappointing results. It was concluded at that time that the anomalous values were randomly scattered and often associated with sediment from present day drainages (ie, re-worked gravel material) and the programme was suspended.

As part of this season's assessment of the potential of the area, pan concentrates were obtained from exposures of the Brown Plains Formation in quarries. The method is roughly quantitative and the best sample yielded 2-4gms from 15 litres of material. (This estimate is a ball park figure and is derived from comparison to samples already weighed and the heavy mineral content determined). This means that the heavy mineral content is roughly 50-100ppm. (Note that this is not the tin content.) Testing of various levels throughout the quarry on the Rocky River track suggests a fairly uniform heavy mineral content (for that site). However, testing of the same unit in other quarries suggests considerable variation in heavy mineral content from area to area.

It is difficult to ascertain the areal extent and volume of the gravels because of the masking effect of the topsoil and surficial gravels. However, the indications so far suggest that the grade and consistency of the mineralisation is insufficient to permit exploitation. Nevertheless, it is still possible for small richer pockets to exist, as indicated by the 1980 programme.

If tin is going to be considered as a possible mineable product, then it should therefore be considered as part of a multi-mineral operation to extract gold-cassiterite-monazite-chromite.

III Monazite

Monazite is a source of specific rare earth elements. Currently, it is obtained as a by-product of heavy mineral sands operations. There are plans afoot to increase monazite extraction from existing heavy mineral sands deposits.

It should be noted that the composition of monazite can vary considerably (within certain limits) and consequently not all monazite is of value.

Monazite is a constituent of the heavy mineral assemblage of the Brown Plains Formation and is only mentioned as a possibility when considered as part of a multi-mineral extraction process (easily done). However, the same grade restrictions (due to sporadic distribution and lack of heavy mineral content within the gravels) apply to this as to cassiterite.

IV Chromite

The concentration of chromite has been reported to be greater in the Little Plain area and may reflect a slightly different input into the area at the time of deposition. In the 1980 auger programme, no chromite of significance was recorded. However, stream sediment sampling from this season's programme did reveal minor chromite.

It can be concluded that chromite does not constitute a significant portion of the heavy mineral content and certainly could not be considered as a lone mineral product.

V Lead/Silver

Anomalous lead (8100 ppm), zinc (425 ppm) and silver (9 ppm) values (and elevated copper) were recorded in one sample (1200N/400) in the 1980 auger programme at Brown Plains. This is most likely a genuine bedrock anomaly (the conclusion reached at that time also) and has similarities to the Timbs Creek silver anomaly (see section 4.3.4). If so, then it is most probably a vein of the Pb-Zn-Ag type.

The follow-up of this should be deferred until the more readily examined Timbs Creek occurence has been prospected and understood.

4.1.2. Rocky River Area

Both gold and magnetite mineralisation have been known in this area for many years. Several attempts have been made to exploit the area for gold by both alluvial and underground operations. Although the underground miners appear to have met with little success, the alluvial operations have been known to be successful. The underground operations were obviously an attempt to locate and exploit the source of this alluvial gold.

Some gold may have been won from the underground workings but, as at Savage River, it appears that the magnetite body was not really a gold proposition. The adit construction was pushed ahead prior to systematic assays being made and the operation appears to have prevented prospecting of the true sources of the Rocky River gold. Coarse gold, (including Tasmania's largest nugget) points to a local source of gold in the area.

Possible sources of gold in the area are:

a) Brown Plains Formation - present to the South of Rocky River and known to contain gold. This unit is drained into Rocky River by Breakneck Creek.

b) Rocky River arsenic anomaly (see section 4.3.1). This anomaly cuts across Rocky River above Breakneck Creek. If this is a source, the gold from this is likely to be fine. There is a significant fine gold proportion in the gold being won from Rocky River.

c) Some minor gold has been recorded in Rocky River several kilometres above Breakneck Creek, ie, within the Meredith Granite. This is most probably derived from Brown Plains Formation which has since been eroded completely.

d) The magnetite occurrence lying to the east of that which was tested by the Rocky River mine was evaluated for magnetite by drilling approximately 24 years ago. As a magnetite resource it is not viable. However, no other assaying was done on the core material and it too may represent a possible gold source.

e) Gold in carbonate veins similar to Specimen Reef, in a greenstone host.

In addition, stream sediment sampling has revealed five zones of anomalism in the area. These are:

I) Rocky River Arsenic Anomaly
This is an arsenic anomaly with a number of sample points indicating a length of 5+km.* The orientation of this is in the strike of the rock units, implying some stratabound arsenic anomalism. The strongest anomaly followed an aligned series of creeks.

* Sample Number	As (ppm)
HM 95	69
96	43
107	15
108	41
109	22
110	25
143	23
144	11
146	14
147	100
177	75
178	21
179	38
243	70

Pan concentrates from this area contain very little heavy mineral, most of which is very fine garnet. This is probably derived directly from the metamorphosed sediments of the Oonah Formation.

Arsenic is normally a high temperature mineral associate and so gold, and to a lesser extent tin, are the main hopes for this anomaly. A three line grid controlled soil sampling programme was undertaken to evaluate this prospect (see 4.3.1).

II) Supergrunt Anomaly

H.M. 112 is a very strongly anomalous sample in As (730ppm), Cu (245ppm), Zn (410ppm), Pb (55ppm), W (222ppm) and S (222ppm) and is located in a large tributary of the Rocky River, upstream of the Meredith Granite contact. Attempts to follow this anomaly upstream have not met with substantial success and it may be that the source of the anomaly is in the immediate locality of the sample, or from a smaller tributary which has not as yet been sampled. Several of these exist and appear to drain an area to the west of the main creek.

There is some minor arsenic anomalism in the upper reaches of Post Office Creek, and this could conceivably be derived from the same horizon. (HM 154 - 20ppm, HM 155 - 14ppm, HM 157 - 22ppm).

III) Breakneck Creek

A minor lead anomaly has been detected in this creek (HM 46 - 85ppm). This was not detected in samples taken in the headwaters of this drainage. At the moment, it is considered a point anomaly that is to be followed up as time permits.

The heavy mineral assemblage of this creek is mainly magnetite with a typical Tertiary Gravel Assemblage.

There is some evidence of alluvial workings (for gold?) in this creek.

IV) Cataract Creek - Goodall Creek

Although these creeks are 3km apart, they are both probably draining the same lithological unit and are both anomalous in copper and zinc. The Rocky River magnetite belt passes through both of these creeks. Considering the presence of chalcopyrite in the Savage River iron mine, it is most likely that the anomalies are caused by this type of association.

V) Bounds Creek

In the upper reaches of Bounds Creek there is a zinc anomaly (HM 240 - 255ppm). There is no other elemental support for this anomaly and is best regarded as a spot anomaly. It is almost on strike of the Rocky River magnetite belt and may represent a trace of it although magnetite was not noted in the pan concentrate. The possibility that it is gold related, like the Specimen Creek and possibly Big Duffer Creek zinc anomalies, warrants investigation.

4.1.3 Timbs Creek Area

This creek has been subjected to various episodes of alluvial gold workings, some of which have involved water race fed sluicing operations. It is presumed, however, that the gold present in the alluvials is derived from the Tertiary gravels which are present in the headwaters (mainly the Little Plain - Brown Plains area). No written evidence of these workings is available.

There are two significant magnetic anomalies which are cut by this drainage system. Both of these have been proven by examination of pan concentrates to be caused by magnetite. Haematite in large quantities was observed in Timbs Creek downstream of the westernmost one of these anomalies. This is now interpreted to be from cracks and fissures within the magnetite zone which become the site of secondary haematite deposition as is the occurrence of haematite at the Savage River Mine.

A single line soil sampling traverse was undertaken across this area as stream sediment sampling revealed three zones of anomalism.

a) Tunnelrace Creek

This is primarily a copper anomaly although a little tin has also been recorded (HM 61 - Cu 210ppm, Sn 13ppm, HM105 - Cu 185 ppm, Sn x). It is associated with the western magnetic anomaly and can be traced to Little Hunter Creek to the south and to a tributary of Savage River near Battys Bend in the north. The anomalism and magnetite are recorded in all these localities and bearing in mind the copper-magnetite association at Savage River, this is the most likely explanation.

b) Timbs Creek Lead

A very high lead value (HM 42 - 305 ppm) was recorded in a tributary of Timbs Creek. Associated with this were anomalous As, Cu and Zn. To follow this up, stream sediments were taken at the junction of this tributary with Timbs Creek and then at 100m intervals along the tributary (incorporating the first value). This follow up stream sediment sampling failed to support the anomaly and it is therefore best regarded as a spot value of little consequence.

c) Eight Mile Creek

Anomalous copper values were detected in Eight Mile Creek (HM 52 - Cu 315ppm). The anomaly is associated (although slightly east of) the eastern magnetic high belt.

There is a little gold in this sample also but, because of the presence of the Brown Plains Formation assemblage, is interpreted as being derived from them rather than being associated with the copper.

4.1.4 Nine Mile Creek

The Cape Copper mine is located in this creek and attempts were made to obtain samples both upstream and downstream of the mine. The course of this creek is roughly linear and diverges only slightly from the strike of the bedrock.

Initially a downstream sample was attempted. The silt sample was collected but no pan concentrate could be obtained. it was concluded at the time that the tailings from the mine were masking the true alluvium of the creek. Further attempts were made downstream but at no point between the Whyte River and the mine could a pan concentrate be obtained.

An upstream sample was then attempted. Once again very little pan concentrate was available thus disproving the conclusion reached on the first attempt. However, significant gold was detected. It is important to note that gold was found in the mine in association with pyrite/chalcopyrite. A grab sample of pyritic material (from the mine?) was assayed but did not contain gold (Rock chip sample 84/0001).

Several follow up samples were taken higher up the creek and a similar result obtained.

As there is not the Brown Plains Formation heavy mineral assemblage present, it is quite likely that this gold is being derived from the bedrock. The horizon along which Nine Mile Creek flows appears to be roughly correlateable with the Rocky River arsenic anomaly and Golden Ridge (and Armstrong Creek?).

If it is related to these, then the possibility of crosscutting features containing gold, as at Golden Ridge, should be considered in future exploration.

4.1.5 Specimen Creek

This locality was worked for both alluvial and underground gold late last century. The name is derived from the specimens of crystallised gold found by early prospectors. Results of the underground operations were said to be disappointing and the field was ultimately abandoned. Water problems limited depth of the workings.

Because of its importance as a potential gold field (working on the premise that former operations either failed to understand the geological controls of the gold, or were abandoned because the overall grade was too low) this area has been re-examined.

As part of this, a number of stream sediment sampling programmes have been conducted in the area, these being:

a) 1979

Very little information is available for this survey. Analysis was conducted by the Geological Survey of Tasmania laboratories.

A high gold value was recorded in Specimen Creek and some lead/silver anomalies were obtained in Davis Creek near where it enters the Savage River Mines Lease.

The high gold value naturally was ascribed to the Specimen Reef gold deposits which were extensively worked last century.

The lead/silver mineralisation may be associated with a carbonate belt which is known to pass through the area. The 1981 survey indicated trace silver in this area but little lead.

b) 1980

This survey was conducted mainly over the tributaries of Specimen Creek. The only records available are for gold (perhaps this was the only element requested for assay?).

The highest vales (0.55 ppm and 0.22 ppm) are both upstream of the line of the lode worked by the miners. This suggests that there may be a further zone of gold mineralisation as yet undetected. This is discussed more fully in section 4.3.6.

Unfortunately, Amdel (the laboratory used for this) employs a policy of dumping samples after six months unless alternative instructions are given. These samples are no longer available.

c) 1981

This was a more complete stream sediment survey which tried to cover Specimen and Davis Creeks with samples at 50m intervals. It was designed to compliment and therefore did not repeat the 1980 programme. Analyses were conducted for Cu, Pb, Zn, Ag and Au.

The most significant results are in Specimen Creek, downstream of the old workings. The anomalies are Cu, Zn, Au. This anomaly is not unexpected and merely confirms the existence of this mineralised zone.

As part of the 1983/84 programme this set of samples was re-analysed for arsenic. There were a number of samples in the anomalous zone which did not have sufficient sample for analysis. There were no other values high enough to be considered anomalous.

d) 1984

Two heavy mineral/interstitial silt samples numbered HM 305 and HM 306 were taken as part of a broad appraisal of the area. HM 305, from Specimen Creek, was anomalous in arsenic (40ppm), zinc (315ppm) and barium (1090ppm). The zinc was expected to be anomalous and the arsenic indicates that this element can be used as a pathfinder for gold in this area. The significance of the barium is as yet unknown.

4.1.6 Big Duffer Creek

This creek has a drainage including the southern portion of the old Golden Ridge goldfield and a portion of the town area (the school). Old exploratory tunnels are known only from the catchment of the tributary, Little Duffer creek. 200 yards upstream from the junction of the creeks there is an old report of a "formation" in which "zinc blende" was found (Smith 1897, p. XLV(45)).

A substantial zinc anomaly was found in Big Duffer Creek which persisted below the junction. It was supported to a degree in arsenic (HM 254 - Zn 195ppm, As 4ppm, HM 255 - Zn 755ppm, As 12ppm). There was no anomaly in Little Duffer Creek.

The chemistry of the anomaly is similar to that of Specimen Creek where the anomaly is related to mine drainage from the old workings and the vein itself is the principal aquifer. It seems reasonable to infer that a similar origin may be responsible for the Big Duffer Creek anomaly. However, there are some problems:

a) absence of anomaly from Little Duffer Creek where there are exploratory tunnels which would be expected to produce an anomaly (but perhaps they are dry);

b) the zinc blende occurrence may be itself sufficient to cause the anomaly and be independent of gold mineralisation;

c) the anomaly may relate to town area contamination. The area warrants follow up work next season.

4.1.7 Armstrong Creek

This area was sampled initially to test for the possibility of osmiridium.

In the pan concentrates very small quantities of heavy minerals were observed (certainly no osmiridium) although in Armstrong Creek itself there was a little gold.

Results of the analysis of the fines sample numbers/ results indicate the presence of a weak arsenic anomaly to the east of the creek. Bearing in mind the gold-arsenic relationship and the stratigraphic position of this area, it is possible to infer a relationship between this and Golden Ridge (Nine Mile Creek - Rocky River arsenic Anomaly).

Access is a problem for this area but nevertheless the concept of potential gold mineralisation is worth investigating. Initially a single line soil sampling traverse should be conducted with the possibility of further traverses as required.

4.1.8 Little Savage River

In conjunction with the diamond sampling (discussed in section 4.2.1) normal stream sediment samples were taken.

Little was revealed in the heavy mineral portion of the samples but an analysis of the fines revealed Zn ranging from 65 to 200ppm, Ba ranging from 490 to 1620ppm and As ranging from 6 to 15ppm (with minor Cu and Pb) anomalism in the eastern tributaries of this river.

The origins of this anomalism are not known. To the north some soil sampling has been done as part of the previous season's programme. This would have covered any stratigraphic control on this anomalism (unless obscured by basalt) and nothing was detected.

Nevertheless, a single line soil sampling traverse could be conducted to evaluate the potential of the area.

4.1.9 McAuliffe Creek

Stream sediment sampling was conducted in this area as a correlation betwen this season's technique (pan concentrate plus interstitial fines) and the technique used in previous years (silt bank). The results indicated that silt bank type samples had a good degree of correlation with the interstitial silt results in this area.

As previously indicated, there is anomalism for copper, zinc and arsenic (HM 113-117 inclusive).

Some soil sampling traverses have been conducted in 1982-83 to the south of this area indicating low order copper and zinc anomalism. Although not conclusively proved, this is most likely the same horizon indicated by the stream sediment sampling.

The pan concentrates reveal the presence of magnetite and it is quite probable that this minor anomalism is another magnetite - minor base metal correlation. Also revealed in one pan concentrate is epidote which is indicative of a metamorphosed (greenschist facies) basic volcanic.

As this anomaly has already been followed up by soil sampling with only weak anomalism, no further work is recommended at this stage.

4.1.10 Savage River - Battys Bend

Several anomalies were detected in this area, these being:

a) Arsenic anomaly

There is a weak arsenic anomaly in two tributaries which flow into Savage River, south of Battys Bend (HM 123 - As 23ppm, HM 126 - As 11ppm).

The anomaly is oriented in the direction of strike of the bedrock and can therefore be considered stratabound anomalism.

As yet no follow up work has been undertaken and considering the low order of the anomalism it must be ranked of low order priority.

b) Lead Zinc Anomaly

A tributary draining into the Savage River at the western end of Battys Bend (HM 129) is anomalous in lead (115ppm) and zinc (235ppm) and weakly so in copper (60ppm). As this tributary bifircates not

far from its junction with Savage River both of these branches were sampled as a follow up. Both indicated that the anomaly continued (HM 294 - Pb 110ppm, Zn 250ppm, HM 295 - Pb 155ppm, Zn 270ppm).

Geologically the headwaters of both of these tributaries drain a carbonate lithology. Lead zinc mineralisation in this context is not unknown. A soil sampling traverse could be undertaken to assess the potential of this zone.

Unfortunately, this area is perilously close to the western boundary of the exploration licence and care should be taken not to inadvertantly cross it.

4.1.11 Frenchman Creek

A modest lead anomaly (H.M. 272 - 45ppm) was found in this creek above the junction with the Whyte River. Since the creek is large at this point it is possible that the anomaly is attenuated from an important source upstream possibly from the area of a well defined magnetic anomaly at the head of the creek (see 4.1.18 below). But there is another possibility indicated by an anomaly of similar order across the Whyte River and along strike from it. This other anomaly is however associated with a trend of elevated copper content not reflected in the Frenchman Creek sample.

Despite the access difficulty some further sampling is advisable.

4.1.12 Alford's Creek

At first it was thought that this area might contain an osmiridium bearing deep lead but no osmiridium was found. Heavy minerals found resembled those from Brown Plains, ie, mature sediments with inputs including the granite and serpentinite terrains.

An interesting outcrop occurs 50 m from the culvert where a cutting exposed nearly 10m in section of an arkosic sand and fine gravel, almost certainly the "granite wash at Big Creek" reported by Twelvetrees (1903) in which he also found traces of tin ore (not confirmed in our own work). Both creek samples and the granite wash outcrop were anomalous in arsenic.

Sample Number	As ppm
H.M. 11	80
H.M. 12	25 (granite wash)
H.M. 17	70

The position of the gravel makes it impossible for it to be part of a sheet deposit and if it were a valley fill it would be unlikely to be so fine grained (unless perhaps ponding had occurred). An interesting possibility is that it is actually a fill of a sinkhole collapse feature similar to those containing fills of Cambrian or Cretaceous sands in McArthur group rocks in the Borroloola region, Northern Territory.

The arsenic values may be significant but interpretation depends on clarifying the origins of the sedimentary body. The base of this is not exposed and it may require a detailed cross section by power auger. Further, the relationship between this and the upper end of Alford's Creek should be established. In addition, a single line soil sampling traverse could be conducted to test the possibility of a bedrock origin of the arsenic anomalism.

4.1.13 Meredith Magnetite Anomaly

This magnetic anomaly was originally considered as a possible tin area (earlier referred to as Tin Anomaly Area D).

One of the pan concentrates from this area contained significant pyrite (and minor pyrrhotite). However, the other samples contained mainly garnet and tourmaline (although one or two grey cassiterite crystals were noted).

Results of the analysis of the fines samples indicate low order anomalism for tin but very little else (HM 33 - Sn 6ppm, HM 35 - Sn 7ppm, HM 36 - Sn 9ppm). As yet, the pan concentrates have not been analysed and this should assist in evaluating the potential of this area.

Nevertheless, the results so far have not been encouraging and if the results of the heavy mineral analysis fail to reveal anything, then no further action would be recommended.

4.1.14 Bowry Creek

Samples taken from this creek and its tributaries predictably contain significant magnetite in the pan concentrates. In addition, there is a small portion of the Brown Plains Formation heavy mineral assemblage present.

Analysis of the fines samples indicated elevated copper and give values in the vicinity of the magnetite (HM 5 - 70ppm, HM 6 - 100ppm). This is not unexpected and does not warrant any follow up at this stage.

4.1.15 Whyte River Tributaries

There is a one point arsenic anomaly (HM 118 - 32ppm) in a tributary draining into the Whyte River below its junction with the Heazlewood River.

Several other tributaries in this area were sampled as a follow up to this point, including two samples further up the same creek. Unfortunately, this anomaly was not confirmed in this follow up and so is best regarded as a point anomaly. No further work is necessary at this stage.

4.1.16 Pineapple Creek

Samples were taken both upstream and downstream of a basalt capping to check the possibility of Tertiary gravels or mineralisation in the bedrock beneath the basalt. (Pineapple Creek has exposed the base of the basalt.)

The pan concentrates were quite small from samples upstream (east) whereas those near the pipeline road appear to contain significant haematite (and magnetite?)

Analysis of the fines indicates little of significance and no further work is recommended.

4.1.17 Owen Meredith and Paradise Rivers

This area was sampled by largely helicopter borne parties. Apart from the areas which are obviously enriched in magnetite, the pan concentrates contain very little heavy mineral.

Further, there is little of significance in the analyses of the fines samples. There has been a substantial coverage of this area, and any mineralisation of significance is unlikely to have been missed.

No further work is recommended at this stage.

4.1.18 Penny Creek Magnetic Anomaly

This anomaly, centred at 464880 in the Mines Department aeromagnetic survey, is one of the few magnetic features not of a routine stratigraphic nature, although quite close to a belt which has been established to produce magnetite-bearing pan samples. Initially further promise was provided by its matching along strike with the most prominent lead anomaly yet discovered.

Pan concentrates from two small tributaries (HM 208, 209) gave heavy mineral concentrates including magnetite, haematite and epidote, but the sources are not necessarily local since the same minerals occur in the stratigraphic magnetic belt adjoining it and the area is one where Brown Plains Formation cover is general, and so a reworked origin is possible. The fines gave elevated values of copper (95 and 50ppm), lead (35 and 20ppm) and zinc (40 and 80ppm) of modest order but possibly significant in terms of the very low local background. The low background, however, may be due to the Brown Plains Formation cover.

There is also some possibility that the magnetic source is not positioned precisely by the contour map (see comments on Frenchman Creek above, 4.1.11).

4.2 STREAM SEDIMENT SAMPLING - DIAMONDS

4.2.1 Little Savage River

The area of interest in the Little Savage catchment is a wide lowland area in which the intriguing air photo vegetation anomalies are clustered. The wide low area in a relatively small stream contrasts with the gorge of the Savage River, so rocks that are weak with respect to erosion are present here (which supported the idea of kimberlites). Once the valley was examined, however, evidence turned up to suggest that it was underlain by a dolomite formation, since there was outcrop of dolomite with a little slate for about a quarter of the river bed examined. So another possibility had to be considered for the vegetation anomalies, that of karst subsidence related features. A cavity once developed can stope its way to the surface leaving behind a breccia pipe or ring fault bounded area, and a corresponding surface sinkhole can intercept gravels from any sheet deposit and these can then drop down the pipe with further subsidence, as in a hopper. Such features are well displayed in the McArthur District of the Northern Territory where there are gravel fills related to the Mulluman Beds (Cretaceous) and Bukalara Sandstone (Cambrian).

The valley is incised to a level well below the Brown Plains formation and sub-basalt gravels, yet it was found that most of the creeks contained abundant quartz pebble gravel similar in aspect to Brown Plains material (samples LSD 5, 8 and 9 were exceptions). Some creeks contained nothing else. It seems probable that this gravel is coming from gravel pipe structures. One possible example of gravel pipe outcrop was found in a subcrop gravel occurrence at 481065. The Savage River cuts through a possible breccia pipe at 479044 but the weak rock inside the feature is reflected by non-outcrop except for a large tilted block of dolomite. Outcrop in the river is nearly continuous outside the feature. This feature is not a gravel pipe and could be a kimberlite, but it unfortunately did not contain a creek that could be sampled.

The area was therefore downgraded as a prospect because some, if not neccessarily all, the air photo anomalies could be explained away, and the hope of getting samples uncontaminated by Tertiary gravel sources (which could have travelled from distant source areas) had been exploded

The samples processed do not show any of the readily diagnosed kimberlite indicator minerals - no diamond, pyrope (kimberlitic garnet) ilmenite or chrome diopside. Spinels (including chromite), however, are common and work is in progress to determine if kimberlitic types are present. Distinction of spinels is by microprobe analysis. It has been determined that chrome spinel is present, but not as yet that the diagnostic feature of complex zoning is also present.

Other grains recorded indicate (a) a granite area component in derivation; almandine (a non-kimberlitic garnet) topaz, tourmaline, cassiterite, rutile, zircon and (b) a serpentinite source area; chromite, spinel, gold? osmiridium. Gold and osmiridium were detected in greater abundance in pan sampling, possibly because grains of less than 40 mesh are readily visible.

Pyroxene is normally absent but is locally common and occurs in areas unlikely to be contaminated by basalt. Given the nature of metamorphism and lithology of the country rock (mostly carbonate and slate, some greenschist grade metavolcanics) a local igneous intrusive source is indicated in these catchments, eg, LSD 4, LSD 14 and possibly also LSD 2 and LSD 9. LSD 14 and LSD 9 come from features deemed the most likely to be genuine intrusions, LSD 2 is from Reid's Harvey Creek, the reputed source of diamonds and LSD 4 has associated with it spinels of "type 2" (see below). Topaz is absent in LSD 14 and LSD 16 which drain the same large anomaly area. Possibly the contaminating gravels here are from the sub-basaltic source only.

In this area and context the relevant minerals of the spinel group are chromite and spinel which cannot be distinguished from each other except by chemical means. This tends to produce loose usage of terms "spinel" and "chromite" for black grains that are actually mixtures of both.

However, both in the field and in the petrologist's report two types of "spinel" could usually be distinguished: Type 1 with very dark brown colour, pitted surface and a degree of rounding of the crystals; Type 2 with very dark brown to black colour, smooth surface and relatively sharp crystal edges. The forms probably reflect different source areas rather than different mineral composition. Type 1 grains have not been analysed but are thought to be basically chromites derived from the Bald Hill Serpentinite (although spinel may be present). A selection of Type 2 grains have been shown to contain both chrome spinels and chromites. Their sharp crystal edges suggest a local or at least closer source than those of Type 1 grains which are partially rounded.

In conclusion, the area is so heavily contaminated by material from distant sources that it would have taken a record of chrome diopside or a cluster of diamonds to have given a reasonable positive result. The "normal positive" of an odd diamond or pyrope grain would have to be considered ambiguous. It is perhaps fortunate that we were spared that dilemma, yet failure to replicate original diamond reports may mean the sampling and examination procedures were inadequate.

4.2.2 Savage Creek

The conditions here proved to be a repeat of the situation in the Little Savage River. The stream bed contained extensive outcropping pavements of dolomite with one 4m bar of slate and sandstone. Some Tertiary gravel contamination was expected since the creek heads in the known Brown Plain Formation gravel area of Badger Plain. But the tributaries which it was hoped would be free of this contamination carried the same abundant quartz pebble gravel and essentially the same heavy mineral suite. A local source of pyroxene is indicated by sample LSD 24.

4.2.3 Longback Creek

Two samples were examined which were selected as control samples to test for the Tertiary gravel component of the heavy mineral suites (samples LSD 26 from Longback Creek at 442 962 and sample LSD 27 from a minor Savage River tributary at 439 973). In both sites osmiridium was abundant in the corresponding HM series HM 122 and HM 129.

Paradoxically, there are some unusual features in that pyroxene and haematite are common yet zircon is absent. Also, the three Type 2 grains analysed by microprobe are all chrome spinels rather than chromites. It could be considered the most promising sample.

4.3 SOIL SAMPLING

In this season's programme, 582 soil samples were collected from the following areas:

Rocky River Arsenic Anomaly	133 samples
Rocky River Arsenic Anomaly Interstitial material from the gravels	30 samples
Rocky River Road	79 samples
Timbs Creek	155 samples
Timbs Creek Silver Anomaly	31 samples
Golden Ridge	77 samples
Specimen Creek	17 samples
Waterfall Creek Magnetic Anomaly	60 samples

In addition to these, soil samples from previous programmes were analysed as follows:

Davis Creek (Specimen Creek)	153 samples

All sample descriptions (where available) and assay results are presented in the appendices.

Assay data for those areas surveyed by more than one exploratory line has been statistically processed by the primitive mean +2 standard deviation calculation to determine anomalies. Note that very high values (subjective assessment only) were removed prior to the calculation. As a method of halo enhancement, mean + standard deviation was also contoured.

A brief examination of the data suggests that more sophisticated geostatistical techniques are not warranted at this stage.

After the calculation of anomolous values was completed, contouring was done with a geological bias, ie. assuming that the mineralisation is stratabound or stratiform.

4.3.1 Rocky River Arsenic Anomaly - See Plans 5.1 to 5.5

This area was investigated as it was the most easily accessible portion of the substantial stream sediment arsenic anomaly.

Three lines at 400m spacing with samples at 25m intervals were used to investigate this anomaly. 133 samples were taken of which 4 failed to penetrate the overlying surficial gravels.

Loaming was also carried out as part of the sampling routine. As part of the panning of these samples, the interstitial material was collected from 30 samples for comparison to "C" horizon samples. The results of the comparison proved conclusively that "C" horizon samples were neccessary (Appendix 11).

The only gold detected so far has been one or two flakes, but this is of limited significance as these samples bear no relationship to any other anomalism, and the gravels are themselves transported material.

Primitive statistical treatment of the analytical data has revealed the presence of eight composite element anomalies. These anomalies, presented as Plate No. 3 are in order of decreasing arsenic values:

1. Arsenic - Copper - Lead. This contains the highest values for these elements and therefore represents the best anomaly.

2. Arsenic - Weak Copper - Weak Lead. This is the most persistent anomaly. The copper and lead are present at the southern end. There is minor tin and silver as well.

3. Arsenic - Copper - Lead - Zinc. The northern extension of this anomaly is zinc only. There is minor silver in the south.

4. Arsenic - Copper - Weak Lead - Zinc. This is mainly a zinc anomaly with the copper elements being detected on the northern line. There is minor silver also.

5. Arsenic - Weak Copper - Lead - Zinc. There is some silver in all lines. Baruim supports this anomaly. This may represent Pb-Zn-Ag mineralisation (veining).

6. Arsenic - Copper - Lead (all weak).

7. Lead - Zinc with minor silver and tin. A one line anomaly only. Barium supports this anomaly.

8. Copper - Zinc with minor silver. This may be the same as anomaly 7. It is a one line only anomaly with barium as well.

Of these anomalies, No's 1, 2 and possibly 5 are the most important and follow up work is recommended.

This follow up should take the form of closing the line spacing to 200m and extending 200m north and south of the current grid. In this way the validity of the anomalies can be confirmed (or denied).

If the anomalism can be demonstrated to be real then the next step would be to commence a diamond drilling programme.

As yet the results of the analysis of the pan concentrates from the loaming exercise are not to hand. If these do not prove to be of value, loaming ought to be discontinued.

4.3.2 Rocky River Road - See Plans 5.1 to 5.5 (part)

The principal feature of the element plots for the road data is the pronounced decrease in values of most elements in the Western end of the traverse, which corresponds to the division between the greenstones and the quartzwacke-slate sequence. Arsenic values are virtually all low which tends to suggest that the area is not the source area for the adjacent alluvial gold. The peak value for copper (680ppm) is supported by silver and may reflect the influence of gossanous vein material in an isolated outcrop at this site (R 1300). Other areas of elevated copper and zinc are not considered significant in themselves. It is possible that the zinc maximum (R 1050) may be related to gold mineralisation, C.f. Specimen Reef.

4.3.3 Timbs Creek - See Plans 5.1 to 5.5 (part)

The single scout line originally proposed in this area was offset in order to avoid difficult terrain. Features of interest comprise the silver anomaly described separately, and areas of Arsenic-Lead and of Copper-Zinc anomaly particularly in the west of the area examined. The peak copper value (Sample 44250E - 990ppm) with support in zinc resembles the pattern found in the Little Donaldson area in previous work. However, it is possible that the copper and zinc represent halo effects around a mineralised body represented by the lead-arsenic area.

4.3.4 Timbs Creek Silver Anomaly - See Plans 5.1 to 5.5 (part)

The Timbs Creek soil sampling traverse indicated a highly anomalous sample at 47200E. This sample contained 745 ppm Cu, 155 ppm Pb, 100 ppm Zn, 240 ppm Ag and 100 ppm As. Of particular interest is silver, which, if present in sufficient quantity, would constitute ore grade material.

To follow this up, a small grid of 3 lines 50m apart, with sample points 5m apart, was centred on this anomalous sample (including a re-drill of the original point).

Unfortunately, this high silver value was not repeated. In fact, silver was below detection limits. However, in the adjacent sample (5m to the east) a 1.5 ppm silver value was recorded. The high base metal response was associated with this point as well, indicating that the re-drill of the original sample point was probably slightly west of the first hole.

There are insufficient values in this grid to warrant statistical treatment and so contouring is on an "eyeball" estimate only. The anomaly thus detected appears to be thin (5-10m) and to have a strike approximately 5° East of North, whereas the general strata strike in the area is more northerly. The implication is that this is a structurally controlled zone, probably a vein of the Pb-Zn-Ag type with some Cu.

The important point of this exercise is to appreciate that a small silver value may be significant as two points less than 5m apart yielded values of 240 and 1.5 ppm. Perhaps any registration of silver should be examined by closing the soil sampling spacing down to 5m (eg. the 1980 auger programme in Brown Plains indicated anomalous lead and silver.)

Perhaps the quickest way of assessing this Timbs Creek silver anomaly is to use a backhoe to dig costeans (0.5 - 1m depth is sufficient in this area so expose "C" horizon). These would then be mapped and systematically channel sampled. Analysis of these samples should then give sufficient information to decide whether it is worth pursuing or not.

4.3.5 Golden Ridge - See Plans 3.1 to 3.5

Although no significant stream sediment anomalies were detected in this area (other than a strong zinc anomaly), it is apparent that if the area had not been extensively prospected in years gone by a gold anomaly would have been detected.

This prospect is well known as one of the major gold producing areas of the Savage River district. A number of mine openings are still evident on the central ridge which passes through the prospect.

According to the Mines Department records of Twelvetrees (1899 and 1903), Weetman and Crockford discovered in situ bedrock gold in 1884. Prior to this much work had been done on the alluvials of the creeks in the area.

The gold obtained is in ragged, peculiar forms and terms such as hollow, skeletal, coralloid and crustiform are used to describe its various shapes.

Gold has been successfully won from the creek alluvials, the surficial gravels and from bedrock. Twelvetrees quotes estimates of 20,000 - 30,000 ounces from the field, including a 5 ounce nugget from Grays Creek. The surficial gravels are reported to have yielded the most gold.

In the surficial gravels, the gold concentration is reported to be strongest over bedrock which is more likely to be auriferous. In bedrock, gold is mainly confined to (carbonate?) veins and occurs as both native gold and auriferous pyrite.

Within the bedrock there are four apparent zones of discontinuous mineralisation, these being (from the west):

1. Weetman and Crockford's Formation
2. Cox's Formation
3. Jarman's (also called Terry's) Formation
4. Gill's Formation

Gold was recovered from thin gossanous reefs that were normally found in groups two or three together, and gold bearing only within the "formations" which are beds less quartz-rich than the prevailing rock of the area. No strong, persistent reefs were found in the time the field was actively worked.

Nevertheless the area is still considered to have potential for significant bedrock gold. It is possible that the underground workings have not fully exploited the area. The erratic gold described by Twelvetrees may represent an alternation of high and low grade zones, in which case a large, low grade deposit would be an exploration target. Further, the presence of auriferous pyrite and the difficulty in treatment of the ore may have caused the premature cessation of mining operations.

As a commencement of exploration to investigate these possiblities, a single line soil sampling traverse was conducted across the area in an attempt to locate these mineralised zones.

The anomalism detected is not of a high order. However, there appears to be four discrete anomalies.

a) 49650E to 49600E: There are elevated copper and arsenic values

Location		Elements (ppm)			
North	East	Cu	Pb	Zn	As
02000	49650	25	x	5	12
	49640	10	5	10	3
	49630	25	10	25	18
	49620	10	x	10	8
	49610	20	x	20	7
	49600	40	x	25	12

b) 49550E to 49500E: There are elevated copper, lead zinc and arsenic values. Note that at 49500E gold is registered as a trace.

Location		Elements (ppm)			
North	East	Cu	Pb	Zn	As
0200	49550	30	5	30	7
	49540	40	5	25	8
	49530	35	15	25	11
	49520	35	45	40	8
	49510	5	x	10	2
	49500	45	10	60	28

c) 49450E: There is an elevated arsenic value (23ppm).

d) 49400E: There are elevated lead and arsenic values (Pb 40ppm, As 28ppm).

Of these anomalies, a) and b) are the most significant and most probably correspond to Cox's Formation and Weetman and Crockford's Formation respectively.

An additional piece of information yielded by this traverse is that the contact between the quartzwacke-slate unit and the greenstone unit appears to have been detected at about 49100E.

Because of the success of the early prospectors in examining the surficial gravels as a guide to bedrock gold, loaming was conducted in conjunction with the soil sampling. No visible gold was detected in the pan concentrates although an analysis of the heavy mineral may alter this. It may be that as these gravels were a significant source of gold, prospectors may have fairly thoroughly worked the gravels over, leaving them devoid of gold.

The success of the soil sampling in delineating two of the zones mentioned by Twelvetrees will considerably assist in further exploration. Soil sampling can now be continued but over a reduced area. Further lines should be sampled to completely delineate these features.

Once this is done, a programme of shallow, vertical percussion drill holes would be advisable, bearing in mind the strike and dip of the auriferous veins. Each mineralised zone should be tested in a number of localities.

Should this not prove anything of significance, it is unlikely that this would constitute a workable deposit.

4.3.6 Specimen Creek - See Plans 2.1 to 2.5

A traverse was conducted along line 200S in order to check the sampling of the older surveys, which were done with augers not really capable of penetrating quartz gravel cover.

The results (which are presented in Appendix 2 and Plate 1) were as follows:

Arsenic: Reasonably good correlation. However, the 1984 analysis (Analabs) is more sensitive than the 1980 analysis (Amdel), which was done with a 20 ppm detection limit

Copper: Although anomalism was still the same for both surveys, the 1984 series is greatly enhanced.

Lead: Similar to copper but less clear.

Zinc: There is no apparent relationship between the 1980 and 1984 data. This may be a mobility problem.

These results suggest that although anomaly definition could still be made on the 1980 survey, the anomalism is less clear and not as easy to determine as the 1984 programme.

In conjunction with this comparative survey, the Specimen Creek data from previous years was re-evaluated. The two most important pieces of information thus revealed are:

1) Stream sediment sampling in 1980 (silt bank type?) indicated anomalous gold upstream (east) of the zone exploited by underground mining. This is upstream of this exploited zone. The inference is that there may be a second auriferous zone as yet undetected.

2) The diamond drilling section 200S was re-plotted (Plate No. 2). This section contains three of the 1981 drill holes including S.P.C. No. 1 in which a small intersection of coarse gold in a carbonate matrix was intersected. The plot revealed that this intersection can be correlated with the tunnel intersection in drill hole S.P.C. No. 4.

   Therefore, it is likely that the intersection in Hole No. 1 is the same horizon exploited by earlier mining operations.

The soil sampling indicated significant copper-arsenic anomalism at approximately 50W (Cu - 210ppm, As 22ppm) which may correspond to the vein which has been exploited) and a larger anomaly centred at 150E (Cu - 195ppm, As 78ppm). This latter anomaly is in the headwaters of the drainages containing anomalous gold east of the exploited zone.

It is clear that drilling was based on an assessment of the underground operations and geophysical data. Although geochemical data was available it does not appear to have been used.

Both soil and stream geochemistry have indicated the presence of a significant anomaly east of the previous drilling programme (Cu - 195ppm, As 78ppm). This anomaly could easily be followed up by drilling from the Pipeline Road (at any time of the year?). If angled west with a dip of 45°, this could also test the continuations of the mineralised vein intersected in drill hole No. 1.

Early reports suggest that auriferous pyrite is present as well as native gold. Therefore all pyritic zones should be assayed.

Further, the massive gold intersected in drill hole No. 1 should be assayed. The gold assay should then be bulked out to 1m. It may be economic, even at that thin an intersection.

4.3.7 Waterfall Creek Magnetic Anomaly - See Plans 4.1 to 4.5

The target of interest in this area was a minor magnetic anomaly aligned along the inferred major fault referred to above (see section 3.1.1), in an area where carbonates and/or volcanic rocks were anticipated. A soil sampling programme was conducted over the area and a supplementary stream sediment sample collected, ie, H.M. 83. Being a self-contained area examined early in the season, it was used as a de facto orientation exercise and its results are described below.

Copper

Copper values were low and sporadic ranging from 12 through to 510 ppm with the average value being 139 ppm. Only six (6) anomalous values (>246 ppm) were obtained (anomalous values being defined as the mean + 1 S.D.).

However, a broad zone of "elevated" copper coincident with the trend of the anomaly is apparent (see plan "4.2").

Lead, Tin, Tungsten, Bismuth and Gold

Lead, tin, tungsten and bismuth values were consistently below the limit of detection, with the few isolated "high" values being inside the prospective area. Gold values were all below the limit of detection, ie, <0.05 ppm. One notable exception being sample WA 00.100 45000, located in the centre of the anomaly, which returned a value of 0.20 ppm.

Zinc

Zinc values were also low with 15 anomalous values obtained (>100 ppm). As in the case of copper, zinc values mimicked the shape of the anomaly trend.

Cobalt Nickel Barium

Low, sporadic values were obtained for these elements with all the anomalous values within the prospective area.

Arsenic

Approximately 45% of arsenic values were 2 ppm or less. However, the remaining values again exhibit a broad "elevated" zone coincident with the anomaly trend. A smaller, separate arsenic anomaly to the south of the main zone was also noted (see plan 4.5).

It was not possible to achieve a satisfactory sample in nine (9) locations due to the presence of underlying Tertiary gravels in the N.E. corner of the grid.

Conclusion and Recommendation

The magnetic anomaly investigated showed a distinct change from the prevailing background especially in copper, arsenic and to a lesser extent zinc, this mineralisation being associated with a magnetite rich pod.

The anomaly was not conclusively "rounded off", and perhaps with a suitable implement the gravels could be penetrated. However, due to the small areal extent of the prospective area (coupled with the low values) no further investigation is warranted.

