

**MICROFILMED**  
FICHE No.012897-

**NEWCREST MINING LIMITED**

**Final Report for  
Exploration Licence 34/92  
Mt Saddleback  
Tasmania**

**OPEN FILE**

**93-3531.**

**D.F. PEARSON**  
Brisbane

December 1993

**Distribution:**

- Newcrest Mining Limited Brisbane (1)
- Newcrest Mining Limited Melbourne (1)
- Department of Mineral Resources, Tasmania (1)

MINES		
FILE REF.		
23 DEC 1993		
DOC. REF.		
OFFICER	FOR ACTION	FOR INFO.
SEE	COVERING	
LETTER	FOLIO	
25		
		DATE

## CONTENTS

	<b>Page No.</b>
SUMMARY .....	1
1. INTRODUCTION .....	2
2. EXPLORATION OBJECTIVES AND RATIONALE .....	3
3. PREVIOUS EXPLORATION .....	4
4. GEOLOGY .....	5
5. EXPLORATION PROGRAMME .....	7
5.1 Overview .....	7
5.2 Geological Mapping .....	8
5.3 Exploration Completed on EL34/92 .....	9
6. CONCLUSIONS .....	10
7. EXPENDITURE .....	11

**Figures:**

	<b>Scale</b>
1 Location	1:250,000

**Plans:**

1 Geology and Sample Locations EL34/92	1:25,000
--	----------

**Appendix:**

1 Sample Data	
---------------	--

## **SUMMARY**

Exploration Licences (EL) 22/92, 23/92 and 34/92 have been collectively explored over the period October 1992 to December 1993 for large scale stockwork style gold mineralisation. The exploration programme has included geological mapping at 1:25,000 (and in greater detail at selected localities), image processing and interpretation of aeromagnetic data available for part of the project area, drainage sampling and detailed geochemical surveys including soil and outcrop sampling. In the course of this work many of the sites of old mine workings and prospects identified by previous workers have been visited and assessed.

On EL34/92 work focused on a geochemical anomaly at Sweets Creek previously identified by Placer. This anomaly was shown to be sourced in a narrow zone of breccia with sporadic weak gold and arsenic mineralisation.

