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E.L.'s 7/73 & 10/76, NORTHERN TASMANIA

EXPLORATION AT WESTERN CETHANA

AUGUST 1976 - 1977

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Submitted to : R.J. Rebek

Copy to : Department of Mines, Tasmania
Asarco (Aust.) Pty. Ltd.

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1. SUMMARY

This report details the results of exploration on E.L.'s 7/73 and 10/76 at Western Cethana, Northern Tasmania, during the period August 1976 - August 1977.

Western Cethana embraces part of a belt of altered acid volcanics of Cambrian age ('Nietta Group' of T.M. Porter). This belt is the northern extension of the volcanics hosting the Mt. Lyell and Rosebery Cu-Pb-Zn ore bodies.

Exploration over the twelve months has comprised geochemical sampling, geological mapping, IP surveys and the diamond drilling of three holes totalling 460 metres.

The geochemical and geological work defined a strongly-altered sequence of acid volcanic pyroclastics and tuffs, carrying anomalous Pb-Zn values. Minor outcropping Pb-Zn mineralisation was found in several places. The results of the gradient array IP surveys were generally disappointing with no significant anomalies discovered.

Three diamond drill holes were drilled under geochemical anomalies. The drill holes encountered minor dispersed Pb-Zn sulphides throughout the altered volcanics, with the more mineralised zones typically averaging 0.2-0.5% combined Pb-Zn over a couple of metres.

Best results were from 77CC1 which was drilled under an outcrop of siliceous quartz-sericite schist containing thin bands of Pb-Zn sulphides. The hole intersected 0.4m of 8.2% Zn, 0.2% Pb in siliceous schists between 78.6-79.0 m; and 2.6m of 0.92% Zn 0.91% Pb in an altered black tuff with bedded Pb-Zn sulphides between 98-100.6 m.

It is recommended that the geophysical results in the vicinity of 77CC1 be re-evaluated prior to the drilling of several shallow percussion drillholes in that area.

2. CONCLUSIONS

Rocks indicative of an environment suitable for the deposition of syngenetic sulphides occur within the volcanics, but generally only contain traces of sulphides.

The most significantly mineralised of these potential host rocks located to date is the black tuff with minor bedded sphalerite and galena, encountered in hole 77CC1.

From the drilling results at both Western and Eastern Cethana (see later report) it is clear that significant sulphide accumulations within the volcanics can reasonably be expected to give an IP response, although this response may be quite subdued.

The high IP chargeabilities obtained over dark shales and siltstones at the southern ends of lines 1000-1200E are considered to be due to their visible pyrite, and probable graphitic, contents.

Weak IP anomalies in the vicinity of 77CC1, when combined with the favourable lithologies, high level of alteration and known mineralisation in that area, constitute the best of the remaining exploration targets at Western Cethana.

3. RECOMMENDATIONS

The IP data in the vicinity of diamond drillhole 77CC1 be re-evaluated with a view to drilling several shallow percussion holes in this area.

4. INTRODUCTION

Western Cethana lies between the Forth River and the deserted township of Cethana 18km south west of Sheffield in Northern Tasmania. The area is covered by two adjacent E.L.'s - E.L. 7/73 of 440 sq km (Asarco - CRAE Joint Venture) and E.L. 10/76 of 10 sq km (CRAE).

The focus of interest at Western Cethana is a belt of Cambrian altered acid volcanics considered prospective for Cu-Pb-Zn mineralisation of the Mt. Lyell and Rosebery types.

CRAE's interest in the area stems from T.M. Porter's recognition of the altered volcanics in road cuts during his Tasmanian regional study in 1974. The area was largely held by Asarco who at that time were carrying out active exploration on E.L. 7/73.

Asarco detected Pb-Zn anomalies in two creeks draining the altered volcanics of Western Cethana. Apart from more detailed drainage sampling of both creeks, no follow-up work was attempted. (See Asarco Reports).

In 1975 Asarco withdrew from Tasmania and in September that year CRAE signed a Letter of Intent for a Joint Venture on E.L. 7/73. This agreement was finalised in July 1976.

E.L. 10/76 was pegged in March 1976 when the Department of Mines relinquished part of a Reserve within E.L. 7/73. This E.L. was granted on 29th March 1976.

Exploration by CRAE at Western Cethana commenced in August, 1976, and work done in the twelve months since that date is the subject of this report.