4.4 GEOLOGICAL MAPPING

4.4.1 General Observations

a) An outcrop of the distinctive cleaved tuff unit described previously was found at 480038. Its location implies that the inferred major fault occurs between this outcrop and the mine area and a position following a straight alignment of the Savage River is now favoured for the local portion of the fault.

b) Dolomite was found to be abundant in the valleys of Savage Creek and the Little Savage River. This outcrop area bridges the gap between the Little Donaldson area outcrop and the previously mapped area of the Savage Dolomite near Corinna. It appears that as the Donaldson area is approached there is a facies change with dolomite being replaced by black slate.

c) The dolomite shows its original textures. There is some dolarenite/dolorudite from which facing can be determined, eg, at 474060 and 461024 where the facing is eastward. The most common texture is a breccia with unsupported clasts of (probably) stromatolite mats in a lighter matrix.

d) The distinctive greenschist unit which contains the magnetite and magnesite bodies can be traced to the Rocky River area using the same boundary criteria.
1. At the top a change to predominantly grey phyllite with sandstone and quartz veins. In auger samples this corresponds to a sharp drop in background copper content. (Some greenschist with magnetite can occur in this unit near the base).
2. At the bottom a change to thin bedded sandstone. Reasonably good outcrop may be needed to pick this division.

e) The two linear belts of magnetic rock which occur west of the magnetite bearing greenschist unit can be diagnosed by means of abundant magnetite in pan concentrates.

f) Between these two belts is another marker traceable by abundant epidote in pan concentrates. An epidote bearing outcrop found by the Whyte river at 453886 showed epidote in segregations up to 10cm diameter in a rock with superficially appeared to be porphyritic in feldspars. Porphyroblasts can simulate phenocrysts in this metamorphic environment but it is thought likely that this rock is a genuine volcanic.

g) At Little Plain the Corinna road exposes a distinctive cleaved quartz-rich rock which has a distinct air photo expression. A rock of this nature has not been observed in the north of the exploration licence. It may be a metamorphosed tuff.

h) The distinctive cleaved tuff of the northern area is not observed in the Corinna road section, but rocks resembling the shale marker adjacent to it occur at 445910 near the exploration licence boundary.

i) Coarse gravels observed mainly in the Savage River town area could in some cases be proved to be overlain by basalt eg, at 490045, south of the central pit. These gravels were typically quite coarse with cobbles greater than 10cm usual and boulders up to 50cm. Rock types present included quartz, quartz tourmaline rock and greisen, but also sandstones in up to 50% of the larger clasts. Some lignitic clay with plant fossil material occurs near the Northern Deposit Crib Room at 507080.

j) Fine gravels observed principally at Brown Plains appeared to overlie the coarse gravel and by implication, the basalt. Grainsize is typically less than 10cm with clasts poorly rounded and associated with much grit and coarse sand. The composition was almost exclusively of mature rock types, vein quartz, with minor quartz tourmaline rock and greisen. The form of the deposits was as a thin sheet of up to perhaps 6 metres thickness mantling the highest and most perfectly preserved plateau remnants. Its form is that of a sheet related to erosion surface development. It was never found, however, in a situation where it unequivocally overlaid basalt. Its post basalt inferred date is based on apparent truncation of the basalt by the erosion surfaces on which the gravel lies.

4.4.2. Rocky River

Notes were taken of outcrop in the Rocky River principally in the hope of locating outcrop of the weak belt of rock which corresponds to strong arsenic anomaly in the soil samples. This feature was probably found at 503881.

The outcrop situation at this point comprised two outcrops of intrusive aspect, pyritic and silicified in part separated by a deep waterhole with no outcrop. Outside this area phyllite and sandstone outcrop was virtually continuous. The anomaly could be in a vein riddled altered dyke, of which the more resistant outer edges formed the outcrops.

The phyllite/sandstone unit proved to contain a lower division comprised principally of phyllite with fewer quartz veins, at least one bed of magnetite bearing equigranular greenschist and some intrusions thought to be originally andesite. The change to the greenschist unit at 498888 is abrupt. A short distance downstream

some float cobbles of magnetite ore were noted which in this position would imply that beds of magnetite ore previously unrecorded occur in this part of the sequence.

From 495893 downstream float of a white carbonate rock was observed, which is almost certainly magnesite.

4.4.3 Rocky River Road Traverse

The traverse enabled precise boundaries to be established for the magnetite bearing greenschist unit. In the phyllite/sandstone unit above, one green rock interval was found, probably corresponding to the isolated magnetite greenschist on the Rocky River. Textural features made visible by weathering hint that this rock may be a tuff.

In an interval of poor outcrop, gossanous vein quartz was encountered which was anomalous in Cu, Pb, and Ag at 49758980.

An unusual leucocratic altered gabbro was found at 49358985.

At 49108990 is a loose sandy material, probably the rock identified as a cataclasite by Atkinson (1960). This is more likely to be the remains of a magnesite bed reduced to its insoluble residue.

4.4.4 Specimen Creek Traverse

The object of the work in this area was to establish correlation with the stratigraphic units usable in the south of the area. However, the section is not particularly good and the correlation suggested here could easily be wrong.

At 51151085 the McPhee's adits expose thinbedded sandstones. The favoured correlation accepts this outcrop as representative and to be correlated with the thinbedded sandstone unit despite (1) an outcrop of pyritic dolomite further downstream and (2) two outcrops of pink soft weathered rock, the only outcrop in the next 200m of the creek section. These have to be explained away as intrusions.

At 51401095 a boulder outcrop 5m in diameter, of chert breccia, is interpreted as the breccia marker of the Main Creek area. The rest of the section examined comprises greenschists sometimes with obvious magnetite and/or pyrite. The boundary with the phyllite/sandstone unit is inferred to lie to the east of the Pipeline Road.

On this interpretation, the gold bearing area at Specimen Reef is to the west of the zone explored by the Golden Ridge underground workings.

5. CONCLUSIONS AND RECOMMENDATIONS

The 1983/84 field season has been a successful one in achieving its aim of a regional appraisal of sufficient standard to permit the required reductions of the area.

In terms of exploration methods, the following conclusions have been reached:

1. Stream sediment sampling of the heavy mineral/interstitial silt type is effective and yields as far as possible reproducible results. It also enables some geological information to be collected as part of the sample process.

2. Soil sampling involving the methods developed this season is effective in penetrating to "C" horizon. Tests conducted through the season indicate the necessity of obtaining "C" horizon samples to the point that any other sample is almost valueless.

In terms of prospect evaluation, the following conclusions have been reached:

A. The Brown Plains Formation is not considered to have economic potential for alluvial minerals, even if considered as a multi-mineral prospect.

B. A significant stream sediment arsenic anomaly has been successfully followed by soil sampling in the Rocky River area, indicating several zones of anomalism, which are to be followed up. This prospect has potential for gold or tin mineralisation.

C. A very strong polymetallic stream sediment anomaly (Supergrunt) has been detected at one point in a tributary of Rocky River. Follow up of the bigger tributaries further upstream has failed to successfully explain this anomaly. Stream sediment sampling should be conducted over the smaller tributaries, as well as additional samples in the mainstream, to either disprove or locate the cause of the anomalism.

D. Although Nine Mile Creek was originally prospected for copper, significant gold was detected in the pan concentrate. This gold is not associated with the Brown Plains Formation heavy mineral assemblage and therefore may have bedrock affiliations. If this be so, then its stratigraphic position, being similar to Golden Ridge and the Rocky River arsenic anomaly, makes this area extremely attractive as a gold prospect.

   Initially a soil sampling traverse should be conducted across this area to test for geochemical response. Once this has been determined the horizon can then be delineated by further soil sampling.

E. Golden Ridge has long been known as a gold prospect. Except in Big Duffer Creek, the stream sediment sampling proved little of significance (possibly due to overworking by prospectors).

The soil sampling traverse successfully detected two of the four of Twelvetree's zones of mineralisation. This will assist in delineation of them by further soil sampling in preparation for more detailed evaluation.

F. Specimen Creek was tested several years ago by stream sediment sampling, soil sampling, magnetic surveys, induced polarisation and self potential techniques. On the basis of an interpretation of the old mining data and the geophysical surveys, a drilling programme was conducted. It is likely that the drilling detected the original gold bearing zone.

There is geochemical evidence to suggest that there may be a further auriferous zone to the east of the zone tested. This has not been tested although its geochemical response in soil sampling is greater than the original zone. There is sufficient data available to go straight into a diamond drilling programme to test this possibility.

The weak arsenic response in Armstrong Creek is of importance because of its stratigraphic position. This may be correlated with Rocky River Arsenic anomaly - Nine Mile Creek - Golden Ridge.

A soil sampling traverse should be conducted to test for similarity of geochemical response with these other zones. If this proves positive, scope should be allowed for expansion of the soil sampling programme.

H. The Timbs Creek soil sampling traverse located a significant base metal and silver anomaly. This was followed up by a small grid based soil sampling traverse. A distinct zone was thus delineated although the silver analysis defied repetition. This zone is angled to the bedrock strike and could be a Pb-Zn-Ag vein.

The anomaly is still of interest and should be followed up by shallow costeans, then mapping and channel sampling.

In consideration of this anomaly, although the silver value was not repeated, silver was detected at a level of 1.5ppm. This suggests that any registration of silver should be followed up by detailed soil sampling.

I. A Pb-Zn-Ag anomaly was detected in the Brown Plains area. The anomalism, being similar to that of the Timbs Creek soil sampling line, is of interest.

A follow up of this is warranted if the follow up of Timbs Creek proves significant.

J. In stream sediments it may be worth testing the concept that zinc anomalism may be a pathfinder for gold (particularly if arsenic is present as well). For base metals, relative and persisting anomalies may prove significant, eg, the lead anomaly H.M. 124.

APPENDIX 1

Stream Sediment Sample Data - Heavy Mineral Series
Sample numbers, location, remarks and fines analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2265
236.1 08: - 2265B
236.1 08: - 2370
236.1 08: - 2370B
236.1 08: - 2370C
236.1 08: - 2308
236.1 08: - 2343
236.1 08: - 2343B
236.1 08: - 2376
236.1 08: - 2376B
236.1 08: - 2376C
236.1 08: - 2399
236.1 08: - 2399C
236.1 08: - 2450D
236.1 08: - 2467D
236.1 08: - 2467G
236.1 08: - 2491C
236.1 08: - 2491G

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES

Sample Number	Creek/River	Location N	Location E	Remarks
1	Tributary of Timbs Creek	91.70	47.22	Small rocky section
2	Eight Mile Creek	92.27	47.93	Rocky creek bed
3	Tributary of Timbs Creek	91.22	45.10	" " "
4	Tributary of Brown Plains Creek	91.03	45.75	Small rocky section
5	Bowry Creek	97.23	47.34	Rocky creek bed
6	" "	96.97	48.00	" " "
7	Timbs Creek	92.33	43.80	" " "
8	Tributary of Eight Mile Creek	91.65	46.65	" " "
9	Tributary of Savage River	06.42	53.61	Gravelly creek bed
10	" " " "	07.43	53.62	Rocky creek bed
11	Alford's Creek	06.88	54.17	" " "
12	Tertiary gravel - in road cutting at Alford's Creek	06.98	54.12	Coarse channel bases
13	Tertiary gravel - in road cutting near sample 1	91.70	47.30	" " "
14	Chinamans Creek	93.45	47.90	Coarse creek bed
15	Council Gravel Quarry - Little Plains	91.08	44.65	Possible channel bases
16	Tributary of Goodall Creek	92.43	48.78	Rocky creek bed
17	Alford's Creek	06.73	53.95	" " "
18	Tributary of Armstrong Creek	08.42	52.05	" " "
19	Armstrong Creek	08.52	52.00	" " "
20	Goodall Creek	92.42	49.20	" " "
21	Tributary of Heazlewood River	01.38	51.40	" " "
22	Armstrong Creek	10.05	53.10	" " "
23	Kaysers Creek	10.15	53.04	" " "
24	Little Hunter Creek	89.45	44.62	Gravelly creek bed
25	Tributary of Little Hunter Creek	89.40	44.30	Rocky creek bed
26	Nine Mile Creek (No HM sample)	93.45	49.59	" " "
27	Nine Mile Creek	93.79	49.49	" " "
28	Tributary of Pineapple Creek	16.33	52.90	" " "
29	Pineapple Creek	16.19	52.95	" " "
30	Tributary of Pineapple Creek	15.80	51.83	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	Element (ppm)											Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Ba	Au	
1			NOT	COLLECTED								
2			NOT	COLLECTED								Minor gold
3			NOT	COLLECTED								
4			NOT	COLLECTED								Minor gold
5	70	15	160	4	x			x	6	57	IS	Magnetite
6	100	20	125	3	x			x	6	IS	IS	Magnetite
7	130	10	140	x	x			x	5	100	x	Haematite
8	40	5	60	IS	IS			x	2	50	IS	
9	15	5	15	3	x			x	x	45	x	
10	20	5	30	7	x			x	2	60	IS	
11	20	10	25	5	x			x	10	80	IS	
12	55	20	40	6	x			x	62	25	x	
13	35	5	20	25	x			x	4	25	x	
14	20	10	35	5	x			x	4	70	IS	
15	x	x	5	15	x			x	4	15	x	
16	25	25	35	IS	IS			x	2	75	IS	
17	10	5	15	4	x			x	17	70	IS	Minor gold
18	40	10	70	4	x			x	10	IS	IS	
19	25	20	65	8	x			x	3	70	IS	Minor gold
20	80	10	230	4	x			x	5	IS	IS	Minor gold
21	15	10	30	x	x			x	9	60	IS	
22	20	15	35	8	x			x	9	70	IS	
23	30	20	55	x	x			x	x	60	IS	
24	65	30	75	IS	IS			x	7	85	IS	
25	10	20	15	3	x			x	3	60	IS	Minor gold
26	50	25	90	4	x			x	8	80	x	No HM sample taken
27	35	20	85	3	x			x	7	85	x	Gold
28	40	15	90	5	x			x	1	85	IS	
29	35	20	50	5	x			x	4	IS	IS	
30	30	15	110	10	x			x	5	100	IS	

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES

Sample Number	Creek/River	Location N	Location E	Remarks
31	Pineapple Creek	16.00	51.85	Rocky creek bed
32	Tributary of Whyte River	97.17	50.29	" " "
33	" " " "	96.85	50.45	" " "
34	Base of Sheetwash gravels - Rocky River track	91.40	48.24	Gravelly sands
35	Tributary of Whyte River	96.45	50.83	Rocky creek bed
36	" " " "	96.00	50.95	Coarse creek bed
37	Timbs Creek	92.05	45.25	Rocky creek bed
38	" "	92.25	46.45	" " "
39	Tributary of Timbs Creek	92.13	46.42	" " "
40	" " " "	92.45	45.95	" " "
41	Bracken Creek	92.28	46.20	" " "
42	Tributary of Timbs Creek	92.13	46.00	Coarse creek bed
43	" " " "	92.10	46.18	Coarse & rocky creek bed
44	Quarry on Corinna Road	94.25	48.85	Coarse gravels
45	" " " "	94.05	48.83	" "
46	Breakneck Creek	88.58	49.35	Rocky creek bed
47	Hall Creek (Cataract Creek)	89.30	49.43	" " "
48	Quarry on Rocky River track	91.72	47.80	Coarse gravels
49	" " " " "	91.72	47.80	" "
50	Tributary of Rocky River	87.93	50.98	Coarse creek bed
51	" " " "	87.83	51.14	" " "
52	Eight Mile Creek	92.70	47.13	Rock bars
53	Base of surficial gravels - near sample 1	91.75	47.30	Coarse gravels
54	Graham Creek	91.75	48.62	Coarse creek bed
55	Tributary of Graham Creek	91.38	48.60	" " "
56	Tributary of Whyte River	91.73	49.22	" " "
57	Barren Creek	90.30	48.80	" " "
58	Eight Mile Creek	92.63	47.43	" " "
59	Chinamans Creek	93.03	47.30	" " "
60	Tributary of Timbs Creek	93.03	47.20	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	Element (ppm)											Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Ba	Au	
31	45	20	90	x	x			x	4	80	IS	
32	25	10	55	x	x			x	7	60	x	
33	20	15	30	6	x			x	6	75	x	
34	x	x	5	6	x			x	x	10	x	
35	15	10	15	7	x			x	5	75	x	Pyrite
36	20	15	20	9	x			x	5	80	IS	
37	35	25	95	6	x			x	9	100	IS	
38	175	2	140	5	x			x	2	45	x	
39	120	25	130	x	x			x	2	30	x	Minor gold
40	55	20	100	4	x			x	2	80	x	Minor gold
41	80	10	85	8	x			x	x	40	IS	
42	115	305	420	x		60		IS	11	IS	IS	
43	120	10	115	x		40		x	5	45	IS	Minor gold
44	15	85	110	x		x		0.4	2	x	x	
45	10	x	10	x		x		x	x	x	x	
46	55	85	150	x		40		IS	5	110	IS	
47	85	20	215	x		40			3	135	IS	
48	5	x	15	10		5			x	IS	IS	
49	5	x	5	16		5			x	5	x	
50	15	20	35	x		15			9	55	x	
51	15	x	30	x		15			8	40	x	
52	315	30	200	3		60			3	125	IS	Minor gold
53	5	x	10	x		10			x	120	IS	
54	25	20	40	22		20			1	115	x	Minor gold
55	40	5	45	x		20			1	205	IS	Minor gold
56	65	10	185	x		55			x	45	IS	Minor gold
57	40	x	35	x		25			1	120	x	Minor gold
58	20	x	30	x		35			x	110	IS	Minor gold
59	45	5	50	x		35			x	IS	IS	Minor gold
60	55	5	50	x		40			1	IS	IS	Gold

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES

Sample Number	Creek/River	Location N	Location E	Remarks
61	Tunnelrace Creek	92.10	44.38	Coarse creek bed
62	Tributary of Timbs Creek	92.50	44.25	" " "
63	" " " "	92.00	44.95	" " "
64	" " " "	92.13	44.83	" " "
65	Tributary of Whyte River	00.88	51.95	" " "
66	" " " "	00.75	51.85	" " "
67	Hall Creek (Cataract Creek)	89.40	49.65	" " "
68	Post Office Creek	92.00	49.82	Boulder bed
69	Wilson's Creek	90.65	49.25	Coarse gravels
70	Whyte River	01.35	51.78	Rocky creek bed
71	Heazlewood River	01.38	51.40	" " "
72	Tributary of Goodall Creek	92.95	48.78	Coarse creek bed
73	Nine Mile Creek	94.37	49.34	Gravelly creek bed
74	Goodall Creek	93.25	48.88	Rocky creek bed
75	Tributary of Heazlewood River	02.90	51.80	Gravelly and rocky
76	Big Duffer Creek	02.08	48.48	Rocky creek bed
77	Tributary of Whyte River	89.10	48.65	Coarse creek bed
78	" " " "	89.07	48.45	" " "
79	Tributary of Bowry Creek	97.02	46.62	" " "
80	Bowry Creek	97.05	46.73	Rocky creek bed
81	Owen Meredith River	82.83	44.15	Point bar deposit
82	Paradise River	83.20	44.45	" " "
83	Tributary of Savage River	00.42	45.40	Rocky creek bed
84	" " " "	00.08	45.75	Coarse creek bed
85	Lucy Creek	85.53	43.05	Gravelly creek bed
86	Nancy Creek	85.05	44.65	" " "
87	Main Creek	99.50	47.11	Point bar deposit
88	Tributary of Main Creek	99.35	47.20	Rocky creek bed
89	Tributary of Whyte River	90.54	47.50	" " "
90	" " " "	90.20	47.06	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	Element (ppm)											Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	
61	210	x	125	13		115			4		130	IS	Haematite
62	80	15	95	17		75			x		150	IS	
63	30	15	95	x		75			4		IS	IS	
64	80	10	75	x		50			1		80	x	Haematite
65	15	5	25	x	x	10	x		5		85	x	
66	15	5	35	x	x	20	x		2		IS	IS	
67	70	15	90	x		35			8		90	x	Minor gold
68	25	15	45	x	x	25	x		8		IS	IS	Minor gold
69	40	15	90	x	x	20	x		10	20	80	IS	Magnetite/haematite
70	235	25	280	IS		155	x		60	75	150	IS	
71	55	55	115	IS		140			7	30	155	IS	
72	5	x	10	x		10			x	x	55	IS	pyrite
73	25	5	45	x		40			x	10	55	IS	gold
74	65	10	190	x		55			3	75	75	IS	haematite
75	15	15	30	x		15			6	15	120	IS	
76	70	10	90	x		35			7	55	85	IS	minor gold
77	40	5	45	x		30			x	25	130	IS	magnetite
78	35	5	30	x		20			x	20	110	IS	magnetite
79	50	5	65	x		40			4	35	130	IS	magnetite
80	70	15	110	x		40		0.1	4	60	70	IS	magnetite/minor gold
81	35	15	60	IS		30			4	20	125	IS	magnetite
82	40	5	60	x		35			2	20	120	IS	magnetite
83	95	10	130	x		75			1	45	200	IS	magnetite
84	85	30	115	x		60			2	40	115	IS	magnetite
85	55	15	80	x		35			x	15	100	IS	magnetite
86	85	20	120	x		45			x	40	125	IS	magnetite
87	270	10	75	x		105			4	60	50	IS	Main Ck(mine tailings contamination)
88	85	10	195	x		70			2	60	75	IS	
89	40	10	60	x		35			x	30	140	IS	
90	90	10	135	x		45			x	50	125	IS	

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES

Sample Number	Creek/River	Location N	Location E	Remarks
91	Tributary of Bowry Creek	95.35	47.40	Rocky creek bed
92	" " " "	95.25	47.25	Rock crevices
93	" " " "	96.70	46.75	Gravelly creek bed
94	" " " "	95.75	47.15	" " "
95	Tributary of Rocky River	88.10	50.05	" " "
96	" " " "	88.15	50.70	Rocky creek bed
97	Rocky River	87.10	52.72	Boulder & rocky creek bed
98*	Tributary of Whyte River	90.82	47.50	Rocky creek bed
99	Donelly Creek	92.80	46.85	Coarse creek bed
100*	Brown Plains Creek	90.90	45.75	" " "
101*	Little Hunter Creek	90.58	44.60	" " "
102*	Tributary of Whyte River	91.00	46.83	Rocky creek bed
103*	" " " "	91.03	47.20	Gravelly creek bed
104*	Tributary of Little Hunter Creek	90.83	44.40	Coarse creek bed
105*	Tunnelrace Creek	91.25	44.12	Rocky creek bed
106*	Tributary of Timbs Creek	91.55	45.85	Coarse creek bed
107	Wilsons Creek	90.73	51.05	Rocky creek bed
108	Tributary of Wilsons Creek	90.64	50.65	Coarse creek bed
109	Tributary of Rocky River	87.25	51.12	" " "
110*	" " " " (also known as Eight Mile Creek)	87.12	51.65	Gravelly creek bed
111*	" " " "	86.97	51.95	" " "
112	" " " "	87.37	52.50	Rocky creek bed
113	McAuliffe Creek	11.15	49.50	" " "
114*	" "	11.23	49.50	" " "
115	" "	11.62	49.05	" " "
116*	Tributary of McAuliffe Creek	11.71	49.02	" " "
117*	McAuliffe Creek	11.60	48.93	" " "
118	Tributary of Whyte River	99.85	50.75	" " "
119*	Tributary of Chinamans Creek	93.98	46.98	Gravelly creek bed
120*	Donelly Creek	93.67	46.78	Rocky creek bed

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM)												Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	
91	80	5	125	x		80			x	50	150	IS	Haematite, minor gold
92	65	10	105	x		55			2	45	165	IS	magnetite
93	95	20	155	x		75			x	60	160	IS	"
94	75	15	120	x		65			x	45	120	IS	"
95	30	45	80	x		20		0.2	69	20	90	IS	
96	30	35	35	x		10		0.2	43	15	80	IS	
97	15	15	15	19	15	10	x		9	x	35	IS	minor gold, monazite
98	50	15	65	x		40			1	40	180	IS	
99	65	10	175	x		65			x	30	80	IS	
100	70	20	80	x		40			2	25	105	IS	minor gold, epidote
101	20	5	15	x		10			x	x	130	IS	
102	165	15	120	9		30			x	25	45	IS	
103	35	10	80	x		50			x	40	110	IS	
104	135	5	85	x		60			4	50	55	IS	magnetite
105	185	5	145	x		120			2	65	120	IS	
106	50	15	100	x		45			x	25	55	IS	
107	10	x	20	x		15			15	x	55	IS	
108	15	20	30	x		10			41	10	50	IS	
109	25	10	60	IS	IS	25	2		22	15	120	IS	
110	15	x	20	x	x	10	2		25	5	60	x	
111	10	x	10	x	x	10	x		9	5	65	x	
112	245	55	410	222	222	10	6		730	10	30	x	
113	80	x	110	x		90			14	45	150	x	
114	80	x	105	x		95			10	50	165	x	
115	100	5	160	9		125			29	60	215	x	
116	90	x	140	x		110			5	55	125	x	magnetite/haematite
117	95	x	160	x		135			5	65	225	x	
118	35	10	75	8		25			32	25	145	x	
119	60	x	185	x		50			2	20	60	x	very minor gold
120	105	10	130	x		60			3	50	45	x	minor gold

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES

Sample Number		Creek/River	Location N	Location E	Remarks
	121*	Tributary of Savage River	96.00	44.73	Rocky creek bed
D1	122	Longback Creek	96.26	44.08	" " "
	123*	Tributary of Savage River	96.73	44.70	" " "
	124*	" " " "	95.00	43.73	" " "
	125*	" " " "	94.92	44.40	" " "
	126*	" " " "	94.91	44.58	" " "
	127*	" " " "	95.18	44.79	" " "
	128	" " " "	97.15	45.60	" " "
D2	129*	" " " "	97.35	43.75	" " "
	130*	" " " "	97.38	44.30	" " "
	131*	Tributary of Whyte River	99.10	52.12	" " "
LSD1	132*	Tributary of Little Savage River	05.95	47.35	" " "
	133	Tributary of Whyte River	93.93	50.36	(No HM) " " "
	134	" " " "	95.08	50.35	(No HM) " " "
LSD2	135*	Tributary of Little Savage River	04.60	47.20	" " "
LSD3	136*	" " " "	03.85	47.32	" " "
	137*	Tributary of Whyte River	00.33	52.80	" " "
	138*	" " " "	00.43	52.82	" " "
LSD4	139*	Tributary of Little Savage River	05.18	47.25	Small waterfall
LSD5	140*	" " " " "	05.00	47.80	Rocky creek bed
LSD6	141*	Little Savage River	05.25	47.48	" " "
LSD7	142*	" " "	04.05	47.65	" " "
	143*	Tributary of Rocky River	89.00	51.12	Gravelly creek bed
	144*	" " " "	88.95	51.20	" " "
	145*	" " " "	88.63	51.58	Rocky creek bed
	146*	Wilsons Creek	89.93	51.31	Gravelly creek bed
	147*	Tributary of Wilsons Creek	89.72	50.16	Rocky creek bed
	148	Paradise River	84.47	52.05	" " "
	149*	Tributary of Paradise River	84.65	52.20	" " "
	150*	" " " "	84.94	51.33	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM)												Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	
121	30	5	75	x		40			5	25	190	x	magnetite
122	35	20	95	x		40			5	30	175	x	"
123	30	10	75	4		35			23	20	135	x	"
124	75	x	100	x		60			2	40	100	x	"
125	150	x	110	x		150			3	60	125	x	"
126	140	x	135	x		90			11	60	80	x	"
127	70	x	95	x		60			4	40	105	x	"
128	55	x	115	x		45			4	35	75	x	magnetite, epidote
129	60	115	235	x		70			5	25	70	x	magnetite,gold,osmiridium
130	135	x	140	x		105			2	65	135	x	haematite
131	5	x	10	x	x	10	2		3	5	50	x	
132	25	10	120	x		110			5	50	80	x	minor gold
133	20	x	50	x		30			10	20	70	x	no H.M. collected
134	25	20	60	x		25			8	20	120	x	" " "
135	45	10	120	x		85			5	30	355	x	
136	25	25	125	x		50			3	20	80	x	gold, osmiridium
137	25	10	35	4	x	30	2		15	10	120	x	
138	35	x	50	x	x	35	x		9	15	75	x	monazite
139	15	x	35	x		20			7	10	155	x	
140	70	x	90	x		70			15	30	490	x	
141	35	10	205	x		110			5	45	210	x	
142	40	10	155	x		90			5	35	200	x	minor gold
143	10	15	30	3	11	15	x		23	10	85	x	
144	10	x	20	x	x	15	x		11	5	65	x	
145	5	x	5	x	x	10	2		4	5	40	x	
146	20	x	30	x	x	20	x		14	10	75	x	
147	10	10	20	x	x	20	2		100	20	80	x	
148	15	x	20	4	x	10	x		5	5	75	x	
149	10	x	20	3	x	15	x		8	5	80	x	
150	20	x	25	x	x	20	2		6	5	100	x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
151	Paradise River	84.72	51.70	Rocky creek bed
152 *	Tributary of Paradise River	84.93	51.75	" " "
153	Post Office Creek	92.92	51.78	" " "
154	Tributary of Post Office Creek	92.85	51.90	" " "
155	" " " "	92.60	51.74	" " "
156 *	Post Office Creek	92.68	51.28	" " "
157 *	Tributary of Post Office Creek	92.42	51.18	" " "
158 *	Tributary of Owen Meredith River	81.25	49.70	" " "
159 *	" " " "	81.20	50.00	" " "
160 *	" " " "	81.30	50.26	No H.M. sample
161 *	" " " "	81.00	50.48	" "
162 *	" " " "	81.15	50.70	" "
163 *	" " " "	81.27	50.62	" "
164 *	Paradise Creek	81.95	51.75	" "
165 *	Tributary of Paradise River	82.66	52.55	" "
166 *	" " "	82.58	52.50	" "
167 *	" " "	84.98	51.05	" "
168	Paradise River	84.86	50.30	" "
169	Tributary of Paradise River	84.72	50.32	" "
170 *	" " "	84.62	50.23	" "
171 *	Lucy Creek	86.63	47.00	gravelly creek bed
172 *	Tributary of Paradise River	86.32	48.50	Rocky creek bed
173 *	Breakneck Creek	86.80	48.83	" " "
174 *	Tributary of Breakneck Creek	86.98	48.70	" " "
175 *	Tributary of Whyte River	87.46	47.68	gravelly creek bed

070

298070

A1.13

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM)												Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	
151	15	x	20	x	x	20	x		5	5	95	x	
152	10	x	15	5	x	15	x		5	5	70	x	
153	20	x	25	9	x	20	2		10	5	65	x	
154	10	x	20	11	18	15	2		20	5	15	x	
155	35	x	30	IS	x	20	2		14	5	50	x	
156	20	x	50	4	x	25	2		11	20	100	x	
157	25	5	30	8	x	20	2		22	5	80	x	
158	10	x	35	3	x	20	2		9	10	70	x	
159	25	x	35	x	x	20	2		4	10	95	T	
160	10	x	25	x	x	20	2		11	10	75	x	
161	30	5	35	3	x	20	2		5	5	100	x	
162	10	x	20	x	x	20	2		5	5	75	x	Minor Pyrite
163	20	x	30	x	x	20	2		3	5	8	x	Minor gold
164	10	x	20	x	x	15	2		10	5	70	T	
165	30	x	30	x	x	15	2		2	5	80	x	
166	10	x	15	x	x	30	2		1	5	70	x	
167	30	x	35	x	10	20	2		5	5	90	x	
168	20	x	25	x	x	15	x		3	5	70	x	
169	25	x	25	IS	x	15	2		3	5	95	x	
170	15	x	20	x	x	15	x		4	5	90	x	
171	20	x	85	x		15			x	5	25	x	
172	10	x	10	x		15			1	5	35	x	
173	25	x	25	x		20			1	5	40	T	
174	15	x	30	x		30			1	10	55	x	
175	45	x	35	19		20			1	5	35	x	Minor gold

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location		Remarks
176 *	Lucy Creek	86.93	48.00	rocky creek bed
177 *	Tributary of Rocky River	88.82	50.73	gravelly creek bed
178 *	" " "	88.98	50.43	" " "
179 *	Nolan Creek	89.24	50.23	rocky creek bed
180	Owen Meredith River	80.85	48.78	" " "
181	Tributary of Owen Meredith River	81.06	48.90	rock bar
182 *	" " " "	81.25	48.65	rocky creek bed
183 *	Tributary of Finlay Creek	82.70	49.55	" " "
184 *	Finlay Creek	82.65	49.58	" " "
185	Bounds Creek	85.65	49.60	" " "
186	Paradise River	85.54	49.66	" " "
187 *	Tributary of Paradise River	85.88	50.18	" " "
188 *	" " "	85.35	50.53	" " "
189 *	Paradise River	85.18	50.43	" " "
LSD 8 190 *	Tributary of Little Savage River	07.78	48.10	gravelly creek bed
LSD 9 191 *	" " " "	07.65	48.23	Rocky creek bed
LSD10 192 *	" " " "	07.26	48.13	" " "
LSD11 193 *	Little Savage River	07.35	48.08	" " "
LSD12 194 *	Tributary of Little Savage River	07.18	47.72	" " "
LSD13 195 *	" " " "	06.96	47.87	gravelly creek bed
LSD14 196 *	" " " "	05.72	47.60	" " "
LSD15 197 *	Little Savage River	06.20	47.52	rocky creek bed
LSD16 198 *	Tributary of Little Savage River	06.40	47.70	gravelly creek bed
199	Tributary of Whyte River	97.85	51.16	rocky creek bed
200 *	" " "	97.56	51.50	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM) Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	Remarks
176	10	x	5	x		15			x	5	35	x		
177	30	20	30	x	x	15	2		75	10	75	x		
178	20	x	25	x	x	10	2		21	x	35	x		
179	15	15	70	x	x	20	x		38	10	80	x		Minor magnetite
180	25	x	45	x	x	20	2		12	10	80	x		Minor pyrite
181	20	10	45	x	x	20			6	15	255		x	Minor pyrite
182	20	45	120	x	x	25			9	25	207		x	Pyrite
183	15	x	35	x	x	20			7	10	251		x	
184	20	5	75	x	x	25			14	20	298		x	
185	50	10	140	x	x	40			x	35	300		x	
186	20	5	40	x	x	20			5	10	223		x	
187	20	5	35	x	x	15			14	10	281		x	
188	15	5	45	x	x	20			6	10	239		x	
189	15	x	35	x	x	15			3	10	173		x	
190	60	5	90	x		155			4	45	15		x	
191	80	5	200	x		200			6	65	1620		x	
192	85	25	190	x		130			14	55	1390		x	
193	50	10	185	x		145			8	55	792		x	
194	50	15	130	x		150			4	65	104		x	
195	55	15	80	x		60			6	25	762		x	
196	50	15	85	x		60			15	30	873		x	
197	40	10	175	x		105			6	50	464		x	
198	25	55	65	x		40			12	20	684		x	
199	25	x	40	x	x	25			11	15	315		x	Monazite
200	20	5	40	x	x	20			6	15	279		x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
201 *	Tributary of Whtye River	97.78	51.52	rocky creek bed
202 *	" " "	97.62	51.70	" " "
203 *	" " "	97.50	52.10	" " "
204 *	" " "	97.35	51.92	" " "
205 *	" " "	98.00	52.18	" " "
206 *	" " "	98.02	52.00	" " "
207 *	" " "	88.33	46.14	" " "
208 *	" " "	88.22	46.12	gravelly creek bed
209 *	" " "	88.22	46.30	" " "
210 *	" " "	87.83	46.82	" " "
211 *	" " "	87.90	47.16	" " "
212 *	" " "	87.98	47.25	" " "
213 *	Tributary of Lucy River	85.08	47.20	" " "
214 *	" " "	85.93	46.78	rocky creek bed
215 *	Lucy Creek	86.05	46.75	" " "
216 *	Tributary of Paradise River	85.80	48.36	" " "
217 *	" " "	83.80	47.12	gravelly/rocky creek bed
218 *	" " "	83.83	47.23	" "
219 *	Paradise River	83.75	47.30	" "
220 *	" "	84.25	48.20	" "
221 *	Paradise Creek	84.13	48.15	" "
222 *	Doctors Creek	82.04	47.53	" "
223 *	Finlay Creek	82.25	47.88	" "
224 *	Owen Meredith River	82.05	47.80	rocky creek bed
225	Tributary of Paradise Creek	83.80	49.80	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM)													Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	
201	20	5	55	x	x	25			9	20	301		x	
202	15	x	10	x	x	20			11	10	235		x	Monazite
203	10	x	10	x	x	15			5	10	214		x	
204	10	x	10	x	x	15			11	10	240			
205	10	x	10	x	x	15			3	10	244		x	
206	10	x	20	x	x	15			3	10	287			
207	35	x	60	7	x	35			8	30	187		x	
208	95	35	140	x	x	45			5	70	78		x	Magnetite/haematite epidote
209	50	20	80	x	x	30			2	20	166		x	"
210	45	x	60	x	x	35			3	20	395		x	
211	20	x	65	x	x	50			3	25	105		x	
212	35	x	35	x	x	25			2	15	257		x	
213	20	x	20	x	x	15			2	10	104		x	Tourmaline
214	15	x	25	x	x	20			1	10	168		x	"
215	20	x	35	x	x	35			2	20	236		x	"
216	10	x	20	x	x	30			2	15	376		x	"
217	45	x	30	x	x	35			3	45	254		x	Magnetite
218	10	x	20	x	x	30			2	20	217		x	"
219	20	5	30	x	x	20			6	15	224		x	"
220	15	5	35	x	x	20			6	15	240		x	
221	40	x	40	x	x	30			6	20	324		x	
222	60	5	115	x	x	45			8	40	339		x	Magnetite
223	65	x	100	x	x	45			5	30	363		x	"
224	50	x	60	x	x	30			6	25	261		x	"
225	20	x	35	x	x	20			6	10	245		x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
226	Paradise Creek	83.58	49.83	rocky creek bed
227	Tributary of Paradise River	84.90	48.65	" " "
228	Paradise River	84.88	48.84	" " "
229	Tributary of Paradise Creek	84.32	49.90	" " "
230	Tributary of Whyte River	90.42	50.97	" " "
231	" " "	90.58	50.92	" " "
232	" " "	90.75	51.03	" " "
233	" " "	90.74	51.30	" " "
234	" " "	90.55	51.42	" " "
235	Tributary of Rocky River	87.04	53.05	" " "
236	" " "	87.48	53.55	" " "
237	" " "	86.85	53.78	" " "
238	Rocky River	87.22	54.51	" " "
239	Tributary of Rocky River	87.02	54.53	" " "
240	Bounds Creek	86.63	49.18	gravelly creek bed
241	Tributary of Breakneck Creek	87.53	49.20	" " "
242	Tributary of Paradise Creek	86.55	50.45	" " "
243	" " "	86.35	50.15	" " "
LSD17 244 *	Tributary of Little Savage Creek	02.45	46.15	" " "
LSD18 245 *	Savage Creek above junction of creek & 244	02.35	46.05	rocky creek bed (some gold)
LSD19 246 *	Tributary of Little Savage Creek	02.80	45.75	Gravelly creek bed gold & silver mineral
LSD20 247 *	" " " "	02.75	45.65	Gravelly ck bed(gold)
LSD21 248 *	Savage Creek below junction 249	02.85	45.60	Rocky creek bed
LSD22 249 *	Tributary of Little Savage Creek	03.00	45.45	Gravelly creek bed
LSD23 250 *	" " " "	03.00	45.20	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES ANALYSIS RESULTS

Sample Number	ELEMENT (PPM)													Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	
226	25	x	25	x	x	15			5	10	218		x	
227	25	x	30	x	x	30			4	25	426		x	
228	20	x	50	x	x	20			5	10	273		x	
229	15	x	25	x	x	15			5	10	153		x	
230	25	x	70	x	x	30			6	30	284		x	
231	25	x	40	x	x	20			9	15	235		x	Minor monazite
232	25	5	90	x	x	30			8	30	339		x	
233	15	x	30	x	12	20			9	15	193		x	Minor monazite
234	20	x	35	x	x	20			18	10	238		x	" "
235	10	x	30	x	x	25			4	10	41		x	Monazite/tourmaline
236	10	x	30	x	x	15			3	10	75		x	" "
237	15	x	35	x	18	20			7	5	62		x	" "
238	20	x	30	4	x	15			12	10	45		x	" "
239	10	5	25	x	x	15			4	5	99		x	" "
240	25	x	255	x	x	35			3	20	192		x	Minor gold
241	20	5	170	x	10	50			4	60	51		x	Magnetite
242	5	25	25	x	x	15			12	5	102		x	
243	10	5	30	x	x	20			70	10	276		x	
244	15	10	75	x	x	25			x	10	37		x	Minor gold
245	35	15	140	x	x	65			4	30	227		x	
246	25	15	95	x	x	45			1	20	140		x	
247	45	10	155	x	x	55			16	25	307		x	Gold, osmiridium
248	20	5	70	x	x	60			2	35	222		x	Gold
249	20	15	45	x	x	35			6	20	187		x	
250	15	5	65	x	x	6			3	30	172		x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
LSD24 251 *	Tributary of Little Savage River	02.70	45.10	" " "
LSD25 252 *	Savage Creek	02.50	45.00	Rocky creek bed
253 *	Tributary of Savage River (South of Battys Bend track)	95.30	45.60	Gravelly creek bed
254 *	Big Duffer Creek	01.70	49.45	" " "
255 *	Little Duffer Creek	01.75	49.50	" " "
256 *	Big Duffer Creek	01.65	49.55	" " "
257 *	Tributary of Main Creek	98.60	47.20	" " "
258 *	Tributary of Savage River (Nth of Battys Bend track)	95.45	47.90	Rocky creek bed
259 *	" " "	94.80	47.70	Gravelly creek bed
260 *	" " "	94.80	46.95	Gravelly creek bed (some gold)
261 *	Tributary of Little Hunter Creek	90.35	44.40	Gravelly creek bed
262 *	" " " "	89.85	44.25	Gravelly creek bed
263 *	Tributary of Rocky River	87.90	52.75	Rocky Creek bed
264 *	" " "	88.40	52.80	" " "
265 *	" " "	88.70	53.00	" " "
266 *	" " "	89.35	52.75	Gravelly creek bed
267 *	" " "	89.70	53.40	Rocky creek bed
268 *	" " "	89.65	53.55	" " "
269 *	Tributary of Lower Whyte	89.30	45.60	" " "
270 *	" " "	88.95	45.50	" " "
271 *	" " "	88.55	45.20	Gravelly creek bed
272 *	" " "	87.75	44.15	Rocky creek bed
273 *	Tributary of Upper Whyte	01.05	51.28	Gravelly creek bed
274 *	Bracken Creek (Headwaters)	94.30	46.45	Sand/gravel creek bed
275 *	Tributary of Upper Whyte	00.63	50.86	Rocky creek bed