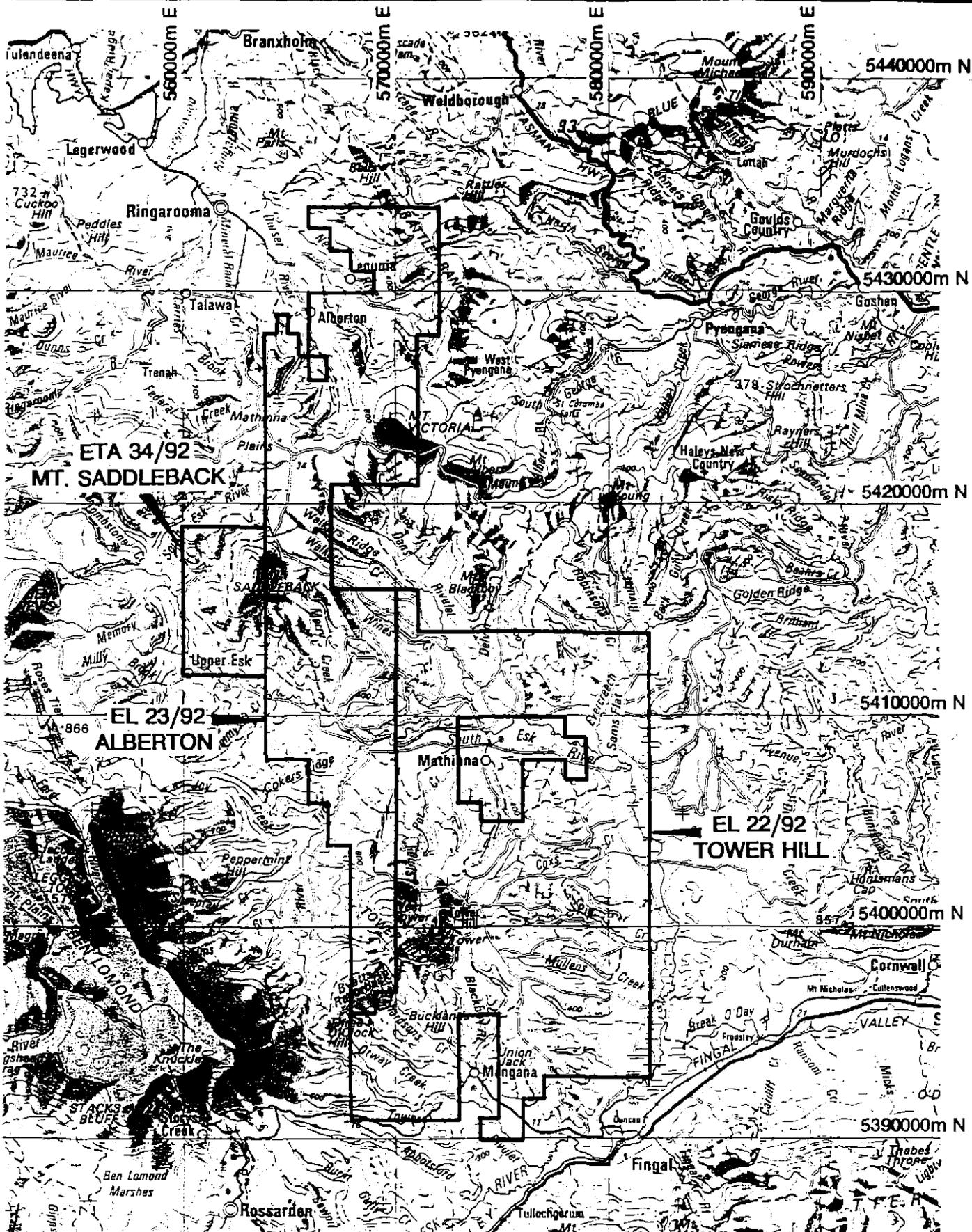
As this project does not meet Newcrest's requirements and no evidence of a suitably large zone of mineralisation is apparent on EL34/92 it has been decided to relinquish the licence at the end of its first year.

## 1. INTRODUCTION

Exploration Licence EL34/92 was granted on 8 January 1993 and together with ELs 22/92 and 23/92 formed part of Newcrest Mining Ltd's Mathinna Project.

Most of the licence covers land controlled by the Forestry Commission and dedicated to the management of native timber production. Topographically the licence is dominated by the peak of Mt Saddleback and steep ridges and ravines radiating to the west. The South Esk river valley runs through the western and northern parts of the licence and a small amount of private cleared grazing land is located in the valley.

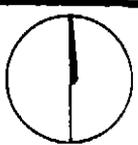
Access to the central part of the licence is provided by forest tracks.



5 cm

0 5 10km

945005



NORTH

<b>NEWCREST MINING LIMITED</b>		
COMPILED	DP	SCALE 1:250,000
DRAWN	BS	DRAWING No. TMAT 1
DATE	Dec. 1993	FIGURE No. 1

**MATHINNA PROJECT TASMANIA**  
**LOCATION MAP**

## **2. EXPLORATION OBJECTIVES AND RATIONALE**

The objective of Newcrest's exploration on the Mathinna project is to locate substantial resources of gold mineralisation suitable for development at a scale commensurate with the company's existing operations. That is, in the order of 100,000 oz gold production per annum or greater.

The distribution of known gold mineralisation in the project area suggests that there has been a regionally extensive mineralising event concentrated on a narrow NNW trending structural corridor probably related to deep crustal fracturing. This setting is considered prospective for large scale vein stockwork style mineralisation similar to that at the Enterprise Mine at Pine Creek Northern Territory, or the Carson Hill/Jamestown style of the Mother Lode district of California.