All geological and geochemical work was undertaken or supervised by G. Purvis with assistance from T. Ellis during December 1976. Initial geophysical surveys were undertaken by M. Kirton; a later survey was carried out by Scintrex Pty. Ltd., and supervised by M. Kirton. Diamond drilling was done by Longyear (Australia) Pty. Ltd.

5. GEOLOGY

A description of the rock units present in the area is given in the legend of the geological plan.

Some of the more-important geological points are as follows:

5.1 Alteration

The acid volcanics are predominantly pyroclastics and tuffs, which have been altered to quartz-sericite ± chlorite schists. The alteration is considered to have been caused by the action of surface and near-surface thermal water generated by the volcanism. The schistosity is the imprint of a later regional stress on the relatively incompetent altered rocks.

5.2 Depositional Environment

The original environment for the volcanics was marine - as evidenced by sedimentary bedding throughout the belt. It is possible the vent(s) which supplied the volcanic material may have been terrestrial, The location of this vent(s) is not known.

5.3 Potential Host Rocks for Mineralisation

In volcanic events, periods of quiesence are required for the deposition of massive sulphide bodies. Such periods are indicated within the volcanic rock suite by fine grained volcanogenic sediments - e.g. tuffs and tuff-shales. Those showing a chemical sedimentation component, such as cherts or black tuff-shales, particularly indicate conditions suitable for sulphide deposition.

Such rocks occur at Western Cethana, especially within the zone of siliceous quartz-sericite schists, and the chlorite schists to the south of them. On geological grounds they are the most-prospective rock units present in the area.

5.4 Stratigraphy

In the southern part of the area there is a sequence of sandstones, siltstones and shales, here named the Cethana Sandstones.

These sediments clearly show a gradation northwards into the acid volcanics, and both have the same attitude - a steep dip to the north. In the south the sediments are well-bedded sandstones and shales. Northwards the grain size decreases, the bedding becomes less distinct and a tuffaceous component is increasingly evident.

From indistinct examples of graded bedding and scour-and-fill structures, the sediments appear to face to the north and therefore lie stratigraphically beneath the volcanics.

The uppermost acid volcanics are the most highly altered, and there was a steady increase in the level of alteration as the volcanics were deposited i.e.: there was more thermal water present towards the final stages of the volcanic event.

Overlying the acid rocks are unaltered dacitic volcanics, mainly lavas and reworked pyroclastic debris. They show many similarities to the acid volcanics, from which they are separated by a sharp break. This break is probably a disconformity, as regionally the dacitic rocks are part of the same broad belt of Cambrian volcanics. They demonstrate the cyclic nature of the volcanism and are unlikely to be greatly separated in time from the underlying acid volcanics.

The Ordovician Roland Conglomerate/Acid Volcanic contact, where exposed on the old Lorinna road at the southern end of line 19800E, appears to be an angular unconformity on which some limited fault movement has taken place. In some exposures the conglomerate abuts volcanics with no evidence for movement on the contact at all.

This contact has been mapped on the Sheffield one-mile sheet as a thrust.

6. GEOCHEMISTRY

The results of soil and rock sampling for Pb and Zn are shown on the plans at the back of the report. Copper results have not been presented in plan form as few anomalous values were obtained (see Appendices 3-5).

Higher values for manganese show a relationship with anomalous levels of Pb and Zn in soils and rocks. Boulders of pyrolusite occur in places and roadcuts of altered volcanics with above average values of Pb and Zn often display conspicuous manganese stains on the schistosity planes.

The very low values of Na_2O recorded in rock and soil samples testify to the high level of alteration of the volcanics.

Within the altered volcanics there are areas of both anomalously high and anomalously low levels of Pb and Zn, indicating the hydrothermal solutions were leaching, transporting and depositing these metals.

7. GEOPHYSICS

The results of the geophysical surveys conducted at Western Cethana are the subject of separate reports by M. Kirton, and A. Howland-Rose of Scintrex Pty. Ltd. (see References).

A couple of general points can be made:

1. The lack of IP anomalies over the area of siliceous quartz-sericite schists is discouraging considering they represent altered potential host rocks within volcanics in which basemetal mineralisation is present. The weak IP responses in this area appear on geological grounds, to offer the best targets for future exploration.

2. The lack of any IP anomalies along the main soil anomaly, when considered in the light of the later drilling results, which showed the soils had comparable values to the bulk geochemistry of the underlying rocks, gives an important insight into the merits of these various exploration techniques.

