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Report on Field Investigations on Harvey Creek - Little Savage River Area

EL 4/61

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REPORT ON FIELD INVESTIGATIONS OF THE HARVEY CREEK - LITTLE SAVAGE RIVER AREA - E. L. 4/61

I.   INTRODUCTION

During the period 19th February to 30th March 1979, field investigations were undertaken over the area of interest, an area of some eight square kilometres. These investigations, in the main, involved a geochemical stream sediment survey. Spot gravel samples were poured for gold and diamond detection, without success.

II.   LOCATION AND ACCESS (Maps 1 and 2)

The area of interest is situated approximately 2.5 kilometres due west of the Savage River Mine open cut, between grid lines 5403500 metres N and 5406500 metres N, and 345500 metres E and 348000 metres E. Formed access to and within the area is non existent. This necessitated the cutting of a 3.5 kilometre base foot track, from the western margin of the open cut, in a westerly direction, to the headwaters of Harvey Creek. A minor foot track was cleared along the Little Savage River from its junction

with Harvey Creek, for a distance of some 1.5 kilometres
to the north, and some 0.5 kilometres to the south.

III.   PHYSIOGRAPHY AND TOPOGRAPHY (Maps 1 and 2)

The area investigated forms part of a peneplain,
up to 400 metres above sea level, which has been deeply
dissected by the Little Savage River and its tributaries,
the resultant landscape being extremely rugged and diffi-
cult to traverse.

IV.   RAINFALL AND VEGETATION (Vegetation - Maps 1 and
2)

Rainfall is in excess of 200 millimetres per
annum, and is relatively evenly distributed throughout the
year. Rivers and creeks are at their lowest levels during
February - March, the most favourable time for field inves-
tigations.

Vegetation is, in the main, very thick temperate
rain forest. Myrtle, sassafras and giant manferns are the
most common forms. Horizontal scrub and bauera are so dense
in some areas that progress on foot is practically impossi-
ble. Consequently, progress in the field is slow.

V.   GEOLOGY (Map 3)

The area with which this report deals is occupied
by the psammitic assemblage (not the peletic assemblage as
previously outlined by Urquhart and the Mines Department)
of the Whyte Schist as outlined by Urquhart, 1966, in Geolo-
gical Survey Bulletin No. 48, "Magnetite Deposits of the
Savage River - Rocky River Region."

The Whyte Schist is a belt of metamorphic rocks
that extend from Granville Harbour in the southwest, to
north of Savage River, and form part of what is termed the
"Arthur Lineament," a zone of intense deformation extending
for some 115 kilometres N.N.E. across the northwest corner
of Tasmania.

The psammitic sediments observed in the field include shales, siltstones, mica-quartz-schists and phyllites, black graphite-pyrite schists and quartzite, with occasional dolomite, calcareous cherts and conglomerate. These sediments are generally grey or white and the assemblage as a whole is pale in colour.

VI.   GEOCHEMICAL SURVEY (Maps 4, 5 and 6 and Graphs 1, 2 and 3)

(i)   A stream sediment survey was carried out over an area of approximately 8 square kilometres. The onset of continuous rain in late March forced a closure of the sampling programme for the season.

(ii)   Collection and Preparation of Stream Sediments

Samples of wet stream sediments were collected from recent and active alluvium. Samples were collected at approximately 500 metre intervals along Little Savage River and Harvey Creek and their tributaries. Location of samples were plotted on 1:40,000 scale aerial photographs and 1:50,000 scale topographic sheets in the field, and the samples dried and sieved at base as follows:

> +40 mesh - panned for Au, Sn and diamonds before
>   rejection
> -40 +80 mesh - retained in sample bags.
> -80 mesh - despatched to Tetchem Laboratories,
>   Cairns, for analysis.

The lack of -80 mesh material in the stream sediments was a problem, necessitating the collection of large initial samples to obtain sufficient -80 material for Au determination.

(iii)   Geochemical Analyses (Graphs 1, 2 and 3)

Stream sediments of -80 mesh were analyzed by A.A.S. for copper, lead, zinc, silver and gold content, at the Tetchem Laboratories, Cairns.