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES SAMPLE ANALYSIS

Sample Number	ELEMENT (PPM)													Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	
251	30	5	100	x	x	90			2	40	145		x	
252	40	10	130	x	12	130			4	55	247		x	
253	50	x	65	x	x	30			1	25	123		x	magnetite,epidote,gold
254	40	5	195	x	x	25			4	45	269		x	magnetite
255	25	15	50	x	x	20			12	25	369		x	minor gold
256	70	10	755	x	x	20			12	25	307		x	trace-pyrite
257	275	5	170	x	x	105			4	60	67		x	pyrite
258	150	5	135	x	x	95			7	130	132		x	
259	30	x	55	x	x	40			1	35	553		x	
260	65	10	130	x	x	90			x	50	390		x	
261	100	x	90	x	x	75			2	70	173		x	
262	90	5	100	x	x	75			13	85	223		x	
263	10	35	20	x	x	10			3	x	52		x	
264	x	15	5	x	x	5			3	x	60		x	
265	x	x	15	35	x	10			5	x	37		x	
266	5	10	10	x	x	10			4	5	41		x	
267	15	60	100	x	x	15			4	5	56		x	
268	15	60	95	x	x	20			8	5	63		x	
269	30	30	70	x	x	35			6	25	377		x	
270	80	15	75	x	x	35			2	30	121		x	
271	45	10	80	x	x	35			1	30	220		x	
272	25	45	50	x	x	30			17	50	356		x	
273	15	15	10	x	x	10			4	5	306		x	
274	30	x	45	x	x	20			x	10	40		x	
275	15	10	25	x	x	20			4	15	300		x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
276 *	Tributary of Upper Whyte	00.65	50.95	rocky creek bed
277 *	Tributary of Timbs Creek (mouth of Tributary)			gravelly creek bed
278 *	Tributary of Timbs Creek (+100m)			" " "
279 *	" " " (+300m)			" " "
280 *	" " " (+400m)			" " "
281 *	" " " (+500m)			" " "
282 *	Tributary of Bowry Creek (Nth of Battys Bend Track)	95.40	46.35	" " "
283 *	" " "	95.45	46.40	" " "
284 *	" " "	95.20	46.55	" " "
285 *	Tributary of Savage River (Sth of Battys Bend track)	94.80	46.10	" " "
286 *	Tributary of Owen Meredith River	82.05	45.40	" " "
287 *	Owen Meredith River	82.00	45.45	" " "
288 *	" " "	81.50	45.95	" " "
289 *	Tributary of Owen Meredith River	81.45	46.00	rocky creek bed
290 *	Brown's Plain Creek	89.45	46.15	gravelly creek bed
291 *	Tributary of Lower Whyte River	89.00	45.25	rocky creek bed
292 *	Little Hunter Creek	88.70	44.50	" " "
293 *	Tributary of Lower Whyte River	88.65	44.45	gravelly creek bed
294 *	Tributary of Savage River	97.45	43.80	" " "
295 *	" " "	97.45	43.75	" " "
296 *	Tributary of Upper Whyte River	99.30	50.55	" " "
297 *	" " " "	99.55	50.45	" " "
298 *	" " " "	99.70	50.45	" " "
299 *	" " " "	99.80	50.65	" " "
300 *	Tributary of Main Creek	00.10	48.55	" " "

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES SAMPLE ANALYSIS

Sample Number	ELEMENT (PPM)													Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	
276	10	25	30	x	x	20			5	15	362		x	
277	55	10	110	x	x	50			2	90	304		x	
278	75	10	100	x	-	45			3	45	241		x	
279	105	25	100	x	-	45			6	40	199		x	
280	75	10	95	x	-	45			4	40	208		x	
281	35	15	105	x	-	50			4	45	184		x	
282	65	10	180	x	-	60			1	45	266		x	
283	50	15	100	x	-	35			1	45	163		x	
284	20	5	80	x	-	40			1	30	256		x	
285	10	5	25	x	-	20			1	15	79		x	
286	50	10	70	x	-	60			1	35	355		x	
287	30	20	45	x	-	30			4	20	378		x	
288	30	10	55	x	-	30			4	20	365		x	
289	50	15	90	x	-	45			5	50	437		x	
290	60	10	80	x	-	35			4	55	126		x	
291	30	10	55	x	-	30			8	25	304		x	
292	40	10	70	x	-	40			5	40	378		x	
293	100	50	115	x	-	80			31	50	274		x	
294	70	110	250	x	-	65			6	25	227		x	
295	40	155	270	x	-	50			5	20	75		x	
296	35	25	105	x	-	30			13	25	364		x	
297	30	10	70	x	-	35			5	35	258		x	
298	15	5	55	x	x	25			7	25	315		x	
299	25	10	145	x	x	35			11	25	413		x	
300	20	x	40	x	x	25			10	20	243		x	

STREAM SEDIMENT SAMPLE DATA - Heavy Mineral Series

Sample Number	Creek/River	Location N	Location E	Remarks
301 *	Tributary of Main Creek	00.10	48.60	gravelly creek bed
302 *	" " "	5400.00	48.90	" " "
303 *	" " "	5400.20	48.95	rocky creek bed
304 *	" " "	5400.15	48.95	" " "
305 *	Specimen Creek Arthur River Sheet 7915	10.85	51.10	" " "
306 *	Hall Creek	10.90	51.00	" " "

Notes - Asterisk * denotes LSD

STREAM SEDIMENT SAMPLE DATA - HEAVY MINERAL SERIES
FINES SAMPLE ANALYSIS

Sample Number	ELEMENT (PPM)													Remarks
	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	
301	20	10	60	x	x	30		-	10	65	335		x	
302	15	x	35	x	x	20		-	6	10	241		x	
303	60	15	90	x	x	35		-	12	35	409		x	
304	10	5	30	x	x	20		-	6	10	217		x	
305	110	10	315	x	x	100		-	40	115	1090		x	
306	45	15	135	x	x	55			7	40	364		x	

x = below limit of detection
IS = insufficient sample
- or blank = element not determined

APPENDIX 2

Stream Sediment Sample Data - Silt Series
Davis Creek and Specimen Creek Area
Sample numbers, location, silt analysis (1981) and
silt analysis (1984)

Analytical Report Number

Analabs Report 236.1:08 - 2478

STREAM SEDIMENT SAMPLE DATA - SILT SERIES
DAVIS CREEK - SPECIMEN CREEK AREA

Sample Number	Location North	Location East	Creek	Elements (ppm) 1981 Cu	Pb	Zn	As	Au	1984 As
SO 27	11.54	51.685	Davis Creek	60	10	65	0.5	x	3
28	11.53	51.76	" "	100	10	80	0.5	x	3
29	11.23	51.89	Trib. of Specimen Creek	35	x	35	0.5	x	5
30	11.22	51.895	" " " "	50	15	65	0.5	x	6
31	10.71	50.765	Trib. of Hall Creek	40	5	90	0.5	x	2
32	10.52	50.715	Hall Creek	35	10	70	0.5	x	2
33	11.535	51.72	Davis Creek	85	5	75	x	x	3
34	11.545	51.675	" "	75	10	105	0.5	x	3
35	11.55	51.68	Trib. of Davis Creek	80	5	140	0.5	x	4
36	11.55	51.64	Davis Creek	80	5	130	0.5	x	2
37	11.60	51.595	" "	60	x	95	0.5	x	I.S.
38	11.65	51.55	" "	60	10	90	x	x	2
39	11.55	51.505	" "	50	5	85	0.5	x	1
40	11.565	51.49	Trib. of Davis Creek	15	x	25	0.5	x	x
41	11.54	51.465	Davis Creek	40	x	65	0.5	x	1
42	11.515	51.43	" "	40	5	90	0.5	x	1
43A	11.485	51.41	Trib. of Davis Creek	50	5	110	x	x	3
(44) 43B	11.495	51.39	Davis Creek	50	x	120	0.5	x	2
45	11.495	51.35	" "	45	5	120	x	x	4
46	11.50	51.305	" "	30	5	100	x	x	4
47	11.51	51.265	" "	35	5	100	x	x	2
48	11.52	51.23	" "	45	5	135	0.5	x	5
49	11.525	51.225	Trib. of Davis Creek	15	x	55	0.5	x	6
50	11.485	51.185	Davis Creek	30	5	105	x	x	10
51	11.445	51.155	" "	15	x	65	0.5	x	4

STREAM SEDIMENT SAMPLE DATA -SILT SERIES
DAVIS CREEK - SPECIMEN CREEK AREA

Sample Number	Location North	Location East	Creek	Elements (ppm) 1981 Cu	Pb	Zn	As	Au	1984 As
SO 52	11.41	51.13	Davis Creek	30	x	90	0.5	x	6
53	11.37	50.11	" "	25	x	90	x	x	8
54	11.33	51.095	" "	30	x	110	x	x	9
55	11.31	51.10	Trib. of Davis Creek	10	x	20	x	x	4
56	11.285	51.80	Davis Creek	35	5	125	0.5	x	10
57	11.24	51.70	" "	35	5	115	0.5	x	9
58	11.195	51.55	" "	40	x	90	0.5	x	5
59	11.155	51.045	" "	45	x	105	x	x	4
60	11.115	51.30	" "	30	x	85	0.5	x	5
61	11.07	51.15	" "	35	x	95	0.5	x	7
62	11.035	51.00	" "	40	x	100	x	x	6
63	10.99	50.995	" "	45	x	100	x	x	6
64	10.945	50.995	" "	30	x	90	0.5	x	4
65	10.90	51.00	" "	25	x	90	x	x	4
66	10.84	50.975	Hall Creek	55	15	160	x	I.S.	I.S.
67	10.81	50.940	" "	45	10	175	0.5	0.8	I.S.
68	10.775	50.895	" "	50	10	180	x	x	I.S.
69	10.765	50.85	" "	45	15	165	x	x	7
70	10.74	50.805	" "	35	5	140	0.5	1.98	4
71	10.71	50.775	" "	25	5	75	x	0.06	3
72	10.89	51.005	Davis Creek	20	5	65	x	x	I.S.
73	10.875	50.995	Hall Creek	25	5	95	x	x	I.S.
74	10.88	51.01	Specimen Creek	35	10	125	x	0.03	6
75	10.885	51.06	" "	35	10	140	0.5	x	4
76	10.875	51.11	" "	45	5	170	x	x	I.S.

STREAM SEDIMENT SAMPLE DATE - SILT SERIES
DAVIS CREEK - SPECIMEN CREEK AREA

Sample Number	Location		Creek	Elements (ppm) 1981					1984
	North	East		Cu	Pb	Zn	As	Au	As
SO 77	10.87	51.16	Specimen Creek	50	15	195	x	I.S.	I.S.
78	10.88	51.205	" "	80	5	275	x	x	I.S.
79	10.87	51.21	McPhee's Creek	70	5	190	x	x	3
80	10.825	51.22	" "	30	x	95	0.5	x	1
81	10.77	51.225	" "	40	x	110	0.5	x	1
82	10.88	51.215	Specimen Creek	70	5	265	x	0.28	7
83	10.895	51.245	" "	55	5	300	0.5	0.80	I.S.
84	10.91	51.28	" "	60	x	285	x	x	I.S.
85	10.925	51.32	" "	NOT SUBMITTED ?					
86	10.935	51.33	Trib. of Specimen Creek	20	x	50	x	x	3
87	10.93	51.335	Specimen Creek	100	10	605	x	0.24	I.S.
88	10.94	51.37	" "	70	5	440	x	0.32	7
89	10.945	51.415	" "	75	5	440	x	x	I.S.
90	10.935	51.455	" "	90	5	380	0.5	x	6
91	10.93	51.50	" "	55	20	225	x	1.4	I.S.
92	11.205	51.885	Trib. of Specimen Creek	45	30	65	x	0.16	I.S.
93	11.15	51.865	" " " "	25	10	35	x	0.03	2
94	11.115	51.845	" " " "	20	15	30	x	x	4
95	10.96	51.74	" " " "	90	25	115	x	x	I.S.
96	10.925	51.77	" " " "	65	25	85	x	x	8
97	10.875	51.79	" " " "	40	40	55	x	0.03	I.S.
98	10.825	51.80	" " " "	40	25	50	x	0.03	6
99	10.820	51.80	" " " "	25	30	40	x	x	5
100	10.82	51.805	" " " "	10	20	25	x	1.1	4

STREAM SEDIMENT SAMPLE DATA - SILT SERIES
DAVIS CREEK - SPECIMEN CREEK AREA

Sample Number	Location North	Location East	Creek	Elements (ppm) 1981 Cu	Pb	Zn	As	Au	1984 As
SO 101	10.825	51.855	Trib. of Specimen Creek	10	15	35	x	x	5
102	10.81	51.805	" " " "	40	25	50	x	x	I.S.
103	10.765	51.825	" " " "	40	20	45	x	x	I.S.
104	10.97	51.735	Specimen Creek	60	20	90	x	x	I.S.
105	10.93	51.535	" "	110	20	775	x	1.9	11
106	10.93	51.58	" "	205	35	3050	x	0.64	I.S.
107	10.945	51.63	" "	105	25	975	x	x	15
108	10.955	51.665	" "	175	30	1650	0.5	0.08	I.S.
109	10.965	51.71	" "	160	35	2150	x	0.32	I.S.
110	10.965	51.73	" "	90	15	345	x	2.7	I.S.
111	10.965	51.72	" "	115	20	200	x	1.6	I.S.
112	11.02	51.75	" "	160	25	1300	x	1.4	I.S.

APPENDIX 3

Stream Sediment Sample Data - Diamond Series

Analytical Report Number

Diamond Laboratory Services Pty. Ltd. Reports:

Laboratory Reference No. - AA 15650 - 19 April 1984
Laboratory Reference No. - AA 15697 - 28 June 1984

089

298089

A3.2

Diamond Laboratory Services Pty. Ltd.

HEAVY MINERAL DIVISION
Australian Representative for:

DIAMOND GRADING LABORATORIES

3rd Floor
89 York Street
Sydney, N.S.W. 2000
Telephone (02) 290 1022

DUPLICATE

HEAVY MINERAL CONCENTRATE ANALYSIS

EXAMINATION FOR KIMBERLITIC MINERAL INDICATOR GRAINS

CONSIGNMENT (Lab. Ref. No.):	AA 15650
CLIENT:	INDUSTRIAL AND MINING INVESTIGATIONS P/L.
SAMPLE NUMBER (Client's Ref.):	LSD 7, LSD 18, LSD 26.
TOTAL NUMBER OF SAMPLES:	THREE
DATE SAMPLES RECEIVED:	4.4.84
DATE SAMPLES COMPLETED:	12.4.84

The above consignment has been sorted and checked and the results tabulated on the accompanying sheets.

Key to symbols used in the report:

	Etched
l.abr.	Lightly abraded
abr.	Abraded
R.O.S.	Remnant of original surface
R.O.K.	Remnant of kelyphitic surface
	Diamonds
N.K.	Non-kimberlitic
	Angular

19.4.84

.....

Laboratory Supervisor Date

RESULTS AND DISCUSSION

Samples LSD 7, 18, 26

Each of the samples was found to be abundant in black grains whose appearance suggests chromite and therefore warrant further investigation.

A representative number of these grains have been sent for further investigation by electron microprobe analysis to determine their composition.

In addition to these grains the samples contained grains of non-kimberlitic garnets, topaz, tourmaline, zircon, cassiterite, pyroxene and gold.

Silvery grey metallic grains were also noticed in samples LSD 18 and LSD 26 which are thought to be an alloy of the platinum group of metals.

The results are tabled on the following page.

Representative grains of the minerals listed are available for inspection if required.

CONCENTRATION OF RAW SAMPLES

The concentrate from each of these samples was small in relation to the size of the raw samples.

Therefore, a substantial saving of transport and establishment of concentrate costs could be made if the samples are washed and partially concentrated before shipping to Sydney.

However, because of the size of the concentrate, especially in the -1mm. size fraction, extreme care should be exercised in the initial concentrating steps to avoid loss of these important grains.

Only partial concentration is therefore recommended with a cut-off point which allows plenty of margin for error.

19.4.84.

091

DUPLICATE

298091

METHOD OF EXAMINATION

Three samples numbered LSD 7, LSD 18 and LSD 26 were received for inspection.

The processing and visual inspection of all samples was carried out at the Sydney premises of Diamond Laboratory Services Pty. Ltd.

Each of the samples was screened and processed using all steps required to produce a heavy mineral concentrate for observation.

As none of the samples had not undergone any preparation, the steps required after the initial weight was recorded involved washing and screening and heavy media separation using bromoform as the flotation medium. The heavy mineral fraction of each sample was sieved into the following fractions:

+16 mesh	:	coarse fraction
+25 mesh	:	medium fraction
+44 mesh	:	fine fraction
-44 mesh	:	extra fine fraction

No further work was performed on the light float which was discarded, nor was the extra fine fraction inspected at this stage.

Visual inspection of the concentrates was carried out by qualified sorters using stereomicroscopes. Each sample was examined grain by grain for traces of kimberlitic indicator minerals.

Grains considered to have morphological characteristics consistent with kimberlitic indicator minerals were isolated and sent for further confirmatory analysis.

Other grains of interest recognised by our sorters are listed in the 'Other Grains' column and may include the following: moissanite, fluorite, pyroxene, olivine, zircon, tourmaline, kyanite, corundum, rutile, haematite, cassiterite, mica, pyrites, gold, bronzite, etc.

Representative samples of all grains listed in the following pages as present in these samples are available for further inspection if needed.

19.4.84.

298092 A3.5

Diamond Laboratory Services Pty. Ltd.

HEAVY MINERALS DIVISION

3rd Floor
89 York Street
Sydney, N.S.W. 2000
Telephone (02) 290 1022

CONSIGNMENT AA.15650.... SAMPLE No's. LSD.7. : LSD.18 : LSD.26.... DATE 12.4.84.....

Sample No.	Mesh Size	Garnet	Ilmenite	Chrome Diopside	Spinel	Other Grains	Remarks
LSD 7	+16	1 N.K.	—	—	10	20 TOPAZ. 1 TOURMALINE.	
	+25	5 N.K.	—	—	20	ABUNDANT TOPAZ. 1 ZIRCON: ½ TOURMALINE.	
	+44	10 N.K.	—	—	ABUNDANT	ABUNDANT TOPAZ: 1 CASSITERITE? 1 GOLD: 2 PYROXENE: 10 TOURMALINE.	
	+60	—	—	—	—	—	
LSD 18	+16	3 N.K.	—	—	10	1 TOURMALINE: 10 TOPAZ.	
	+25	12 N.K.	—	—	ABUNDANT	AB. TOPAZ: 5 HAEMATITE: 2 GOLD: 10 TOURMALINE.	
	+44	26 N.K.	—	—	ABUNDANT	AB. TOPAZ: 6 HAEMATITE: 4 ZIRCONS: 5 CASSITERITE: 2 RUTILE: 6 GOLD: 10 TOURMALINE.	1 METALLIC SILVERY NUGGET.
	+60	—	—	—	—	3 PYROXENE: —	
LSD 26	+16	3 N.K.	—	—	15	1 HAEMATITE 1 GOLD: 10 TOPAZ.	
	+25	13 N.K.	—	—	ABUNDANT	7 GOLD: 10 HAEMATITE: 2 PYROXENE: AB. TOPAZ.	1 METALLIC SILVERY NUGGET.
	+44	28 N.K.	—	—	ABUNDANT.	30 HAEMATITE: 25 PYROXENE: 10 GOLD: 1 CASSITERITE: AB. TOPAZ.	2 METALLIC SILVERY NUGGETS
	+60	—	—	—	—	—	
	+16						
	+25						
	+44						
	+60						
	+16						
	+25						
	+44						
	+60						
	+16						
	+25						
	+44						
	+60						

SAMPLES RECEIVED IN LAB .....14.4.84..... SAMPLES SEPARATED .....14.4.84.....

09'

DUPLICATE

298093 A3.6

METHOD OF EXAMINATION

Three samples numbered LSD 7, LSD 18 and LSD 26 were received for inspection.

The processing and visual inspection of all samples was carried out at the Sydney premises of Diamond Laboratory Services Pty. Ltd.

Each of the samples was screened and processed using all steps required to produce a heavy mineral concentrate for observation.

As none of the samples had not undergone any preparation, the steps required after the initial weight was recorded involved washing and screening and heavy media separation using bromoform as the flotation medium. The heavy mineral fraction of each sample was sieved into the following fractions:

+16 mesh	:	coarse fraction
+25 mesh	:	medium fraction
+44 mesh	:	fine fraction
-44 mesh	:	extra fine fraction

No further work was performed on the light float which was discarded, nor was the extra fine fraction inspected at this stage.

Visual inspection of the concentrates was carried out by qualified sorters using stereomicroscopes. Each sample was examined grain by grain for traces of kimberlitic indicator minerals.

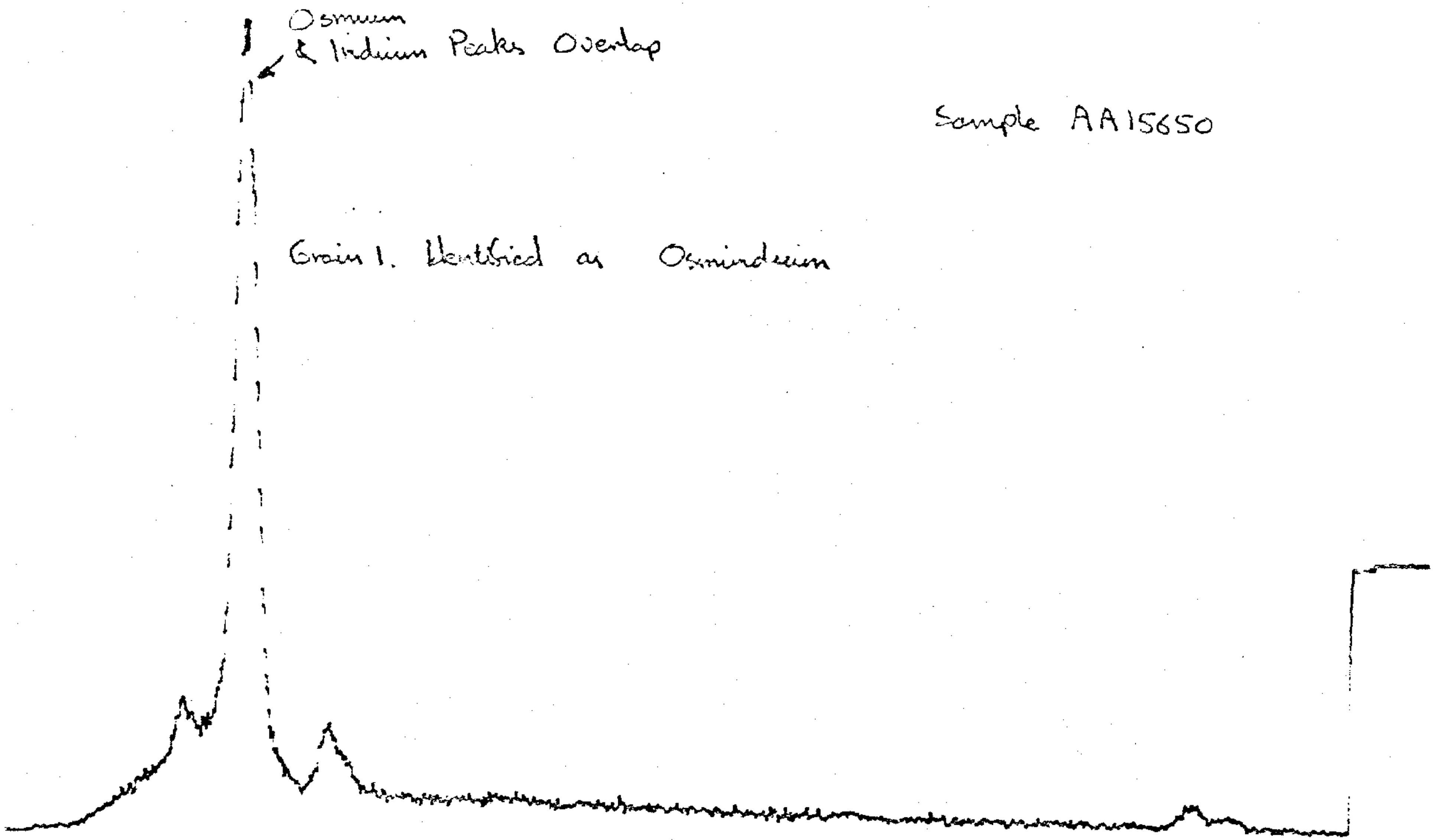
Grains considered to have morphological characteristics consistent with kimberlitic indicator minerals were isolated and sent for further confirmatory analysis.

Other grains of interest recognised by our sorters are listed in the 'Other Grains' column and may include the following: moissanite, fluorite, pyroxene, olivine, zircon, tourmaline, kyanite, corundum, rutile, haematite, cassiterite, mica, pyrites, gold, bronzite, etc.

Representative samples of all grains listed in the following pages as present in these samples are available for further inspection if needed.

19.4.84.

091



To Be Annexed to Report No 15650.
2.7.84.

298094

A3.7

```
GRAIN 2\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
 TIO2           .17            .16            .005           .004
AL2O3          59.14          58.57          2.662          2.359
CR2O3          9.91           9.82           .299           .265
  FEO          10.29          10.19          .329           .291
  MNO          .16            .16            .005           .005
  MGO          21.3           21.1           1.213          1.075

TOTAL          100.97         100            4.513          5.316
MG:FE          .786641 : .213359
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 78.6641 : 21.3359
 0  0  .17  59.14  0  9.91  10.29  0
 .16  21.3  0  0  0  0  100.97

 2129  24902  71617  2763  2229  1985  1708  1592
 1299  1038  6297  1648  5056  640  3029  1950
SELECT E.D.S. ROUTINE? GRAIN 3\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
AL2O3          60.43          60.02          2.715          2.409
CR2O3          8.82           8.76           .266           .236
  FEO          10.31          10.24          .329           .292
  MNO          .09            .09            .003           .003
  MGO          21.03          20.89          1.195          1.061

TOTAL          100.68         100            4.508          5.323
MG:FE          .784121 : .215879
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 78.4121 : 21.5879
 0  0  0  60.43  0  8.82  10.31  0
 .09  21.03  0  0  0  0  100.68

 2046  24779  73404  2669  2108  2086  1697  1520
 1137  1031  5709  1538  5067  638  3097  1877
SELECT E.D.S. ROUTINE? GRAIN 4\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
 TIO2           .1             .1             .003           .002
AL2O3          56.6           56.3           2.6            2.307
CR2O3          12.17          12.11          .375           .333
  FEO          11.93          11.87          .389           .345
  MNO          .27            .27            .009           .008
  MGO          19.46          19.35          1.131          1.004

TOTAL          100.53         100            4.507          5.322
MG:FE          .744079 : .255921
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 74.4079 : 25.5921
 0  0  .1  56.6  0  12.17  11.93  0
 .27  19.46  0  0  0  0  100.53
```

2132 22620 48568 2776 2203 2085 1831 1630
1278 1162 7569 1882 5771 650 3100 1952
SELECT E.D.S. ROUTINE? GRAIN 5\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
SIO2	.1	.1	.004	.004
TIO2	.15	.14	.005	.004
AL2O3	31.12	30.53	1.577	1.387
CR2O3	38.41	37.68	1.306	1.149
FEO	13.92	13.65	.501	.441
NIO	.13	.13	.004	.004
MNO	.41	.4	.015	.013
MGO	17.71	17.37	1.136	.999
TOTAL	101.95	100	4.548	5.277

MG:FE .693952 : .306048
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 69.3952 : 30.6048
0 .1 .15 31.12 0 38.41 13.92 .13
.41 17.71 0 0 0 0 101.95

1844 18763 37527 3339 2647 2401 2051 1953
1478 1391 22420 4005 6779 750 3443 2413
SELECT E.D.S. ROUTINE? GRAIN 6\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
TIO2	.18	.18	.007	.006
AL2O3	5.39	5.34	.32	.284
CR2O3	66.83	66.15	2.657	2.361
FEO	18.18	17.99	.765	.68
MNO	.94	.93	.04	.036
MGO	9.51	9.41	.713	.634
TOTAL	101.03	100	4.502	5.329

MG:FE .482409 : .517591
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 48.2409 : 51.7591
0 0 .18 5.39 0 66.83 18.18 0
.94 9.51 0 0 0 0 101.03

1609 10262 9186 3838 3266 2924 2480 2388
1762 1660 39700 6731 8913 822 4068 2957
SELECT E.D.S. ROUTINE? GRAIN 7\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
TIO2	.19	.18	.007	.006
AL2O3	4.71	4.68	.279	.243
CR2O3	64.17	63.66	2.545	2.223
FEO	18.59	18.45	.781	.682
MNO	.49	.49	.021	.018
MGO	12.65	12.55	.946	.827
TOTAL	100.8	100.01	4.579	5.239

MG:FE .547771 : .452229
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 54.7771 : 45.2229
0 0 .19 4.71 0 64.17 18.59 0
.49 12.65 0 0 0 0 100.8

```
 1636  12836  8369  3874  3107  2971  2464  2403
 1754  1527  38005  6256  9042  868  4034  2937
SELECT E.D.S. ROUTINE? GRAIN 8\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
 TIO2           .11            .11            .004           .004
AL2O3          6.28           6.25           .368           .328
CR2O3          67.57          67.22          2.651          2.365
  FEO          14.89          14.82          .618           .552
  MNO          .65            .64            .027           .024
  MGO          11.01          10.96          .815           .727

TOTAL          100.51         100            4.483          5.351
MG:FE          .568737 : .431263
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 56.8737 : 43.1263
 0  0  .11  6.28  0  67.57  14.89  0
 .65  11.01  0  0  0  0  100.51

 1685  11603  10147  3865  3153  2809  2470  2295
 1694  1602  39949  6582  7441  813  4038  2883
SELECT E.D.S. ROUTINE? GRAIN 9\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
 TIO2           .17            .16            .006           .005
AL2O3          3.72           3.67           .22            .195
CR2O3          68.87          67.97          2.734          2.423
  FEO          16.85          16.63          .708           .627
  MNO          1              .99            .042           .038
  MGO          10.73          10.59          .803           .712

TOTAL          101.34         100.01         4.513          5.314
MG:FE          .531436 : .468564
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 53.1436 : 46.8564
 0  0  .17  3.72  0  68.87  16.85  0
 1  10.73  0  0  0  0  101.34

 1535  11166  7275  3782  3153  2869  2418  2320
 1721  1643  40861  6894  8319  850  4021  2852
SELECT E.D.S. ROUTINE? GRAIN 10\? 5
OXIDE          WT% UNORM      WT% NORM       6 OXYGEN       4 CATIONS
 TIO2           .26            .26            .009           .008
AL2O3          15.17          15.05          .858           .756
CR2O3          53.63          53.21          2.036          1.793
  FEO          19.47          19.31          .782           .689
  MNO          .74            .73            .03            .026
  MGO          11.54          11.45          .826           .728

TOTAL          100.81         100.01         4.541          5.282
MG:FE          .513682 : .486318
CA:NA:K        0 : 0 : 0
CA:MG:FE       0 : 51.3682 : 48.6318
 0  0  .26  15.17  0  53.63  19.47  0
 .74  11.54  0  0  0  0  100.81
```

1697 12285 19810 3475 2937 2731 2364 2174
1712 1504 31833 5497 9345 828 3803 2757
SELECT E.D.S. ROUTINE? GRAIN 11\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
TIO2	.18	.18	.007	.006
AL2O3	5.67	5.64	.337	.299
CR2O3	65.76	65.34	2.621	2.324
FEO	18.31	18.2	.773	.685
MNO	.97	.96	.041	.037
MGO	9.75	9.69	.733	.65
TOTAL	100.64	100.01	4.513	5.318

MG:FE .48672 : .51328
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 48.672 : 51.328
0 0 .18 5.67 0 65.76 18.31 0
.97 9.75 0 0 0 0 100.64

1649 10476 9495 3707 3013 2981 2446 2364
1764 1622 39042 6661 8970 800 4062 2976
SELECT E.D.S. ROUTINE? GRAIN 12\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
TIO2	.13	.13	.004	.004
AL2O3	26.62	26.37	1.42	1.251
CR2O3	41.53	41.14	1.486	1.309
FEO	18.82	18.64	.713	.628
MNO	.57	.57	.022	.019
MGO	13.28	13.15	.896	.789
TOTAL	100.95	100	4.541	5.283

MG:FE .556868 : .443132
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 55.6868 : 44.3132
0 0 .13 26.62 0 41.53 18.82 0
.57 13.28 0 0 0 0 100.95

1779 14324 32605 3363 2668 2515 2166 2074
1519 1419 24395 4391 8944 746 3537 2567
SELECT E.D.S. ROUTINE? GRAIN 13\? 5

OXIDE	WT% UNORM	WT% NORM	6 OXYGEN	4 CATIONS
TIO2	.11	.11	.004	.004
AL2O3	4.75	4.75	.283	.251
CR2O3	67.06	67.1	2.679	2.375
FEO	16.07	16.08	.68	.603
MNO	1.05	1.05	.045	.04
MGO	10.9	10.91	.822	.728
TOTAL	99.94	100	4.513	5.317

MG:FE .54727 : .45273
CA:NA:K 0 : 0 : 0
CA:MG:FE 0 : 54.727 : 45.273
0 0 .11 4.75 0 67.06 16.07 0
1.05 10.9 0 0 0 0 99.94

1589 11417 8449 3812 3120 2958 2492 2272
1700 1549 39707 6779 7983 800 3979 3017
SELECT E.D.S. ROUTINE?

VARIATION IN THE COMPOSITION OF CHROMITE FROM A NUMBER OF GEOLOGICAL ENVIRONMENTS.

Chromite (or chrome spinel) is a common accessory mineral found in all of the various rock types associated with:-

1. The ophiolite suite (ocean-floor rocks), including
   (a) Alpine - type (Metamorphic) peridotites and
   (b) Cumulate (igneous) perdotites.
2. Continental layered mafic - ultramafic intrusions.

In some cases the chromite becomes concentrated to form tabular, lens-shaped or irregular masses to form economic concentrations. Chromite deposits associated with ophiolitic rocks are known by the general term podiform chromites. Those associated with the large continental layered intrusions are known as stratiform chromites.

3. Chromite is also a very minor accessory in kimberlites where it occurs in several different ways.

Chromite variation in Podiform and Stratiform types.

The published literature does not differentiate between chromite found as an accessory mineral in the various rock types of the ophiolite suite and the continental layered complexes, and the chromite found as a major constituent in podiform and stratiform deposits. Information which can be found refers entirely to the economic occurrences of the mineral. There is no reason however, why it should not also apply within the main body of the rocks themselves.

The composition of chromite from podiform deposits is very variable because of the complicated crystallization and deformational history of most ophiolitic rocks.

In stratiform deposits on the other hand, the chemical variation is a direct reflection of the degree of fractionation of the mineral from its parent.

The Fe content of podiform chromites remains fairly constant (10-16% FeO) while in stratiform chromites Fe and Cr. show a reciprocal arrangement with Fe increasing with the degree of fractionation while Cr decreases.

Chromites from podiform deposits are typically more magnesian than those from stratiform deposits. In podiform chromites the Fe^{2+}: Mg is usually < 1 and is almost constant for and individual deposit, while in the stratiform chromites, Fe^{2+}:Mg = 0.5 - 2.5 and may vary considerably in individual deposits.

The diagram below illustrates this point.

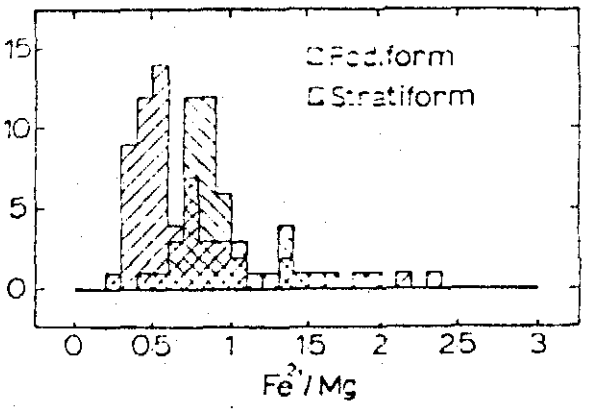


Fig. 3. Atomic ratio of Fe^{3+} vs Mg for chromites from stratiform and podiform deposits. Fe^{3+} calculated from total Fe by assuming spinel stoichiometry. Analyses by electron microprobe.

It is the reciprocal relation of Cr and Al which characterizes podiform chromites. They tend to be bimodal, concentrating into high Al and / or high Cr groups. The reason for this bimodality is not clear but may be pressure related. Nearly all high Cr and high Al chromites come from podiform deposits.

The figure below illustrates the atomic proportions of Cr, Al and Fe for chromites from podiform and stratiform intrusions.

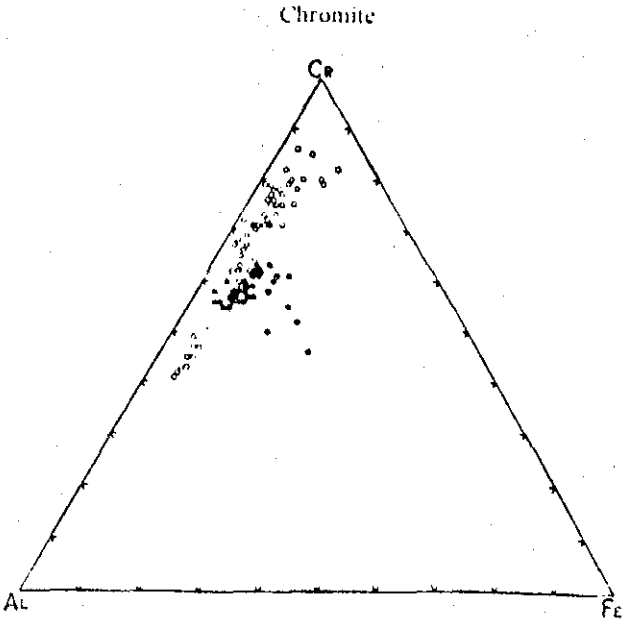


Fig. 51. Atomic proportions of Cr, Al, and Fe for chromites from stratiform intrusions *(solid circles)* and podiform deposits *(open circles)*. Fe^{3+} calculated from total Fe by assuming spinel stoichiometry and shown as Fe on diagram. Analyses by electron probe. (After Dickey, 1975)

A distinction between chromites from stratiform and podiform deposits can also be made on the basis of TiO_2 concentrations. Podiform chromites usually contain $< 0.3\%$ TiO_2 while in stratiform deposits it may range from $0.5 \rightarrow 2\%$.

In summary:

	PODIFORM	STRATIFORM
Fe^{2+}:Mg	< 1	0.5 - 2.5
FeO	Fairly constant 10-16%	Variable with differentiation, as high as 28%. Reciprocal with Cr.
Cr / Al	Reciprocal wide variation.	Fairly uniform.
TiO_2	< 1%	0.5 - 2.5%

Chromite variation in Kimberlites

There are quite large variations in the chemistry of chrome spinels found in kimberlites. This is because the mineral occurs in a variety of ways. It is more properly referred to as "Chrome spinel" rather than true chromite.

Occurrences of chrome spinel are:

1. As xenocrysts (single large crystals in rock)
2. Primary groundmass spinels.
3. Secondary spinels mantling (1) and (2).
4. Secondary spinels in garnet kelyphitic rims.
5. Secondary spinels mantling picroilmenite.
6. As exsolved inclusions in picroilmenite.

The outstanding and characteristic features of categories (1), (2) and (4) are the presence and degree of extraordinary complex zoning in the chrome spinel.

Xenocrystic chrome spinels and those mantling garnet kelyphites (categories (1) and (4)) compositionally match those chromites occurring in a wide range of peridotite inclusions in kimberlites and cover the range of podiform and stratiform types from which they cannot be distinguished except by the presence of zoning.

They were probably shed into the kimberlite during fragmentation of peridotite xenoliths.

Some primary groundmass chrome spinel, secondary mantling spinels and those exsolved from picroilmenite (categories (2),(3) (5) and (6)) tend to be much richer in TiO_2 and Fe, especially Fe^{3+}. They may contain up to 5% TiO_2, 10% Fe_3O_4 and 25% $FeAlO_4$. Their composition is not unique to kimberlites. However, the complex zoning where by up to 5 distinct and contrasting primary chrome spinels may be found together between the innermost core and outermost mantle of an

individual grain is unique.

Some spinels which either mantle or exsolve from picroilmenite may contain up to 16% TiO_2 and 28% Fe_2O_3 and are unique to kimberlites. These could not be considered to be "chrome" spinels in the true sense, however.

References:

DICKEY, J.S (1975) A hypothesis of origin for podiform chromite deposits. Geochem. Cosmochim. Acta, 39 p. 1061 -1074

HAGGERTY, S.E. (1975) The chemistry and genesis of opague minerals in kimberlite.
First Internat. Kimberlite Conference. p. 295 - 307.

THAYER, T.P. (1970). Chromite segregations as petrogenetic indicators.
Geol. Soc. S.Africa Spec. Publ. 1 p. 380 - 390.

Analyses of grains probed:-

Grain	2	3	4	5	6	7
Fe/Mg	0.5	0.5	0.7	0.9	2	1.5
FeO	10.	10.	12.	14.	18	18.5
Cr:Al	1:6	1:8	1:5	1:09	12:1	16:1
TiO_2	.16	-	.1	.1	.18	.18

	8	9	10	11	12	13
Fe/Mg	1.2	1.6	1.8	2.	1.5	1.6
FeO	15.	16.	19.	18.	18.5	16.
Cr/Al	11:1	22:1	4:1	13:1	2:1	16:1
TiO_2	.11	.16	.26	.18	.13	.11

Conclusions:

1. Not stratiform - because of TiO_2 content and wide variation in Cr:Al ratio.

2. Some features of podiform, except that Fe content is too variable.

3. Cannot tell whether kimberlitic or not - no unique features.

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298104

A3.17

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HEAVY MINERAL CONCENTRATE ANALYSIS

EXAMINATION FOR KIMBERLITIC MINERAL INDICATOR GRAINS

CONSIGNMENT (Lab. Ref.No.) :	AA 15697
CLIENT:	INDUSTRIAL AND MINING INVESTIGATIONS P/L
SAMPLE NUMBER(Client's Ref.):	BATCH 1 LSD 1,2,3,4,6,8,9,10,11,14,16,20,21,24, 25,27.
TOTAL NUMBER OF SAMPLES:	SIXTEEN
DATE SAMPLES RECEIVED:	11.5.84
DATE SAMPLES COMPLETED:	20.6.84

The above consignment has been sorted and checked and the results tabulated on the accompanying sheets.

Key to symbols used in the report:

	Etched
l.abr.	Lightly abraded
abr.	Abraded
R.O.S.	Remnant of original surface
R.O.K.	Remnant of kelyphitic surface
	Diamond
N.K.	Non - kimberlitic
	Angular

28.6.84.

Laboratory Supervisor Date

METHOD OF EXAMINATION

A total of 24 samples were received for inspection in two batches of 16 samples and eight samples labelled as follows:

Batch 1 : LSD 1,2,3,4,6,8,9,10,11,14,16,20,21,24,25,27.

Batch 2 : LSD 5,12,13,15,17,19,22,23.

Samples LSD 7,18,26 had been submitted earlier for inspection in contract number AA 15650.

All of these samples had been partially concentrated by careful panning in the field to minimise initial transportation weights.

After initial weights of samples received were recorded,the final steps of preparation involving washing and screening and heavy media separation with bromoform were performed.