From the work at both Western and Eastern Cethana (see later report) it is considered that economic concentrations of Cu-Pb-Zn sulphides in this environment must have some anomalous IP response, even if this response is quite small.

The corollary of this is that drilling based on geology and geochemistry alone is unlikely to intersect economic mineralisation.

8. DRILLING

Three diamond drillholes were put down during January-February 1977. Holes 77CC2 and 3 were sited to test geochemical soil anomalies. Hole 77CC1 was drilled under outcropping mineralisation.

After the disappointing geophysical results, drilling was still considered worthwhile because some of the outcropping mineralisation was very sphalerite-rich. It was felt that if the mineralisation beneath the soil anomalies was similar, it could have little intrinsic geophysical expression. In fact, the holes intersected values of the same order as the soil anomalies.

Results are shown in detail in the drill logs (Appendix 1) and the drill sections (Plans Tc 49-51). The hole locations are shown on the geological and geochemical plans.

The reasons for siting each hole can be summarised as follows:

77CC1 - A shallow-depth test beneath mineralised siliceous quartz-sericite schist. The schist contains sparse bands of sulphides 0.5-5cm thick, parallel to the schistosity. The largest of these bands assayed 23% Zn and 0.71% Pb. There are numerous gossan fragments in this area.

77CC2 - Designed to pass right across the main zone of Pb-Zn soil anomalies. Specifically aimed at a +1000ppm Pb soil anomaly at 280-300S on line 1100E.

77CC3 - A subsurface test beneath the strongest part of the main soil anomaly.

J.G. Purvis

REFERENCES

Barker, R.G.	February 1974	Stream Sediment Sampling Survey. E.L. 7/73. Paradise, Tasmania. Asarco (Australia) Pty. Ltd. Report
Barker, R.G.	March 1975	E.L. 7/73 Paradise, Tasmania Report for the Year Ending March 15, 1975 Asarco (Australia) Pty. Ltd. Report
Howland-Rose, A.W.	August 1977	A Report on Gradient Array Electrical Induced Polarization, MMR, and Total Magmetic Field Surveys over the East Cethana Grid, Near Devonport, Tasmania on behalf of CRA Exploration Pty. Ltd. Scintrex Pty. Ltd. Report'
Kirton, M	August 1977	Phase I Induced Polarization Surveys Cethana, E.L. 10/76, Tasmania 1976/77 CRAE Report 8960

KEYWORDS

Copper, lead, zinc, acid volcanics, pyroclastics, Cambrian, geol. mapping - detailed, geochem. - soil, geochem.- rock, geophys - I.P., drill - diamond, alteration.

Location: Burnie BK 55-3 1:250,000 map sheet

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LIST OF PLANS

Plan No.	Title	Scale
Tc89	Location Map	1:250 000
Tc85	Geological Map Cethana West E.L.'s 10/76 and 7/73	1: 5 000 (approx.)
Tc88	Sample Location Map Cethana West E.L.'s 10/76 & 7/73	1: 5 000 (approx.)
Tc87	Geochemical Map - ppm LEAD Cethana West 10/76 & 7/73	1: 5 000 (approx.)
Tc86	Geochemical Map - ppm ZINC Cethana West 10/76 & 7/73	1: 5 000 (approx.)
Tc49	Diamond Drill Section 77-C.C. 1 Cethana West - E.L. 10/76	1: 500
Tc50	Diamond Drill Section 77-C.C. 2 Cethana West - E.L. 10/76	1: 500
Tc51	Diamond Drill Section 77-C.C. 3 Cethana West - E.L. 10/76	1: 500