Generally, the accuracy of analyses would be ± 15%. The lower limits of detection of various elements are as follows:

Copper	1 parts per million
Lead	3 parts per million
Zinc	3 parts per million
Silver	0.5 parts per million
Gold	0.1 parts per million

(iv)   Statistical Evaluation of Analyses

Sample locations were plotted on a base map of 1 to 31,680 compiled by the former Chief Mining Engineer at Savage River, J. P. Sheehan. (The insignificant Ag (silver) and Au (gold) values did not warrant an evaluation). The concentration of metallic ions of copper, lead and zinc are shown beneath each sample on the appropriate plan.

Analytical results were studied statistically using the Cumulative Frequency Method involving medians and quartiles (See Appendix A). Details of calculations are included.

A summary of the median value, standard deviation and lowest anomalous value for the various elements are given below.

No. of Samples	Elements	Median	Standard Deviation	Lowest Anomalous Value
25	Copper	2.25*	5.25*	23.25*
25	Lead	6.75*	4.875*	26.25*
25	Zinc	13.00*	21.75*	100.00*

* ppm = parts per million.

(v)   Conclusions on Stream Sediment Survey

Analyses were obtained on 25 samples collected from Little Savage River and Harvey Creek and its tributaries. This gives a density of three samples per square kilometre. The maximum and minimum values of copper, lead and zinc are as follows.

Element	Maximum (ppm)	Minimum (ppm)
Copper	12	1
Lead	24	4
Zinc	55	3

The lower values for all elements tend to be associated with quartzites, phyllites and shales, whilst the higher values tend to be associated with schists, particularly the blacker graphite-pyrite variety.

As can be seen from the above chart, no sample from the stream sediment survey proved to be anomalous. This result is not unexpected as no base mineralization of note is known to occur within the psammitic assemblage of the Lower Precambrian Whyte Schist.

VII.   CONCLUSIONS

It is most unlikely that any significant base-metal mineralization, or concentrations of diamonds, occur within the Harvey Creek - Little Savage River Area of E.L. 4/61.

VIII.   AREAS FOR FUTURE EXPLORATION - E.L. 4/61

The areas within E.L. 4/61 with reasonable access have been investigated.

The area to the north and north-west of the Savage River open cut has limited access on its eastern margin, by way of the "pipeline" road (See Maps 1a and 2a of this Report). As no exploratory work at all has been attempted in this area (apart from the Northern Iron Deposit), it should be investigated in the near future.

Any exploration of this area will be an expensive operation. The area is extremely rugged in relief, and covered completely by dense temperate rain forest, thus necessitating both vehicular and foot track construction.

As mentioned previously, field work within E. L. 4/61 is controlled by the weather (i.e. the amount of rainfall); therefore, it will be at least October before preliminary investigations of this area can commence.

M. D. EDYVEAN, B.Sc.

7th May 1979.

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1.   Geochemical Analyses

2.   Statistical Evaluation and Calculations -
          Copper, Lead and Zinc.

STATISTICAL EVALUATION - COPPER

ppm	1	2	3	4	5	6	7	8	9	10	11	12
Frequency	9	3	2	2	2	1	1	1	1	2	-	1
Cumulative Frequency	9	12	14	16	18	19	20	21	22	24	24	25
Cumulative Percentage	36	48	56	64	72	78	80	84	88	96	-	100

From Graph 1. Q_3=75% Cumulative Frequency 5.75 ppm
Me=50% Cumulative Frequency 2.25 ppm
Q_1=25% Cumulative Frequency 0.50 ppm

Thus: (1) Standard Deviation at 1.5 (Q_3 - Me) =
1.5 (5.75 - 2.25) = 1.5 x 3.5 = 5.25 ppm

(2) Normal Distribution = Me + 1.5 (Q_5 - Me) =
Me + Standard Deviation = 5.25 + 2.25 = 7.50 ppm

(3) Anomalous Value = Me + 6 (Q_3 - Me) =
Me + 4 Standard Deviations = 2.25 + 21.0 = 23.25 ppm

STATISTICAL EVALUATION – LEAD

p.p.m.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Frequency	3	2	5	5	–	1	1	–	4	1	–	–	1	–	–	–	–	1	–	–	1
Cumulative Frequency	3	5	10	15	–	16	17	–	21	22	–	–	23	–	–	–	–	24	–	–	25
Cumulative Percentage	12	20	40	60	–	64	68	–	84	88	–	–	92	–	–	–	–	96	–	–	100

From Graph 2. $Q3$ = 10.00 p.p.m.
Me = 6.75 p.p.m.
$Q1$ = 5.25 p.p.m.