The heavy mineral fraction was sieved into the following size fractions:

+ 16 mesh : Coarse fraction
+ 25 mesh : Medium fraction
+ 44 mesh : Fine fraction
- 44 mesh : Extra fine fraction.

No further work was performed on the light float which was discarded.

Samples in batch 2 were not processed at all until batch 1 results were available. They are being held in storage until further notice.

Visual inspection of the concentrates was carried out by qualified sorters using stereomicroscopes. Each sample was examined grain by grain for traces of kimberlitic indicator minerals.

Grains considered to have morphological characteristics consistent with kimberlitic indicator minerals were isolated and sent for further confirmatory analysis.

../2..

Other grains of interest recognised by our sorters are listed in the 'Other Grains' column and may include the following: moissanite, fluorite, pyroxene, olivine, zircon, tourmaline, kyanite, corundum, rutile, haematite, cassiterite, mica, pyrites, gold, bronzite,etc.

Representative samples of all grains listed in the following pages as present in these samples are available for further inspection if needed.

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LSD: 1 : 2 : 3 : 4 : 6 : 8 :
9 : 10 : 11 : 14 : 16 : 20 :

CONSIGNMENT AA 15697 SAMPLE No's. 21 : 24 : 25 : 27 DATE 20.6.84

Sample No.	Mesh Size	Garnet	Ilmenite	Chrome Diopside	Spinel	Other Grains	Remarks
LSD 1	+16	1 N.K.	—	—	20	20 Topaz:	
	+25	13 N.K.	—	—	25	1 Zircon: 25 Topaz: 1 Gold	
	+44	28 N.K.	—	—	30	3 Zircons: 2 Tourmaline 30 Topaz: 3 Gold: 2 Rutile	
	+60	—	—	—	—	—	
LSD 2	+16	—	—	—	—	—	
	+25	4 N.K.	—	—	10	1 Zircon: 1 Gold: 15 Topaz.	
	+44	30 N.K.	—	—	20	2 Rutile: 4 Gold: 25 Topaz. 3 Pyrogene: 10 Zircons.	
	+60	—	—	—	—	—	
LSD 3	+16	6 N.K.	—	—	5	1 Gold: 10 Topaz.	
	+25	10 N.K.	—	—	10	1 Gold: 20 Topaz.	
	+44	15 N.K.	—	—	15	2 Rutile: 2 Cassiterite: 5 Gold: 25 Topaz:	
	+60	—	—	—	—	—	
LSD 4	+16	3 N.K.	—	—	5	5 Topaz.	
	+25	4 N.K.	—	—	10	2 Pyrogene: 2 Zircons: 10 Topaz.	
	+44	6 N.K.	—	—	15	16 Pyrogene: 3 Zircons: 15 Topaz:	
	+60	—	—	—	—	—	
LSD 6	+16	—	—	—	20	3 Topaz:	
	+25	6 N.K.	—	—	25	5 Topaz: 1 Gold: 10 Zircons	
	+44	20 N.K.	—	—	30	3 Tourmaline 10 Topaz: 10 Zircons: 1 Gold	
	+60	—	—	—	—	—	
LSD 8	+16	3 N.K.	—	—	1	1 Zircon: 10 Topaz	
	+25	4 N.K.	—	—	6	1 Zircon: 10 Topaz.	
	+44	16 N.K.	—	—	10	2 Tourmaline: 1 Zircon: 1 Rutile: 1 Cassiterite:	
	+60	—	—	—	—	—	

SAMPLES RECEIVED IN LAB 11.5.84 SAMPLES SEPARATED 11.5.84

SAMPLES UNPACKED AND CHECKED 11.5.84 SLIDES CHECKED 20.6.84

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298108 A3.21

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LSD's: 1 : 2 : 3 : 4 : 6 : 8 :
9 : 10 : 11 : 14 : 16 : 20 :

CONSIGNMENT ..AA.1569Y.. SAMPLE No's. ..21 : 24 : 25 : 27..... DATE ~~20.6.84~~.....

Sample No.	Mesh Size	Garnet	Ilmenite	Chrome Diopside	Spinel	Other Grains	Remarks
	+16	4 N.K.	—	—	—	1 TOPAZ.	
	+25	3 N.K.	—	—	—	2 TOPAZ: 2 ZIRCONS.	
	+44	6 N.K.	—	—	—	3 TOURMALINE: 2 ZIRCONS. 4 TOPAZ: 4 PYROXENE.	
LSD 9	+60	—	—	—	—	—	
	+16	1 N.K.	—	—	—	1 TOPAZ.	
	+25	5 N.K.	—	—	10	10 TOPAZ: 1 ZIRCON.	
	+44	11 N.K.	—	—	15	1 TOURMALINE: 6 ZIRCONS: 1 RUTILE: 5 TOPAZ.	
LSD 10	+60	—	—	—	—	—	
	+16	3 N.K.	—	—	4	3 TOPAZ.	
	+25	3 N.K.	—	—	6	6 ZIRCONS:	
	+44	8 N.K.	—	—	15	2 TOURMALINE: 1 ZIRCON: 4 GOLD.	
LSD 11	+60	—	—	—	—	—	
	+16	—	—	—	—	—	
	+25	5 N.K.	—	—	5	10 PYROXENE: 5 TOURMALINE.	
	+44	10 N.K.	—	—	10	9 PYROXENE: 6 ZIRCONS: 5 TOURMALINE.	
LSD 14	+60	—	—	—	—	—	
	+16	1 N.K.	—	—	—	—	
	+25	14 N.K.	—	—	2	3 ZIRCONS: 1 TOURMALINE.	
	+44	20 N.K.	—	—	5	2 RUTILE: 1 CASSITERITE. 1 GOLD: 3 TOURMALINE.	
LSD 16	+60	—	—	—	—	—	
	+16	3 N.K.	—	—	—	10 TOPAZ:	
	+25	5 N.K	—	—	3	15 TOPAZ: 3 TOURMALINE: 1 ZIRCON.	
	+44	10 N.K.	—	—	10	2 ZIRCONS: 30 TOPAZ. 2 TOURMALINE: 1 GOLD.	
LSD 20.	+60	—	—	—	—	—	

SAMPLES RECEIVED IN LAB ..11.5.84..... SAMPLES SEPARATED ....11.5.84.....

SAMPLES UNPACKED AND CHECKED ...11.5.84..... SLIDES CHECKED .....20.6.84.....

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298109 A3.22

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LSD -- 1 : 2 : 3 : 4 : 6 : 8 :
9 : 10 : 11 : 14 : 16 : 20 :

CONSIGNMENT ...AA..15697. SAMPLE No's. ...21 : 24 : 25 : 27..... DATE ..20.6.84.....

Sample No.	Mesh Size	Garnet	Ilmenite	Chrome Diopside	Spinel	Other Grains	Remarks
	+16	1 N.K.	—	—	—	1 TOPAZ.	
	+25	11 N.K.	—	—	10	5 TOPAZ: 1 TOURMALINE.	
	+44	15 N.K.	—	—	20	3 CASSITERITE. 10 TOPAZ: 5 GOLD	
LSD 21	+60	—	—	—	—	—	
	+16	—	—	—	2	—	
	+25	5 N.K.	—	—	2	2 TOPAZ: 4 GOLD.	
	+44	21 N.K.	—	—	10	4 PYROXENE: 2 TOURMALINE: 4 TOPAZ: 6 GOLD, 2 CASSITERITE.	
LSD 24	+60	—	—	—	—	—	
	+16	—	—	—	—	—	
	+25	2 N.K.	—	—	1	2 GOLD: 1 TOPAZ.	
	+44	10 N.K.	—	—	5	3 CASSITERITE: 5 TOPAZ: 4 GOLD: 4 TOURMALINE:	
LSD 25	+60	—	—	—	—	—	
	+16	3 N.K.	—	—	—	1 RUTILE: 1 GOLD: 3 TOPAZ.	
	+25	20 N.K.	—	—	5	3 TOURMALINE: 2 CASSITERITE: 4 ZIRCONS: 4 GOLD: 5 TOPAZ:	
	+44	30 N.K.	—	—	10	5 GOLD: 10 TOPAZ: 4 TOURMALINE: 4 ZIRCONS:	
LSD 27	+60	—	—	—	—	—	
	+16						
	+25						
	+44						
	+60						
	+16						
	+25						
	+44						
	+60						

SAMPLES RECEIVED IN LAB ..... 11.5.84 ..... SAMPLES SEPARATED ..... 11.5.84 .....

SAMPLES UNPACKED AND CHECKED ... 11.5.84 ..... SLIDES CHECKED 20.6.84

DISCUSSION

In the observation of the samples LSD 1 - 27 including those in batch two referred to in your letter of 11-5-84 two fairly distinct types of spinel have been observed.

Type 1: Appears to have undergone some type of alteration to the surface resulting in a pitted surface. The body colour is distinctly lighter tending toward dark brown. Some crystal shapes are evident however the edges are not as sharp as type 2.

Type 2: This type exhibits smooth surfaces and has a darker body colour tending more to black or very dark brown. Some crystal shapes are evident. Edges of the crystals are overall sharper than type 1.

None of these grains exhibit distinctly visible zoning, however, detailed microprobing of specific areas of grains may show differences in composition.

Type 2 grains from LSD 7, 18, 26 were isolated and sent for electron microprobe analysis and these analyses are included for your perusal.

A closer examination of the type of grain seen in each of the samples seem to indicate a trend of occurrence of type 2 and type 1 grains. However, the significance of this can only be assessed by you, as you know the relationship between the sample number and the terrain.

A description of the grains observed sample by sample follows:

LSD 1	:	Type 1 - rounded, pitted surface.
LSD 2	:	Same as 1.
LSD 3	:	Same as 1 and 2.
LSD 4	:	Spinels darker, more angular definite difference in appearance from LSD 1,2,3.
LSD 6	:	Mixture of 1 and 4.
LSD 7	:	As no. LSD 6 however, more darker spinels of type 2.
LSD 8	:	Same as LSD 7.
LSD 9	:	Grains show signs of alteration.
LSD 10	:	Same as LSD 9 - more grains of type 1.
LSD 11	:	Type 1 more predominant, more rounded.
LSD 14	:	Grains show signs of alteration (type 1).
LSD 16	:	Predominance of type 1 grains.
LSD 18	:	Angular - not rounded a predominance of type 2 grains.
LSD 20	:	Grains show signs of alteration.
LSD 21	:	As in LSD 20.
LSD 24	:	As in 20, 21.
LSD 25	:	A mixture of type 1 and type 2 grains.
LSD 26	:	Darker and smoother grains. Mainly type 2.
LSD 27	:	A mixture of type 1 and type 2 grains.

APPENDIX 4

Soil Sample Data - Line 200S Specimen Creek Series
Comparison Between 1984 Check Traverse and 1980 Programme
Location and Results

Analytical Report Number

Analabs Report 236.1 08: - 2467C

SOIL SAMPLE DATA
LINE 200S SPECIMEN CREEK SERIES
COMPARISON BETWEEN 1984 CHECK TRAVERSE AND 1980 PROGRAMME

Location		1980 (AMDEL) Elements (ppm)				1984 (ANALABS) Elements (ppm)			
North	East	Cu	Pb	Zn	As	Cu	Pb	Zn	As
200 S	100 W	6	<5	26	<20	45	x	80	23
	75 W	8	<5	20	<20	70	5	230	2
	50 W	50	10	20	20	210	5	55	22
	25 W	10	<5	10	<20	20	5	20	6
	00	<2	<5	12	<20	50	5	55	8
	25 E	4	<5	4	<20	35	x	25	2
	50 E	2	<5	4	<20	5	5	105	2
	75 E	14	5	16	<20	25	10	35	5
	100 E	24	20	44	<20	30	15	50	7
	125 E	14	5	40	20	30	10	90	13
	150 E	60	10	130	80	195	10	65	78
	175 E	20	10	34	20	30	15	80	8
	200 E	12	5	60	20	15	10	110	3
	225 E	50	10	22	50	120	20	60	40
	250 E	40	5	28	30	110	5	100	31
	275 E	65	5	90	40	60	5	65	11
	300 E	85	20	200	30	215	10	75	24

APPENDIX 5

Soil Sample Data -Specimen Creek and Davis Creek Grid Series
Location, analysis (1981) and analysis (1984)

Analytical Report Number

Analabs Report 236.1 08: - 2478

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location		Elements (ppm) 1981 Cu	Pb	Zn	Ag	Au	1984 As	Remarks
300 S	475 W	60	x	5	0.5	x	3	This line is
	450 W	35	x	20	x	x	2	co-ordinated in the
	425 W	35	x	40	x	x	3	Specimen Creek grid,
	400 W	20	x	25	x	x	5	but forms part of
	375 W	20	x	25	x	x	4	the Davis Creek Grid
	350 W	70	x	40	x	x	3	being line 00
	325 W	75	x	25	x	x	3	475 W = 25 S
	300 W	70	x	60	x	x	6	150 W = 350 S
	275 W	100	x	35	x	x	7	
	250 W	145	10	35	x	x	6	
	225 W	265	20	60	x	x	14	
	200 W	70	25	25	x	x	20	
	175 W	x	20	15	x	x	7	
	150 W	10	115	15	x	0.06	4	
100 E	025 S	115	10	70	x	x	3	
	050 S	150	5	70	x	x	3	
	075 S	70	10	95	x	x	6	
	100 S	65	5	25	x	x	x	
	125 S	160	5	50	x	x	x	
	150 S	170	x	25	x	x	x	
	175 S	140	5	40	x	x	2	
	200 S	50	10	55	x	x	x	
	225 S	55	10	40	x	x	1	
	250 S	40	10	60	x	x	x	

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location		Elements (ppm) 1981					1984	Remarks
		Cu	Pb	Zn	Ag	Au	As	
200 E	025 S	135	10	50	x	x	3	
	050 S	95	25	45	x	x	3	
	075 S	150	20	55	x	x	3	
	100 S	125	10	75	x	x	4	
	125 S	215	10	80	x	x	3	
	150 S	125	x	115	x	x	x	
	175 S	40	10	25	x	x	x	
	200 S	25	5	25	x	x	x	
	225 S	45	5	15	x	x	x	
	250 S	140	10	40	x	x	3	
500 S	225 W	115	10	50	x	x	1	↧ This line is co-ordinated in the Specimen Creek Grid but forms part of the Davis Creek Grid, being line 200 225 W = 275 S 125 W = 375 S
	200 W	55	5	50	x	x	x	
	175 W	90	10	25	x	x	1	
	150 W	45	x	35	x	x	x	
	125 W	55	5	25	x	x	1	
300 E	025 S	5	10	10	x	x	3	
	050 S	55	20	60	x	x	4	
	075 S	45	10	55	x	x	3	
	100 S	85	10	50	x	x	3	
	125 S	160	10	85	x	x	5	
	150 S	20	25	75	x	x	44	
	175 S	100	5	70	x	x	2	
	200 S	20	10	90	x	x	x	

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location		Elements (ppm) 1981					1984	Remarks
		Cu	Pb	Zn	Ag	Au	As	
300 E	225 S	35	10	60	x	x	1	
	250 S	90	5	85	x	x	x	
	275 S	45	5	30	x	x	1	
	300 S	60	5	40	x	x	2	
	325 S	135	10	60	x	x	4	
	350 S	125	10	80	x	x	2	
	375 S	200	10	100	x	x	7	
400 E	025 S	x	x	x	0.5	x	2	
	050 S	10	x	5	x	x	2	
	075 S	55	x	15	x	x	5	
	100 S	90	x	20	x	x	6	
	125 S	45	x	25	x	x	7	
	150 S	10	x	10	x	x	3	
	175 S	10	x	5	x	x	2	
	200 S	145	x	40	x	x	17	
	225 S	105	x	50	x	x	5	
	250 S	25	x	50	x	x	1	
	275 S	30	x	50	x	x	x	
	300 S	405	x	245	x	x	1	
	325 S	135	x	110	x	x	1	
	350 S	130	x	65	x	x	2	
	375 S	45	x	80	x	x	x	
	400 S	30	x	25	x	x	2	
	425 S	10	x	10	x	x	3	
	450 S	x	x	10	0.5	x	1	
	475 S	50	x	20	x	x	3	

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location		Elements (ppm) 1981					1984	Remarks
		Cu	Pb	Zn	Ag	Au	As	
500 E	025 S	10	x	35	x	x	4	
	050 S	60	x	55	x	x	7	
	075 S	40	x	45	x	x	4	
	100 S	20	x	15	x	x	5	
	125 S	20	x	70	x	x	6	
	150 S	85	x	210	x	x	6	
	175 S	155	x	285	x	x	3	
	200 S	45	x	425	x	x	x	
	225 S	80	x	155	x	x	1	
	250 S	135	x	270	x	x	2	
	275 S	225	x	120	x	x	2	
	300 S	205	x	75	x	x	4	
	325 S	265	5	40	x	0.03	3	
	350 S	185	5	25	x	x	2	
	375 S	105	5	25	x	x	2	
	400 S	100	10	60	x	x	1	
	425 S	30	5	10	x	x	2	
	450 S	15	10	5	x	x	1	
600 E	025 S	30	5	20	x	x	4	
	050 S	40	10	55	x	x	8	
	075 S	30	10	30	x	x	6	
	100 S	5	10	10	x	x	2	
	125 S	45	20	115	x	x	2	
	150 S	80	30	160	x	x	2	
	175 S	45	35	90	x	x	1	

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location		Elements (ppm) 1981					1984	Remarks
		Cu	Pb	Zn	Ag	Au	As	
600 E	200 S	80	20	80	x	x	2	
	225 S	40	25	55	x	x	4	
	250 S	100	15	80	x	x	3	
	275 S	265	5	195	x	x	x	
	300 S	110	15	150	x	x	2	
	325 S	190	10	170	x	x	2	
	350 S	250	10	160	x	x	x	
	375 S	85	5	225	x	x	x	
	400 S	230	15	130	x	x	1	
	425 S	200	5	115	x	x	3	
	450 S	115	10	95	0.5	x	3	
	475 s	110	5	85	x	x	6	
700 E	025 S	5	5	5	0.5	x	1	
	050 S	20	5	5	0.5	x	3	
	075 S	75	15	140	x	x	10	
	100 S	120	5	110	x	x	2	
	125 S	90	10	95	x	x	2	
	150 S	110	15	125	x	x	1	
	175 S	140	25	140	x	x	x	
	200 S	70	10	105	x	x	x	
	225 S	115	15	145	x	x	1	
	250 S	40	10	135	x	x	1	
	275 S	60	x	210	0.5	x	2	
	300 S	95	x	145	x	x	1.5	
	325 S	130	x	425	x	x	1	
	350 S	150	x	280	x	x	1	

298119

A5.7

SOIL SAMPLE DATA
DAVIS CREEK AND SPECIMEN CREEK GRID SERIES

Location	Elements (ppm) 1981 Cu	Pb	Zn	Ag	Au	1984 As	Remarks
BASELINE 000	270	x	110	x	x	4	
025	80	x	30	x	x	2	
050	45	x	25	x	x	1	
075	90	x	60	x	x	1	
100	345	x	240	x	x	2	
125	160	x	160	x	0.03	1	
150	195	60	175	x	x	I.S	
175	125	x	55	x	x	x	
200	125	x	55	x	x	3	
225	75	x	45	x	x	3	
250	75	x	55	x	x	3	
275	45	x	50	x	x	3	
300	45	x	30	x	x	6	
325	10	x	35	x	x	5	
350	55	x	90	x	x	5	
375	70	x	80	x	x	3	
400	20	x	25	x	x	4	
425	20	x	25	x	x	5	
450	20	x	25	x	x	10	
475	5	x	15	x	x	4	
500	10	x	15	x	x	2	
525	5	x	40	x	x	4	
550	20	x	50	x	x	3	
575	90	x	70	x	x	1	
600	15	x	30	x	x	I.S	
625	10	x	10	x	x	5	
650	x	x	x	x	x	x	
675	x	x	x	x	x	x	
700	x	x	5	x	x	1	

APPENDIX 6

Soil Sample Data - Golden Ridge Series
Location, horizon, description and analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2491
236.1 08: - 2491E

SOIL SAMPLE DATA
GOLDEN RIDGE

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
02000	50300	1.00	C	blue grey	schists? slate	
	50275	0.90	C	cream	white (talcose?) schists	
	50250	0.60	C	cream	white (talcose?) schists	
	50225	1.00	C	brown	pale schists	
	50200	1.30	C	chocolate brown	brown schists	
	50175	1.40	C	chocolate brown	brown & green schists	
	50150	1.30	B	cream	gravels	could not penetrate gravels
	50125	1.20	C	cream	light brown & cream schists ptygmatic quartz	
	50100	0.50	C	light brown	grey/green schist	
	50075	0.80	C	cream	pale mica schist	
	50050	1.00	C	cream	pale green/grey schist	
	50025	1.20	C	brown	pale green/grey schist	
	50000	1.20	C	light brown	pale green schist	
	49975	0.60	C	grey/green	schists	
	49950	1.40	C	brown silver/grey	schists	
	49925	1.30	C	brown/ pale olive	schistose	
	49900	0.60	C	grey	grey schists.Ptygmatic qtz	
	49875	0.60	C	grey/olive	grey schists	
	49850	0.60	C	cream	white (talcose?) schists	
	49825	0.20	C	green/light brown	thin laminated schists	
	49800	0.40	C	light brown	schistose	
	49790	0.60	C	brown/green	mica schists	
	49780	0.70	C	brown/green	mica schists	
	49770	0.40	C	cream	sandy schists?	
	49760	0.40	C	brown/green	mica schists	

SOIL SAMPLE DATA
GOLDEN RIDGE

Location North	Location East	Elements (ppm) Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	Remarks
02000	50300	5	x	15	x	2	x	345	5		3	1	
	50275	x	x	5	x	x	x	389	11		x	x	
	50250	x	x	5	x	x	x	282	11		5	x	
	50225	x	x	5	x	x	3	396	x		x	x	
	50200	x	x	5	x	x	x	354	10		x	x	
	50175	x	x	5	x	x	x	227	x		x	x	
	50150	x	x	10	x	x	x	5	x		x	x	
	50125	x	x	10	x	x	x	297	x		x	x	
	50100	x	x	5	x	x	x	332	9		x	x	
	50075	x	x	5	x	x	x	149	3		x	x	
	50050	x	x	x	x	x	x	218	7		x	x	
	50025	x	x	5	x	x	3	269	5		x	x	
	50000	x	x	10	x	x	x	304	11		x	x	
	49975	x	x	60	x	x	x	325	x		3	x	
	49950	x	x	10	x	x	x	391	x		x	x	
	49925	x	x	75	x	x	x	147	x		x	x	
	49900	x	x	20	x	x	x	199	7		x	x	
	49875	25	5	60	x	12	x	253	3		3	x	
	49850	x	x	5	x	x	x	182	9		x	x	
	49825	x	x	35	x	1	x	213	x		3	x	
	49800	5	10	10	x	1	x	254	x		x	x	
	49790	x	x	5	x	1	x	332	x		x	x	
	49780	5	25	10	x	2	x	516	x		3	x	
	49770	x	x	10	x	1	x	284	14		x	x	
	49760	x	5	10	x	x	x	370	5		x	x	

SOIL SAMPLE DATA
GOLDEN RIDGE

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
02000	49750	0.50	C	light green	schists	
	49740	1.10	C	light brown	"	
	49730	1.00	C	light green	"	
	49720	0.60	C	silver grey	"	
	49710	0.50	C	" "	"	
	49700	0.90	C	grey cream	sandy mica schist	
	49690	1.20	C	" "	grey green mica schist	
	49680	0.60	C	cream	schistose? sandy	very hard
	49670	0.50	C	silver grey	schists	
	49660	0.30	C	" "	schists. Ptygmatic quartz	
	49650	1.10	C	silver grey	schists	
	49640	1.00	C	grey/brown/ cream	schistose	no gravel sample
	49630	0.80	C	" "	"	
	49620	0.80	C	" "	Similar, Some iron stain	
	49610	0.80	C	" "	Similar, grey schists	
	49600	0.80	C	yellow brown /grey	grey schists	
	49590	0.70	C	light brown /yellow brown	sandy schists?	
	49580	0.30	C	grey	schists	no gravel sample
	49570	0.30	C	"	"	" " "
	49560	0.30	C	"	similar, Sandy	" " "
	49550	0.70	C	yellow brown /grey	grey green schists	
	49540	0.40	C	" "	" " "	no gravel sample
	49530	0.90	C	" "	" " "	
	49520	0.60	C	silver grey	schists	no gravel sample
	49510	0.30	C	" "	"	" " "

122A

298124

A6.5

SOIL SAMPLE DATA
GOLDEN RIDGE

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
02000	49750	x	x	5	x	x	x	423	9		x	x	
	49740	x	x	10	x	x	x	685	x		x	x	
	49730	x	x	5	x	x	x	245	5		x	x	
	49720	x	x	5	x	x	x	419	x		x	x	
	49710	x	x	5	x	x	x	255	3		x	x	
	49700	x	x	x	x	x	x	126	15		x	x	
	49690	x	x	5	x	x	3	280	15		x	x	
	49680	x	x	5	x	x	x	264	x		5	x	
	49670	x	x	5	x	x	x	446	15		x	x	
	49660	x	x	5	x	x	3	488	10		x	x	
	49650	25	x	5	x	12	x	460	7		5	x	
	49640	10	5	10	x	3	x	381	14		4	x	
	49630	25	10	25	x	18	3	450	x		x	x	
	49620	10	x	10	x	8	x	380	15		x	x	
	49610	20	x	20	x	7	x	498	11		4	x	
	49600	40	x	25	x	12	x	460	14		x	x	
	49590	10	x	5	x	4	x	268	x		x	x	
	49580	5	5	5	x	1	3	447	8		x	x	
	49570	5	x	5	x	2	x	462	4		4	x	
	49560	5	x	10	x	3	x	208	8		4	x	
	49550	30	5	30	x	7	x	454	x		x	x	
	49540	40	5	25	x	8	x	418	x		x	x	
	49530	35	15	25	x	11	4	462	24		x	x	
	49520	35	45	40	x	8	x	460	10		x	x	
	49510	5	x	10	x	2	x	289	17		x	x	

SOIL SAMPLE DATA
GOLDEN RIDGE

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
02000	49500	0.30	C	silver grey	schists	no gravel sample
	49490	0.30	C	grey	grey green schists	" " "
	49480	0.40	C	silver grey	schists	
	49470	0.90	C	yellow brown/grey	schistose	
	49460	0.90	C	" "	grey schists	
	49450	0.60	C	" "	" "	
	49440	1.10	C	brown	schistose	
	49430	0.30	C	brown/grey	grey schists	
	49420	0.75	C	brown	schists	
	49410	1.10	C	chocolate/brown	schists	
	49400	1.00	C	brown/cream	schistose	
	49375	0.80	C	olive	schists	
	49350	0.30	C	cream	sandy (schists?)	
	49325	1.30	C	orange/cream	sandy	
	49300	0.80	C	cream	"	
	49275	0.80	C	"	"	
	49250	1.20	C	brown/olive	schists	
	49225	0.80	C	cream	sandy	
	49200	0.50	C	brown/olive	silver/green schists	
	49175	0.80	C	cream/ light brown	schists	
	49150	0.70	C	brown	schists	
	49125	0.40	C	brown/light brown	"	
	49100	0.40	C	light brown/ light green	schistose	
	49075	0.60	C	light brown/ yellow brown	green schist	no gravel sample
	49050	0.50	C	brown/ light green	" "	" " "
	49025	1.20	C	yellow brown	" "	" " "
	49000	1.10	C	" "	" "	" " "

123 A

298126

A6.7

SOIL SAMPLE DATA
GOLDEN RIDGE

Location North	Location East	Cu	Pb	Zn	Elements (ppm) Ag	As	Sn	Ba	Te	Ni	Sb	Au	Remarks
02000	49500	45	10	60	x	28	x	554	11		6	T	
	49490	x	x	10	x	1	x	177	10		x	x	
	49480	x	x	5	x	2	x	365	11		x	x	
	49470	5	x	30	x	16	x	424	x		5	x	
	49460	20	5	30	x	13	x	475	3		x	x	
	49450	10	5	10	x	23	4	650	19		x	x	
	49440	10	x	10	x	x	x	553	11		3	x	
	49430	5	x	5	x	x	x	601	4		x	x	
	49420	x	x	10	x	1	x	279	x		x	x	
	49410	5	5	50	x	1	x	x	11		x	x	
	49400	15	40	10	x	28	x	203	11		10	x	
	49375	10	15	145	x	1	x	x	x		x	x	
	49350	5	x	5	x	2	x	161	x		x	x	
	49325	5	x	10	x	16	x	428	12		x	x	
	49300	x	x	5	x	1	x	175	17		5	x	
	49275	5	x	5	x	x	x	146	10		4	x	
	49250	10	10	95	x	4	x	x	12		3	x	
	49225	x	x	5	x	2	x	139	14		3	x	
	49200	x	x	15	x	x	x	212	6		x	x	
	49175	x	x	5	x	1	x	281	13		5	x	
	49150	x	x	10	x	1	x	339	8		6	x	
	49125	x	5	40	x	x	x	112	x		3	x	
	49100	5	x	35	x	3	x	180	17		x	x	
	49075	10	x	10	x	3	x	251	4		4	x	
	49050	5	x	15	x	2	x	245	5		3	x	
	49025	30	5	25	x	8	x	186	11		3	x	
	49000	30	10	45	x	5	x	174	2		x	T	

APPENDIX 7

Soil Sample Data - Waterfall Creek Magnetic Anomaly Series
Location, analysis and remarks

Analytical Report Number

Amdel Report: - 3380/84

298128

A7.2

SOIL SAMPLE DATA
WATERFALL CREEK MAGNETIC ANAMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	As	Co	Sn	W	Bi	Ni	Ba	Au	
00.30	45350	56	<2	110	<2	46	<4	10	4	86	740	<.05	
	45325	250	<2	76	3	40	4	<10	4	76	210	<.05	
	45300	16	<2	66	2	16	10	10	<4	50	980	<.05	
	45275	80	<2	60	3	20	<4	10	<4	46	470	<.05	
	45250	220	<2	120	2	70	4	<10	4	96	120	<.05	
	45225	150	<2	38	16	10	4	<10	<4	40	250	<.05	
	45200	210	<2	70	15	20	<4	15	<4	86	230	<.05	
	45175	340	<2	86	16	30	<4	<10	<4	120	130	<.05	
	45150												Quartz gravels
	45125												No samples
	45100												taken.
	45075												"
	45050												"
	45025												"
00.10	44850	100	<2	66	4	26	4	15	<4	86	45	<.05	
	44875	60	<2	50	4	20	6	10	<4	70	45	<.05	
	44900	80	<2	50	6	20	<4	10	<4	70	990	<.05	
	44925	310	<2	96	5	190	8	<10	4	110	170	<.05	
	44950	38	<2	36	10	10	8	<10	<4	20	430	<.05	
	44975	56	<2	100	28	10	<4	10	<4	66	370	<.05	
	45000	120	11	80	13	36	4	20	<4	90	980	0.20	
	45025	150	<2	100	4	56	14	10	<4	100	550	<.05	
	45050	510	<2	46	38	26	4	<10	<4	60	140	<.05	
	45075	460	<2	130	6	70	10	<10	4	160	190	<.05	
	45100	200	<2	100	<2	100	4	<10	4	100	75	<.05	

SOIL SAMPLE DATA
WATERFALL CREEK MAGNETIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	As	Co	Sn	W	Bi	Ni	Ba	Au	
00.10	45125	140	6	48	<2	56	<4	15	<4	56	350	<.05	
	45150	200	<2	90	4	56	6	<10	<4	80	180	<.05	
	45175	76	<2	86	2	30	<4	10	<4	56	760	<.05	
	45200	110	<2	60	3	20	8	10	4	40	210	<.05	
	45225	96	12	60	4	20	8	15	<4	40	230	<.05	
	45250	140	2	66	2	20	4	10	<4	56	220	<.05	
	45275	180	<2	120	<2	70	<4	10	<4	76	170	<.05	
	45300	66	6	36	2	6	<4	15	<4	40	450	<.05	
	45350	12	<2	70	<2	36	4	<10	<4	56	300	<.05	
	45400	66	<2	96	<2	46	<4	15	<4	66	470	<.05	
	45450	26	8	60	2	100	<4	10	<4	50	370	<.05	
	45500	110	5	36	<2	36	6	10	<4	36	340	<.05	
	45550	120	15	96	<2	26	<4	<10	<4	66	350	<.05	
	45600	110	3	22	<2	10	4	10	<4	36	260	<.05	
	45650	48	<2	40	<2	26	4	10	4	100	190	<.05	
99.90	44800	100	<2	100	5	30	6	10	<4	96	630	<.05	
	44825	110	<2	86	22	30	<4	<10	<4	140	410	<.05	
	44850	86	<2	80	11	110	4	<10	4	140	450	<.05	
	44875	110	<2	110	<2	76	8	<10	<4	240	120	<.05	
	44900	210	<2	60	<2	140	6	15	<4	76	55	<.05	
	44925	200	<2	110	<2	20	<4	<10	<4	76	60	<.05	
	44950	220	<2	130	<2	56	6	10	<4	90	80	<.05	
	44975	86	<2	16	2	340	4	15	<4	40	140	<.05	
	45000	86	<2	48	6	36	<4	<10	<4	100	280	<.05	
	45025	140	<2	70	27	16	6	10	4	110	520	<.05	

298130

A7.4

SOIL SAMPLE DATA
WATERFALL CREEK MAGNETIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	As	Co	Sn	W	Bi	Ni	Ba	Au	
99.90	45050	180	<2	130	28	50	6	10	<4	110	160	<.05	
	45075	120	<2	100	4	76	<4	10	<4	86	140	<.05	
	45100	20	<2	34	3	10	6	10	4	30	270	<.05	
99.925	45000	140	<2	46	9	36	<4	<10	<4	46	450	<.05	
99.950		490	<2	48	7	10	4	<10	<4	66	250	<.05	
99.975		90	<2	46	<2	60	<4	<10	<4	100	85	<.05	
00.000		250	<2	76	<2	80	<4	10	<4	66	440	<.05	
00.025		170	<2	130	<2	96	6	10	<4	130	110	<.05	
00.050		96	<2	76	11	30	<4	10	<4	96	240	<.05	
00.075		86	13	80	11	30	<4	<10	<4	110	740	<.05	
00.100		120	11	80	13	36	4	<20	<4	90	980	0.20	anomalous Au sample
00.125		120	<2	100	16	96	4	<10	<4	130	780	<.05	
00.150		140	8	100	10	36	8	<10	<4	86	890	<.05	
00.175		46	<2	80	22	10	8	<10	<4	70	610	<.05	
00.200		34	<2	46	<2	30	4	<10	<4	70	600	<.05	rock chip sample
00.225		12	<2	42	<2	26	<4	<10	<4	90	600	<.05	
00.250													Quartz gravels
00.275													No sample
00.300													taken.

APPENDIX 8

Soil Sample Data - Timbs Creek Series
Location, horizon, description and analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2450B
236.1 08: - 2491B
236.1 08: - 2491D

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
92000	47500	1.10	C	light brown /white	White mica (schist?)	
	47475	0.80	C	"	"	
	47450	0.80	C	light brown /brown	White mica (schist) ptygmatic quartz	
	47425	0.75	C	brown	green mica schist	
	47400	0.50	C	"	brown mica schist	
	47375	0.75	C	"	" " "	
	47350	1.20	B/C	"	brown mica schist some gravel	partly b horizon
	47325	0.60	C	"	brown mica schist	
	47300	0.75	C	brown/green	(massive) green mica schist	
	47275	0.75	C	"	non-foliated green mica schist	
	47250	0.75	C	"	"	
	47225	0.75	C	"	"	
	47200	0.50	C	grey green	green mica schist	
	47175	1.10	C	yellow brown	"	
	47150	1.20	C	light brown /green	chlorite clots -silts?	B horizon below gravels
	47125	1.50	B	cream	surficial gravels	maximum depth of auger
	47100	1.50	B	cream	"	"
	47075	0.50	B	cream	"	hardpan, 4 attempts
	47050	1.50	C	light brown	tertiary clays	
	47025	1.20	C	yellow brown /dark brown	relic banding -silts?	
	47000	1.10	C	green/brown	chlorite schists	
	46975	1.20	C	green	similar sandy texture	
	46950	0.75	C	"	"	
	46925	1.20	C	"	"	
	46900	0.80	C	green/brown	green mica schist	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Elements (ppm)										Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
92000	47500	10	10	10	x	x	x	808	x	25		x	
	47475	15	10	20	x	x	x	780	x	35		x	
	47450	x	5	5	x	3	x	252	4	15		x	
	47425	10	10	20	x	x	x	345	x	50		x	
	47400	20	10	5	x	x	x	272	x	30		x	
	47375	5	15	5	x	x	x	362	x	20		x	
	47350	5	x	5	x	x	x	188	8	10		x	
	47325	5	15	5	x	x	x	178	5	15		x	
	47300	160	15	50	x	x	x	119	x	95		x	
	47275	10	10	45	x	x	x	590	6	85		x	
	47250	40	10	70	x	x	x	360	4	85		x	
	47225	110	15	190	x	4	x	232	x	85		x	
	47200	745	155	100	240	100	3	510	x	45		x	
	47175	75	x	55	x	4	x	553	x	65		x	
	47150	65	20	80	x	1	x	313	x	75		x	
	47125	5	10	5	0.5	x	36	14	x	10		x	
	47100	x	x	30	0.5	x	46	x	x	5		x	
	47075	5	x	5	0.5	x	21	14	6	10		x	
	47050	5	10	5	0.5	x	20	x	x	10		x	
	47025	15	10	40	x	x	6	63	x	30		x	
	47000	35	10	115	x	x	x	308	x	70		x	
	46975	50	20	125	x	1	x	223	8	130		x	
	46950	420	45	280	x	1	x	97	25	105		x	
	46925	15	x	135	x	1	x	134	9	70		x	
	46900	45	5	110	x	1	x	292	x	70		x	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
92000	46875	1.00	C	green brown	mottled brown/green sandstone? schist?	
	46850	0.75	C	yellow brown	brown sandstone? Mn or Fe	
	46825	1.00	C	green brown	green mica schist	
	46800	1.10	C	brown/light green	mottled green schist?	
	46775	1.00	C	"	green chlorite schist?	
	46750	0.80	C	"	"	
	46725	0.50	C	light green	"	
	46700	1.00	C	brown	green & brown mica schist	
	46675	0.75	C	"	similar ptygmatic quartz	
	46650	1.00	C	brown & green	mica schist	
	46625	0.75	C	"	green mica schist	
	46600	0.50	C	light brown	light brown & green mica schist	
	46575	0.50	C	red brown	green schists?	
	46550	0.50	C	light brown	green schist	
	46525	0.50	C	"	"	
	46500	0.75	C	light brown	green schist	
	46475	0.80	C	yellow brown	yellow brown & green schists	
	46450	1.00	C	light brown/ yellow brown	schist & micaceous sandstone	Adjacent to creek. May be transporte
	46425	1.20	C	yellow brown	metasilt?? metavolcanics	
	46400	1.00	C	"	"	
	46375	0.75	C	"	"	
	46350	0.50	C	"	"	
	46325	0.30	C	"	"	
	46300	0.40	C	"	"	
	46275	0.30	C	"	similar,some green chips	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
92000	46875	35	5	95	x	1	x	208	x	60		x	
	46850	680	15	150	x	20	x	197	8	115		x	
	46825	250	x	95	x	3	x	44	x	65		x	
	46800	35	10	30	x	x	x	468	7	60		x	
	46775	5	15	100	x	x	x	409	x	90		x	
	46750	x	10	90	x	x	x	427	9	65		x	
	46725	x	10	95	x	x	x	320	5	55		x	
	46700	120	10	60	x	x	x	378	x	45		x	
	46675	x	x	25	x	x	x	125	x	15		x	
	46650	5	x	130	x	x	x	111	x	85		x	
	46625	35	20	225	x	x	x	272	22	80		x	
	46600	5	15	55	x	x	x	448	9	45		x	
	46575	20	20	85	x	2	x	485	7	70		x	
	46550	20	40	70	x	3	x	427	10	45		x	
	46525	x	10	60	x	x	x	419	11	35		x	
	46500	x	5	40	x	x	x	414	x	30		x	
	46475	65	10	115	x	1	x	513	7	80		x	
	46450	35	5	60	x	x	6	264	x	45		x	
	46425	155	10	60	x	6	x	11	x	105		x	
	46400	305	5	115	x	6	x	23	4	155		x	
	46375	230	20	65	x	5	x	22	x	110		x	
	46350	145	10	70	x	2	x	24	9	85		x	
	46325	70	5	35	x	1	x	x	x	50		x	
	46300	210	15	50	x	3	x	x	15	70		x	
	46275	260	5	60	x	3	x	x	17	70		x	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
92000	46250	0.40	C	yellow brown	similar	minor Fe or Mn stain
	46225	1.00	C	"	similar,thinly banded	
	46200	1.00	C	yellow brown /red brown	" "	
	46175	0.75	C	brown green	green medium grained schist?	
	46150	0.50	C	"	similar (no schistosity?)	
	46125	1.00	C	brown	medium grained green & brown meta volcanic??	Adjacent to creek May be transported
	46100	0.90	C	dark brown	" "	
	46075	0.75	C	"	Fine-medium grained closely jointed rock	Fe or Mn stain
	46050	1.30	C	yellow brown	sandy texture M.G.Rock	
	46025	0.50	C	light green /brown	relic medium grained rock	
	46000	1.20	C	light brown	sandstone? or volcanic? brown medium grained	Adjacent to creek May be transported
	45975	1.20	C	"	green. similar	
	45950	0.75	C	light brown /green	green mica schist ptygmatic quartz	
	45925	1.00	C	light green /brown	granular green schist	
	45900	0.20	C	brown/ light green	thin laminated green schist	
	45875	0.40	C	"	schistose?	
	45850	0.75	C	green	granular greenschist	
	45825	1.00	C	tan/green	coarse,granular greenschist	"schistose" clays
	45800	0.75	C	"	" " "	
	45775	1.00	C	"	" " "	
	45750	1.00	C	yellow brown	schistose	
	45725	1.40	C	tan/green	granular greenschist	
	45700	1.40	C	"	" "	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location North	Location East	Cu	Pb	Zn	Elements (ppm) Ag	As	Sn	Ba	Te	Ni	Sb	Au	Remarks
92000	46250	320	30	65	x	20	x	17	x	80		x	
	46225	210	10	70	x	6	x	x	27	60		x	
	46200	240	10	55	x	x	x	x	x	60		x	
	46175	195	10	90	x	1	x	39	19	65		x	
	46150	175	10	145	x	x	x	x	16	75		x	
	46125	340	5	105	x	2	x	21	x	75		x	
	46100	450	5	130	x	1	x	22	8	65		x	
	46075	490	x	125	x	1	x	x	8	45		x	
	46050	185	30	45	x	20	x	x	26	50		x	
	46025	390	10	155	x	x	x	x	6	70		x	
	46000	360	10	120	x	4	x	43	x	70		x	
	45975	190	15	100	x	1	x	269	x	65		x	
	45950	15	15	70	x	1	x	518	11	55		x	
	45925	10	15	65	x	x	x	740	x	50		x	
	45900	5	15	60	x	1	x	645	x	40		x	
	45875	25	20	45	x	1	x	454	x	65		x	
	45850	35	15	90	x	1	x	68	28	55		x	
	45825	15	5	95	x	2	x	422	28	55		x	
	45800	50	5	80	x	3	x	229	x	50		x	
	45775	95	15	100	x	2	x	587	8	65		x	
	45750	165	20	120	x	7	5	485	4	95		x	
	45725	75	10	115	x	4	3	794	13	70		x	
	45700	75	15	90	x	6	x	541	15	65		x	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
91800	45700	0.5	C	olive/brown	greenschist	
	45675	1.00	C	olive/light green	"	
	45650	1.40	C	olive/brown	"	
	45625	1.00	C	brown	brown/grey schists	
	45600	1.00	C	olive/brown	greenschist	
	45575	0.40	C	yellow-red-brown/green	"	
91750	45575	0.50	C	brown	brown/grey schists	
	45550	0.50	C	chocolate/brown	brown schist	
	45525	0.50	C	creamy light green	granular? greenschist	
	45500	0.50	C	light green	greenschist	
	45475	1.40	C	brown	cream schists	
	45450	1.00	C	light green	greenschist	
	45425	0.40	C	brown/green	"	
	45400	1.00	C?	cream/white	sands	may be tertiary
	45375	0.50	C	cream	schists	
	45350	0.70	C	cream/light green	greenschists	sands above this
	45325	0.60	C	cream/brown	schists	
	45300	0.80	C	"	"	
	45275		TERTIARY,	surficial	sands and gravels	
	45250		"	"	" " "	
	45225		"	"	" " "	
	45200		"	"	" " "	
	45175	1.65	C	cream,pale green	pale green schists	sands above this
	45150	0.90	C	pale green tan	" " "	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location North	East	Cu	Pb	Zn	Elements (ppm) Ag	As	Sn	Ba	Te	Ni	Sb	Au	Remarks
91800	45700	40	5	80	x	x	x	421	x	55		x	
	45675	30	5	75	x	6	4	382	x	55		x	
	45650	210	15	100	x	6	x	34	8	65		x	
	45625	5	10	10	x	x	x	442	x	15		x	
	45600	5	5	50	x	x	x	261	4	35		x	
	45575	10	185	60	x	43	x	882	10	45		x	
91750	45575	x	25	5	x	2	3	681	14	10		x	
	45550	20	40	10	x	36	x	778	28	25		x	
	45525	x	5	35	x	x	x	701	x	20		x	
	45500	10	25	50	x	15	x	508	4	45		x	
	45475	10	5	10	x	5	-	-	-	20		x	
	45450	25	5	90	x	x	x	269	6	55		x	
	45425	10	25	50	x	11	x	481	23	55		x	
	45400	x	x	x	x	x	I.S.	I.S.	I.S.	5		x	
	45375	x	55	5	x	x	-	-	-	10		x	
	45350	x	15	30	x	x	x	939	6	25		x	
	45325	x	10	15	x	2	x	899	29	15		x	
	45300	x	x	5	x	x	x	735	x	10		x	
	45275	x	x	x	x	x	x	240	x	5		x	
	45250	x	x	x	x	x	x	391	x	10		x	
	45225	x	x	x	x	x	x	10	17	10		x	
	45200	x	x	x	x	x	x	17	16	5		x	
	45175	45	15	120	x	9	x	520	4	45		x	
	45150	10	x	230	x	4	x	318	11	150		x	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
91750	45125	1.50	C	tan/brown	quartz green schist	large metamorphic qtz crystals in schist
	45100	1.75	B	dark brown	cream mica schist	3 holes drilled without success
	45075	1.60	C	pale green	greenschist	
	45050	1.00	C	pale blue	blue slate	
	45025	1.20	C	blue grey	" "	kaolin present
	45000	1.50	C	mottled tan/red	green schists	
	44975	1.75	B	tan	cream schists	
	44950	1.50	C	tan/brown	" "	
	44925	1.75	B	tan	dark green, dense	non-schistose
	44900	1.00	C	red brown	amphibolite?	dense, dark clasts
	44875	1.10	C	red brown	"	Mn stains
	44850	1.40	C	blue/tan	blue foliated slate	
	44825	1.10	C	tan	dark green slate	
	44800	1.40	C	red brown	amphibolite?	dense dark non-schistose clasts
	44775	1.20	C	green/tan	green slate	foliated clays
	44750	1.75	B	orange	-	transported'B' clays gully wall.
	44725	1.40	C	pale blue	blue slate	
	44700	1.70	C	grey green	green slate	
	44675	1.20	C	cream/blue	blue grey slate	
	44650	1.10	C	grey	dark,dense amphibolite?	
	44625	1.65	C	grey	"	
	44600	1.20	C	cream/green	green slate	
	44575	1.20	C	tan/green	" "	
	44550	1.70	B/C?	tan	Fe stained slate	2 holes attempted