APPENDIX 1

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL CORE LOG

PROJECT CETHANA - WEST. TASMANIA

CO-ORDINATES _____ AZIMUTH [redacted]° DRILLERS LONGYEAR COMMENCED 28·1·77 DEPTH 106·40 m HOLE No. 77 CC 1

RL COLLAR _____ INCLINATION 55° DRILL TYPE LONGYEAR MARK 12 COMPLETED 2·2·77 CASING LEFT 4·00 m DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
0·00	3·00	–			Tricone in overburden - no core.										
3·00	5·58	–	NQ		No core recovered - yellow clay										
5·00	7·00	0·40	"		Pale blue-grey siliceous qtz-sericite schist	Very broken. Much limonite - some gossan sulphides. 1-3mm qtz-limonite veins at all angles.	601666	5·00	7·00	0·40	42	32	35	<1	45
7·00	8·00	–	"		No core recovered.										
8·00	9·40	0·30	"		Grey siliceous qtz-ser schist	Very broken. 5% sulphides throughout - fine grained crystalline pyrite and minor silvery-blue grey sulphide.	601667	8·00	9·40	0·30	210	940	300	<1	25
9·40	14·00		"		No core recovered - yellow clayey zones with bee swallowed pyritic schist	Qtz sand and fragments of pyritic schist	601668 (sludge)	8·60	12·60	[redacted]	890	190	180	<1	160
						" " " " " "	601669 (sludge)	12·60	14·00		80	80	65	<1	50
14·00	15·00	0·40	"		Grey greasy siliceous qtz-ser schist	1% pyrite throughout. One bad clayey limonite shear in centre of interval.	601671	14·00	15·00	0·40	270	550	80	<1	18
							601670 (sludge)	14·00	15·00		180	230	75	<1	65
15·00	15·60	0·60	"		Dith. Schistosity 10° to core axis	Very broken. Minor sulphides throughout with + 5% 15·30 - 15·60 in two zones not // to schistosity. Sulphide is dark silvery-grey, some pyrite.	601672	15·00	15·60	0·60	710	740	12	<1	15
15·60	17·00	–	"		No core recovered. Sludge: qtz + schist fragments & minor sulphides		601673 (sludge)	15·60	17·00		270	780	50	<1	45
17·00	17·60	0·40	"		Greasy, broken, waxy siliceous qtz-ser schist. Schistosity 10-15° to core axis.	1% fine pyrite throughout.									
17·60	18·30	0·70	"		Greasy clayey waxy silvery-green schist - highly fractured and sheared. Schistosity 30° to core axis.	3-5% pyrite throughout though concentrated in zones // to schistosity. Minor dark blue-grey sulphide	601674	17·00	19·20	2·00	260	540	48	<1	4300
18·30	19·20	0·90	"		Dith. Schistosity 35° to core axis - locally 15° to axis.	3-5% pyrite, up to 1% dark blue sulphide									
19·20	20·60	0·90	"		Pale green siliceous qtz-ser schist. Clayey sheared zone 19·20 - 19·50 at 15° to core axis.	5% pyrite 19·20 - 19·50m also 1-2% dark blue sulphide. Fine-sheave pyrite 3% with minor blue sulphide.	601675	19·20	20·60	1·40	250	730	70	<1	4560
20·00	20·60	0·60	"		Siliceous qtz-ser schist - highly sheared and fractured. 15° to core axis.	3-5% sulphides. Pyrite : blue sulphide 4:1.									
20·60	22·00	1·20	"		Dith. Clay pug zones along shears - which vary from 15° to // to core axis - one strong shear throughout most of interval. Very broken below 21·60 - core lost here.	10% sulphides concentrated // to shears. 3:2 pyrite : blue sulphide. Locally blue sulphide is + 5%.	601679	20·60	22·60	1·80	3310	2880	150	2	4950
22·00	23·00 / 23·60	1·00	"		Schist - less fractured. Schistosity 15% to core axis steepening towards 23·0m to 40°. Isolated strong shears.	22·00 - 22·60 10% sulphides - mainly pyrite. Blue sulphide 3-5% of total									
						22·60 - 23·00 2% sulphides - mainly pyrite	601677	22·60	23·30	0·70	130	200	20	<1	4300
23·00	23·00 / 23·30	0·90	"		23·00 - 23·30 Dith above. Schistosity 35° to axis.	1-2% pyrite									
					23·30 - 24·00 Sheared and broken schist & peggy clay on shears - 25% to axis.	5-10% sulphides. Pyrite : blue sulphide 2:1									
24·00	25·00	1·00	"		Sheared siliceous qtz-ser schist as above. Schistosity 45° to core axis.	24·00 - 24·30 10% sulphides - concentrated // to schistosity.	601676	23·30	24·30	0·90	980	720	48	2	3600
						24·30 - 25·00 3% sulphides. Pyrite : blue sulphide 2:1.	601678	24·30	25·20	0·90	800	180	22	<1	3350
25·00	26·40	0·90	"		Very clayey sheared schist. Schistosity 35% - 45% to core axis.	25·20 - 25·50 10-15% sulphides 5:1 pyrite : blue sulphide	601681	25·20	28·20	[redacted] 1·70	[redacted] 240	[redacted] 190	[redacted]	<1 [redacted]	3440 [redacted]
						25·50 - 26·40 5% sulphides.									
26·40	27·00	0·20	"		Very clayey broken sheared schist. Pale yellow-green	5% sulphides 5:1 pyrite : blue sulphide									
27·00	27·50	0·40	"		Dith. Schistosity 30% to core axis.	3-5% sulphides. 2:1 pyrite : blue sulphide									
27·50	28·20	0·50	"		Dith.	Dith.									