Thus: (1) Standard Deviation at $1.5 (Q3 - Me) = 1.5 (10.00 - 6.75) = 1.5 \times 3.25 = 4.875$ p.p.m.

(2) Normal Distribution = Me + Standard Deviation = $Me + 1.5 (Q3 - Me) = 6.75 + 4.875$
   = 11.625 p.p.m.

(3) Anomalous Value = Me + 4 Standard Deviations = $Me + 6 (Q3 - Me) = 6.75 + 19.5$
   = 26.25 p.p.m.

STATISTICAL EVALUATION - ZINC

p.p.m.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	26	33	45	46	47	48	55
Frequency	1	1	2	2	-	2	1	-	1	2	-	-	1	2	-	1	1	1	1	2	1	1	1	1
Cumulative Frequency	1	2	4	6	-	8	9	-	10	12	-	-	13	15	-	16	17	18	19	21	22	23	24	25
Cumulative Percentage	4	8	16	24	-	32	36	-	40	48	-	-	52	60	-	64	68	72	78	84	88	92	96	100

From Graph 3. $Q3 = 27.5$ p.p.m.
$Me = 13.0$ p.p.m.
$Q1 = 6.5$ p.p.m.

Thus: (1) Standard Deviation at $1.5 (Q3 - Me) = 1.5 (27.5 - 13.0) = 1.5 \times 14.5 = 21.75$ p.p.m.

(2) Normal Distribution $= Me + $ Standard Deviation $= Me + 1.5 (Q3 - Me) = 13.0 + 21.75$
$= 34.75$ p.p.m.

(3) Anomalous Value $= Me + 4$ Standard Deviations $= Me + 6 (Q3 - Me) = 13.0 + 87.0$
$= 100$ p.p.m.

REPORT ON FIELD INVESTIGATIONS OF THE HARVEY CREEK - LITTLE SAVAGE RIVER AREA - EL 4/61

Maps

Graphs

TETCHEM LABORATORIES PTY. LTD.

1 Ogden Street,
Cairns

Phone 3518

CERTIFICATE OF ANALYSIS

No. 171/79

SHEET No. 1

INV. No.

Samples Submitted by INDUSTRIAL & MINING INVESTAGATIONS PTY. LTD.

Samples Received by 10-4-79 Request No.

All results in p.p.m. unless otherwise indicated.

SAMPLE MARKINGS	Cu	Pb	Zn	Ag	Au			
IMI 66	8	12	46	<0.5	BLD			
67	10	21	55	<0.5	BLD			
68	5	6	16	<0.5	BLD			
69	1	4	19	<0.5	BLD			
70	1	5	5	<0.5	BLD			
71	3	7	18	<0.5	BLD			
72	2	7	12	<0.5	BLD			
73	5	16	11	<0.5	BLD			
74	3	5	15	<0.5	BLD			
75	1	6	9	<0.5	BLD			
76	1	7	6	<0.5	BLD			
77	1	6	5	<0.5	BLD			
78	10	13	47	<0.5	BLD			
79	1	10	8	<0.5	BLD			
80	2	7	6	<0.5	BLD			
81	12	24	48	<0.5	BLD			
82	9	12	45	<0.5	BLD			
83	6	6	33	<0.5	BLD			
84	2	4	16	<0.5	BLD			
85	7	12	45	<0.5	BLD			
86	4	9	26	<0.5	BLD			
87	4	12	12	<0.5	BLD			
88	1	6	3	<0.5	BLD			
89	1	4	4	<0.5	BLD			
IMI 90	1	7	8	<0.5	BLD			

FOR METHOD DETAILS, SEE PRICE LIST

CHIEF CHEMIST _____

DATE 19-4-1979

REMARKS:
METHOD A: No Prep

ABBREVIATIONS:

bld—below limit of detection.

dwt—pennyweights troy per short ton of 2000 pounds.

lb—pounds per short ton.

oz—ounces troy per short ton of 2000 pounds.

ppb—parts per billion = grams per 10^9 grams.

ppm—parts per million = grams per 10^6 grams.