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
91750	45125	5	x	20	x	1	x	642	3	20		x	
	45100	25	90	45	x	12	x	735	3	50		x	
	45075	115	25	235	x	24	x	548	22	90		x	
	45050	15	x	125	x	3	x	532	20	100		0.010	
	45025	20	5	35	x	9	x	359	8	30		x	
	45000	80	30	75	x	43	x	268	x	35		x	
	44975	110	50	35	x	30	x	331	9	30		x	
	44950	25	x	20	x	1	x	333	14	35		x	
	44925	40	5	40	x	x	-	-	-	40		x	
	44900	205	15	85	x	1	x	x	48	70		x	
	44875	340	x	50	x	x	x	x	27	40		x	
	44850	80	10	10	x	41	x	137	28	20		x	
	44825	170	x	145	x	x	x	37	32	100		x	
	44800	305	5	120	x	2	x	113	12	80		x	
	44775	100	x	60	x	5	x	56	31	90		x	
	44750	135	55	40	x	24	3	515	23	45		x	
	44725	50	x	10	x	4	x	269	32	40		x	
	44700	105	x	35	x	x	x	x	33	45		x	
	44675	85	x	65	x	x	x	114	11	45		x	
	44650	90	30	40	x	39	x	1390	28	95		x	
	44625	115	5	110	x	95	x	211	10	70		x	
	44600	65	180	5	x	50	x	952	7	15		x	
	44575	35	25	40	x	8	x	444	14	120		x	
	44550	80	55	20	x	44	x	625	27	40		x	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
91750	44525	1.00	C	dark green	grey green slate	
	44500	1.65	B	brown	slate	probably transported clasts
	44475	1.75	B	orange	slate	2 holes attempted
	44450	1.50	C	tan/green	green slate	
	44425	1.10	C	pale blue pale tan	blue slate	* 10m north of line
	44400	1.30	C	" "	" "	
	44375	1.50	C	" "	" "	* 10m south of line
	44350	1.40	C	" "	" "	* 5m north of line
	44325	1.50	B/C?	brown	Fe stained slate	* 2 holes attempted
	44300	1.50	B/C?	"	"	"
	44275	1.60	C	mottled tan red & green	"	Mn stains
	44250	1.20	C	"	"	"
	44225	1.60	C	"	"	* Mineralised nodule
	44200	1.30	C	"	"	Mn stains
	44175	1.65	C	cream/tan	cream slate	
	44150	0.75	C	"	"	

SOIL SAMPLE DATA
TIMBS CREEK SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
91750	44525	75	20	70	x	18	x	357	10	135		x	
	44500	20	10	20	x	23	-	-	-	30		x	
	44475	85	10	20	x	33	x	1100	18	35		x	
	44450	75	5	35	x	21	x	1830	x	40		x	
	44425	120	5	30	x	1	x	35	24	30		x	
	44400	210	x	20	x	1	x	x	16	60		x	
	44375	215	x	165	x	x	x	198	x	115		x	
	44350	210	x	75	x	1	x	108	x	120		x	
	44325	150	x	120	x	2	x	664	x	200		x	
	44300	395	x	70	x	x	x	62	15	95		x	
	44275	290	x	140	x	x	x	29	x	85		x	
	44250	990	x	70	x	1	x	177	20	125		x	
	44225	120	x	40	x	1	x	x	20	70		x	
	44200	75	x	20	x	x	x	x	20	70		x	
	44175	180	x	10	x	1	x	17	21	65		x	
	44150	165	5	80	x	1	x	x	38	40		x	

APPENDIX 9

Soil Sample Data - Timbs Creek Silver Anomaly Series
Location, horizon, description and analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2491B
236.1 08: - 2491D

SOIL SAMPLE DATA
TIMBS CREEK SILVER ANOMALY SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
92050	47175	0.70	C	Brown	Green schist	
	47180	0.60	C	"	Schistose	
	47185	0.50	C	"	"	
	47190	0.60	C	Brown/olive	Green/grey schists	
	47195	0.70	C	"	" "	
	47200	1.00	C	Olive	" "	
	47205	0.50	C	Silver brown	Fawn schists	
	47210	0.70	C	Mustard brown	Green schist	
	47215	0.50	C	Chocolate brown	Schists	
	47220	1.00	C	Green grey	Green schist	
	47225	0.50	C	Green brown	" "	
92000	47180	1.00	C	Brown	Silver grey schist	
	47185	0.60	C	Olive grey	Green schist	
	47190	0.60	C	Chocolate brown	Schistose	
	47195	0.60	C	Olive brown	Green schist	
	47200	0.50	C	Grey green	Green schist	* See below
	47205	0.50	C	Grey brown	Grey mica schist	
	47210	0.60	C	Blue grey	Silver schist	
	47215	0.60	C	Grey green	" "	
	47220	1.00	C	Grey brown	" "	
91950	47175	0.60	C	Brown green	green schist	
	47180	0.50	C	Green	" "	
	47185	0.60	C	"	" "	
	47190	0.50	C	"	Green schist(granular?)	
	47195	0.50	C	"	" "	

* This sample is a re-drill of this point on Timbs Creek Grid.

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A9.3

SOIL SAMPLE DATA
TIMBS CREEK SILVER ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	
92050	47175	60	5	45	x	3	6	368	8	50		x	
	47180	5	x	80	x	2	x	640	9	60		x	
	47185	15	20	80	x	1	x	370	x	40		x	
	47190	20	15	100	x	1	x	x	6	75		x	
	47195	30	15	125	x	1	x	30	10	80		x	
	47200	275	5	190	x	1	x	x	12	105		x	
	47205	50	10	105	x	3	x	591	3	20		x	
	47210	180	135	420	x	100	x	616	11	55		x	
	47215	20	5	60	x	x	x	753	5	30		x	
	47220	5	x	120	x	x	x	441	8	100		x	
	47225	60	10	140	x	x	x	697	7	85		x	
92000	47180	x	x	25	x	1	x	649	x	30		x	
	47185	5	5	160	x	1	x	58	9	130		x	
	47190	25	10	65	x	1	3	455	6	50		x	
	47195	150	15	105	x	2	x	503	x	50		x	
	47200	230	50	35	x	22	x	590	17	55		x	
	47205	645	660	160	1.5	260	x	526	14	90		x	
	47210	245	65	65	x	10	x	510	15	35		x	
	47215	30	x	80	x	2	x	643	x	45		x	
	47220	60	5	10	x	9	x	667	3	25		x	
91950	47175	195	15	85	x	3	x	451	8	90		x	
	47180	5	5	145	x	1	x	526	7	135		x	
	47185	35	10	105	x	7	x	519	8	105		x	
	47190	70	70	90	x	59	x	545	10	70		x	
	47195	325	165	175	x	20	x	311	7	145		x	

SOIL SAMPLE DATA
TIMBS CREEK SILVER ANOMALY SERIES

Location		Depth (m)	Horizon	Colour	Rock Chips	Remarks
North	East					
91950	47200	0.50	C	Green	Green schist	
	47205	0.30	C	Grey brown	Silver grey schist	
	47210	0.30	C	Green/ yellow brown	Green schist	
	47215	0.30	C	Olive grey	" "	
	47220	0.70	C	Grey/yellow	(Granular?) light green mica schist	
	47225	0.70	C	Fawn/brown	Green/fawn mica schist	

SOIL SAMPLE DATA
TIMBS CREEK SILVER ANOMALY SERIES

Location North	Location East	Elements (ppm) Cu	Pb	Zn	Ag	As	Sn	Ba	Te	Ni	Sb	Au	Remarks
91950	47200	15	45	135	x	6	x	571	13	115		x	
	47205	45	15	60	x	33	4	677	7	95		x	
	47210	110	20	130	x	45	x	628	10	105		x	
	47215	20	5	100	x	28	x	639	5	65		x	
	47220	10	x	70	x	x	3	510	9	30		x	
	47225	5	x	65	x	2	x	457	5	30		x	

APPENDIX 10

Soil Sample Data - Rocky River Arsenic Anomaly Series
Location, horizon, description and analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2450
236.1 08: - 2450C
236.1 08: - 2467B
236.1 08: - 2467E

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
89100	51100	0.40	C	blue	schists	
	51075	0.40	C	yellow brown	schists sandstone?	
	51050	0.60	C	blue grey	slate	
	51025	0.60	C	blue brown	clays (slates? schists?)	no discernable rock chips
	51000	1.20	C	light brown	relic laminations.Metasilt?	
	50975	1.00	C	green/grey	schists, quartz	
	50950	0.75	C	mottled grey /brown	closely jointed schists	
	50925	1.20	C	grey	grey schist & quartz	may not be true C horizon
	50900	0.75	C	brown	thin laminated brown slate? & mica schist,some quartz	
	50875	1.00	C	brown/green	green schist & quartz	
	50850	0.75	C	brown/light brown	metasilt? & quartz	
	50825	0.75	C	light brown /yellow	" "	
	50800	1.00	C	light brown	green mica schist	
	50775	0.75	C	dark brown	black slate	
	50750	0.50	C	" "	black slate, shattered	
	50725	1.20	C	light brown	schist? & quartz	
	50700	1.20	C	"	" "	
	50675	1.00	C	light green brown	thin laminated schist	
	50650	1.30	C	brown	brown schist	
	50625	0.75	C	grey/cream	white schist	
	50600	0.75	C	light brown	green mica schist	
	50575	1.00	C	light brown /brown	brown schist	
	50550	1.00	C	brown	light green schist	
	50525	0.75	C	dark grey	dark grey/greenish mica schist	
	50500	0.60	C	silver grey	silver grey schist	

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89100	51100	15	15	10	0.5	12	x	242	12	x	10	x	
	51075	5	5	15	0.5	9	x	238	7	x	10	x	
	51050	x	15	10	x	2	x	194	10	x	6	x	
	51025	x	35	10	0.5	4	x	247	5	x	8	x	
	51000	15	5	15	x	5	x	198	x	x	20	x	
	50975	x	10	5	x	1	x	395	17	x	8	x	
	50950	10	25	5	x	53	x	334	17	x	37	x	
	50925	x	10	5	x	3	x	215	22	x	11	x	
	50900	x	10	5	x	8	x	351	18	x	15	x	
	50875	5	10	5	x	1	x	335	3	x	5	x	
	50850	x	15	x	x	6	x	271	13	x	5	x	
	50825	10	45	5	x	400	x	176	8	x	16	x	
	50800	x	10	5	x	1	x	190	24	x	x	x	
	50775	x	10	5	x	x	x	342	15	x	8	x	
	50750	x	5	5	x	1	3	344	x	x	x	x	
	50725	45	30	5	x	14	3	220	8	x	8	x	
	50700	5	5	x	x	24	x	97	18	x	18	x	
	50675	x	5	x	x	x	x	131	15	x	5	x	
	50650	x	x	15	x	2	x	62	x	x	3	x	
	50625	x	10	x	x	1	x	96	7	x	3	x	
	50600	x	5	5	x	1	x	180	23	x	3	x	
	50575	x	5	5	x	x	x	x	x	x	7	x	
	50550	5	15	5	x	28	x	92	x	x	7	x	
	50525	x	15	5	x	x	x	410	20	x	5	x	
	50500	5	25	35	0.5	32	6	1840	x	x	6	x	

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Depth (m)	Horizon	Colour	Rock Chips	Remarks
North	East					
89100	50475	0.50	C	grey	grey schist? shale	ferruginous cemented material above
	50450	0.50	C	olive grey	silver grey schist	
	50425	0.80	C	grey	grey schist, talc?	
	50400	0.60	C	mustard	grey mica schist	
	50375	0.30	C	brown	green foliated schist	
	50350	0.40	C	olive brown	grey mica schist	
	50325	1.10	C	light brown /green	meta silt?	
	50300	0.40	C	chocolate brown	light brown mica schist	
	50275	0.80	C	brown	green & brown schist	
	50250	0.50	C	grey brown	talc? & schist(grey)	
	50225	0.40	C	grey tan	fawn mica schist	
	50200	0.40	C	mustard	green schist	
	50175	0.40	C	mustard/ silver brown	grey mica schist	
	50150	0.40	C	green/brown	green schist	

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SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89100	50475	10	60	45	10	8	x	316	4	x	x	x	
	50450	10	x	20	0.5	5	x	469	6	x	x	x	
	50425	x	5	15	0.5	2	x	310	3	x	x	x	
	50400	20	10	20	0.5	8	x	411	13	x	4	x	
	50375	10	20	20	x	2	x	461	9	x	x	x	
	50350	25	180	60	1.0	78	x	495	5	x	9	x	
	50325	85	75	55	x	11	x	x	x	x	20	x	
	50300	x	5	10	x	2	x	317	15	x	4	x	
	50275	x	x	30	x	1	x	268	x	x	3	x	
	50250	x	15	10	x	2	x	237	x	x	x	x	
	50225	5	85	50	0.5	100	x	274	4	x	x	x	
	50200	15	15	40	0.5	13	x	280	22	x	x	x	
	50175	10	5	35	x	4	x	222	x	x	3	x	
	50150	15	15	95	x	3	x	113	5	x	x	x	

298154

A10.6

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
89500	51300	1.0	C	light brown	grey/white mica schist	
	51275	1.0	C	"	mica schist	
	51250	0.5	C	cream	minor quartz frags,schist	
	51225	0.5	C	light brown	fine light brown sandstone?	
	51200	0.75	C	yellow brown	fine grained micaceous rock	C horizon poorly developed
	51175	1.20	C	brown	brown schist? silts?	
	51150	0.5	C	brown,cream	some relic banding	
	51125	0.5	C	grey brown	thinly banded schist & quartz rock	C horizon poorly developed
	51100	0.75	C	green grey	thinly banded schist	"
	51075	1.20	B	light brown	angular quartz gravels	could not penetrate gravels
	51050	0.75	C	brown,cream	thinly banded schist	C horizon poorly developed
	51025	1.0	C	brown	thinly banded schist minor quartz	
	51000	1.2	C	"	" " "	
	50975	0.5	C	"	similar(lighter colour)	
	50950	1.0	C	dark grey	slate	
	50925	0.75	C	light brown /cream	thinly banded,schistose	
	50900	1.0	C	"	" " "	
	50875	1.0	C	orange brown	thinly banded,schistose fine grained	
	50850	1.0	C	cream/grey	white schist	small layer of hard pan
	50825	1.10	C	brown	green schist	
	50800	0.75	C	yellow brown	green mica schist	
	50775	1.50	C	brown	" " "	
	50750	1.30	C	yellow brown	" " "	
	50725	0.50	C	"	green mica schist & sandstone?	definite B horizon
	50700	0.75	C	dark brown	green & brown mica schist & quartz	"

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89500	51300	x	x	5	x	3	x	192	11	x	3	x	
	51275	10	5	10	x	15	x	86	19	x	24	x	
	51250	x	x	x	x	8	x	159	x	x	8	x	
	51225	x	x	x	x	x	x	146	14	x	x	x	
	51200	x	x	5	x	x	x	118	11	x	9	x	
	51175	x	x	20	x	1	x	216	7	x	x	x	
	51150	x	x	5	x	7	x	199	11	x	3	x	
	51125	x	x	x	x	x	x	123	x	x	x	x	
	51100	x	x	x	x	x	x	332	3	x	3	x	
	51075	x	5	5	x	1	x	33	3	x	x	x	
	51050	x	x	x	x	x	x	212	12	x	9	x	
	51025	x	x	x	x	x	x	99	6	x	3	x	
	51000	x	x	x	x	x	x	117	9	x	4	x	
	50975	x	x	5	x	1	x	342	x	x	11	x	
	50950	15	x	x	x	11	x	353	14	x	8	x	
	50925	x	x	5	x	x	x	159	5	x	6	x	
	50900	x	5	5	x	10	x	335	x	x	7	x	
	50875	50	40	10	x	28	x	191	19	x	5	x	
	50850	x	x	15	x	3	x	157	x	x	x	x	
	50825	x	x	10	x	4	x	149	x	x	3	x	
	50800	20	5	10	x	38	x	252	15	x	11	T	
	50775	x	x	15	0.5	5	x	198	5	x	34	x	
	50750	30	5	15	1.0	160	4	224	3	x	9	x	
	50725	20	5	10	x	79	x	291	15	x	10	x	
	50700	x	x	5	x	25	x	49	4	x	x	x	

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
89500	50675	0.75	C	cream	green/grey mica schist and quartz	definite B horizon
	50650	1.0	C	brown	green mica schist	"
	50625	0.50	C	"	grey mica schist and quartz	site at 50630 (50625 in creek) may be hill creep material
	50600	1.20	C	yellow brown	relic banding - schistose	May still be B horizon Definite B hr'zon present
	50575	1.20	C	grey	"	B hr'zon present
	50550	1.20	C	grey/brown	grey green mica schist	
	50525	1.00	C	"	green mica schist	
	50500	0.75	C	grey/brown	green mica schist & quartz	
	50475	0.75	C	"	" " "	
	50450	1.00	C	grey/green	green mica schist	
	50425	0.75	C	"	" " "	
	50400	1.00	C	"	" " "	
	50375	0.75	C	brown	green & brown schists	
	50350	1.00	C	"	green mica schist	
	50325	1.00	C	"	" " "	
	50300	1.20	C	brown & grey	grey/green mica schist	
	50275	0.90	C	brown	green foliated schist	
	50250	1.00	C	light brown /green	probably schist	
	50225	1.10	C	light grey	silver grey schist	
	50200	0.80	C	light brown /light green	green foliated mica schist	
	50175	0.80	C	brown/green	green mica schist	
	50150	1.10	C	"	"	
	50125	0.80	C	"	"	
	50100	0.75	C	light brown /light green	"	

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89500	50675	5	5	5	x	100	x	218	17	x	9	x	
	50650	x	x	5	x	1	x	159	24	x	4	x	
	50625	x	x	5	x	2	x	174	5	10	3	x	
	50600	60	25	5	x	750	x	x	9	x	8	x	
	50575	x	x	5	x	2	x	424	6	x	10	x	
	50550	5	x	5	x	1	x	295	18	x	11	x	
	50525	x	x	5	x	x	x	338	9	x	x	x	
	50500	x	x	5	x	x	x	398	20	x	x	x	
	50475	x	20	5	x	x	x	398	5	x	x	x	
	50450	x	x	5	x	x	x	397	13	x	x	x	
	50425	x	5	10	x	x	x	488	12	x	x	x	
	50400	x	x	5	x	2	x	397	x	x	4	x	
	50375	10	15	125	1.0	1	3	21	7	x	10	x	
	50350	x	5	5	x	x	x	384	14	x	4	x	
	50325	x	x	x	x	x	x	395	15	x	x	x	
	50300	x	x	5	x	x	x	240	7	x	7	x	
	50275	x	x	15	x	1	x	119	4	x	x	x	
	50250	5	20	80	x	x	x	x	11	x	6	x	
	50225	x	x	5	x	x	x	292	19	x	x	x	
	50200	x	x	5	x	x	x	304	19	x	x	x	
	50175	x	x	5	x	x	x	238	24	x	x	x	
	50150	5	10	95	1.5	x	x	32	x	x	3	4	
	50125	x	x	5	x	x	x	261	10	x	x	x	
	50100	15	15	85	x	1	x	x	13	x	x	x	

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SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
89900	51200	0.75	C	light brown/ cream	thin bedded slate? silt?	
	51175	0.30	C	"	thin bedded micaceous sandstone	outcrop nearby
	51150	1.00	C	"	white mica schist	
	51125	1.10	C	brown	brown schists? silt?	
	51100	0.80		light brown	angular gravels	could not penetrat
	51075	0.75	C	light brown /cream	thin bedded slate? silt?	
	51050	0.30	C	grey	slate	
	51025	0.50	C	grey/cream	thinly banded silts?slate	
	51000	0.30	C	"	thinly banded silts? slate & ptygmatic quartz	
	50975	0.30	C	grey	slate, ptygmatic quartz	
	50950	0.75	C	blue grey	schistose	
	50925	1.00	C	light brown	thin laminated schist?slate?	
	50900	1.10	C	cream/ light brown	cream/green schist	
	50875	0.90	C	cream	thin banded silts? sands?	
	50850	1.10	C	grey/cream	micaceous sands? silts?	
	50825	0.75	C	yellow brown	bleached? mica schist quartz	
	50800	0.50	C	"	green mica schist,quartz	
	50775	1.00	C	grey/light brown	grey mica schist	
	50750	1.20	B	light brown	angular gravels	could not penetrate
	50725	0.80		yellow brown /green	green mica schist	
	50700	0.50	C	"	similar,ptygmatic quartz	
	50675	0.60	C	yellow brown	meta silts?	
	50650	0.60	C	yellow brown /light brown	green schist	no gravels present
	50625	1.20	C	"	"	
	50600	0.90	C	"	meta silts?	

298159

A10.11

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89900	51200	10	20	30	0.5	2	x	224	x	x	3	x	
	51175	x	x	5	x	1	x	166	x	x	4	x	
	51150	x	x	5	0.5	1	6	411	6	x	7	x	
	51125	5	x	10	x	x	x	174	4	x	5	x	
	51100	x	x	5	x	x	x	27	7	x	6	x	gravels only
	51075	10	x	10	0.5	1	3	133	x	x	12	x	
	51050	x	x	5	x	1	3	293	3	x	x	x	
	51025	x	x	5	x	x	x	258	6	x	5	x	
	51000	x	5	5	x	1	x	174	x	x	6	x	
	50975	x	x	5	x	1	3	243	11	x	10	x	
	50950	x	x	5	x	x	x	214	9	x	x	x	
	50925	x	x	15	x	x	x	166	7	x	5	x	
	50900	5	x	5	0.5	1	3	310	5	x	6	x	
	50875	x	15	5	0.5	2	x	288	11	x	3	x	
	50850	5	x	5	x	2	x	208	3	x	7	x	
	50825	10	5	10	0.5	18	x	248	x	x	10	x	
	50800	30	10	15	0.5	67	x	183	8	x	4	x	
	50775	5	5	10	x	9	x	305	x	x	6	x	
	50750	x	x	5	x	4	x	65	x	x	x	x	gravels only
	50725	20	15	15	x	110	x	212	x	x	17	x	
	50700	15	15	25	0.5	47	3	336	x	x	11	x	
	50675	10	5	10	0.5	79	x	40	5	x	4	x	
	50650	25	25	15	x	26	x	297	6	x	12	x	
	50625	105	20	25	0.5	110	x	219	11	x	13	x	

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298160 A10.12

SOIL SAMPLING LEDGER
ROCKY RIVER GRID

Location		Depth (m)	Horizon	Colour	Rock Chips	Remarks
North	East					
89900	50575	0.75	C	brown/light brown	pale green schists	
	50550	0.60	C	"	green schists	
	50525	1.00	C	"	"	
	50500	1.20	C	"	"	
	50475	0.80	C	olive brown	mica schist	
	50450	0.60	C	dark blue grey	yellow ribbons, smoky quartz	
	50425	0.50	C	blue grey	schist	
	50400	0.80	C	olive grey	mica schist	
	50375	0.80	C	tan	"	
	50350	0.60	C	blue/brown	grey schist	
	50325	1.00	C	brown	green/grey schist	
	50300	1.20	C	dark brown	schist	
	50275	0.80	C	brown	grey mica schist	
	50250	1.20	C	dark brown	green schist	
	50225	0.80	C	dark brown	silver schist	
	50200	0.75	C	"	schist	
	50175	0.70	C	chocolate brown	fawn schist	
	50150	0.60	C	green brown	green non-foliated schist	
	50125	0.50	C	fawn brown	brown yellow schist	
	50100	0.90	C	brown & grey	schists	

SOIL SAMPLE DATA
ROCKY RIVER ARSENIC ANOMALY SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	
89900	50600	20	45	20	0.5	110	9	118	8	x	9	x	
	50575	x	5	15	0.5	26	x	183	6	x	11	x	
	50550	5	10	15	x	12	x	172	7	x	4	x	
	50525	10	10	5	0.5	15	x	138	9	x	5	x	
	50500	35	30	40	0.5	17	x	283	11	x	7	x	
	50475	5	x	20	x	5	x	185	x	x	6	x	
	50450	15	20	25	0.5	2	10	518	x	x	5	x	
	50425	10	5	20	1.0	1	x	392	4	x	x	x	
	50400	30	10	30	0.5	7	x	440	x	x	7	x	
	50375	45	120	40	1.5	6	x	x	x	x	9	x	
	50350	10	5	5	0.5	1	x	383	7	x	6	x	
	50325	10	x	20	0.5	1	x	253	7	x	x	x	
	50300	x	x	10	x	x	x	176	10	x	6	x	
	50275	x	x	10	0.5	1	x	312	5	x	6	x	
	50250	x	x	25	0.5	1	4	278	x	x	x	x	
	50225	x	5	5	x	1	x	191	3	x	x	x	
	50200	x	x	5	x	1	x	149	x	x	x	x	
	50175	5	5	15	0.5	1	x	269	9	x	x	x	
	50150	200	40	150	1.0	7	x	x	9	x	x	x	
	50125	45	10	65	1.0	100	x	61	x	x	13	x	
	50100	x	x	10	0.5	2	x	312	x	x	x	x	

APPENDIX 11

Soil Sample Data - Rocky River Grid Series
Comparison Between "C" Horizon and Interstitial Gravel Silts
(from Angular Gravels)

Analytical Report Numbers

Analabs Report 236.1 08: - 2467C
236.1 08: - 2478

SOIL SAMPLE DATA
ROCKY RIVER GRID SERIES
"C" SOIL HORIZON

Location		Elements (ppm)											Remark
North	East	Cu	Pb	Zn	Ag	As	Sn	W	Ba	Sb	Te	Au	
89500	50325	x	x	x	x	x	x	x	395	x	15	x	
	50400	x	x	5	x	2	x	x	397	4	x	x	
	50475	x	20	5	x	x	x	x	398	x	5	x	
	50500	x	x	5	x	x	x	x	398	x	20	x	
	50600	60	25	5	x	750	x	x	x	8	9	x	
	50625	x	x	5	x	2	x	10	174	3	5	x	
	50650	x	x	5	x	1	x	x	159	4	24	x	
	50675	5	5	5	x	100	x	x	218	9	17	x	
	50700	x	x	5	x	25	x	x	49	x	4	x	
	50725	20	5	10	x	79	x	x	291	10	15	x	
	50750	30	5	15	1.0	160	4	x	224	9	3	x	
	50775	x	x	15	0.5	5	x	x	198	34	5	x	
	50875	50	40	10	x	28	x	x	191	5	19	x	
	51175	x	x	20	x	1	x	x	216	x	7	4	
	51200	x	x	5	x	x	x	x	118	9	11	x	
	51225	x	x	x	x	x	x	x	146	x	14	x	
89100	50575	x	5	5	x	x	x	x	x	7	x	x	
	50625	x	10	x	x	1	x	x	96	3	7	x	
	50675	x	5	x	x	x	x	x	131	5	15	x	
	50700	5	5	x	x	24	x	x	97	18	18	x	
	50725	45	30	5	x	14	3	x	220	8	8	x	
	50750	x	5	5	x	1	3	x	344	x	x	x	
	50800	x	10	5	x	1	x	x	190	x	24	x	
	50825	10	45	5	x	400	x	x	176	16	8	x	

SOIL SAMPLE DATA
ROCKY RIVER GRID SERIES
INTERSTITIAL GRAVEL SILTS

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	W	Ba	Sb	Te	Au	
89500	50325	x	x	10	x	x	x	x	206	5	24	x	
	50400	x	10	15	x	x	x	x	293	4	x	x	
	50475	x	x	10	x	x	x	x	290	x	x	x	
	50500	x	x	5	x	x	x	x	348	x	8	x	
	50600	x	x	5	x	67	x	x	165	9	x	x	
	50625	x	x	5	x	1	x	x	123	x	8	x	
	50650	x	x	5	x	x	x	x	119	4	x	x	
	50675	x	x	5	x	25	x	x	73	4	4	x	
	50700	x	x	5	x	16	x	x	34	x	x	x	
	50725	x	x	5	x	23	x	x	195	4	x	x	
	50750	x	x	5	0.5	2	x	x	33	x	x	x	
	50775	x	5	5	x	1	x	x	83	13	x	x	
	50875	5	15	10	x	6	x	x	157	10	12	x	
	51175	x	x	5	x	x	x	x	50	4	x	x	
	51200	x	x	5	x	x	x	x	73	6	x	x	
	51225	x	x	5	0.5	x	x	x	88	x	8	x	
89100	50575	x	x	5	x	1	5	x	259	6	x	x	
	50625	x	x	5	0.5	1	x	x	101	x	x	x	
	50675	x	x	5	x	x	x	x	149	9	x	x	
	50700	x	x	5	0.5	4	x	x	97	7	4	x	
	50725	x	x	5	0.5	x	x	x	79	6	x	x	
	50750	x	x	5	0.5	1	x	x	28	6	x	x	
	50800	x	5	x	x	x	x	x	87	4	3	x	
	50825	x	15	5	0.5	120	x	x	186	8	x	x	

SOIL SAMPLE DATA
ROCKY RIVER GRID SERIES
"C" SOIL HORIZON

Location		Elements (ppm)										Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	W	Ba	Sb	Te	Au	
89100	50850	x	15	x	x	6	x	x	271	5	13	x	
	50900	x	10	5	x	8	x	x	351	15	18	x	
	50925	x	10	5	x	3	x	x	215	11	22	x	
	50950	10	25	5	x	53	x	x	334	37	17	x	
	51000	15	5	15	x	5	x	x	198	20	x	x	
	51075	5	5	15	0.5	9	x	x	238	10	7	x	

SOIL SAMPLE DATA
ROCKY RIVER GRID SERIES
INTERSTITIAL GRAVEL SILTS

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	W	Ba	Sb	Te	Au	
89100	50850	x	5	5	x	1	x	x	124	3	5	x	
	50900	x	x	5	x	2	x	x	147	6	x	x	
	50925	x	5	5	x	3	x	x	231	8	4	x	
	50950	x	5	5	x	39	x	x	273	20	x	x	
	51000	x	10	5	x	x	x	x	88	7	x	x	
	51075	x	x	x	x	x	x	x	152	4	10	x	

APPENDIX 12

Soil Sample Data - Rocky River Road Series
Location, horizon, description and analysis

Analytical Report Numbers

Analabs Report 236.1 08: - 2467
236.1 08: - 2467F

165

298168 A12.2

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
Road	00	NO SAMPLE.		ALLUVIAL GRAVELS OF WHYTE RIVER.		
	25	NO SAMPLE.		ALLUVIAL GRAVELS OF WHYTE RIVER.		
	50	0.30	C	brown/grey	thinly bedded slaty rocks	Outcrop dips vertical
	75	0.10	C	brown	" " " "	" " "
	100	0.20	C	grey/brown	thinly bedded silty rocks	" " "
	125	0.20	C	"	similar,slightly micaceous	
	150	0.30	C	yellow brown	thinly bedded micaceous brown silts	
	175	0.50	C	brown/cream	micaceous.Slates or silts?	
	200	0.40	C	yellow brown	schist or micaceous slates?	
	225	0.40	C	green brown	green mica schist	outcrop schists & sandstone
	250	0.50	C	light brown	brown schists	outcrop schists & slate
	275	0.40	C	"	light brown/grey slates	
	300	0.30	C	light brown/ green	green mica schist	
	325	0.10	C	light brown	" " "	
	350	0.60	C	"	brown/green mica schist	
	375	1.10	C	"	" " "	
	400	0.40	C	yellow brown	yellow brown slates?	
	425	0.60	C	light brown	ptygmatic quartz green mica schist, slates	
	450	0.40	C	light brown/ cream	talc schist? mica schist	
	475	0.40	C	brown/dark brown	mica schist & sandstone	
	500	0.40	C	brown/cream	brown,laminated sandstone? Spotted green.	
	525	1.20	C	light brown	sandstone??	
	550	0.80	C	red brown/ brown	" ??	
	575	1.20	C	light brown/ green	sandstone?? schist??	
	600	0.80	C	light brown/ cream	sandstone?	