SUMMARY AND SPECIAL COMMENTS Highly sheared broken clayey siliceous qtz-ser schist & sulphides. Probably within a major fault zone.

LOGGED BY G. PERVIS DATE 30·1·77

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DPH 77 CC 1 Drilling Longyear Drill type Mark 12 Commenced 28-1-77 Completed 2-2-77 Azimuth 045° Inclination 55° Depth 106.40m Casing left 4.00m

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C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL CORE LOG

PROJECT CETHANA - WEST, TASMANIA

CO-ORDINATES ______ AZIMUTH ______ DRILLERS ______ COMME ______ DEPTH ______ HOLE No. 77 CC1

RL COLLAR ______ INCLINATION ______ DRILL TYPE ______ COMPLETED ______ CASING LEFT ______ DPO No(s) ______

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	Pb	Zn	Cu	Ag	Mn
28.20	28.90	—	NQ		No core recovered.										
28.90	29.50	0.60	"		Highly sheared puggy schist. Schistosity 20° to core axis.	15% pyrite 1% blue sulphide. In threads									
						and patches // to schistosity	601682	28.90	30.50	1.60	680	1040	38	1	3650
29.50	30.50	0.80	"		Ditto - very broken and soft. Schistosity 35° to core axis	5% sulphides. 3:1 pyrite : blue sulphide									
30.50	32.00	1.40	"		Very siliceous broken schist.	30.50 - 31.60 10% sulphides in									
						concentrations // to schistosity. Pyrite :	601683	30.50	31.60	1.00	950	770	120	1	5620
						blue sulphide 2:1. ie. 3-4% blue sulphide									
						31.60 - 32.00 3% sulphides 1:1 pyrite :	601684	31.60	33.20	1.00	400	610	42	<1	7860
						blue sulphide.									
32.00	33.20	0.60	"		Ditto - very clayey. Schistosity 15° to core axis.	1-3% sulphides 1:1 pyrite : blue sulphide									
33.20	34.20	0.40	"		Highly brecciated clayey schist.	5% dark grey sheared sulphides.	601685	33.20	36.20	2.10	140	230	25	<1	6800
34.20	34.70	0.50	"		Ditto - core can be bent.	3-7% crystalline pyrite.									
34.70	36.20	1.20	"		Soft sticky clayey mylonitised schist. Shearing 35° to core axis.	3-7% pyrite + grey sulphide - possibly									
						just sheared pyrite.									
36.20	37.40	1.20	"		Ditto to 37.10. Below 37.10 core harder - siliceous schist c̄ calcic veins.	36.70 - 37.10 1-2% pyrite 37.10 - 37.40	601686	36.20	37.60	1.40	70	180	20	<1	7300
						3-5% pyrite.									
37.40	38.90	1.50	"		Creamy grey siliceous qtz-sericite schist c̄ clayey shears in places. No	37.40 - 37.60 10% pyrite									
					brecciation. Numerous qtz-calcic veins c̄ coarse grained fawn-coloured	37.60 - 38.90 1% pyrite c̄ trace blue	601727	37.60	38.90	1.30	90	130	10	<1	5780
					mineral. Schistosity 50° to core axis.	sulphide.									
38.90	39.50	0.60	"		Ditto c̄ calcic veins generally // to schistosity. Schist is slightly calcic	1% pyrite c̄ minor blue sulphide									
					- an alteration effect.		601687	38.90	41.00	2.10	190	390	20	<1	4400
39.50	41.00	1.50	"		Ditto - more clayey and broken. Schistosity 40° to core axis	1-3% sulphides - mainly blue sulphide									
						c̄ lesser pyrite. Blue sulphide									
						extremely fine grained.									