EQUIVALENTS:	p.p.m.	Percentage	oz. (troy)	dwt.	lb. (avdp.)
	100,000	10.0	2910	58300	200
	10,000	1.0	291	5830	20
	1,000	0.1	29.1	583	2
	100	0.01	2.91	58.3	0.2
	10	0.001	0.291	5.83	0.02
	1	0.0001	0.029	0.58	0.002

TRINI

Mapa 2 a. Location, Access, Vegetation. (Harvey Ck.-Little Savage Rv. Area)

011   1:50 000   PROVISIONAL EDITION   5 cm

HORTON   STREAM SEDIMENT SURVEY - SAMPLE LOCATION   SHEET No: 7915-III

LITTLE SAVAGE RIVER AND HARVEY CREEK AREA — E.L.5/61.

1 : 50 000

145°00'
41°30'

MT SUNDAY

Interview Pinnacle

Interview

Badger Plains

Savage River

Obsidian

Savage River

Long Plains

MT

The Longback

Donaldson River

Destination Creek

Sabbath Creek

Longback Creek

Brown Creek

CORINNA

West Plain

Bracken Creek

Blackguards Hill
295

Timbs

Nine Mile Creek

Goodwin Creek

Post Office

A37 MT DONALDSON

PIEMAN RIVER

Savage River

Elizabeth Ridge

Middleton Creek

Boobie Creek

Donaldson Landing

Yarns Reach

Wilsons Point

Ahrberg Hill

Whyte River

Corinna

Plateau

Corinna Creek

Bernafai Creek

Tikkawoppa Ridge

Delville Creek

Newdegate Creek

Delville Saddle

Kehroy Ridge

Hades Ridge

Brothers

E.L. 1/81 BOUNDARY

Little Harvey Creek

Brown River
259

Frenchmans Creek

Nancy Creek

Luck Creek

Rocky Creek

Bounds Road

Water Race

Brassey Creek

Paradise River

Paradise Creek

Owen

Meredith River

Fir Creek

Dymethis Crossing

Whaleback Ridge

Hangmans Creek

E.L. 3/8/ BOUNDARY

George Town Packet Creek

Hoyle Creek

Buttongrass
Rain Forest

Foot Tracks

CONTOUR INTERVAL 40 METRES

5 cm

PRODUCED BY LANDS DEPARTMENT TASMANIA.