Mineralisation of this style can be expected to have a surface expression (barring masking by surficial deposits) of greater than 1 km strike length over widths of 50 m to several hundred metres. Exploration including applied geological mapping/reconnaissance, outcrop sampling, drainage sampling and soil sampling should be effective in detailing such mineralisation if it is present in sufficient magnitude to be of interest.

### 3. PREVIOUS EXPLORATION

Significant previous work in the area of EL34/92 includes geological mapping at 1:25,000 by geologists of the Tasmanian Department of Mines as part of the published 1:50,000 scale map of the Alberton sheet and exploration conducted on ELs 3/90, 10/89 and 8/89 by Placer Exploration Ltd.

Work conducted by Placer is summarised in reports 90-3145, 90-3150, 91-3254 and 91-3255 held at the Mines Dept library. Placer's target was Carlin or Ketzé River style gold mineralisation pursued through drainage samples analysed for Au by BCL and Pb, Cu, Zn, Ag and As with follow-up soil and outcrop sampling.

Exploration in EL10/89 identified anomalies in Memory Creek, Tombstone Creek and Sweets Creek.

The first two anomalies could not be confirmed however, the Sweets Creek anomaly was traced to a silicified quartz vein stockworked zone within the Mathinna Beds. Outcrop area was reported as 120m length and 5 to 10m in width.

The stockwork zone was mapped, chip sampled and partly soil sampled with strong anomalous As and patchy anomalous Au recorded in rock chips over 200m. Au and As grades appeared to increase to the north where sampling was halted by thick bush. Exploration was terminated at that point.

Further investigation of Placer's Sweets Creek anomaly was the main reason for Newcrest application for EL34/92.

#### 4. GEOLOGY

The regional geology of the project area has been recorded in considerable detail by the geologists of the Department of Mines on the Ben Lomond [8414N (48)] and Alberton [8415 S(40)] 1:50,000 geological maps. Host rocks to the primary gold mineralisation are the Mathinna Beds which are also the oldest sequence in the project area.

The Mathinna beds are comprised of a relatively monotonous sequence of shales, siltstones and sandstones which are variably deformed and frequently metamorphosed to phyllites and quartzites.

No precise age has been established for the gold mineralised rocks, however, probable deposition in the late Ordovician to Silurian and folding and cleavage development prior to intrusion of the adjacent Devonian granites is evident in outcrop.

The Mathinna beds are folded on NW trending axes with wavelengths of 0.5-2 km and gentle axial plunge reversals with wavelengths in the order of 2-5 km. Folding is moderate to tight and asymmetric with local steep overturning to the west in some cases. Second order folds including 'M' folds are common with wavelengths of 5-50 m.

Mineralised quartz veining tends to be associated with anticlinal fold limbs commonly sub-parallel to cleavage and in some places following bedding plane partings and forming half saddle reefs on the eastern limbs. Narrow cross veins trending 010°-050° are also mineralised and may dominate locally.

Veins are rarely greater than 1 m in width and vary from massive clean buck quartz to quartz filled fault breccia with chloritic phyllite fragments. Quartz is also commonly brecciated and gold mineralisation is associated with pyrite and arsenopyrite in all of the above vein types and particularly their narrow altered selvages. Mineralised zones appear to have a broad pervasive halo of silicification in sandier units and chlorite alteration in the phyllites. Spotting by cordierite or carbonate is also common in these halos.

Sandstone units tend to be preferentially silicified and commonly host quartz vein stockworks particularly in fold hinge zones, zones of shearing and cross faulting and within the halo zones surrounding mineralisation

Evidence of cleavage parallel shearing is evident in places eg. Mangana Reefs, but significant shearing at 050° is evident in Major's Gully and a shear zone trending 110° cuts between the New Golden Gate Mine and the Golden Hinges adit and no doubt contributed to the anomalous dilation evident there.

Faulting and kink zones are generally dextral, normal, and NE trending, however, a few north trending faults were also observed.