41.00	42.00	0.90	"		Broken and sheared pale creamy-green siliceous qtz-sericite schist.	3% sulphides 3:1 pyrite : blue sulphide.									
					Slightly calcic.	Pyrite very brassy - may contain	601688	41.00	43.00	1.90	200	430	38	<1	5500
						blue sulphide and chalcopyrite mixed in.									
42.00	43.10	1.10	"		Ditto.	Sulphides 1%. pyrite : blue sulphide 1:1.									
43.10	44.40	1.20	"		Ditto.	2-3% sulphides. Mainly pyrite. 3:1									
44.40	45.80	1.20	"		Sheared and broken clayey schist c̄ calcic veins	2% pyrite overall. Pyrite : blue sulph 4:1	601689	43.00	45.00	1.80	190	270	28	<1	6000
45.80	47.30	1.50	"		Sheared and brecciated schist c̄ much ~~[illegible]~~ puggy calcic veining. Schistosity	~~[illegible]~~ 3% sulphides - mainly	601690	45.00	47.00	1.90	85	170	48	<1	4300
					45° to core axis.	pyrite.									
47.30	48.50	1.20	"		Ditto - harder due to some silicification.	1% pyrite c̄ minor blue sulphide.	601728	47.00	48.20	1.20	25	270	65	<1	5840
48.50	49.80	1.30	"		Hard siliceous qtz-sericite schist. Pale silvery grey c̄ green streaked-out	1% pyrite c̄ minor blue sulphide.	601729	48.20	49.80	1.60	35	270	28	<1	4880
					vitric glass shards. - rock is a pyroclastic. Calcic veinlets // schistosity.	1% pyrite - very brassy - probably	601730	49.80	51.30	1.50	60	210	28	<1	5080
49.80	51.30	1.50	"		Ditto. Schistosity 45° to core axis.	intermixed c̄ other sulphides.									
51.30	53.00	1.00	BQ		Creamy siliceous qtz-sericite schist c̄ numerous calcic and qtz-calcic	Trace sulphides except 51.30 - 51.60	601691	51.30	51.60	0.30	80	160	48	<1	2500
					veins < one is 1½ cm wide.	where 5% blue sulphide c̄ trace pyrite	618071	51.60	53.00	0.70	150	220	45	1	4650
						in assoc c̄ threads + veins of calcic									
						material // to schistosity.									
53.00	56.00	3.00			Siliceous schist c̄ much calcic alteration material	<1% sulphides - pyrite : blue sulphide 1:1	601731	53.00	55.00	2.00	35	220	45	<1	3840
56.00	57.30	1.30			Ditto. 30cm wide qtz-calcite vein 56.50 - 56.80 plus others. Schistosity 30° to	Sulphides 1-2%. Blue sulphide : pyrite	601732	55.00	57.30	2.30	70	190	55	<1	4320
					core axis	2:1 c̄ minor chalcopyrite. Some									
						sulphides in qtz veins.									
57.30	59.00	1.70			Siliceous qtz-sericite schist. 10cm qtz vein c̄ fawn mineral 57.30 - 57.40	1-2% blue sulphide c̄ minor pyrite and	601692	57.30	58.90	1.60	150	190	40	<1	4200
						chalcopyrite	601733	58.90	61.00	1.90	80	200	330	<1	5800
59.00	61.00	1.80			Sheared, clayey schist. Qtz veins 59.60 - 59.80 + 60.50 - 60.60.	1% sulphides overall - mainly									
					Second vein contains large blebs of chalcopyrite.	pyrite c̄ lesser blue sulphide and chalcopyrite									
61.00	62.70	1.70			Ditto c̄ abundant calcic alteration. Broken + clayey in places.	~~chalcopyrite~~ 1% sulphides - mostly	601734	61.00	62.70	1.70	320	180	150	1	5750
					Schistosity 40° to core axis.	blue sulphide c̄ lesser chalco + pyrite.									

SUMMARY AND SPECIAL COMMENTS: Weak, persistent base metal sulphides throughout - approximately 1% overall.