Map 4   016

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STREAM SEDIMENT SAMPLE LOCATION AND ANALYSES

COPPER (Cu)
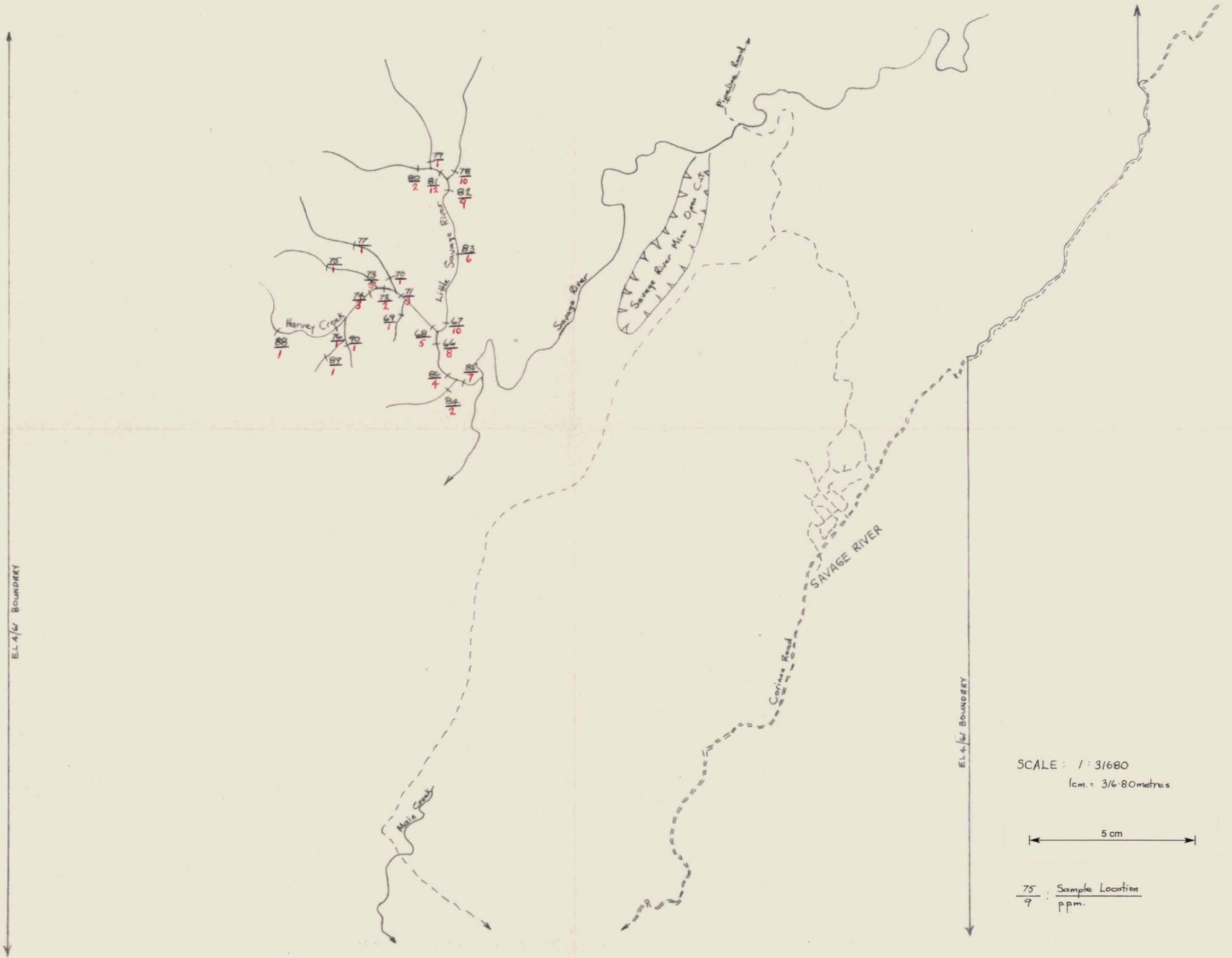
SCALE : 1 : 31680
1cm. = 316·80 metres

|← 5 cm →|

75   : Sample Location
9   p.p.m.

Map 5   7251

168017

STREAM SEDIMENT SAMPLE LOCATION AND ANALYSES

LEAD (Pb)

Pipeline Road

Savage River Mine Open Cut

Little Savage River

Savage River

Harvey Creek

$\frac{77}{10}$ $\frac{78}{13}$

$\frac{80}{7}$ $\frac{81}{14}$ $\frac{82}{12}$

$\frac{79}{6}$ $\frac{83}{6}$

$\frac{76}{6}$ $\frac{73}{8}$ $\frac{70}{5}$

$\frac{74}{8}$ $\frac{72}{7}$ $\frac{71}{7}$ $\frac{67}{21}$

$\frac{88}{6}$ $\frac{75}{7}$ $\frac{90}{7}$ $\frac{69}{4}$ $\frac{68}{6}$ $\frac{66}{12}$

$\frac{89}{4}$ $\frac{86}{9}$ $\frac{85}{12}$

$\frac{84}{4}$

SAVAGE RIVER

Corinna Road

Main Creek

E.L. + /w BOUNDARY

E.L. + /w BOUNDARY

SCALE / : 31680

1 cm = 316·80 metres

|←——— 5 cm ———→|

$\frac{75}{9}$: $\frac{\text{Sample No.}}{\text{p.p.m.}}$

Map 6

168018

STREAM SEDIMENT SAMPLE LOCATION AND ANALYSES

ZINC (Zn)