The Mathinna beds are overlain by flat dipping Permian sandstones and argillites with a basal conglomerate carrying subrounded pebbles and cobbles of silicified quartz veined Mathinna beds and quartz. This sequence is host to coal measures at Fingal, Cornwall and Tower Hill and is overlain by Triassic sediments and Jurassic dolerite. Relatively recent erosion of the flat Permian unconformity has contributed to the eroded plateau like landform of most of the Mathinna beds exposure.

Unconsolidated cover includes deep alluvial fill in the major creeks and river valleys. Several perched alluvial terraces are evident in the valley of the South Esk river.

Extensive areas of Pleistocene age glacial tillus have been recorded by the Mines Department mapping. These deposits are particularly evident where they are dominated by large erratic boulders of Jurassic dolerite. Deposits dominated by Mathinna beds fragments are less easy to discriminate. High energy outwash deposits are also evident on perched positions such as the eastern slopes of Fords Gully 4 km west of Fingal.

Many of the flat topped hills in the Mangana to Mt Saddleback area and the Mathinna and Una Plains further north have abundant Permian detritus in the soil profile as a relatively thin veneer to basement Mathinna beds. These deposits are of minor volume but have great potential to contribute to spurious and misleading geochemistry.

In some areas previously mapped as Mathinna beds the combination of thin Permian wash on the flat ridge tops, thick scree on the steep gorge slopes and alluvial valley fill is such that the only exposure that can safely be regarded as residual is on the ridge shoulders.

## 5. EXPLORATION PROGRAMME

### 5.1 Overview

Newcrest has conducted an exploration programme on the Mathinna Project aimed at the discovery of previously overlooked large tonnage bulk mineable gold resources.

An inspection of many of the old mines in the Mangana, Tower Hill, Mathinna, Dans Rivulet and Alberton gold fields has shown that these deposits are narrow (often less than 1 m in width) irregular veins with erratic grade distribution and generally weak wall rock alteration. However, extensive quartz stockwork zones have been identified in the area and some of these are gold anomalous. Such zones have the tonnage potential to satisfy Newcrest's objectives provided that economic grades can be demonstrated.

The Year 1 programme included the following surveys:

- 1.\* A review of relevant literature and past exploration results.
2. Soil sample and drainage sample orientation Miami and Great Fingal Mine areas.
3. Image processing and interpretation of the Pegasus helimag data.
- 4.\* Reconnaissance geological mapping at 1:25,000 scale and outcrop sampling.
5. Old mine inspections and detailed geological mapping and sampling.
- 6.\* Drainage sampling.
7. Follow-up drainage sampling and soil sampling

(\* programmes conducted directly on EL34/92).

After the initial orientation surveys and aeromagnetic interpretation, geological reconnaissance was concentrated on a number of areas considered to be of greatest prospectivity on the basis of known geology, previous mining and exploration results, geophysical signature and target size. The Sweets Creek anomaly on EL34/92 was one of these areas. Drainage sampling was conducted throughout the licence areas except where comparable data from previous surveys was available or the geomorphology was unsuitable for sampling.

## 5.2 Geological Mapping

Geological mapping completed on EL34/92 as part of the reconnaissance phase of the Mathinna project is presented at 1:25,000 scale on Plan 1. Previous mapping by the Department of Mines provides a detailed geological base for much of the area and has been incorporated on this map.

The Department of Mines mapping has been rigorous in approach and is designed for general use whilst the Newcrest mapping has been somewhat more applied to the needs of gold exploration and as a result some differences are evident. On Plan 1 post Mathinna beds sediments are all considered to be cover and hence a potential mask to the gold mineralisation, thus divisions in this stratigraphy have been simplified. The Permian unconformity, Tertiary sediments and perched Quaternary sediments are all considered to have potential to release previously eroded gold into the present drainage system and could produce misleading geochemical anomalies. Newcrest mapping has paid particular attention to the distribution of these units and evidence of their soil remnants eg. the trace of the Permian unconformity is far more extensive on the flat hill tops than the actual outcrop of intact Permian sediments.