LOGGED BY G. PURVIS DATE 31.1.77

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DIAMOND DRILL CORE LOG

PROJECT CETHANA - WEST, TASMANIA

CO-ORDINATES _____ AZIMUTH _____ DRILLERS _____ COMMENCED _____ DEPTH _____ HOLE No. 77CC1

RL COLLAR _____ INCLINATION _____ DRILL TYPE _____ COMPLETED _____ CASING LEFT _____ DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
62.70	64.40	1.30			Silvery-cream siliceous schist as before ± some clayey broken zones around two 10cm wide qtz veins.	Blebs of chalcopyrite, pyrite and blue sulphide in qtz veins. Overall sulphides 2% blue sulphide > pyrite	601693	62.70	64.50	1.40	95	940	260	<1	5600
64.40	65.60	1.20			Ditto schist ± qtz phenocrysts. Schistosity 20° to core axis. Two thin graphitic partings.	<1% sulphides as above.	601735	64.50	67.80	2.70	110	140	100	<1	4450
65.60	66.70	0.50 Loss			Ditto schist - very broken. 5cm qtz vein at base of interval.	Trace sulphides.									
66.70	68.00	1.30			Ditto schist - rock is clayey and breaks easily along schistosity. 30cm qtz vein 67.70 - 68.00	Minor pyrite, galena and chalcopyrite in qtz vein. Overall <1% sulphides.	601736	67.80	70.70	2.80	60	270	50	<1	5160
68.00	69.50	1.40			Schist ± calcic alteration. Calcic alteration extends into qtz veins 20cm qtz vein 68.10 - 68.30	<1% pyrite > galena & chalcopyrite									
69.50	72.50	3.00			Schist. Lead broken, no qtz veins. Schistosity 50° to core axis.	Overall <1% sulphides. 72 - 72.30	601737	70.70	72.00	1.30	38	160	10	<1	3840
						pyrite stringer ± graphite material	601694	72.00	72.30	0.30	140	390	38	<1	4440
						trends down core - 5-10%	601738	72.30	74.40	2.10	38	180	15	<1	3200
						of total core.									
72.50	75.60	3.10			Schist	1% sulphides overall - some sphalerite in small qtz veins	601739	74.40	76.00	1.60	140	340	22	<1	4400
75.60	78.60	3.00			Creamy siliceous qtz sericite schist after vitric a.v. ± qtz phenocrysts.	1-2% blue sulphide ± lesser pyrite									
						+ trace chalcopyrite. Up to 5%	601695	76.00	78.60	2.60	410	1530	65	<1	5060
						over 10-20 cm.									
78.60	80.00	1.40			Ditto. Schistosity at 30° to core axis.	Band of grey-blue sulphides									
						(sphalerite or galena) ± lesser	601696	78.60	79.00	0.40	1970	9220	340	3	1.0%
						pyrite + trace chalcopyrite runs	601697	79.00	79.40	0.40	160	3170	110	<1	3020
						down core from 78.60 - 79.00 -									
						15% sulphides overall.	601740	79.40	81.20	1.80	80	740	18	<1	3900
						79.00 - 79.40 1-2% blue sulphide									
						± lesser pyrite, trace chalcopyrite									
						79.40 - 80.60 <1% sulphides.									
80.00	83.00	3.00			Schist. Schistosity at 35° to core axis. Graphitic or chloritic threads at 15° to core axis. Schist after a.v. ± qtz phenos Calcic alteration and veinlets	1% sulphides overall. Locally 2-3%.	601741	81.20	83.00	1.80	500	850	80	<1	5720
83.00	86.00	3.00			Siliceous qtz sericite schist ± qtz eyes (after crystal tuff?) Mod. calcic alteration.	Sulphides especially blue type often associated with calcic patches.	601698	83.00	85.30	2.30	220	410	48	<1	4460
						83 - 85.30 1-2% blue sulphide ± minor	601742	85.30	87.00	1.70	200	660	18	<1	5160
						pyrite and chalcopyrite	601743	87.00	88.60	1.60	60	110	18	<1	2760
						85.30 - 86.00 <1% sulphides.									
86.00	89.80	3.80			Ditto. Schistosity at 40° to core axis. Graphitic/chloritic threads at 15° to core axis. 20cm qtz calcite vein // schistosity 88.60 - 88.80	Several % blue sulphide in qtz-calcite vein. Minor chalcopyrite + pyrite. <1% sulphides overall.	601699	88.60	89.80	1.20	570	990	110	<1	1.06%
						88.60 - 89.00 2-3% blue sulphide, chalcopyrite and pyrite.									
89.00	90.00	1.00			Ditto - much calcic alteration.	2-3% sulphides as above.									
90.00	92.00	2.00			Ditto - much calcic alteration. After a.v. ± qtz phenocrysts	2% galena > pyrite trace chalcopyrite	601700	90.00	92.00	2.00	380	910	45	<1	5640
92.00	95.00	3.00			Slightly pinkish - yellow schist. Minor graphitic or chloritic material. Schistosity 50° to core axis.	92 - 94.10 2-3% blue sulphide - v. fine grained.	601701	92.00	94.10	2.10	330	1220	65	<1	4720
						94.10 - 95.80 1-2% sulphides - mainly pyrite.	601702	94.10	95.80	1.70	2380	9900	180	5	4520
95.00	95.30 99.100	0.80 Loss			Ditto after a.v. ± qtz phenocrysts. Calcic alteration. Rock increasingly vitric and siliceous ± graphitic (?) material towards base.	2-3% blue sulphide.									
95.80	98.00	2.20			Graphitic schist. Dark grey. Calcite veins. Boundary ± schist above	3-4% pyrite. 1-2% blue sulphide	601703	95.80	98.00	2.20	150	2000		<1	4700