298169

A12.3

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	Ni	
Road	00	No sample. Alluvial gravels of Whyte River.												
	25	No sample. Alluvial gravels of Whyte River.												
	50	10	x	10	x	8	x	510	x	x	x	x	20	
	75	x	x	5	x	1	x	487	x	x	4	x	15	
	100	5	x	5	x	1	x	415	10	x	3	x	20	
	125	x	5	5	x	1	x	538	8	x	x	x	20	
	150	x	10	25	x	3	x	555	x	x	x	x	25	
	175	20	5	75	x	3	x	615	x	x	x	x	65	
	200	180	5	30	x	4	x	1040	6	x	3	x	45	
	225	x	x	20	x	2	x	369	11	x	x	x	35	
	250	5	5	10	x	2	x	207	x	x	x	x	20	
	275	15	x	25	x	3	x	345	x	x	x	x	30	
	300	x	x	20	x	3	x	284	5	x	5	x	35	
	325	110	20	40	x	8	x	404	x	x	x	x	55	
	350	105	5	20	x	3	x	238	x	x	5	x	40	
	375	x	x	15	x	2	x	254	x	x	x	x	20	
	400	10	x	20	x	3	x	395	6	x	x	x	30	
	425	20	5	15	x	3	x	297	9	x	3	x	30	
	450	100	5	15	x	30	x	106	x	x	4	x	20	
	475	40	x	30	x	3	x	x	x	x	x	x	40	
	500	25	x	20	x	2	x	36	x	x	x	x	25	
	525	105	5	15	x	x	3	17	7	x	6	x	25	
	550	40	x	20	x	2	x	x	41	x	x	x	30	
	575	55	5	35	x	2	x	11	7	x	x	x	40	
	600	35	x	5	x	2	x	22	x	x	x	x	20	

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
Road	625	1.20	C	light brown/ pink	sandstone?	
	650	0.75	C	light brown	white (talcose?)schist	
	675	0.75	C	light brown/ pink	" " "	
	700	1.20	C	light brown	brown metasilts?	minor Mn or Fe stain
	725	0.20	C	light brown/ pink	meta sandy silt??	
	750	0.40	C	"	" " "	
	775	0.75	C	"	" " "	
	800	0.80	C	light brown/ green	sandstone?? medium grained mottled green	
	825	0.40	C	orange	banded yellow & pink	no discernable rock chips
	850	0.30	C	pink	yellow banding. Schist	
	875	0.30	C	orange	banded. Green schist	
	900	0.30	C	brown	pink. Some schist	
	925	0.20	C	light brown	grey schist	
	950	0.20	C	red brown	orange & green schist	
	975	0.30	C	"	yellow/white/pink banding	
	1000	0.40	C	"	orange/pink clasts	
	1025	0.40	C	orange	pink. Schists	
	1050	0.20	C	red brown	orange & red blebs	
	1075	0.20	C	orange brown	yellow & purple clasts	
	1100	0.20	C	red	orange/pink/green grey banding	
	1125	0.15	C	orange red	purple & green clasts	
	1150	1.20	C	"	green blebs	may be in part B horizon
	1175	0.40	C	brown	grey (schist?)	
	1200	0.40	C	orange brown	red/green/yellow blebs	
	1225	0.40	C	purple red	yellow & green schist	

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A12.5

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location		Elements (ppm)												Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	Ni	
Road	625	150	5	75	x	4	x	43	15	10	x	x	55	
	650	110	15	50	x	8	x	19	4	x	x	x	50	
	675	300	5	50	x	2	x	x	x	10	x	x	85	
	700	145	5	180	x	2	x	62	13	x	x	x	60	
	725	15	x	15	x	1	x	13	x	x	x	x	20	
	750	70	5	110	x	2	x	24	x	x	x	x	45	
	775	140	5	135	x	1	x	x	17	x	x	x	60	
	800	25	10	45	x	2	x	x	5	x	x	x	30	
	825	65	10	100	x	2	x	x	16	x	x	x	55	
	850	80	5	75	x	2	x	x	17	x	3	x	65	
	875	45	5	100	x	2	x	111	4	x	x	x	45	
	900	80	5	250	x	3	x	181	27	x	x	x	60	
	925	85	10	115	x	3	x	406	8	x	x	x	55	
	950	240	10	125	x	3	x	21	7	x	x	x	80	
	975	110	5	110	x	2	x	10	14	x	x	x	40	
	1000	90	15	310	x	3	x	94	10	x	x	x	55	
	1025	95	20	260	x	3	x	74	x	x	x	x	60	
	1050	110	30	440	x	2	x	42	4	x	x	x	70	
	1075	155	30	115	x	3	x	125	x	x	8	x	60	
	1100	145	50	85	x	6	x	7150	8	13	x	x	30	
	1125	65	15	85	x	7	x	205	28	x	x	x	35	
	1150	30	5	105	x	3	x	39	x	x	x	x	45	
	1175	25	10	100	x	2	x	54	x	x	x	x	35	
	1200	180	10	105	x	12	x	232	6	x	x	x	45	
	1225	90	15	75	x	3	x	208	10	x	x	x	55	

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A12.6

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location North	Location East	Depth (m)	Horizon	Colour	Rock Chips	Remarks
Road	1250	0.40	C	mustard	purple banding.Small chips clear quartz	
	1275	0.40	C	"	brown & white veins(olive green top)	
	1300	0.30	C	olive grey	grey schist	
	1325	0.30	C	yellow	grey/brown.Some clear qtz	
	1350	1.20	C	"	purple sections	
	1375	1.10	C	yellow brown	fragments of schist	
	1400	1.20	C	"	"	
	1425	0.80	C	olive	schist	
	1450	0.50	C	yellow brown	meta silt??	
	1475	1.20	C	"	schist	
	1500	0.10	C	brown	cream banded micaceous sandstone	
	1525	0.20	C	"	green schist	
	1550	0.40	C	"	green & brown schist	
	1575	1.20	C	brown/grey	silver grey schist. Ptygmatic quartz	
	1600	1.00	C	cream/green	green mica schist	
	1625	1.20	C	"	"	
	1650	0.50	C	light grey/ brown	ptygmatic quartz. Grey mica schist, sandstone??	
	1675	0.80	C	"	Pale mica schist, ptygmatic quartz	
	1700	0.30	B	cream	gravelly sands(tertiary)	could not penetrate
	1725	1.30	C	light brown/ cream	white mica schist	
	1750	1.20	C	light brown	grey schist	
	1775	0.60	C	blue grey	schist?/slate?	
	1800	1.20	C	brown	silver grey schist	
	1825	1.10	C	yellow brown/ brown	green/grey schist	
	1850	0.75	C	grey brown	silver grey schists	

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	Ni	
Road	1250	95	30	50	x	4	x	146	18	x	3	x	45	
	1275	95	20	70	x	2	x	39	17	x	x	x	45	
	1300	685	120	25	2	7	x	2870	x	x	4	x	25	
	1325	80	10	25	x	4	x	542	13	x	x	x	45	
	1350	130	30	55	x	4	x	x	37	x	6	x	75	
	1375	80	20	35	x	1	x	x	6	x	x	x	75	
	1400	60	20	65	x	2	x	x	x	x	x	x	65	
	1425	215	25	45	x	4	x	653	7	x	7	x	70	
	1450	225	30	50	x	9	x	226	x	x	6	x	50	
	1475	250	20	45	x	25	x	299	40	x	9	x	35	
	1500	x	x	5	x	2	x	136	x	x	x	x	5	
	1525	x	x	10	x	1	x	207	x	x	x	x	10	
	1550	5	5	25	x	2	x	360	x	x	x	x	25	
	1575	x	x	5	x	3	x	244	4	x	6	x	15	
	1600	x	x	5	x	2	x	195	4	x	6	x	10	
	1625	x	20	5	x	2	4	378	7	x	x	x	10	
	1650	x	5	5	x	2	x	258	7	x	3	x	10	
	1675	x	x	5	x	1	x	285	x	x	x	x	10	
	1700	x	x	10	x	2	6	x	x	x	4	x	10	
	1725	x	5	5	x	1	x	803	x	x	x	x	5	
	1750	x	x	5	x	1	x	5018	x	x	x	x	10	
	1775	x	x	10	x	2	x	408	x	x	x	x	10	
	1800	x	5	5	x	1	x	251	x	x	x	x	10	
	1825	5	x	15	x	3	x	243	x	x	x	x	20	
	1850	x	x	10	x	2	4	274	x	x	x	x	15	

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location		Depth	Horizon	Colour	Rock Chips	Remarks
North	East	(m)				
Road	1875	0.60	C	grey/green	silver grey schists	
	1900	1.00	C	lemon/cream	schists,some sandy material	
	1925	1.00	C	silver grey	schists,ptygmatic quartz	
	1950	1.20	C	olive grey	sandy. schistose	
	1975	1.20	C	silver grey	" "	
	2000	0.75	C	olive grey	schists	

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A12.9

SOIL SAMPLE DATA
ROCKY RIVER ROAD SERIES

Location		Elements (ppm)											Remarks
North	East	Cu	Pb	Zn	Ag	As	Sn	Ba	Te	W	Sb	Au	Ni	
Road	1875	5	5	10	x	2	x	240	6	x	x	x	20	
	1900	x	x	5	x	1	x	170	9	x	x	x	10	
	1925	x	x	30	x	1	x	338	3	x	x	x	15	
	1950	50	5	190	x	3	x	x	7	x	x	x	100	
	1975	x	x	5	x	1	x	383	x	x	x	x	10	
	2000	5	20	45	x	4	x	93	x	x	x	x	50	

APPENDIX 13

Rock Sample Description and Results

Analytical Report Numbers

Analabs Report 236.1 08: - 2459
236.1 08: - 2491F

ROCK SAMPLE DESCRIPTION AND RESULTS
ROCK SAMPLE LEDGER

Sample Number	Area	Location N	Location E	O/C or Float	Description
84/0001	Cape Copper Mine	93.70	49.52	Float	Grey chloritic, (pyritic schist)
84/0002	Rocky River	87.79	50.32	O/C	Gossanous cherty material
84/0003	" "	87.79	50.32	O/C	Similar, less gossanous
84/0004	" "	87.79	50.32	O/C	Cherty material with mineralised veinlet (1/2 mm x 5 mm)
84/0005	" "	89.00	49.45	Float	Pyritic carbonate (magnesite?)
84/0006	" "	88.53	49.61	Float	Green non-fissile greenschist (with magnetite)
84/0007	" "	88.53	49.61	O/C	Thin banded green non-fissile greenschist. Minor magnetite?
84/0008	Rocky River Road			O/C	Gossanous vein material(bold outcrop)
84/0009	Pipeline Survey	11.12	51.50	O/C	Siliceous breccia (false gossan)
84/0010	McPhee Creek	10.83	51.13	O/C	Ferruginous material - McPhee Creek adit.
84/0011	" "	10.83	51.13	O/C	McPhee Creek country rock
84/0012	Specimen Creek	10.85	51.11	O/C	Dark grey pyritic carbonate, S.Creek

O/C = outcrop

ROCK SAMPLE DESCRIPTION AND RESULTS
ROCK CHIP LEDGER - ANALYTICAL RESULTS

Sample Number	Cu	Pb	Zn	Sn	W	Ni	Mo	Ag	As	Co	Ba	Au	Bi	Remarks
84/0001	10	50	15					x	97			x		
84/0002	20	45	100					x	33			x		
84/0003	5	25	20					x	32			x		
84/0004	x	5	5					x	3			x		
84/0005	x	15	50					x	3			x		
84/0006	60	5	135					x	1			x		
84/0007	10	5	115					x	6			x		
84/0008	155	25	30	x	x			0.5	18		368	T		
84/0009	25	x	135	x	x			x	17		x	x		
84/0010	45	10	60	x	x			x	85		144	x		
84/0011	30	x	30	4	x			x	15		631	x		
84/0012	25	20	50	x	x			0.5	22		30	x		

84/0012	Mn	Fe	Ca	Mg	S	Si	Loss on ignition
	2150	3.65%	12.75%	7.75%	2.3%	25.9%	27.5%

298179

REPORT ON FIELD INVESTIGATIONS

WITHIN EXPLORATION LICENCE 4/61

WEST COAST, TASMANIA

SUMMER FIELD SEASON 1983-1984

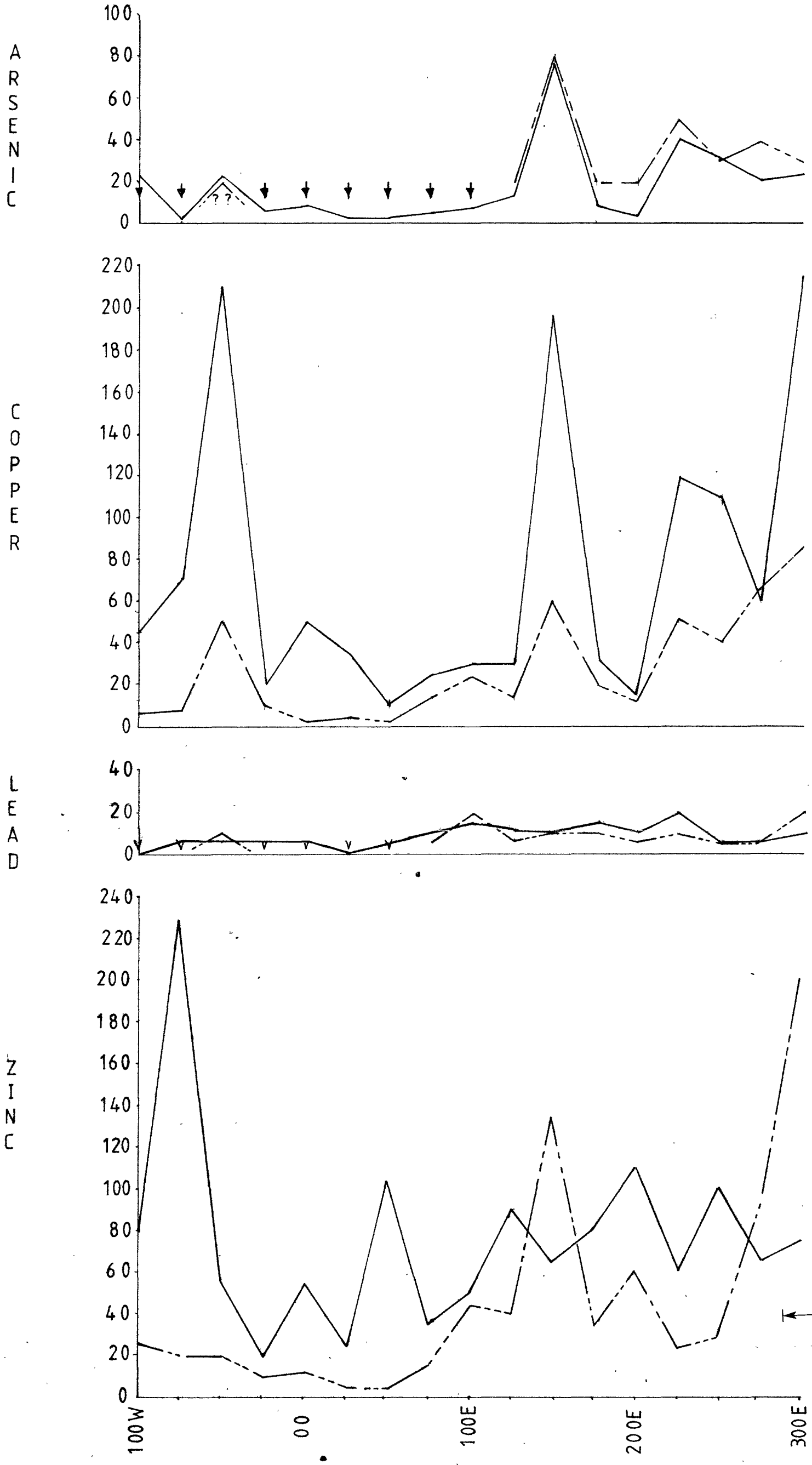
TABLE OF PLATES AND PLANS

AUGUST 1984

Industrial and Mining Investigations Pty Limited

Transparencies held in Vertiplan. ✓

E. TABLE OF PLATES AND PLANS



0014

PLATE 1

84-2262 vol 2.

INDUSTRIAL & MINING INVESTIGATIONS PTY. LTD.

EL. 4/61 SAVAGE RIVER.

SPECIMEN CREEK.

SOIL SAMPLING – LINE 200S

ASSAY COMPARISONS 1980-1984

298181

SCALES. Horizontal. 1:2500

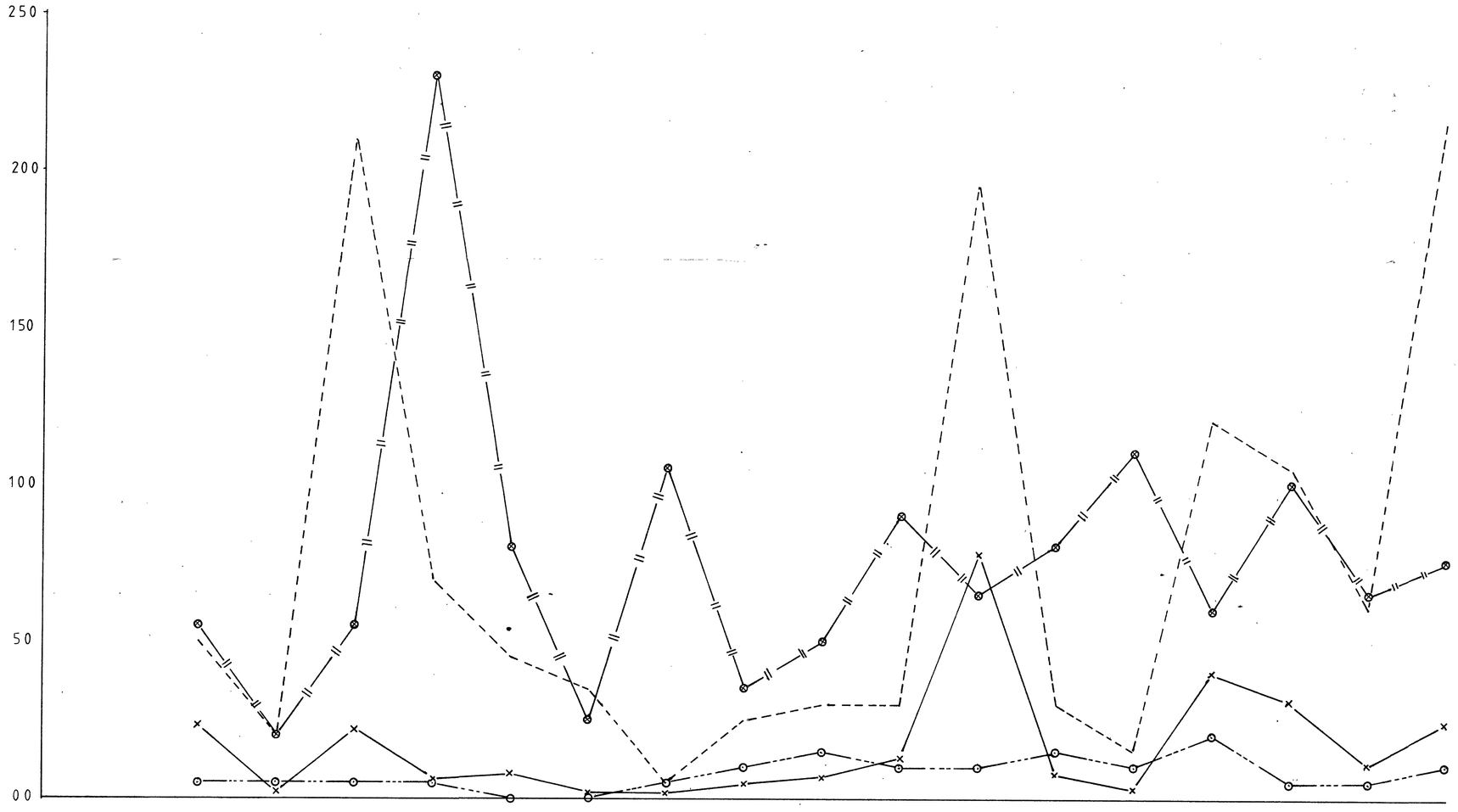
Vertical 20 p.p.m./cm.

LEGEND. 1980 ——- - ——

1984 ———

DRAWN. 7-6-1984

DRAWN BY W.S. RISEBOROUGH, SINCLAIR DRAFTING SERVICES, P.O. BOX 936, BURNIE, TASMANIA 7320



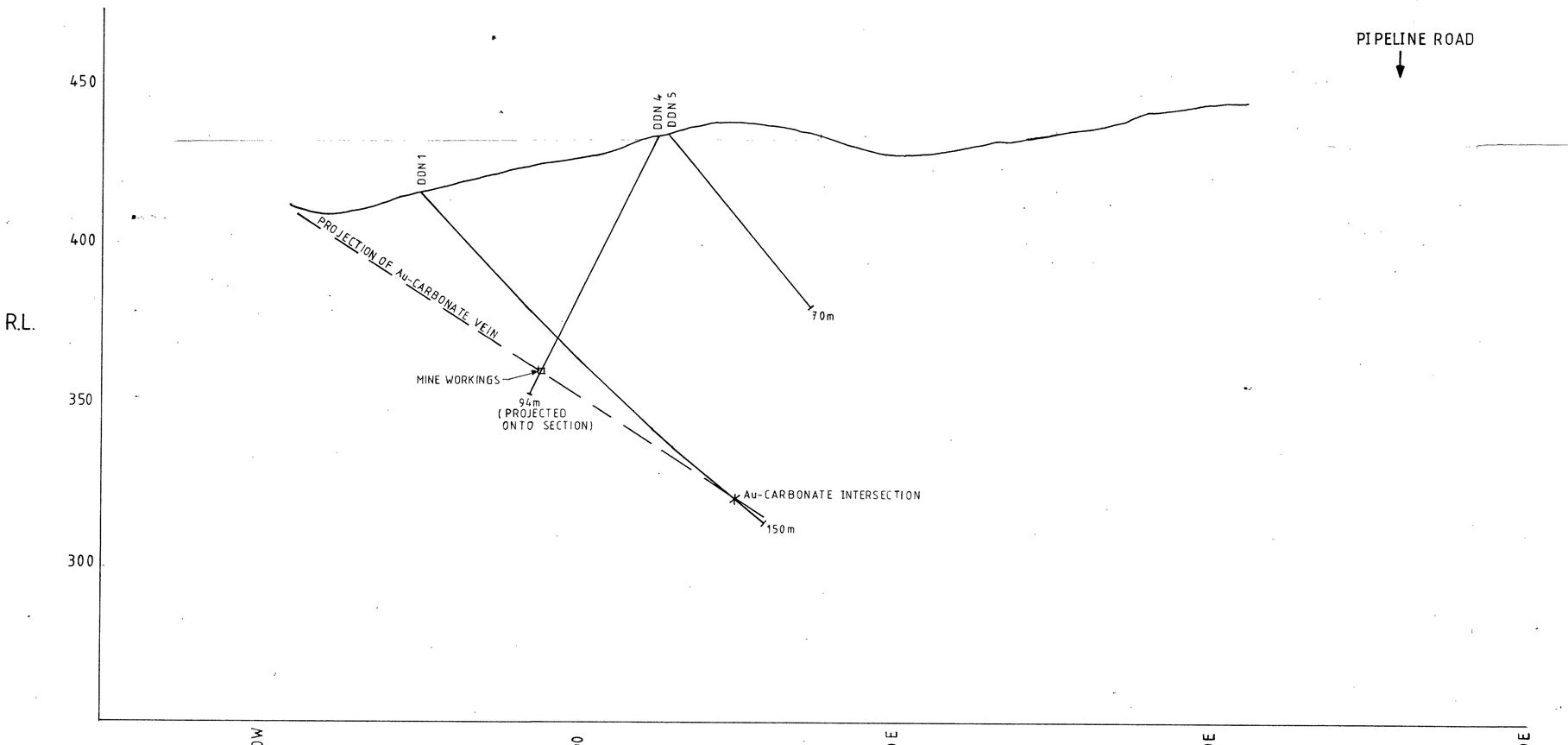
SOIL GEOCHEMISTRY (1984 PROGRAMME)

ARSENIC

COPPER

LEAD

ZINC



PIPELINE ROAD

DRILL HOLE INFORMATION

Drill Hole	Strike	Dip	T.D.
DDN 1	130°(mag.)	-45°	150m.
		-42°(at 150m)	
DDN 4	280°(mag.)	-50°	94m
DDN 5	130°(mag.)	-50°	70m

200 0 200 400 600 800 1000

SCALE 1=1000

5 cm

298182

PLATE 2

BL-2262 VOL 2

INDUSTRIAL & MINING INVESTIGATIONS PTY. LTD.

EL.4/61 SAVAGE RIVER.

SPECIMEN CREEK.

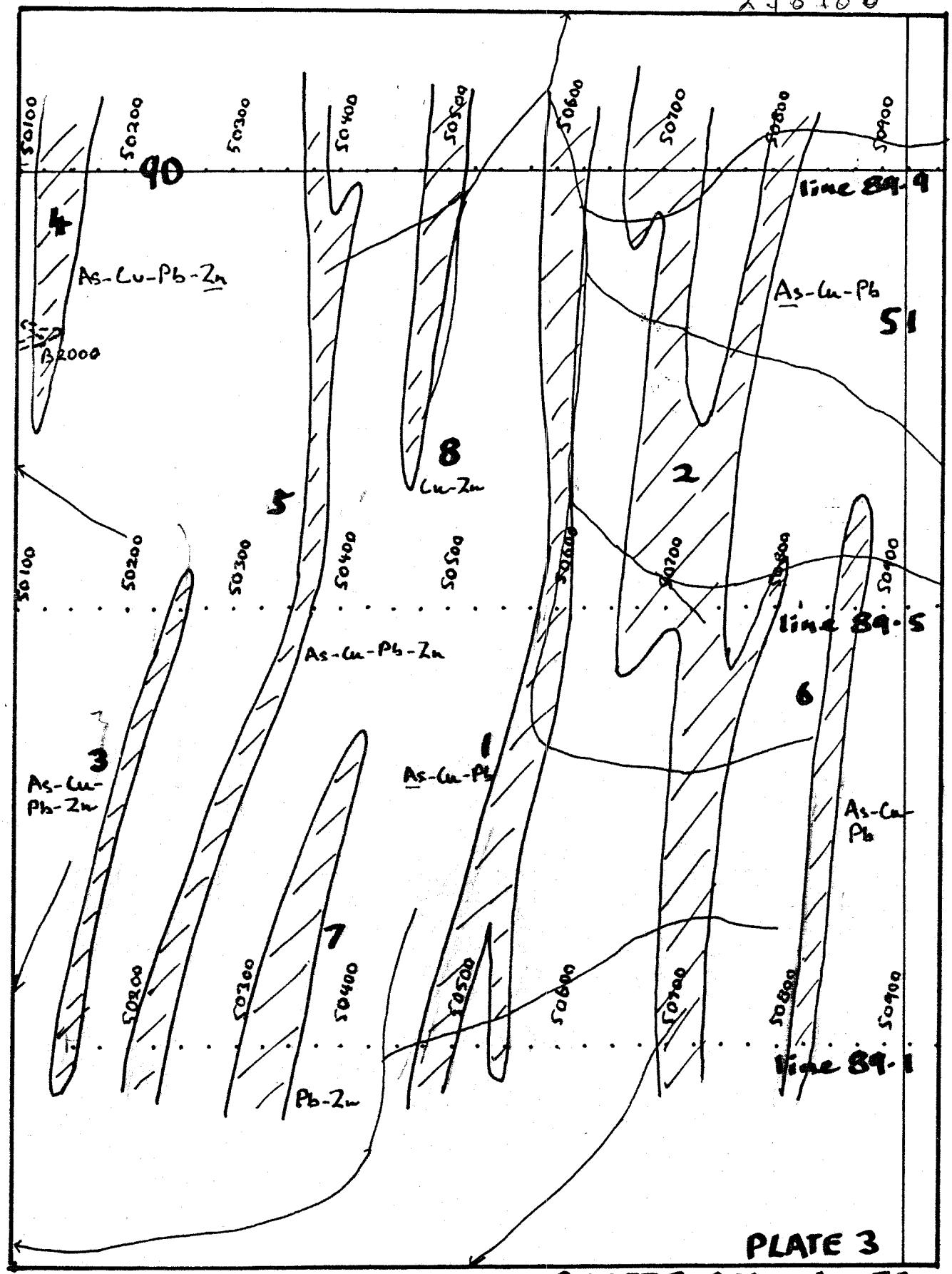
LINE 200S 000

DRILL HOLE CROSS SECTIONS AND SOIL GEOCHEMISTRY.

LOOKING NORTH (GRID)

DRAWN BY W.S.RISEBOROUGH. SINCLAIR DRAFTING SERVICES P.O.BOX 936 BURNIE. TASMANIA 7320.

298183



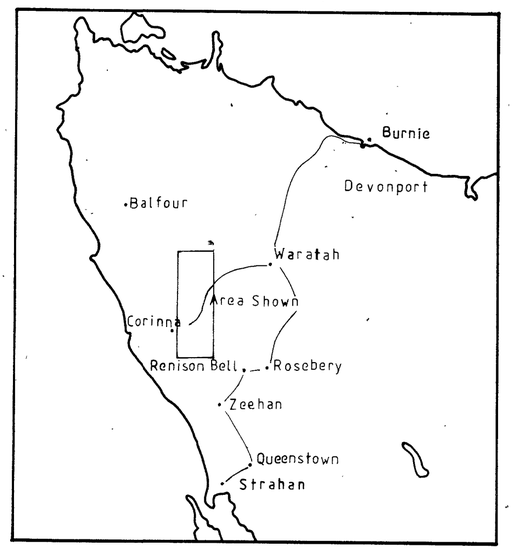
ROCKY RIVER AREA - COMPOSITE ANOMALIES

84-2262 Vol 2

0014A.

PYRAMID HILL
River
Donaldson
Little
Pineapple Creek
5415000
SPECIMEN REEF
MAP 2
Specimen Ck
Davis Creek
Creek
Keys
Broderick Creek
Fulfords Ck.
Hall Ck.
Nineteen Mile Ck.
Ginty's Ck
RIVER
Armstrong
SAVAGE
Travel Pit
Savage River
McAuliffe
MAP 6
Open Cut Mine
Mine Settling Pond
Mine Workings
SAVAGE RIVER MINE
5405000
Obsidian Ck
HEAZLEWOOD PLAINS
TOWNSHIP
MAP 3
Big Surrey Ck
Rivulet
Contact Ck.
Savage River
ROAD
MAP 4
THE LONGBACK
Main
Bowry Creek
CORINNA
WHYTE
MT. MEREDITH
Paradox
5400000
Sabbath Creek
Guthie Creek
MAP 5 (part)
Timbs Creek
Eight Mile Ck
Bracken Creek
WEST PLAINS
Ninemile Creek
Goodall Creek
Post Office
Tunnel race Ck
Clubmoss Ck
Graham Ck
Wilsons Creek
MT DONALDSON
Doodle Creek
Little Hunter Ck.
Brown Plains Ck.
BROWN
ELIZABETH RIDGE
Middleton Creek
Sophys Ck
Penny Ck
Frenchman Ck
Lafayette Ck
ROCKY
Breakneck Ck
Bounds Creek
SUPERGRUNT
AHRBERG HILL
CORINNA
Corinna Creek
Nancy Creek
Lucy Creek
LEFROY RIDGE
HADES RIDGE
PARADISE
Paradise Creek
Finlay Creek
OWEN
MEREDITH
Doctors Creek
Hangmans Creek
WHALEBACK RIDGE
H.E.C. RESERVE
PIEMAN ROAD
5385000
5380000
340000
345000
350000
355000

Grid in meters.



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve
- Sample Location LSD Series — o 27
- Area of grid sampling

TNGN MN
1·2 11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

SOIL SAMPLING PROJECT LOCATIONS
DIAMOND SAMPLE LOCATIONS

PLAN 1·0

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, H. Shannon
DRAWN, B. Green, H. Shannon

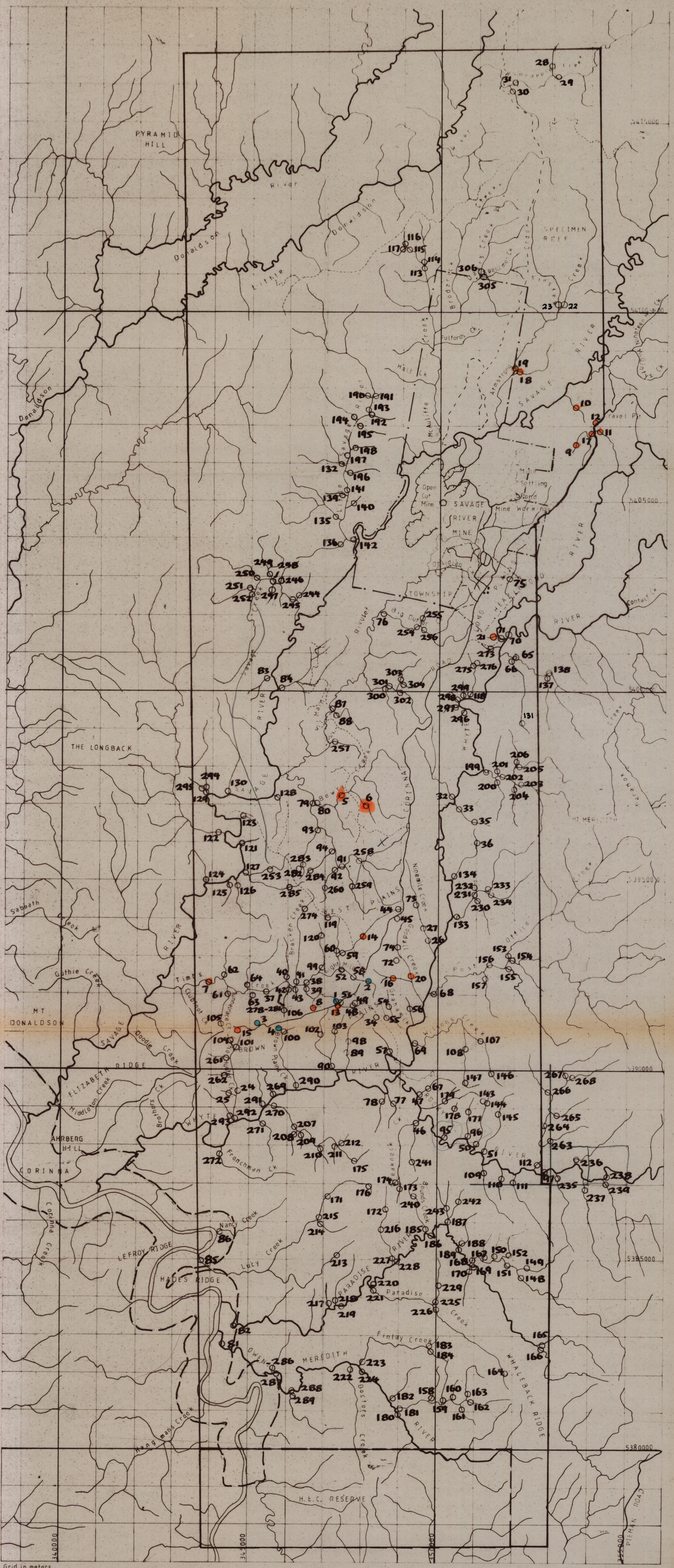
1 0 1 2 3 4 5km.

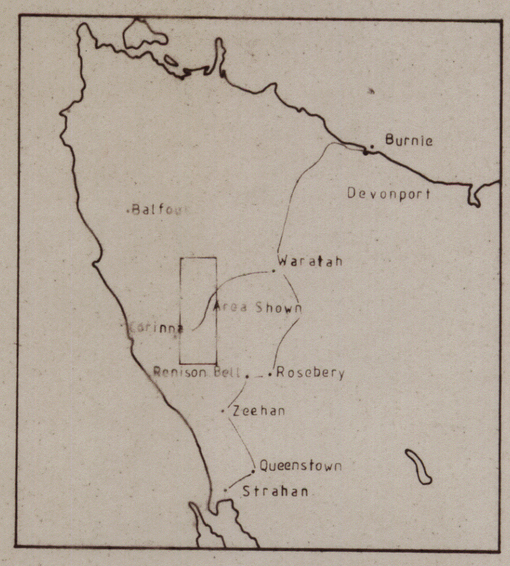
Scale 1: 50,000 — June 1984

84-2262 vol 2.

001

298184





LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point (HM series) O 37

TNGN MN
1·2
11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

SAMPLE LOCATIONS/NUMBERS PLAN 1·1

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, B. Penny
DRAWN, B. Green, H. Shannon

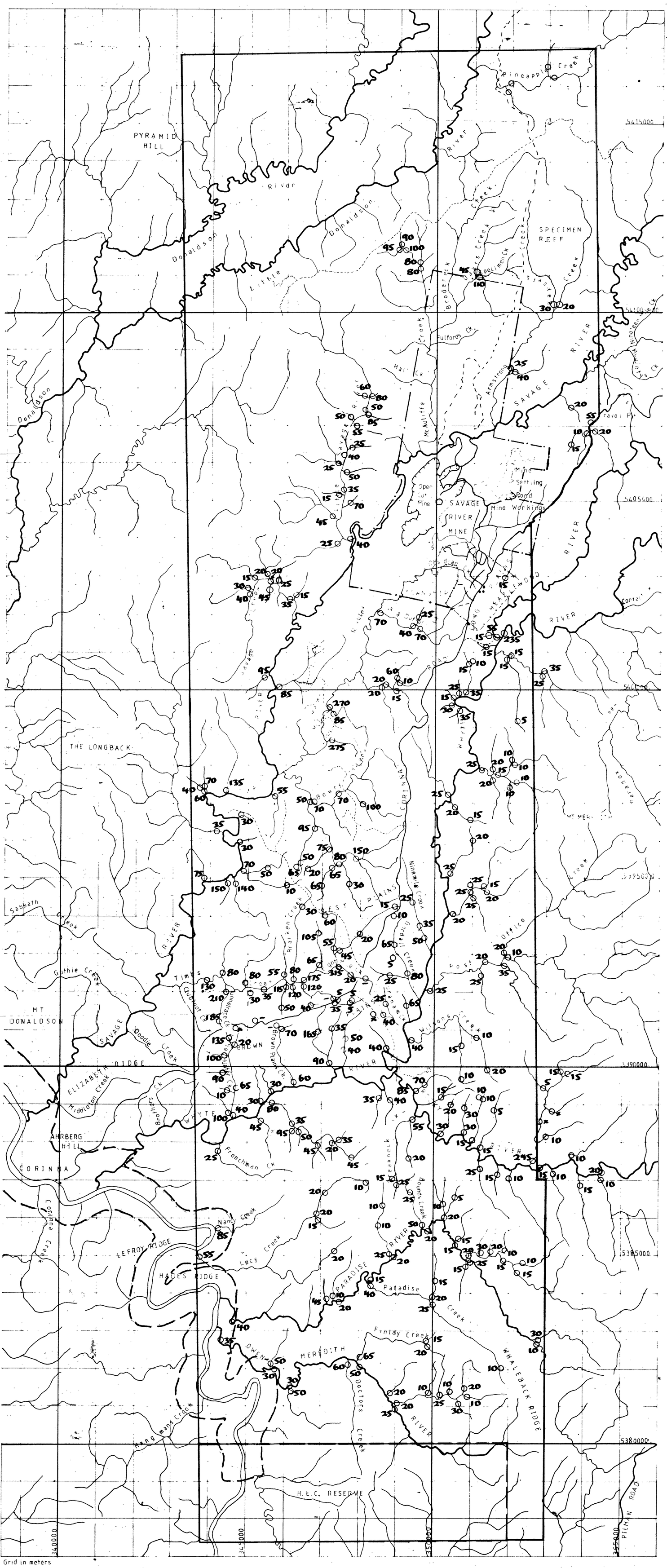
1 0 .1 2 3 4 5km.

Scale 1:50,000

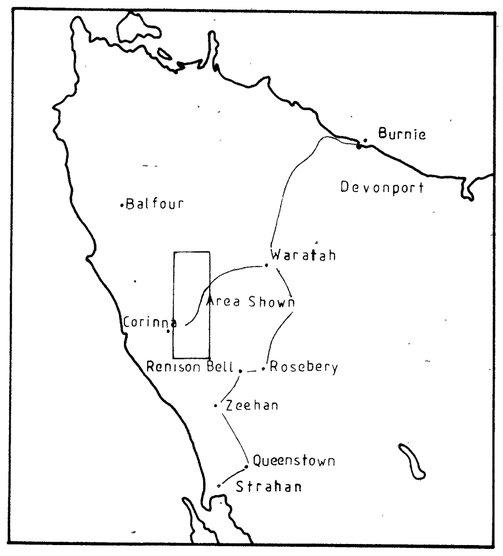
5 cm

June 1984

Grid in meters



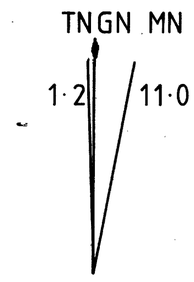
Grid in meters



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

○ 70 Cu in fines ppm
– not determined
* below detection limit (5 ppm)



INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

COPPER — PLAN 1·2

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

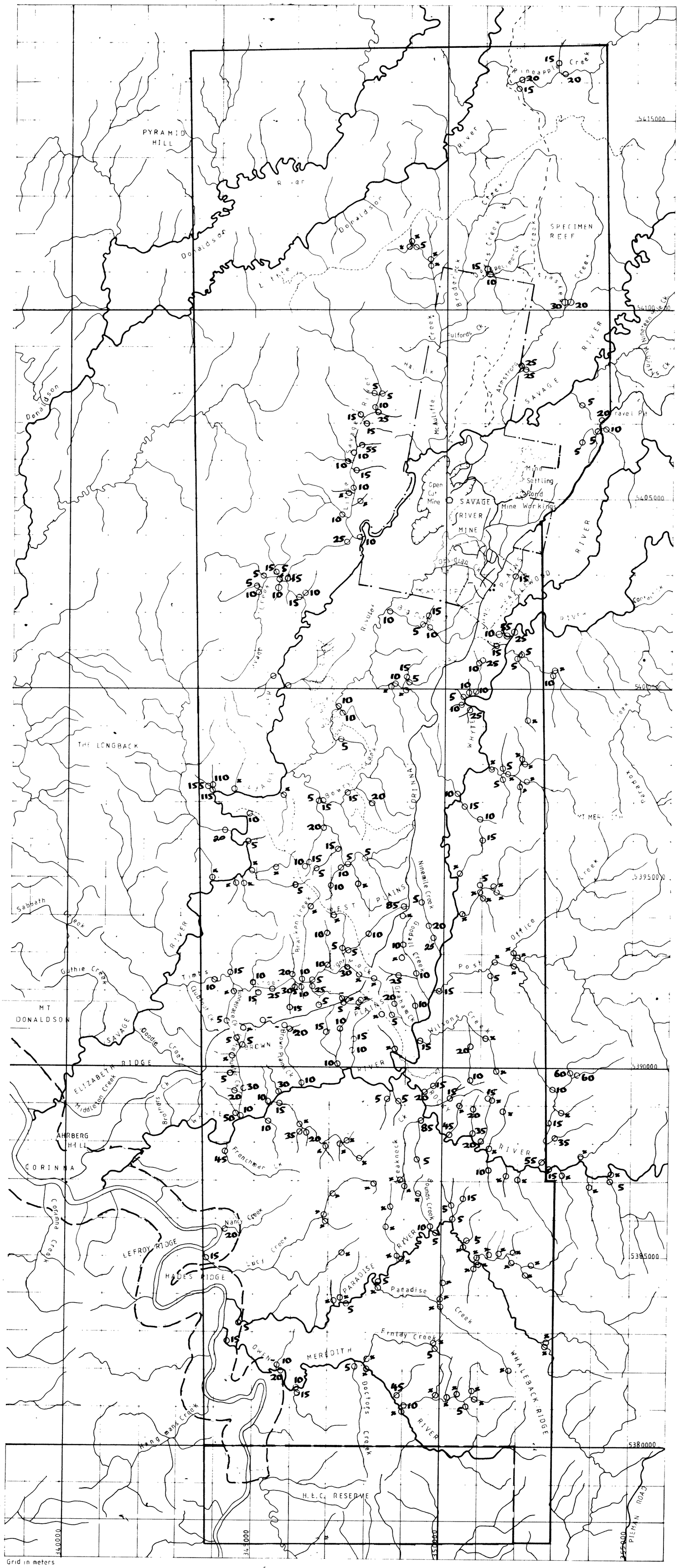
298186

1 0 1 2 3 4 5 km.

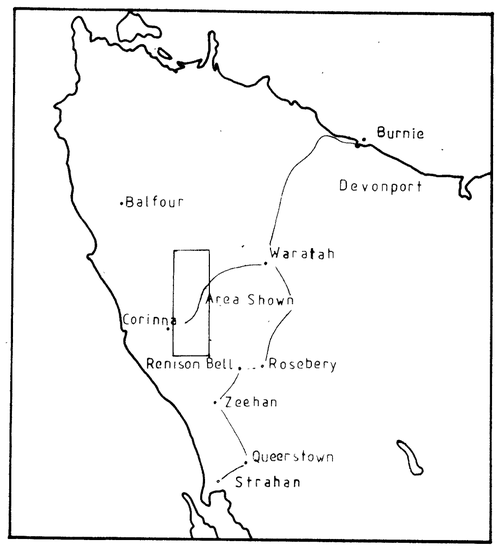
5 cm

Scale 1: 50,000 — June 1984

84-2262 vol 2.



Grid in meters



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

O 15 Pb in fines ppm
– not determined
× below detection limit (5ppm)

TNGN MN
1·2 11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

LEAD PLAN 1·3

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

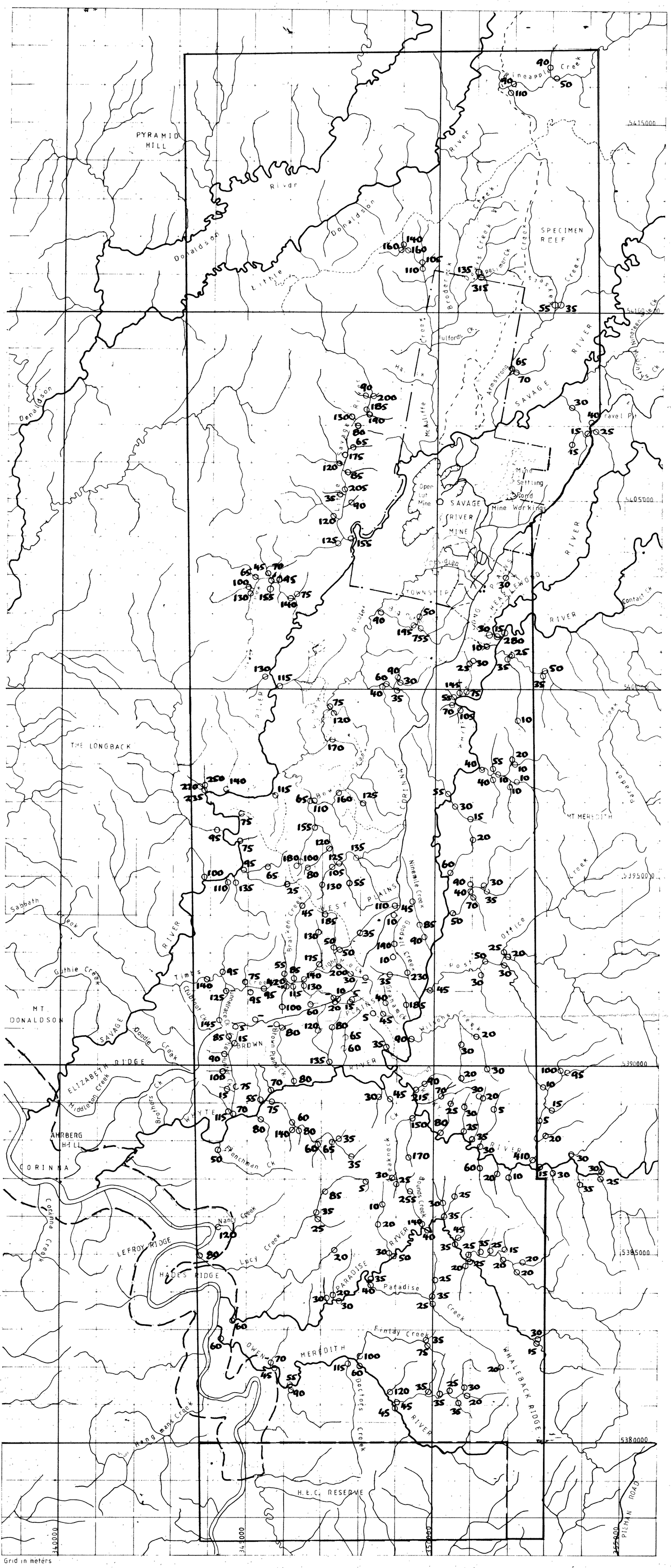
1 0 1 2 3 4 5km.