SCALE. 1 : 31680

1 cm = 316·80 metres

5 cm

$\frac{75}{9}$: $\frac{\text{Sample No.}}{\text{p.p.m.}}$
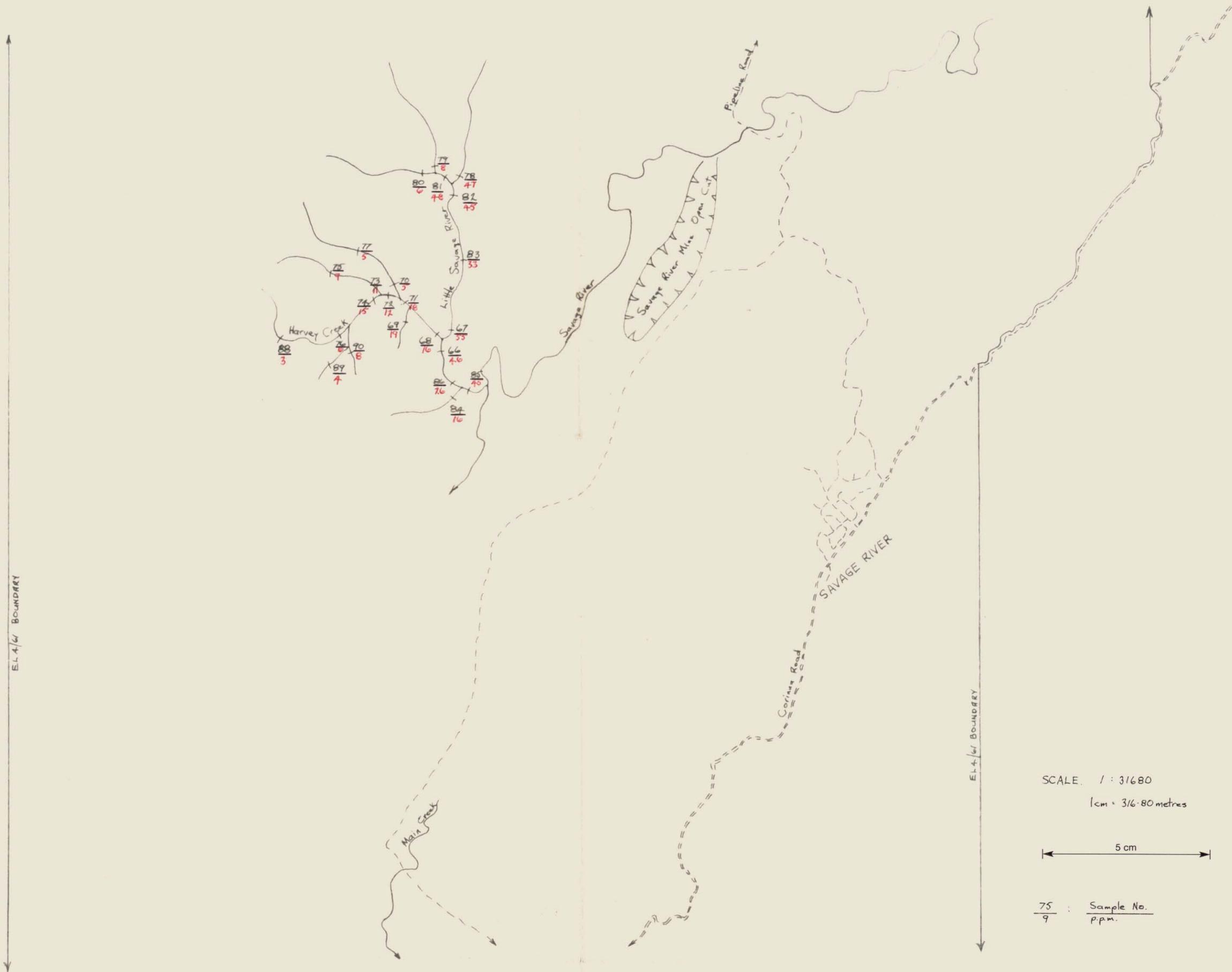
GRAPH 1

Statistical Evaluation Stream Sediments
Cu. Analyses.