Within the Mathinna beds close inspection of many of the areas of previous gold mining shows that there is a direct relationship with anticlines. Consequently particular attention has been paid during the Newcrest mapping to identifying fold closures and axial plane traces.

Because these observations have led to some differences with the Department of Mines mapping where these changes have occurred, a heavy continuous line has been used to indicate a Newcrest mapped geological boundary as distinct from boundaries traced from the Department of Mines' maps without modifications, which are presented as finer partly broken lines on the maps. Furthermore, bedding and structural fabric observations by Newcrest are recorded in heavier pen than previous Mines Department mapping and old mine sites inspected by Newcrest are named in heavier script than those which have not been visited.

Plan 1 also records the locations of outcrop rock chip samples taken during the reconnaissance.

### 5.3 Exploration Completed on EL34/92

Exploration completed within EL34/92 concentrated on evaluation of the Sweets Creek anomaly. The outcropping stockwork vein system previously explored by Placer was located and inspected and outcrop samples T005/001/R - 004/R (Results listed in Appendix 1) were taken. Extensions of the zone to the north where thick scrub had previously halted work by Placer were also inspected and samples T005/006/R - 009/R were taken in this area. The later inspection was made much easier by the recent clear felling of the forest block covering this area.

The site inspection confirmed that the original drainage anomaly was sourced from a narrow zone of sporadically mineralised quartz breccia which terminates to the Northwest against the Scottsdale granite. The breccia is 1 to 3m wide and developed in andalusite sericite schist which forms part of the thermal aureole of the Scottsdale granite. In all other respects it appears typical of the narrow quartz arsenopyrite breccia veins characteristic of the Alberton, Mathinna and Mangana fields and so is not of significance in terms of Newcrest's requirements.

A series of six drainage samples were taken to confirm and extend previous sampling by Placer. (Samples T005/001/D -006/D Appendix 1). As with the outcrop samples, these samples were assayed for Au by fire assay and Cu, Pb, Zn, Ag, Bi and As by AAS at Analabs Burnie Laboratory and in addition 2kg of material sieved to -2mm was analysed for Au by active bulk cyanide leach at ALS Laboratory Brisbane.

Sample T005/001/D was taken immediately downstream from the intersection of the breccia zone with the upper reaches of Sweets Creek. This sample site was difficult as the creek was steep and prone to periodic storm flushing whilst possessing a thick ground matting of man-fern roots. The sample returned 2.07 ppb Au and 14 ppb As which is considered mildly anomalous by comparison with the regional data.

Samples T005/002/D - 004/D were taken from catchments within the Scottsdale batholith to provide background data and samples 005/D and 006/D were taken from the northern slopes of Mt Saddleback in catchments covering the SE strike extension of the anomalous zone.

Sample T005/005/D returned 4.08 ppb Au by BCL 54 ppb Au by FA and 12 ppm As and is considered anomalous. However, given the experience with the anomaly at Sweets Creek and other anomalies of similar strength in similar geomorphic conditions elsewhere on the adjacent licences it is considered that the result is unlikely to reflect significant mineralisation.

**6. CONCLUSIONS**

- \* The Sweets Creek geochemical anomaly represents a narrow sporadically mineralised zone which terminates to the north west against the Scottsdale granite contact.
- \* Work on EL34/92 has provided no evidence of the large scale mineralisation required by Newcrest.
- \* No further work aimed at large stockwork style mineralised zones appears warranted.

**7. EXPENDITURE**

Expenditure on EL34/92 was as follows:

<b>Item</b>	<b>Expenditure</b>
Salaries and Wages	5,017
On costs	464
Assays	154
Supplies	168
Tenement Costs	1,188
Travel and Accommodation	686
Office and Administration	104
	<b><u>\$7,781</u></b>

**Note:** Some costs incurred on this licence for vehicle use and administration have been borne by the other larger licences on the Mathinna Project.