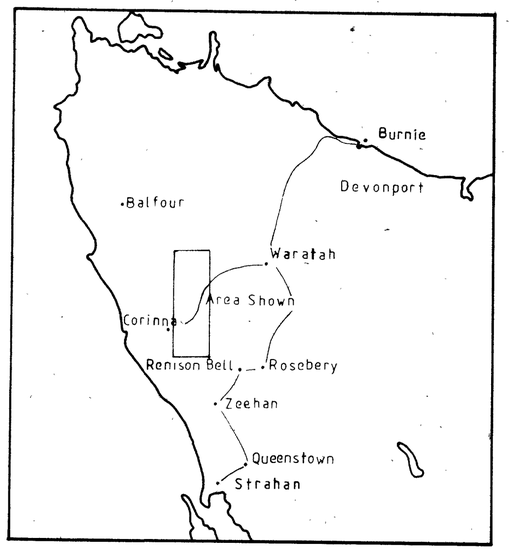
Scale 1: 50,000 June 1984

84-2262 vol 2.

004

298187





LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

○ 55 Zn in fines ppm.
– not determined
< below detection limit (5ppm)

TNGN MN
1·2 11·0

Grid in meters

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

ZINC PLAN 1·4

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.

COMPILED, L. Vanzino

DRAWN, B. Green, H. Shannon 298188

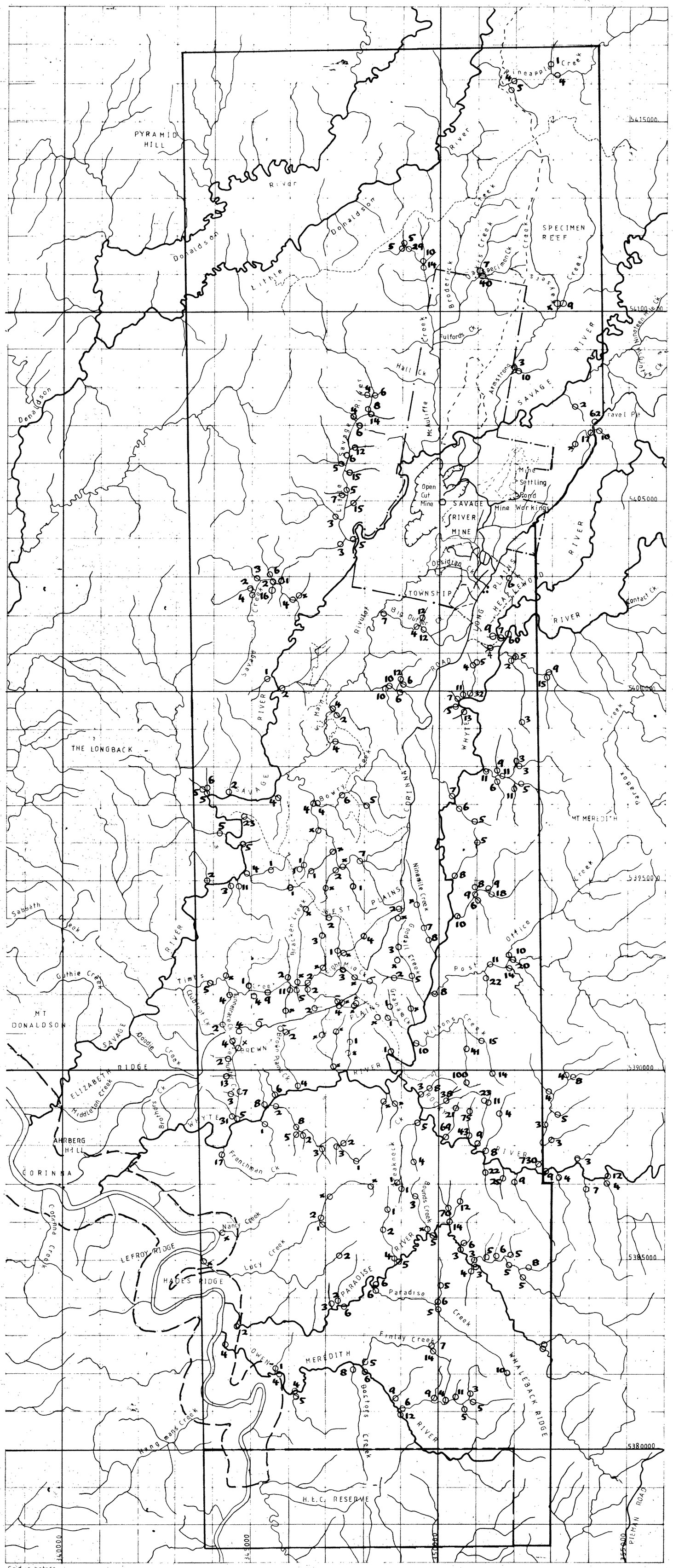
1 0 1 2 3 4 5km.

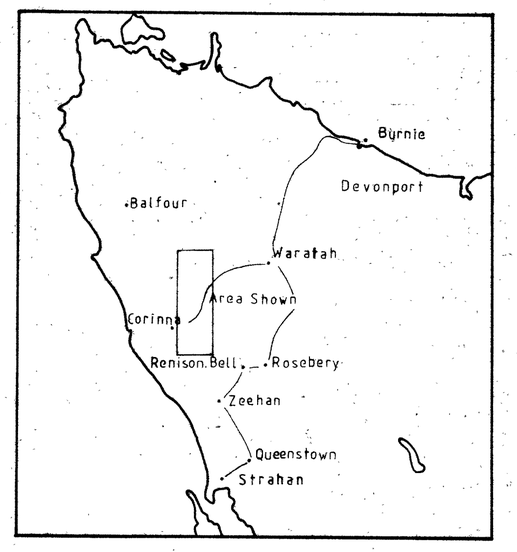
5 cm

Scale 1: 50,000 June 1984

84-2262 vol 2.

005





LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

O 11 As in fines ppm.
- not determined
x below detection limit (1 ppm.

TNGN MN
1·2 11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

ARSENIC PLAN 1·5

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

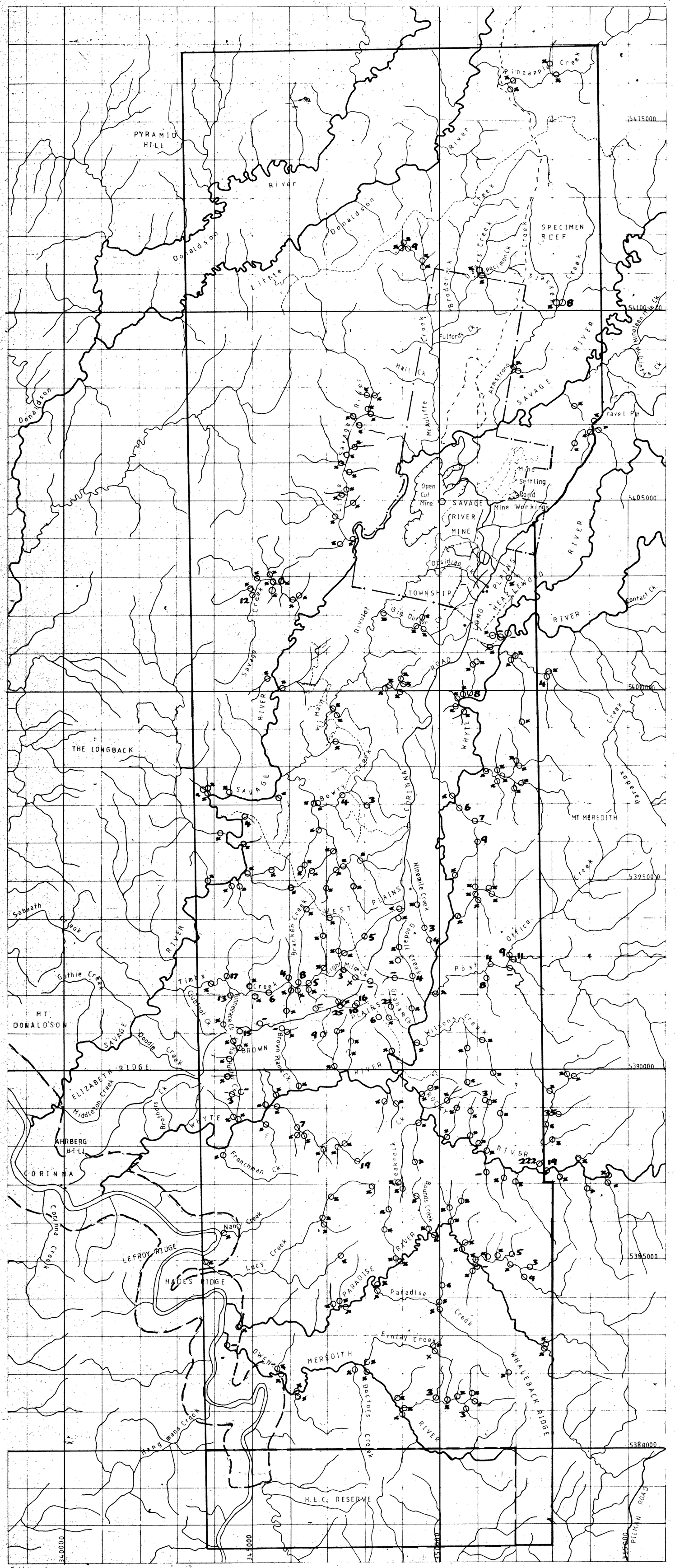
1 0 1 2 3 4 5 km.

Scale 1:50,000 (5 cm) June 1984

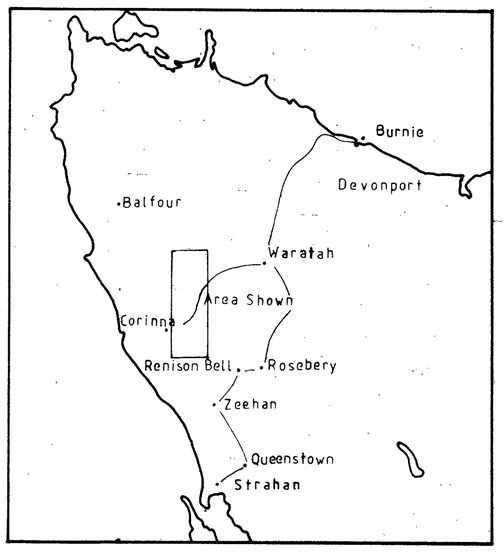
84-2262 vol 2.

006

298189



Grid in meters



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

O 11
Sn in fines ppm.
- not determined
x below detection limit (3ppm)

TNGN MN
1·2 11·0

298190

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

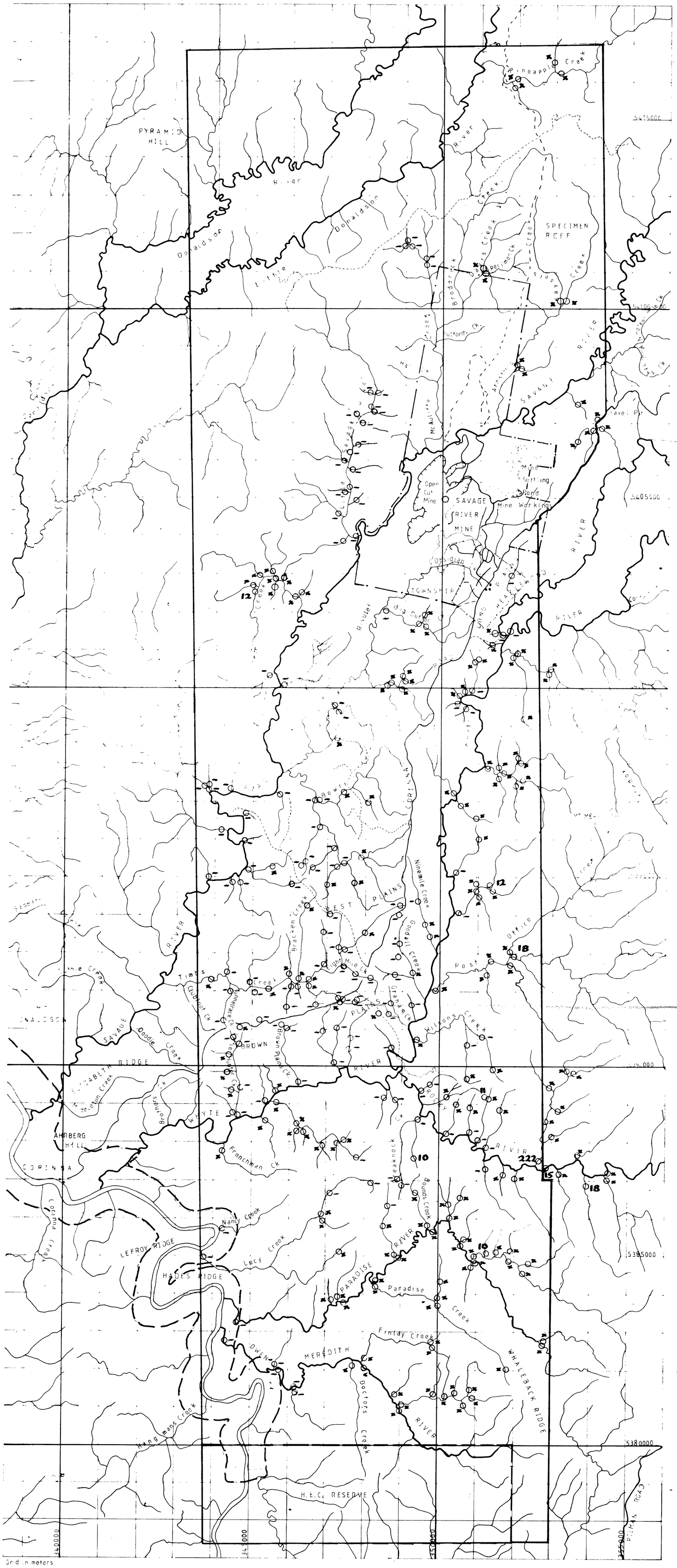
TIN PLAN 1·6

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

1 0 1 2 3 4 5km.

Scale 1:50,000 June 1984

84-2262 vol 2.



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E.L. Boundary
- H.E.C. Reserve, Scenic Reserve
- Sample Point

18 — W in fines ppm
\- — not determined
x — below detection limit (10ppm)

TNGN MN
1·2 11·0

298191

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

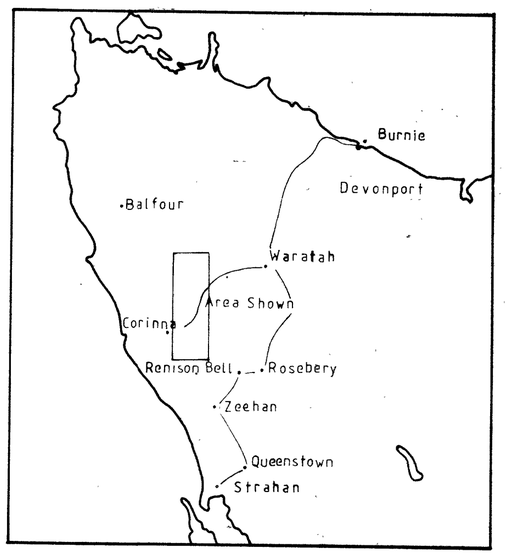
TUNGSTEN PLAN 1·7

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

1 0 1 2 3 4 5 km.
5 cm

Scale 1: 50,000 June 1984

84-2262 vol 2.



LEGEND

- Road
- Track
- River
- Creek
- Town Lease
- Mine Lease
- E L Boundary
- H E C Reserve, Scenic Reserve
- Sample Point

O 60 = Ni in ppm.
x below detection limit of assay
– not assayed for Ni

TNGN MN
1·2 11·0

298192

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

STREAM SEDIMENT SURVEY

NICKEL PLAN 1·8

DATA COLLECTED, 1983 - 84 by B.P., L.V., B.G., H.S., P.C.
COMPILED, L. Vanzino
DRAWN, B. Green, H. Shannon

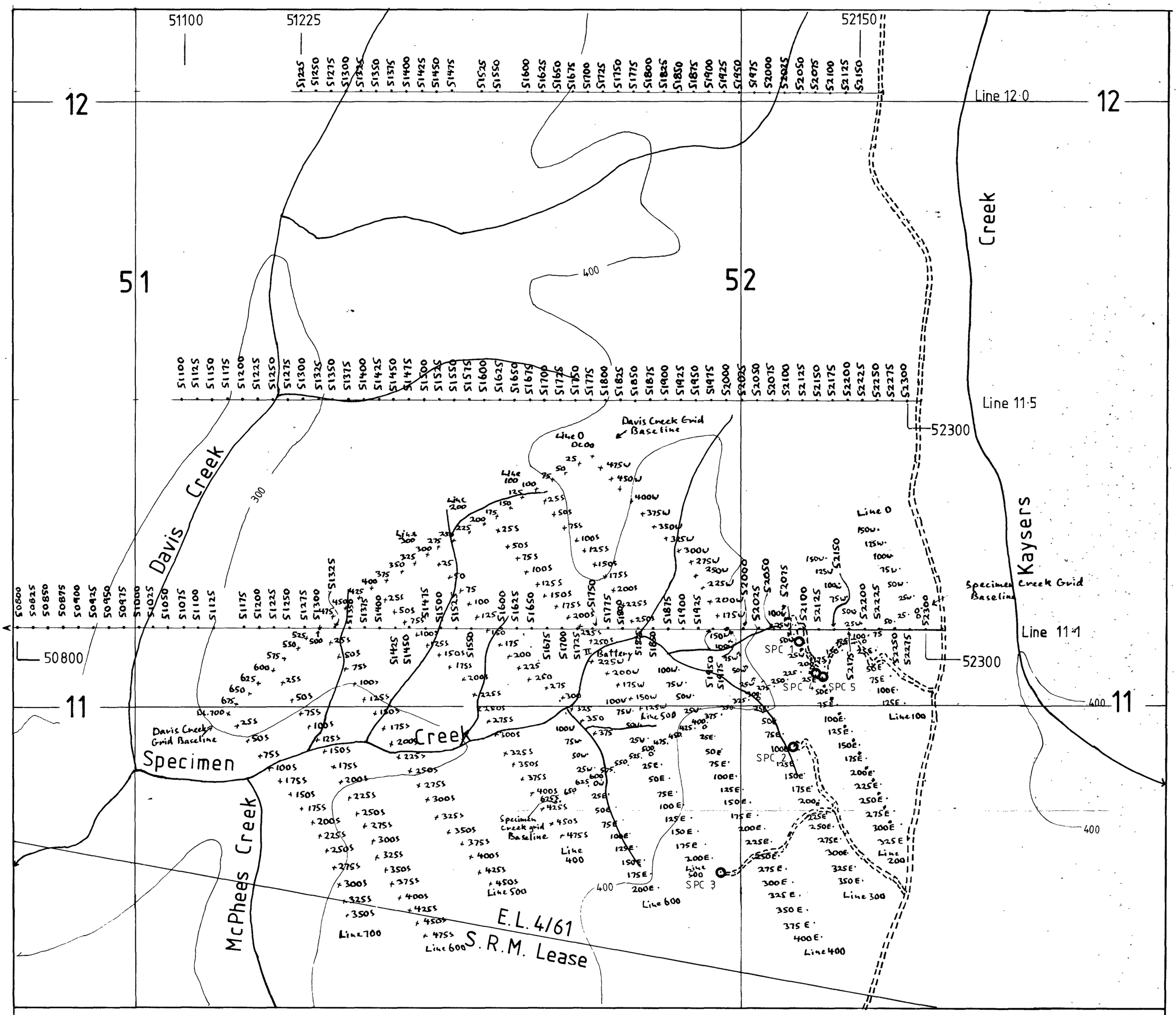
1 0 1 2 3 4 5km.

Scale 1: 50,000 June 1984

84-2262 vol 2 *

009

Grid in meters



LEGEND

soil sample 1980 - 81 (·175E)
" " 1981 - 82 (×375S)
" " 1982 (S125)
repeat 1984 (·175*E)

tenure boundary
—11— grid lines AMG
creek
road
contour
drillhole (SPC 1)

GN
TN 1·2 MN 11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

SPECIMEN REEF
GEOCHEMICAL SAMPLING
SAMPLE LOCATIONS

PLAN 2·1

DATA COLLECTED : J. Wall 1980 - 81, E. Dubowski 1981 - 82
H. Shannon, J. Woodman 1982 B. Penny 1984

COMPILED : H. Shannon, E. Dubowski

DRAWN : H. Shannon

200 100 0 500m

Scale 1 : 5,000 (5 cm)

June 1984

51100
51225
52150
12
Line 12·0
51
52
Creek
400
Davis Creek
300
Kaysers
Line 11·5
52300
50800
Line 11·1
SPC 1
SPC 4
SPC 5
SPC 2
SPC 3
11
Specimen
Creek
McPhees Creek
E.L. 4/61
S.R.M. Lease

LEGEND

24. soil sample 1980 - 81 · repeat 1984
x " " 1981 - 82
• " " 1982

tenure boundary
—11— grid lines AMG
creek
road
contour
SPC 1 drillhole

GN
TN 1·2 MN 11·0

298194

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

SPECIMEN REEF
GEOCHEMICAL SAMPLING
COPPER ANALYSIS VALUES p.p.m.

PLAN 2·2

DATA COLLECTED : J. Wall 1980-81, E. Dubowski 1981-82
H. Shannon, J. Woodman 1982 B. Penny 1984

COMPILED : H. Shannon, E. Dubowski

DRAWN : H. Shannon

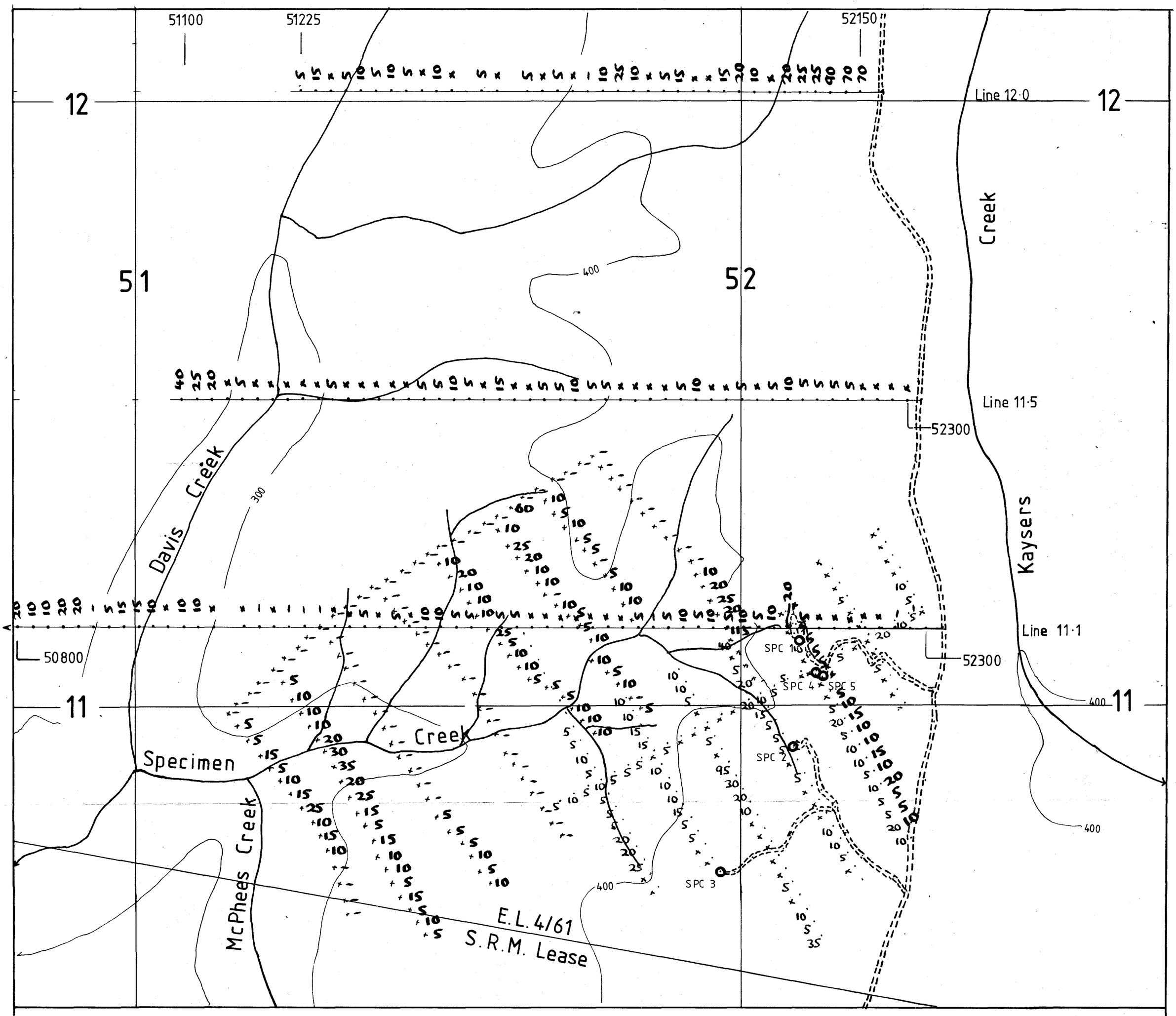
200 100 0 500m

5 cm

Scale 1 : 5,000

June 1984

84-2262 vol 2.



LEGEND

soil sample 1980 - 81 — repeat 1984
" " 1981 - 82
" " 1982

tenure boundary
—11— grid lines AMG
creek
road
contour
drillhole SPC 1

GN
TN 1·2 MN 11·0

298195

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

SPECIMEN REEF
GEOCHEMICAL SAMPLING
LEAD ANALYSIS VALUES p.p.m. PLAN 2·3

DATA COLLECTED : J. Wall 1980-81, E. Dubowski 1981-82
H. Shannon, J. Woodman 1982 B. Penny 1984

COMPILED : H. Shannon, E. Dubowski

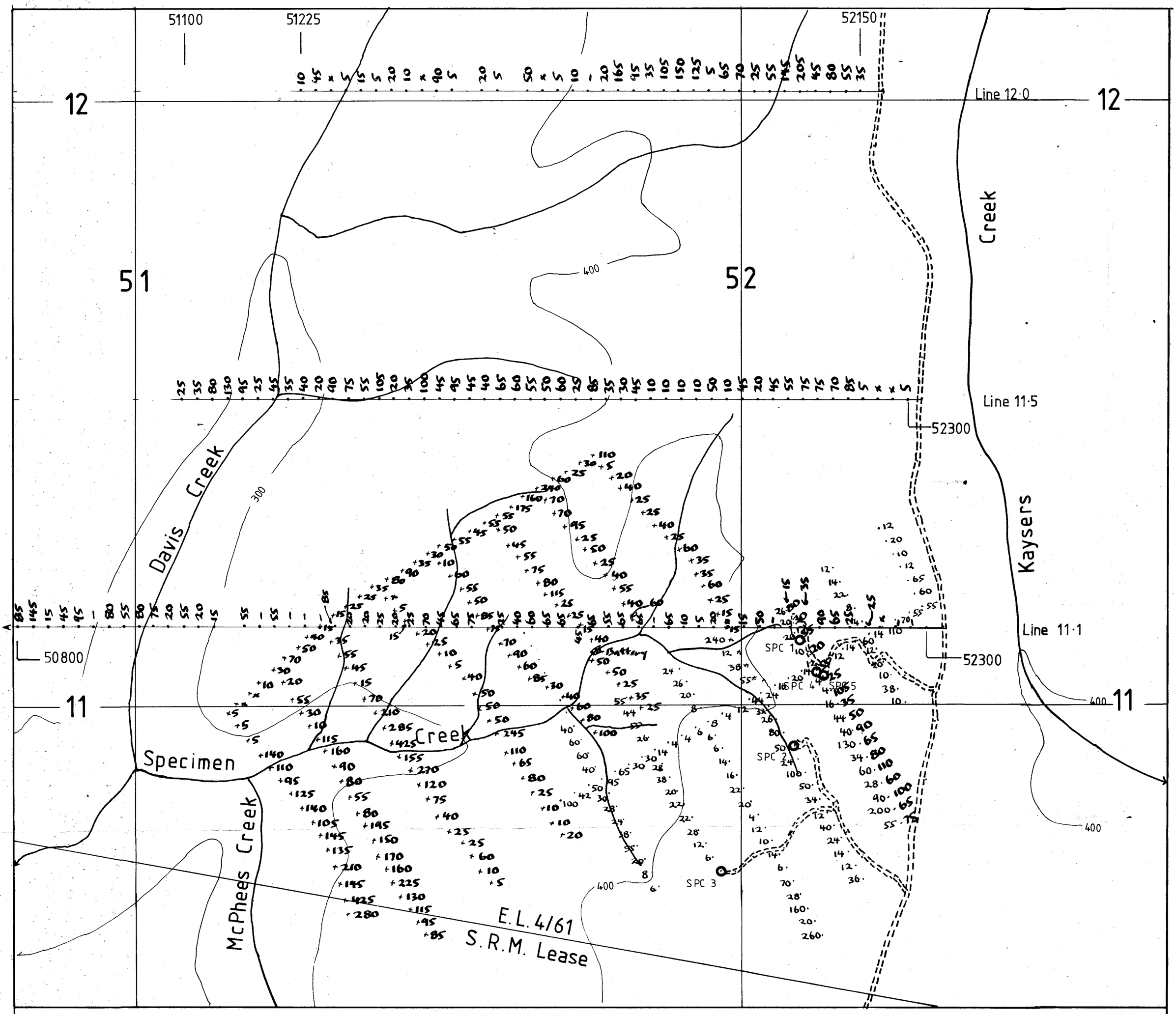
DRAWN : H. Shannon

200 100 0 500m

5 cm

Scale 1 : 5,000 June 1984

84-2262 vol 2.



LEGEND

·22	soil sample 1980 - 81	repeat 1984
×45	" " 1981 - 82	
•5	" " 1982	

298196

- tenure boundary
- —11— grid lines AMG
- creek
- road
- contour
- $o_{SPC\,1}$ drillhole

GN
TN 1·2 MN 11·0

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

SPECIMEN REEF
GEOCHEMICAL SAMPLING
ZINC ANALYSIS VALUES p.p.m.

PLAN 2·4

DATA COLLECTED : J. Wall 1980-81, E. Dubowski 1981-82
H. Shannon, J. Woodman 1982 B. Penny 1984

COMPILED : H. Shannon, E. Dubowski

DRAWN : H. Shannon

200 100 0 500m

5 cm

Scale 1 : 5,000

June 1984

84-2262 vol 2

51100
51225
52150
12
Line 12·0
12
51
52
Creek
Line 11·5
52300
Kaysers
Davis Creek
300
400
Line 11·1
52300
50800
11
11
400
Specimen Creek
McPhees Creek
SPC 1
SPC 4
SPC 5
SPC 2
SPC 3
400
400
E.L. 4/61
S.R.M. Lease

LEGEND

soil sample 1980 - 81 repeat 1984
" " 1981 - 82
" " 1982

tenure boundary
—11— grid lines AMG
creek
road
contour
drillhole SPC 1

GN
TN 1·2
MN 11·0

298197

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

SPECIMEN REEF
GEOCHEMICAL SAMPLING
ARSENIC ANALYSIS VALUES ppm PLAN 2·5

DATA COLLECTED : J. Wall 1980 - 81, E. Dubowski 1981 - 82
H. Shannon, J. Woodman 1982 B. Penny 1984

COMPILED : H. Shannon, E. Dubowski

DRAWN : H. Shannon

200 100 0 500m

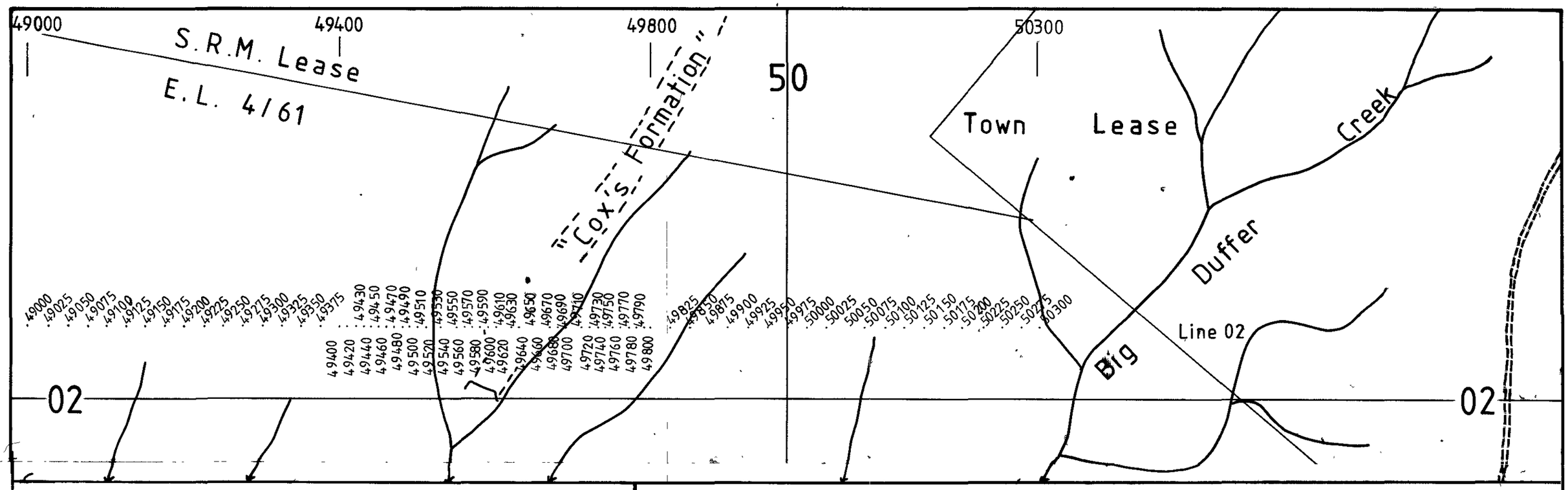
5 cm

Scale 1 : 5,000 June 1984

84-2262 vol 2.

298198

84-2262.



LEGEND

- creek
- road
- soil sample
- open cut and inferred gold bearing ground (after Twelvetrees)
- tenure boundary
- 02 — grid lines AMG

GN
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

GOLDEN RIDGE
GEOCHEMICAL SAMPLING
SAMPLE LOCATIONS

PLAN 3·1

DATA COLLECTED : B. Penny
COMPILED : L. Vanzino
DRAWN : H. Shannon, B. Green

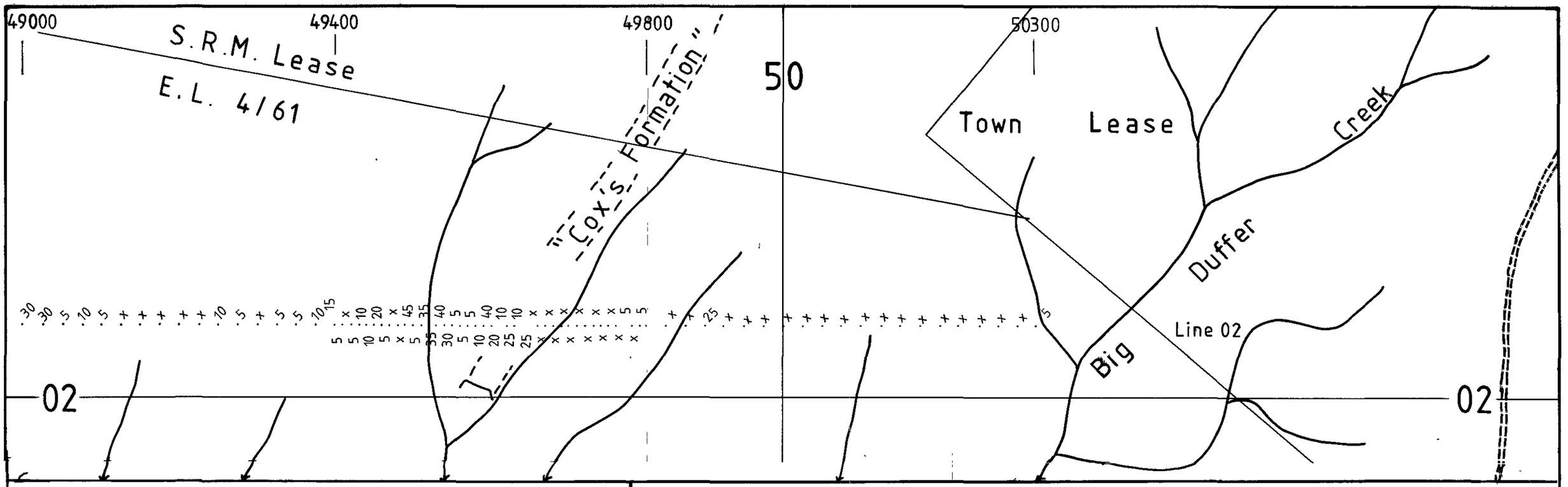
100 0 100 200 300 400 500 m

Scale 1 : 5,000

June 1984

298199

84-2262



LEGEND

- creek
- road
- soil sample (p.p.m.)
- open cut and inferred gold bearing ground (after Twelvetrees)
- tenure boundary
- 02 grid lines AMG

G N
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

GOLDEN RIDGE
GEOCHEMICAL SAMPLING
COPPER ANALYSIS VALUES

PLAN 3·2

DATA COLLECTED : B. Penny
COMPILED : L. Vanzino
DRAWN : H. Shannon, B. Green

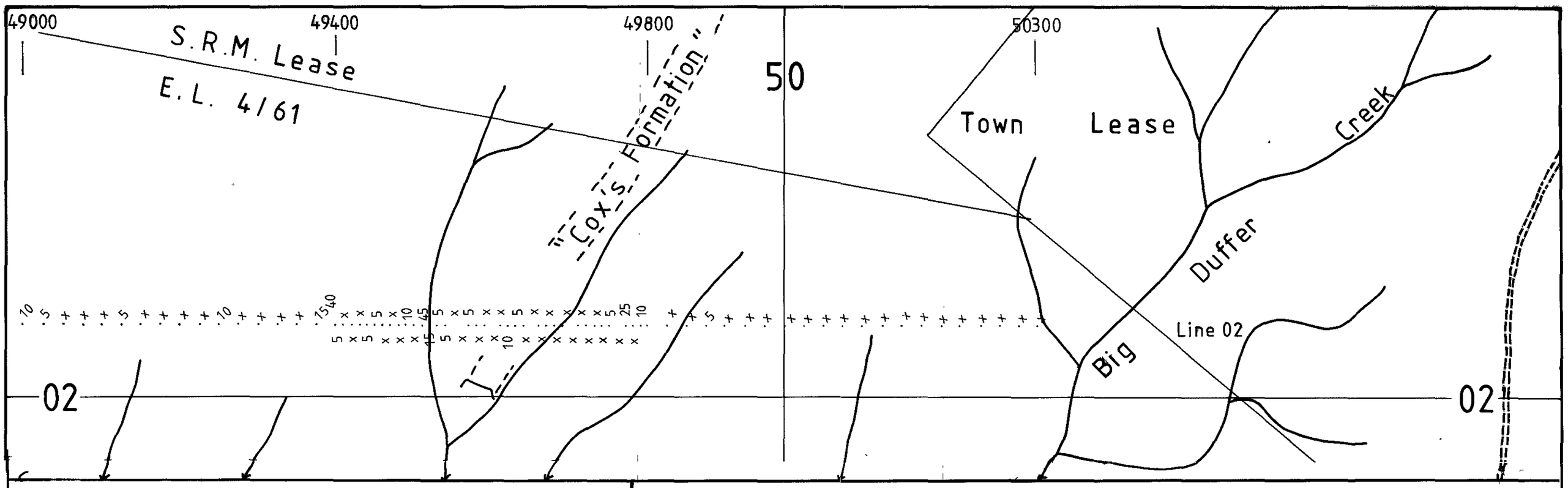
100 0 100 200 300 400 500 m

Scale 1 : 5,000

June 1984

298200

84-2262



LEGEND

- creek
- road
- soil sample (p.p.m.)
- open cut and inferred gold bearing ground (after Twelvetrees)
- tenure boundary
- 02 grid lines AMG

GN
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

GOLDEN RIDGE
GEOCHEMICAL SAMPLING
LEAD ANALYSIS VALUES

PLAN 3·3

DATA COLLECTED : B. Penny
COMPILED : L. Vanzino
DRAWN : H. Shannon, B. Green

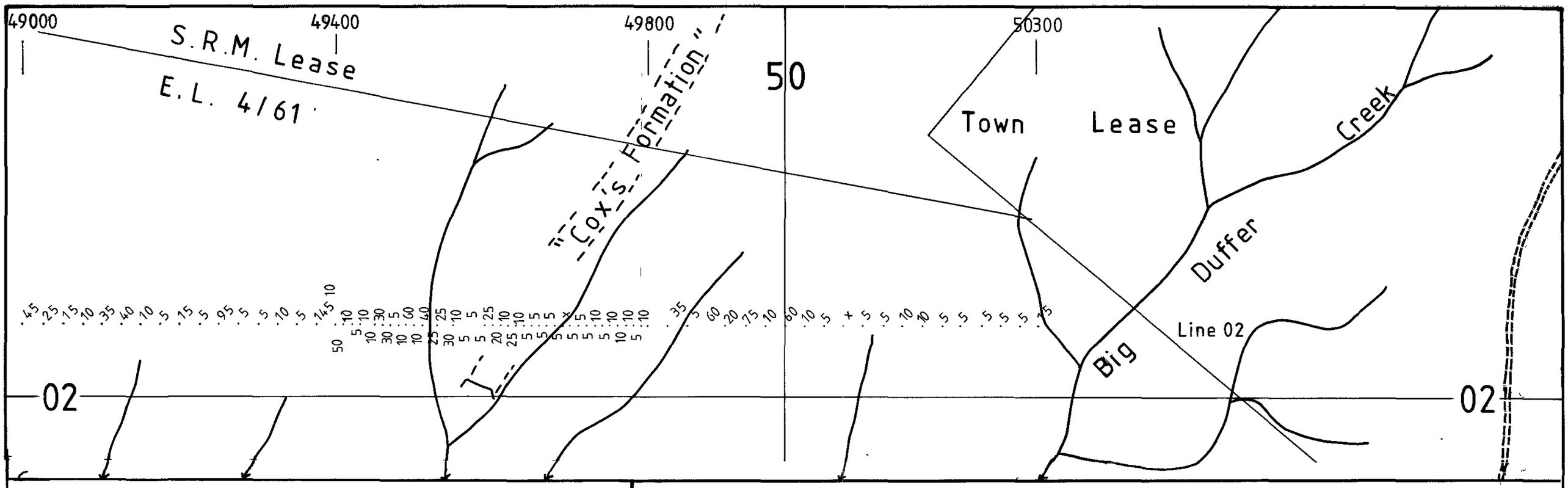
100 0 100 200 300 400 500 m

Scale 1 : 5,000

June 1984

298201

84-2262



LEGEND

- creek
- road
- soil sample (p.p.m.)
- open cut and inferred gold bearing ground (after Twelvetrees)
- tenure boundary
- 02 — grid lines AMG