Cumulative %

Q_3 = 5.75 ppm

M_e = 2.75 ppm

Q_1 = ... ppm
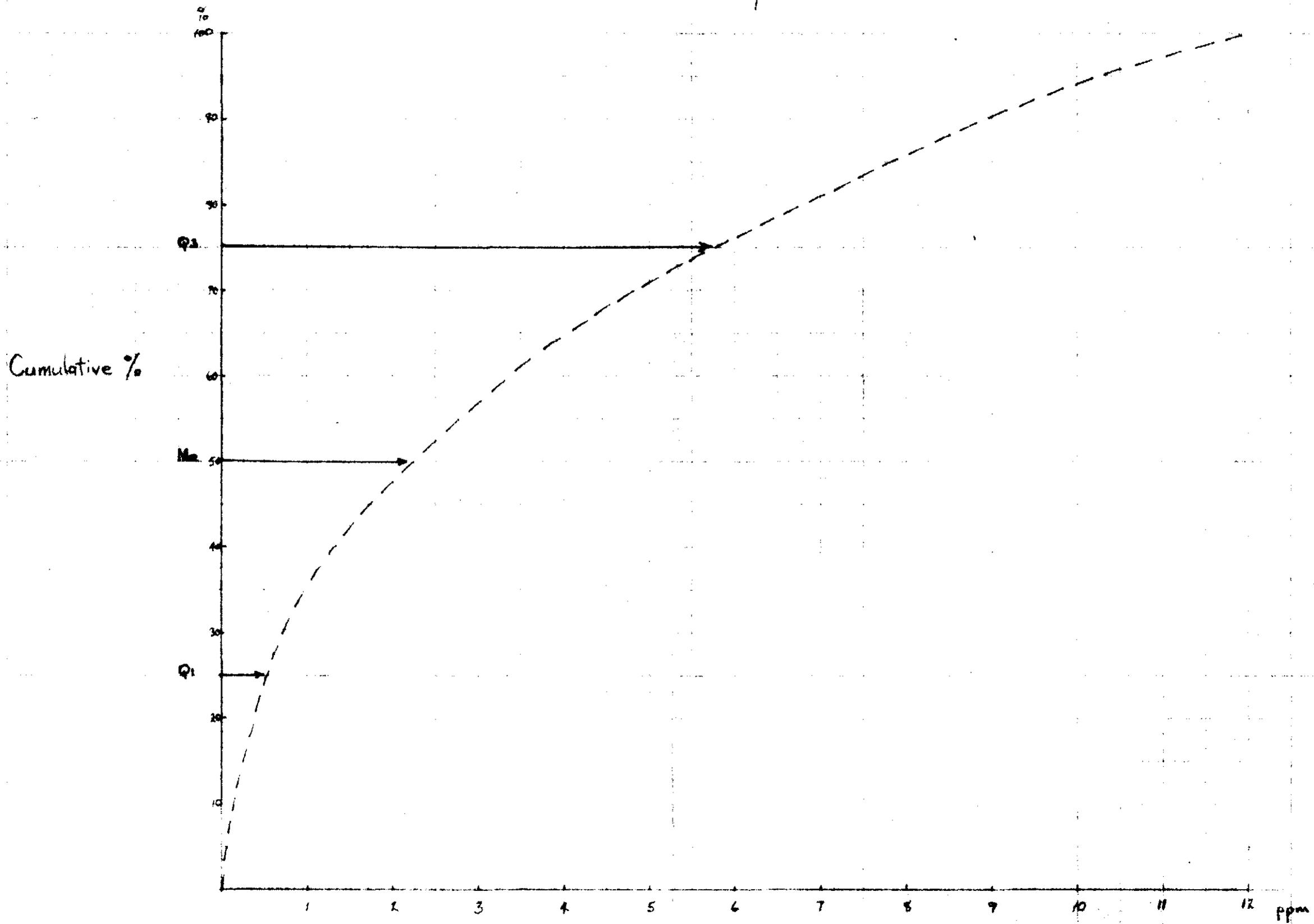
5 cm
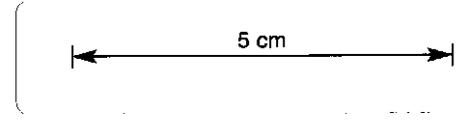
GRAPH 2