945015

**APPENDIX I**

**Sample Data**

### OUTCROP SAMPLES

Sample	East	North	Width(M)	Geology	Cu	Pb	Zn	Ag	Au(ppm)	Au(R)	Bi	As
T005001R	561850	5415700	20	Quartz veined ser andalusite schist	18	12	45	<2	0.068	0.056	<1	640
T005002R	561850	5415700	1	Schist breccia quartz matrix	11	9	8	<2	0.170	-	<1	1500
T005003R	561850	5415700	0	Quartz arsenopyrite vein	18	16	26	<2	0.080	-	<1	3210
T005004R	561850	5415700	1	Quartz stockworked schist	15	21	31	<2	0.270	-	<1	3760
T005005R	561850	5415600	7	Quartz meshworked schist	17	13	27	<2	<0.005	-	<1	310
T005006R	561900	5416600	2	Quartz pyrite veined schist	25	21	33	<2	<0.005	-	<1	11
T005006R	561650	4516550	5	Quartz stockworked quartzite	15	10	17	<2	<0.005	-	<1	29
T005008R	561600	5416500	10	Quartzite breccia quartz float	31	13	30	<2	0.005	-	<1	220
T005009R	561500	5416850	10	Quartz meshworked schist float	11	12	13	<2	0.005	0.005	<1	29
T0050010R	554300	5420200	2	Quartz feldspar veins	9	8	11	<2	0.008	-	<1	2
T0050011R	554300	5420200	5	Pink granite smokey quartz	19	18	26	<2	<0.005	-	<1	1
T0050012R	561250	5416800	5	Pink granite smokey quartz	8	10	37	<2	<0.005	-	<1	2