G N
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

GOLDEN RIDGE
GEOCHEMICAL SAMPLING
ZINC ANALYSIS VALUES

PLAN 3·4

DATA COLLECTED : B. Penny
COMPILED : L. Vanzino
DRAWN : H. Shannon, B. Green

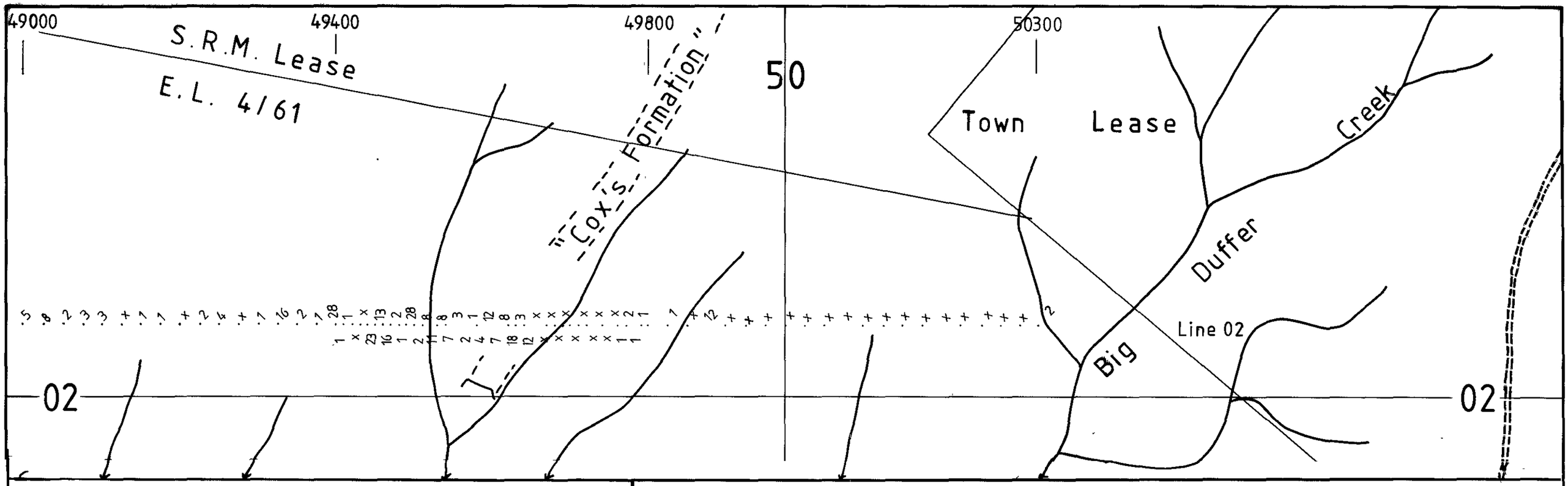
100 0 100 200 300 400 500 m

Scale 1 : 5,000

June 1984

298202

84-2262



LEGEND

- creek
- road
- soil sample (p.p.m.)
- open cut and inferred gold bearing ground (after Twelvetrees)
- tenure boundary
- 02 grid lines AMG

G N
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

GOLDEN RIDGE
GEOCHEMICAL SAMPLING
ARSENIC ANALYSIS VALUES

PLAN 3·5

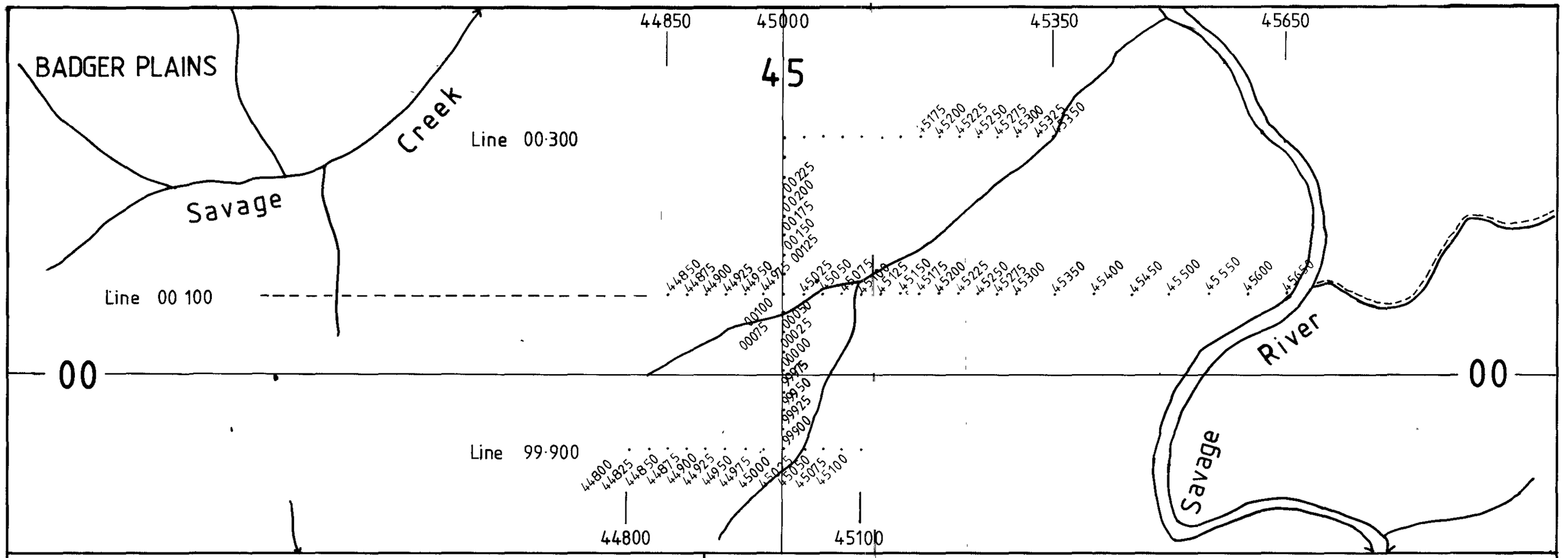
DATA COLLECTED : B. Penny
COMPILED : L. Vanzino
DRAWN : H. Shannon, B. Green

100 0 100 200 300 400 500 m

Scale 1 : 5,000

June 1984

84-2262



LEGEND

- creek
- foot track
- soil sample
- —00— grid lines AMG

G N
TN 1·2°
MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

WATERFALL CREEK GEOCHEMICAL SAMPLING SAMPLE LOCATIONS

PLAN 4·1

DATA COLLECTED : L. Vanzino

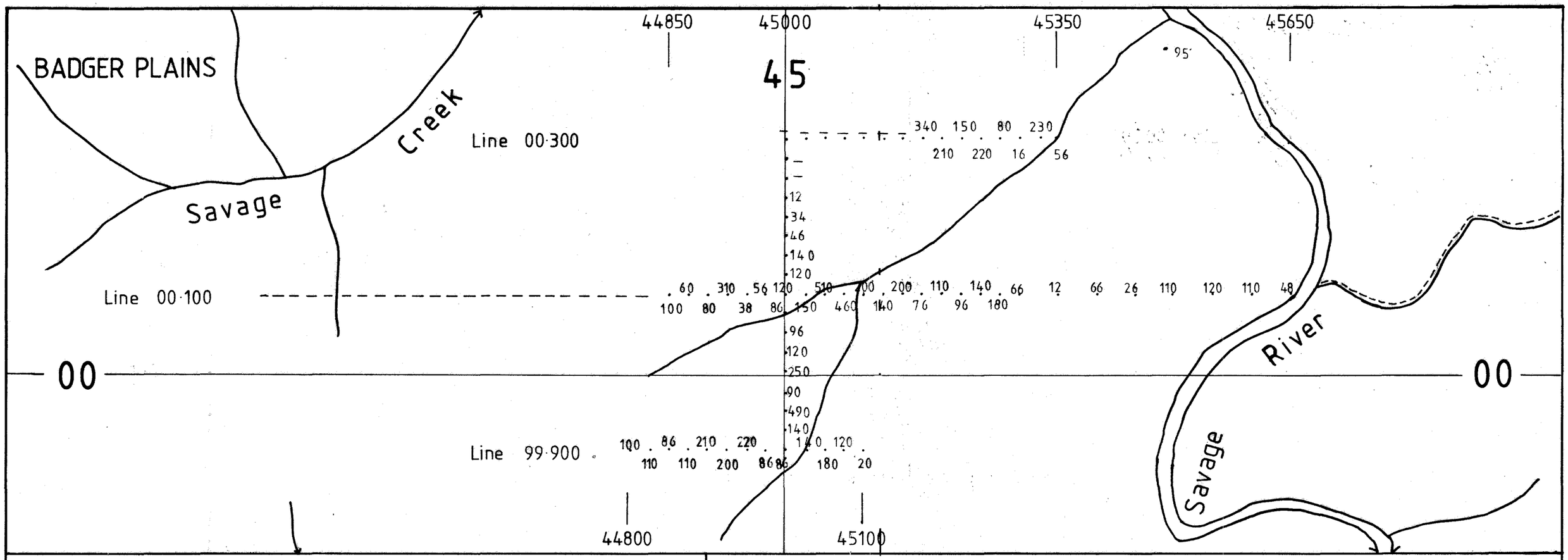
COMPILED : L. Vanzino

DRAWN : H. Shannon

200 100 0 500m

Scale 1 : 5,000

June 1984



LEGEND

creek

foot track

soil sample (p.p.m.)

—00— grid lines AMG

G N

TN 1·2° MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

WATERFALL CREEK
GEOCHEMICAL SAMPLING
COPPER ANALYSIS VALUES

PLAN 4·2

DATA COLLECTED : L. Vanzino

COMPILED L. Vanzino

DRAWN : H. Shannon

298204

5 cm

200 100 0 500m

0022

Scale 1 : 5,000

June 1984

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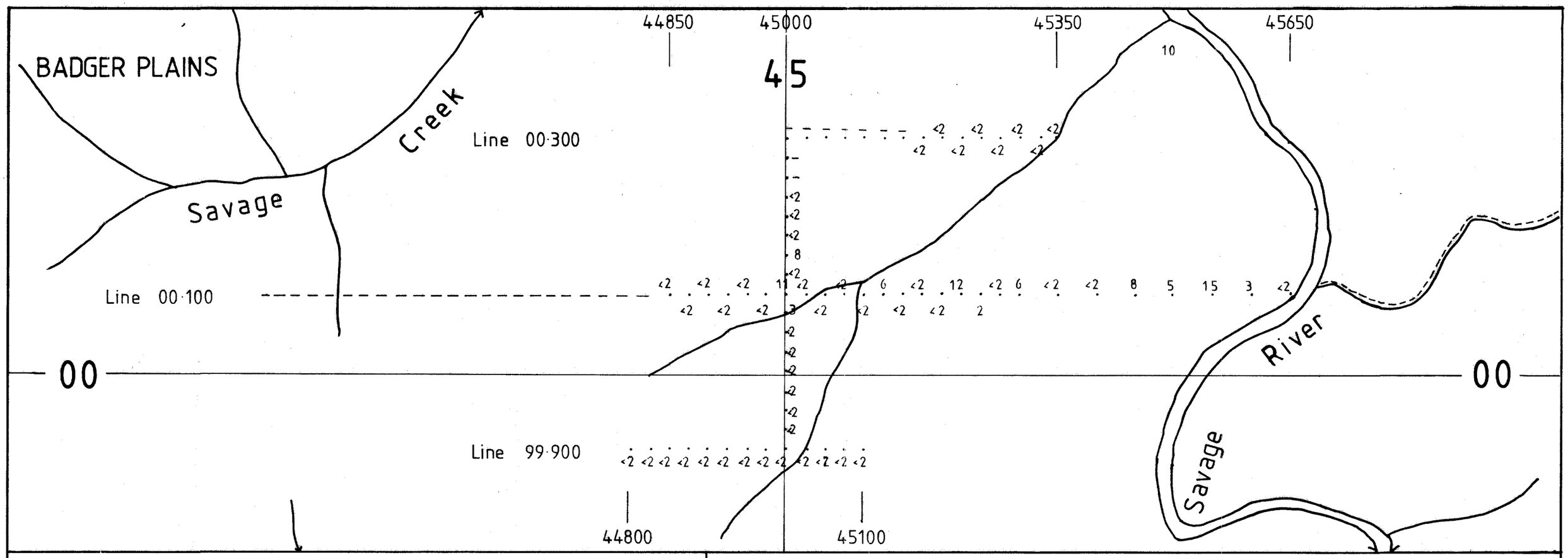


LEGEND

creek

foot track

soil sample (p.p.m.)

—00— grid lines AMG

G N

TN 1·2°

MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

WATERFALL CREEK
GEOCHEMICAL SAMPLING
LEAD ANALYSIS VALUES

PLAN 4·3

DATA COLLECTED : L. Vanzino

COMPILED : L. Vanzino

DRAWN : H. Shannon

298205

200 100 0 500m

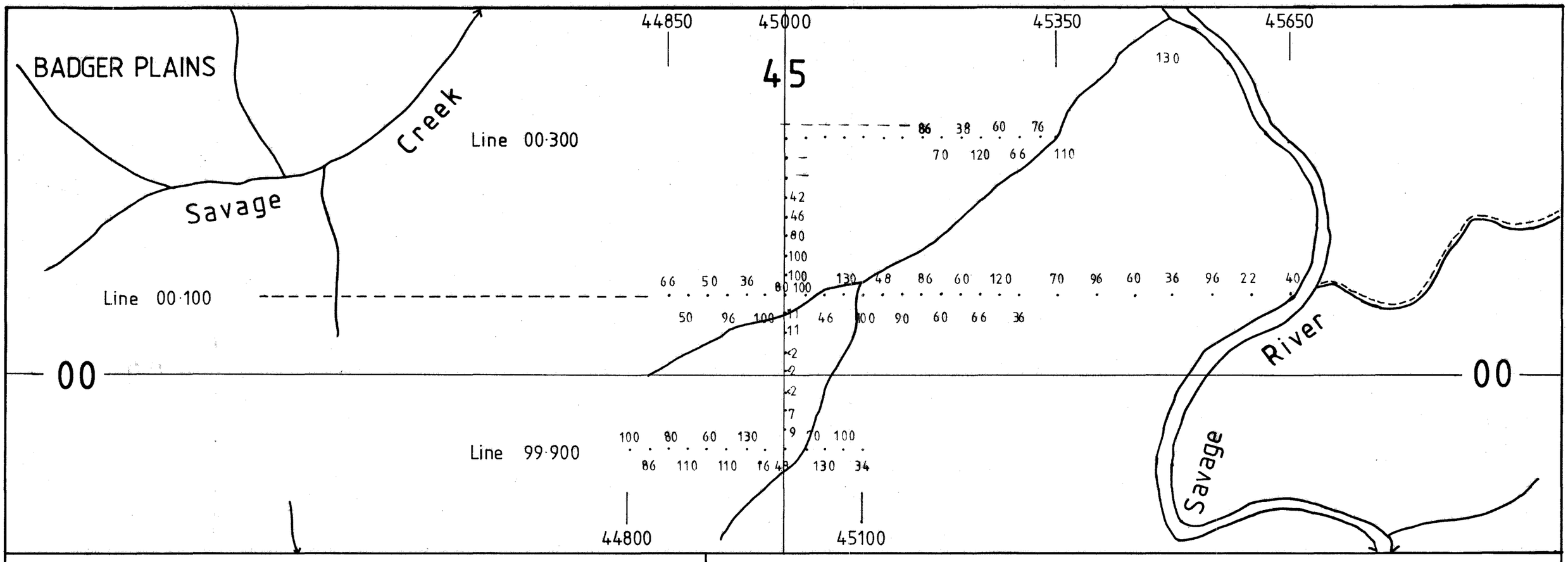
0023

5 cm

Scale 1 : 5,000

June 1984

84-2262 vol 2.



LEGEND

creek

foot track

soil sample (p.p.m.)

—00— grid lines AMG

G N

TN 1·2° MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

WATERFALL CREEK
GEOCHEMICAL SAMPLING
ZINC ANALYSIS VALUES

PLAN 4·4

DATA COLLECTED : L. Vanzino

COMPILED : L. Vanzino

DRAWN : H. Shannon

298206

200 100 0 500m

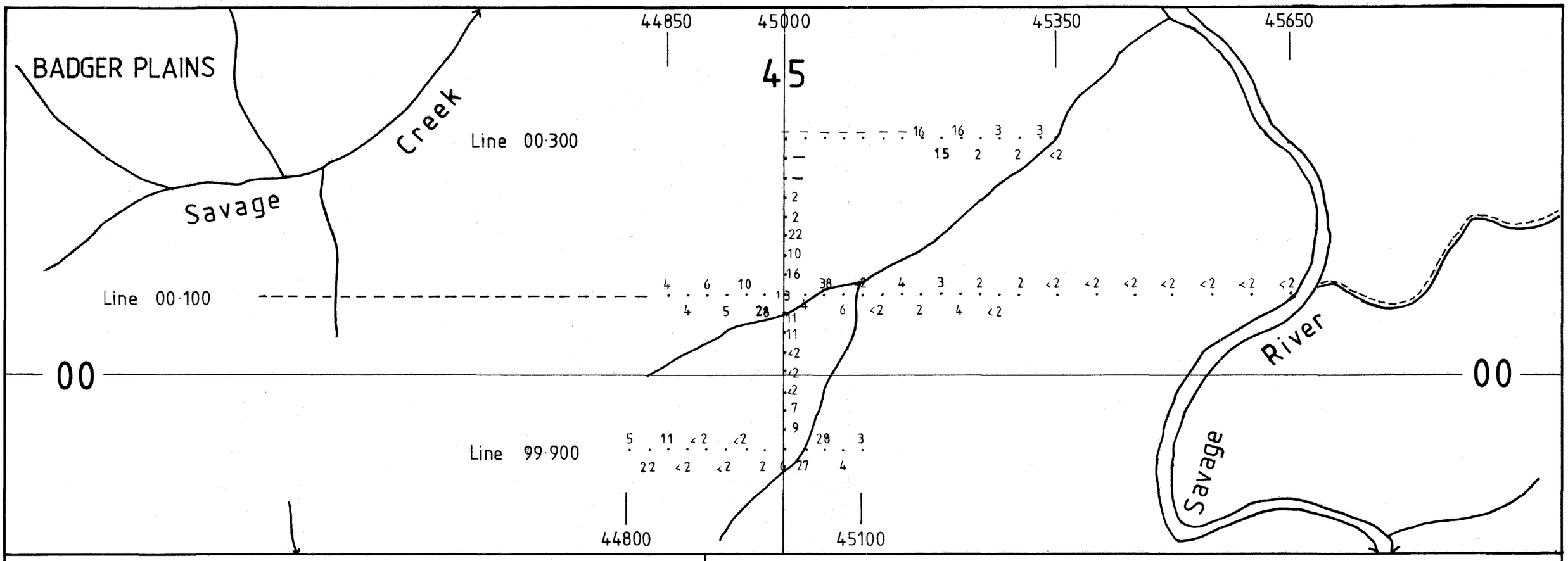
0024

5 cm

Scale 1 : 5,000

June 1984

84-2262 vol 2.



LEGEND

creek

foot track

soil sample (p.p.m.)

—00— grid lines AMG

G N

TN 1·2°

MN 11·0°

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

WATERFALL CREEK
GEOCHEMICAL SAMPLING
ARSENIC ANALYSIS VALUES

PLAN 4·5

DATA COLLECTED : L. Vanzino

COMPILED : L. Vanzino

DRAWN : H. Shannon

298207

200 100 0 500m

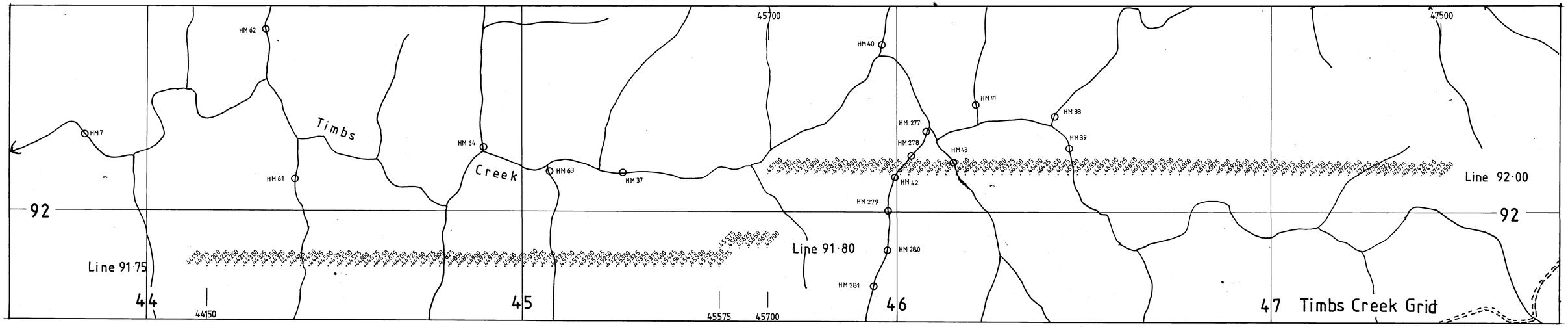
0025

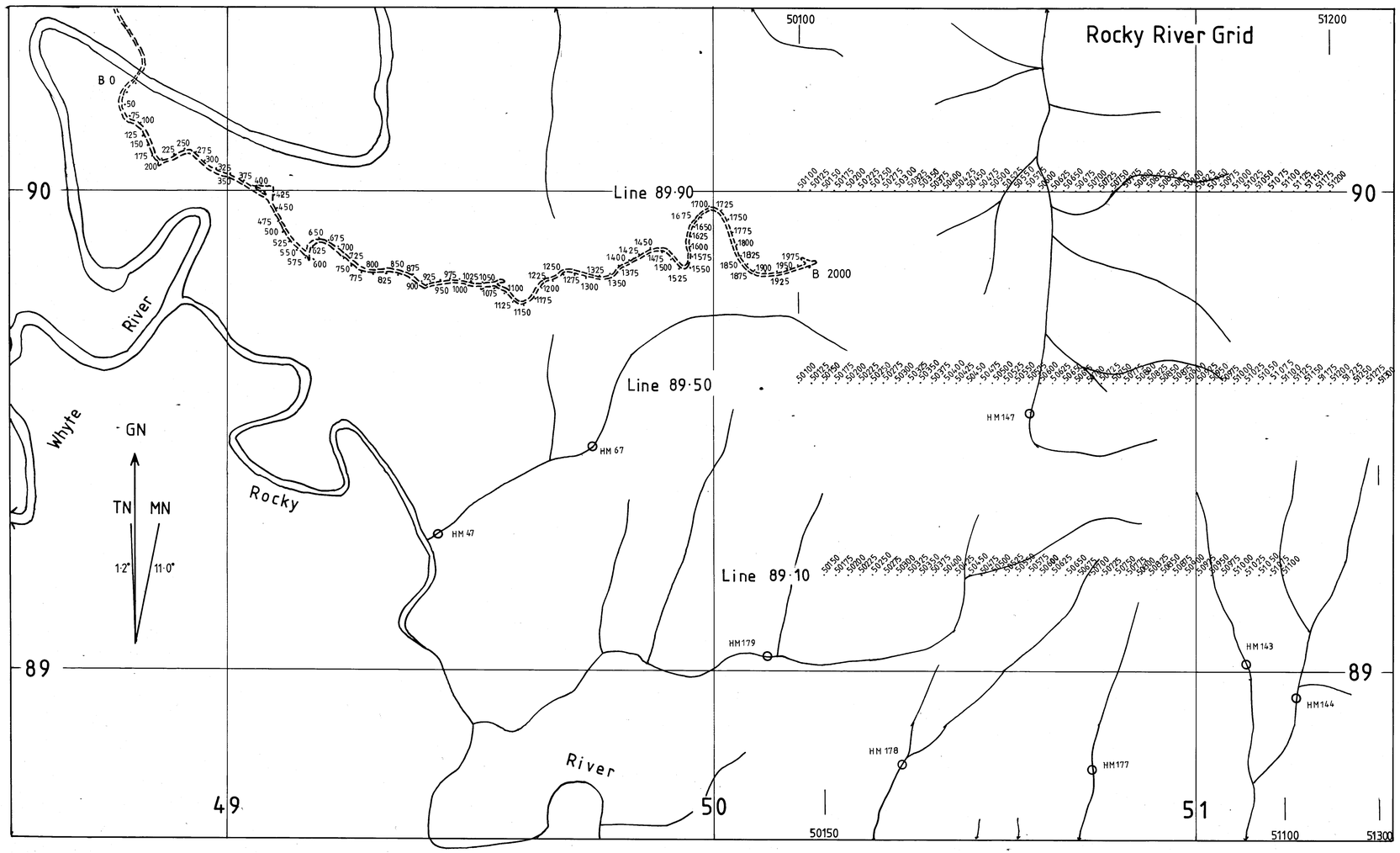
5 cm

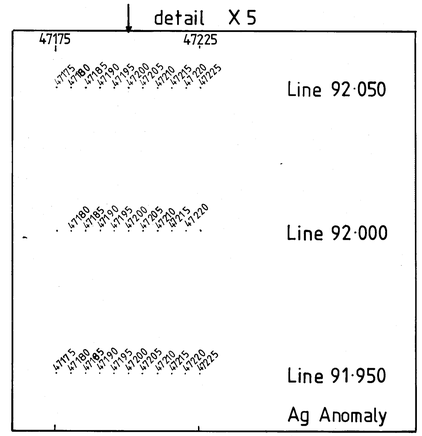
Scale 1 : 5,000

June 1984

84-2262 vol 2.







LEGEND

- 92 — grid lines AMG
- stream
- road
- silt sample
- soil sample

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

TIMBS CREEK AND ROCKY RIVER AREAS
GEOCHEMICAL SAMPLING
SAMPLE LOCATIONS PLAN 5·1

DATA COLLECTED : B. Penny, L. Vanzino 1984
COMPILED : L. Vanzino, H. Shannon, B. Penny
DRAWN : H. Shannon

100 50 0 100 200 300 400 500 metres

Scale 1 : 5,000 June 1984

Timbs Creek

Ag anomaly

Line 91·75

Line 91·80

Line 92·00

Line 92·050

Line 92·000

Line 91·950

Ag Anomaly

Line 89·90

Line 89·50

Line 89·10

Rocky River Grid

Timbs Creek Grid

detail X 5

Whyte River

Rocky River

GN

TN MN

1·2° 11·0°

LEGEND

—92— grid lines AMG

stream

road

o silt sample

soil sample (p.p.m.)

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

TIMBS CREEK AND ROCKY RIVER AREAS GEOCHEMICAL SAMPLING COPPER ANALYSIS VALUES PLAN 5·2

DATA COLLECTED : B. Penny, L. Vanzino 1984

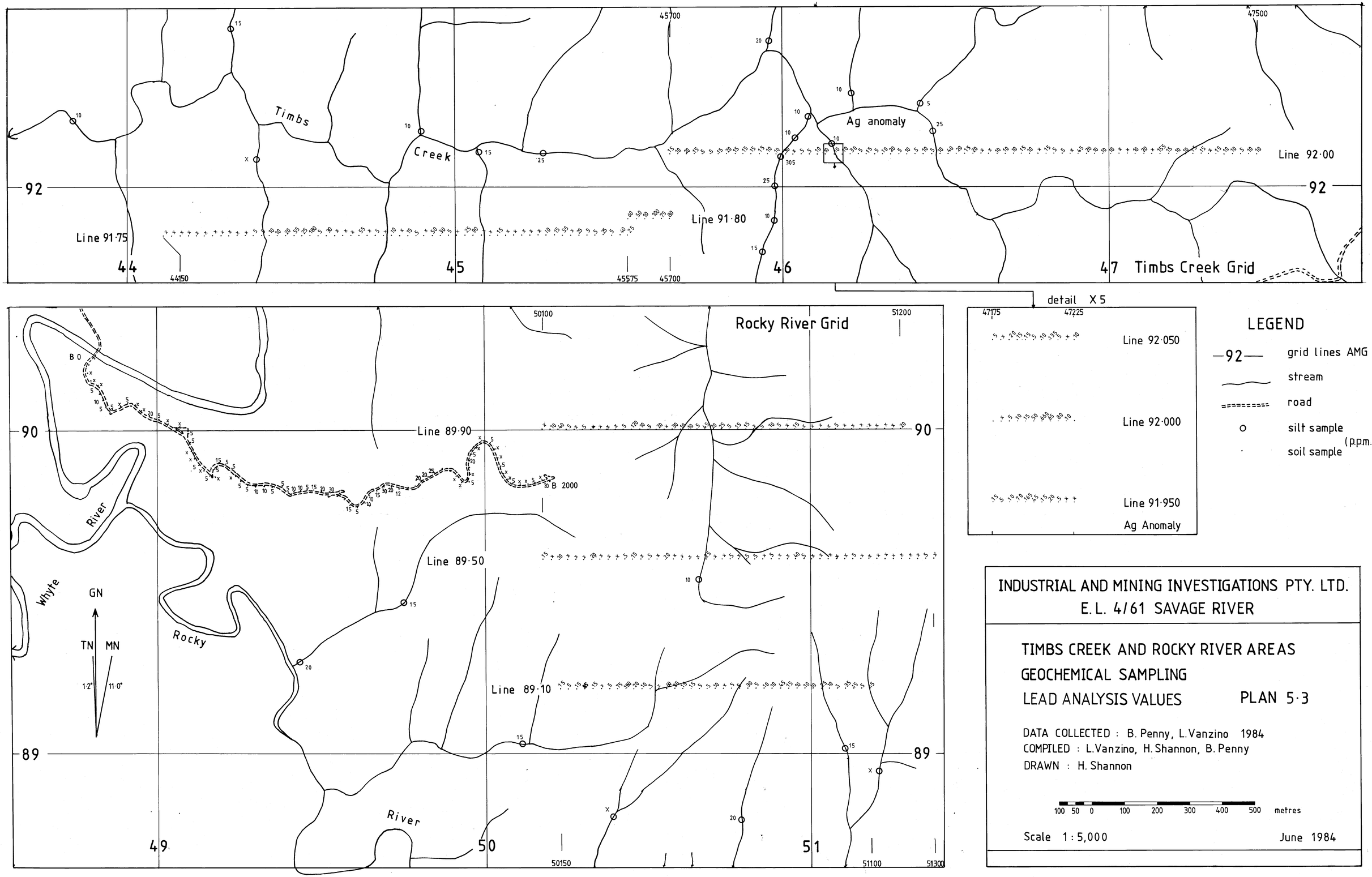
COMPILED : L. Vanzino, H. Shannon, B. Penny

DRAWN : H. Shannon

100 50 0 100 200 300 400 500 metres

Scale 1 : 5,000

June 1984



LEGEND

- —92— grid lines AMG
- stream
- road
- o silt sample (p.p.m.)
- soil sample

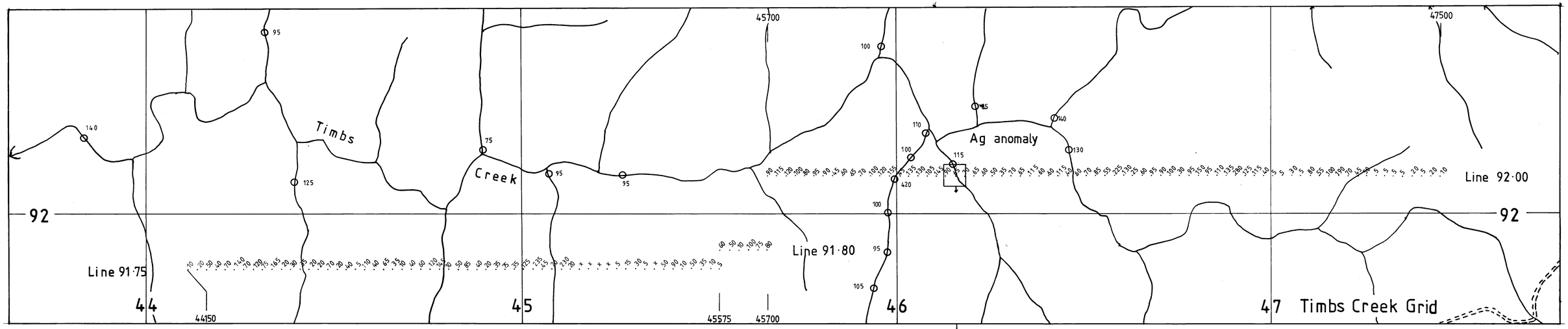
INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

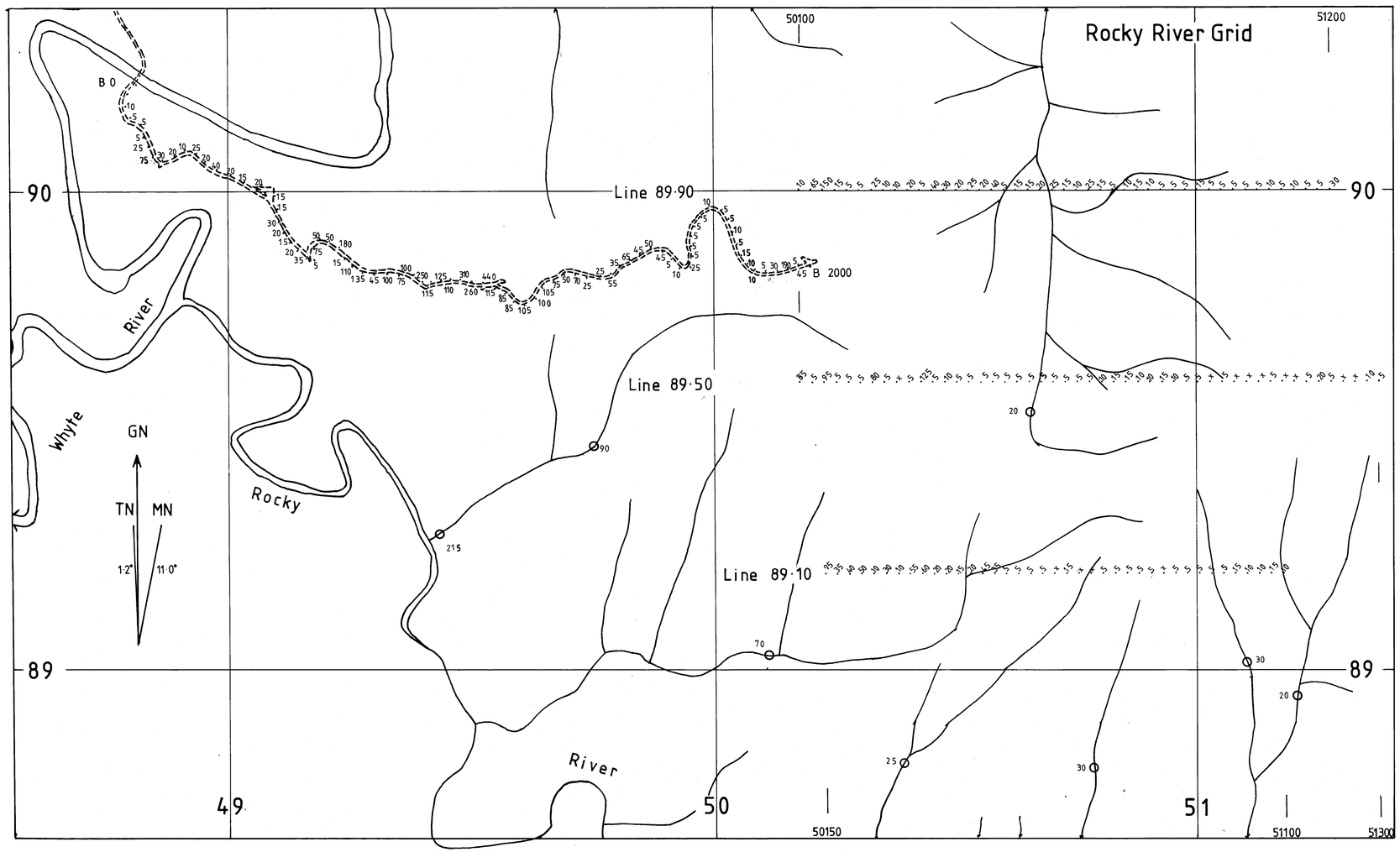
TIMBS CREEK AND ROCKY RIVER AREAS
GEOCHEMICAL SAMPLING
LEAD ANALYSIS VALUES — PLAN 5·3

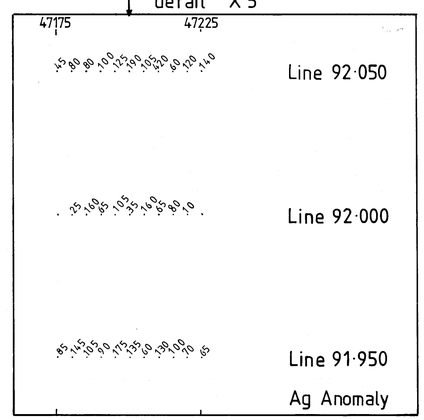
DATA COLLECTED : B. Penny, L. Vanzino 1984
COMPILED : L. Vanzino, H. Shannon, B. Penny
DRAWN : H. Shannon

100 50 0 100 200 300 400 500 metres

Scale 1 : 5,000 June 1984







LEGEND

—92— grid lines AMG

stream

road

o silt sample

soil sample (p.p.m.)

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.
E.L. 4/61 SAVAGE RIVER

TIMBS CREEK AND ROCKY RIVER AREAS
GEOCHEMICAL SAMPLING
ZINC ANALYSIS VALUES PLAN 5·4

DATA COLLECTED : B. Penny, L.Vanzino 1984
COMPILED : L.Vanzino, H. Shannon, B. Penny
DRAWN : H. Shannon

100 50 0 100 200 300 400 500 metres

Scale 1 : 5,000 June 1984

Timbs Creek

Ag anomaly

Line 92·00

Line 91·75

Line 91·80

92

44

45

46

47 Timbs Creek Grid

44150

45575

45700

47500

detail X 5

47175

47225

Line 92·050

Line 92·000

Line 91·950

Ag Anomaly

Rocky River Grid

50100

51200

Line 89·90

Line 89·50

Line 89·10

90

89

B 0

B 2000

River

Whyte

Rocky

River

GN

TN MN

1·2° 11·0°

49

50

51

50150

51100

51300

LEGEND

—92— grid lines AMG

stream

road

o silt sample (p.p.m.)

soil sample

INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

TIMBS CREEK AND ROCKY RIVER AREAS GEOCHEMICAL SAMPLING ARSENIC ANALYSIS VALUES PLAN 5·5

DATA COLLECTED : B. Penny, L. Vanzino 1984

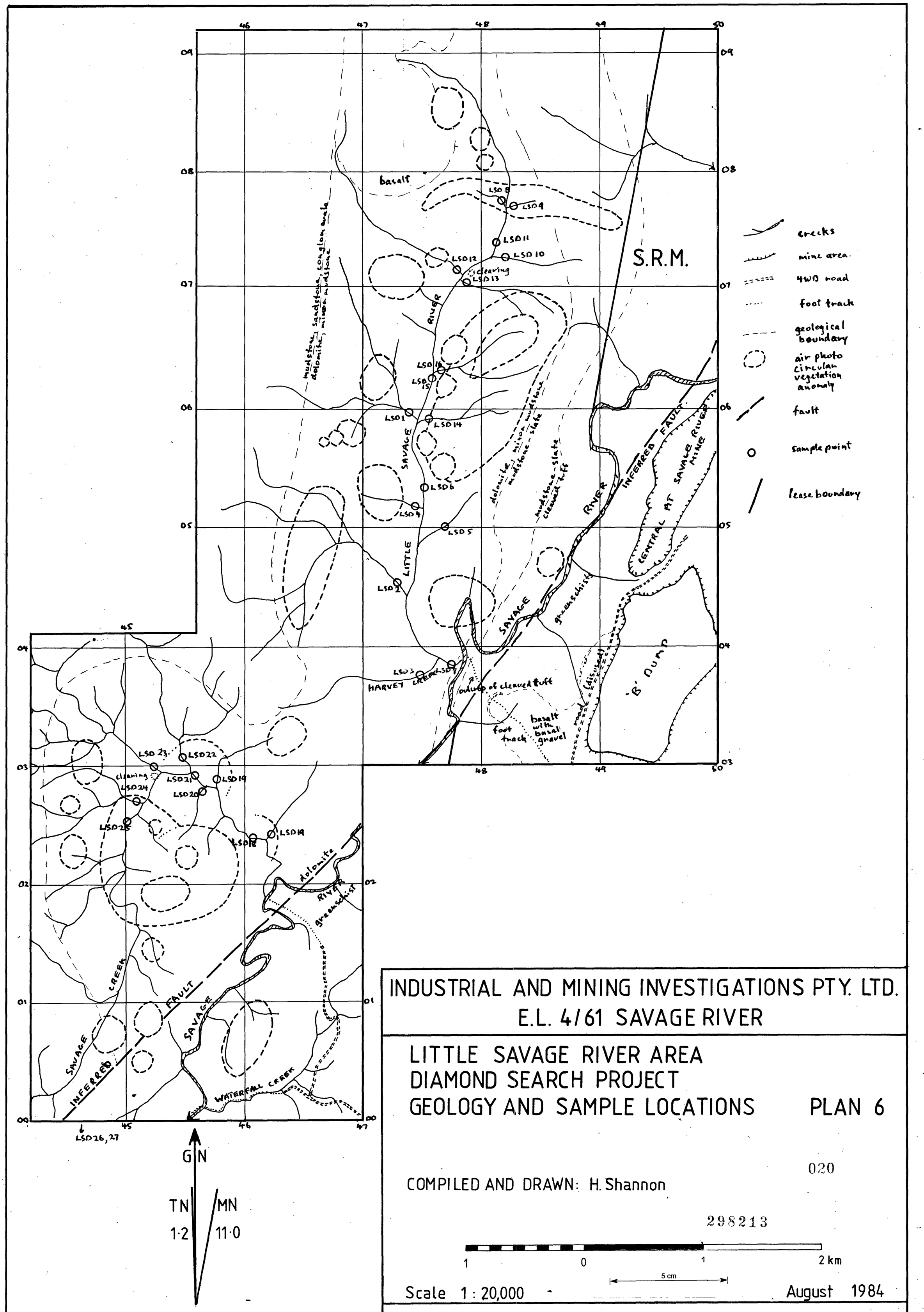
COMPILED : L. Vanzino, H. Shannon, B. Penny

DRAWN : H. Shannon

100 50 0 100 200 300 400 500 metres

Scale 1 : 5,000

June 1984



INDUSTRIAL AND MINING INVESTIGATIONS PTY. LTD.

E.L. 4/61 SAVAGE RIVER

LITTLE SAVAGE RIVER AREA
DIAMOND SEARCH PROJECT
GEOLOGY AND SAMPLE LOCATIONS — PLAN 6

020

COMPILED AND DRAWN: H. Shannon

298213

1 0 1 2 km

5 cm

Scale 1 : 20,000 — August 1984

84-2267