Statistical Evaluation Stream Sediments
Pb Analyses

Q_3 = 10·90 ppm

Me = 6·75 ppm

Q_1 = 5·25 ppm

5 cm
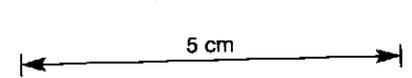
GRAPH 3
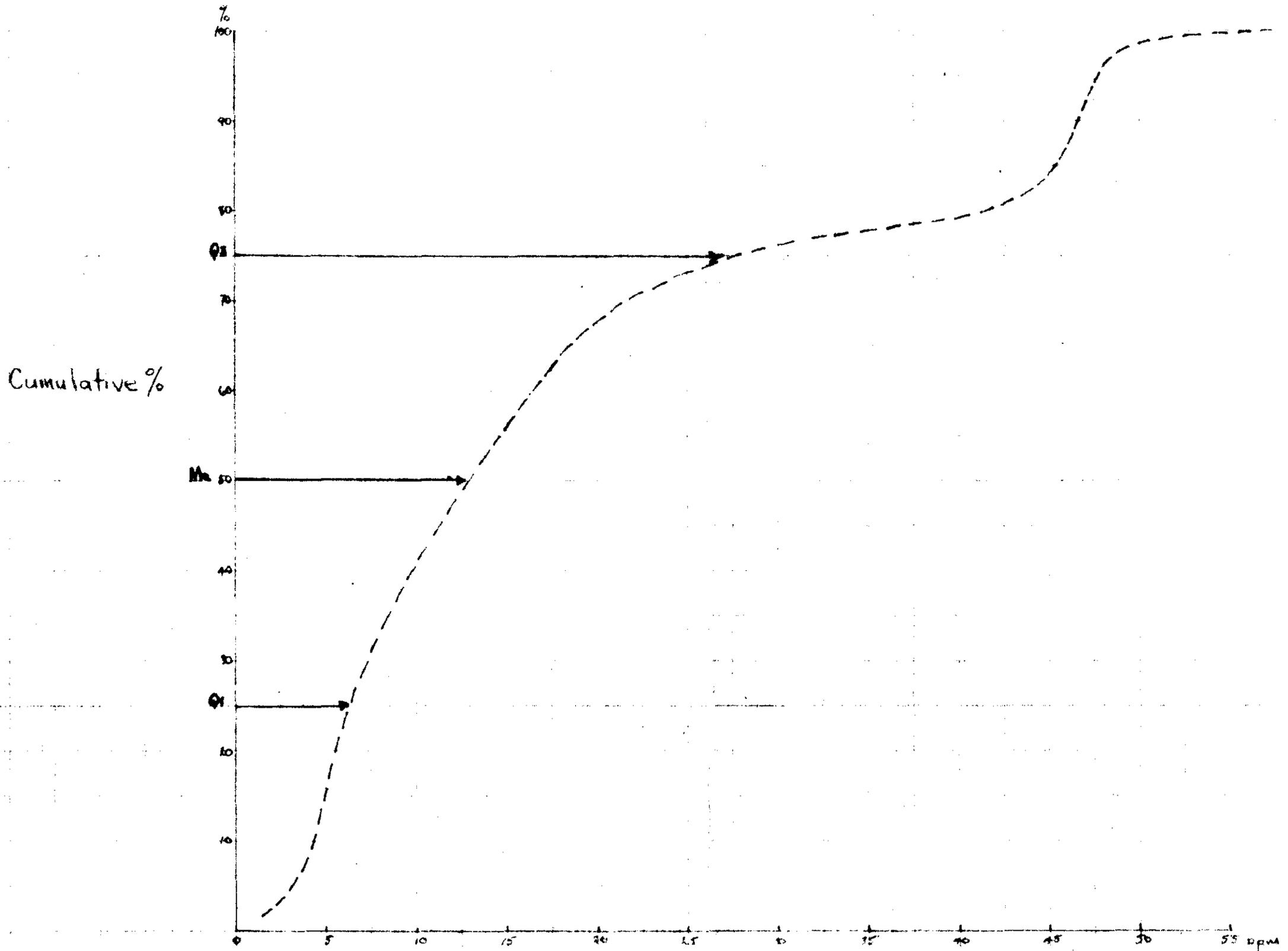
Statistical Evaluation- Stream Sediments
Zn Analyses

Cumulative %

$Q_3 = 27.5$ ppm

$Me = 13.0$ ppm

$Q_1 = 6.5$ ppm

5 cm