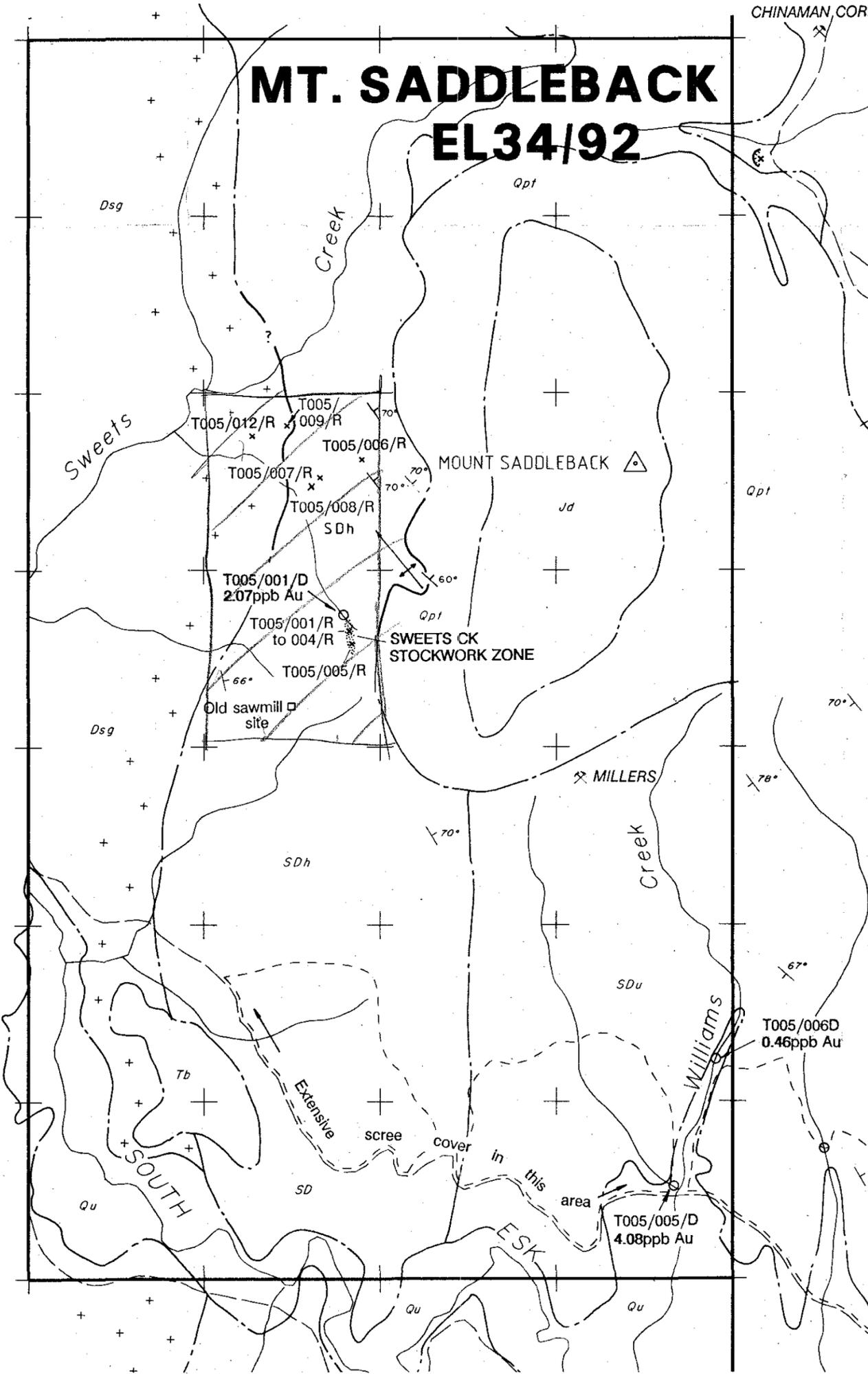
### DRAINAGE SAMPLES

Sample	East	North	Provenance	Cu	Pb	Zn	Ag	Au FA ppm	AU BCL ppb	Bi	As
T005001D	561800	5415750	Hornfels	25	18	100	<2	<0.005	2.07	<1	14
T005002D	554300	5420200	Granite	6	11	8	<2	<0.005	0.32	>1	1
T005003D	554150	5420400	Granite	11	34	43	<2	<0.005	0.29	>1	2
T005004D	554100	5420500	Granite	6	9	9	<2	<0.005	0.23	>1	<1
T005005D	563650	5412500	Hornfels	14	19	83	<2	<0.054	4.08	>1	12
T005006D	563900	5413300	Hornfels	21	21	113	<2	<0.005	0.46	>1	8

560000mE 561000mE 562000mE 563000mE 564000mE

541900mN  
541800mN  
541700mN  
541600mN  
541500mN  
541400mN  
541300mN  
541200mN

# MT. SADDLEBACK EL34/92



CHINAMAN CORNER

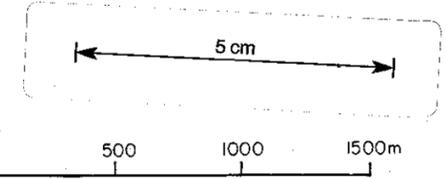
**LEGEND**

- Qu Quaternary cover - alluvial, scree, talus
- Qpt Talus with large exotic boulders commonly Jurassic dolerite
- Tb Tertiary
- Tu Tertiary undifferentiated sediments
- Jd Jurassic dolerite
- Pu Permian sediments undifferentiated
- Pt Permian sediment float
- Dba Granite of the Blue Tier Batholith
- Dsg Granite of the Scottsdale Batholith
- SDh Hornfelsed Mathinna beds
- SDu Mathinna beds

- Bedding (Newcrest)
- Bedding (Dept. of Mines Geological survey)
- Cleavage
- Kinking
- Shearing
- Hard rock mine working
- Alluvial diggings
- Drainage sample site
- Rock sample site
- Single soil sample, soil sample traverse
- Fold axis
- Geological boundary (Dept. of Mines Geological survey)
- Geological boundary (Newcrest)

**93-3531.**

945017



	<b>NEWCREST MINING LIMITED</b>	
	COMPILED DP	SCALE 1: 25,000
	DRAWN BS	DRAWING No. T005-2
NORTH	DATE May 1993	PLAN 1
<b>MT. SADDLEBACK EL34/92</b> <b>GEOLOGY &amp;</b> <b>SAMPLE LOCATIONS</b>		