SUMMARY AND SPECIAL COMMENTS: Siliceous qtz-ser schist ± several % sulphides: pyrite > sp, ga > cp.

LOGGED BY G.P. DATE 30.1.77

SHEET 3 OF 4

CRAE 117

015

294016

C.R.A. EXPLORATION PTY. LIMITED

Diamond DRILL CORE LOG

PROJECT CETHANA - WEST, TASMANIA EL 10/76

CO-ORDINATES _____ AZIMUTH _____ DRILLERS _____ COMMENCED _____ DEPTH _____ HOLE No. 77CC1

RL COLLAR _____ INCLINATION _____ DRILL TYPE _____ COMPLETED _____ CASING LEFT _____ DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
					appears // to schistosity.			95.00							
98.00	100.00	2.00	BQ		Graphitic schist. Probable bedding at 10° to core axis.	2-3% pyrite, up to 5% blue sulphide in bedded (?) bands	601704	98.00	100.00	2.00	10300	10900	190	12	5950
100.00	100.50	0.50	"		Dike. Basal contact at 35°/core axis.	2% blue sulphide, 1-2% pyrite.	601705	100.00	100.60	0.60	8300	3600	120	7	8900
							601744	100.60	101.50	0.90	150	150	28	<1	3920
100.50	106.40	5.90	"		Siliceous qtz-sericite schist after vitric tuff ± occasional qtz 'eyes'. Schistosity 45° to core axis. Calcite veinlets // schistosity.	Minor pyrite, trace blue sulphide.	601745	101.50	104.00	2.50	30	130	18	<1	2640
							601746	104.00	106.40	2.40	75	190	18	<1	2800
					END OF HOLE.										
						Average of whole hole:				99.5	936 560	1240	74	<1	4334

SUMMARY AND SPECIAL COMMENTS: Mineralised graphitic schist after black shale, from 95.50 – 100.50 metres. Hole completed in

LOGGED BY GP DATE 31-1-77

SHEET 4 OF 4

CRAE 117

016

2940117

017

C.R.A. EXPLORATION PTY. LIMITED

~~DIAMOND~~ DIAMOND DRILL CORE LOG

PROJECT: OETHANA - WEST, TASMANIA

CO-ORDINATES:	AZIMUTH: 210°	DRILLERS: LONGYEAR	COMMENCED: 4.2.77
DEPTH: 164.10	HOLE No.: 77 CC 2	RL COLLAR:	INCLINATION: 61°
DRILL TYPE: MARK 12	COMPLETED: 9.2.77	CASING LEFT: 4.00 m	DPO No(s):

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES (WEATH., ALTERATION, FRACTURING, VEINING, MINERALIZATION)	SAMPLE No.	FROM (M)	TO (M)	REC (M)	Pb	Zn	Cu	Ag	Mn
0.00	3.50	–			Tricone – no core.										
3.50	5.20	0.05	NQ		Very siliceous acid volcanic c̄ qtz phenocrysts and limonite stains.										
5.20	6.00	0.20	"		Very broken. Vein qtz and chloritic acid volcanic c̄ limonite stains										
6.00	6.50	0.50	"		Chloritic schistose acid volcanic c̄ limonite and manganese stains										
6.50	9.50	2.80	"		Chloritic schistose acid volcanic c̄ many qtz phenocrysts.	Pink (potassic ?) alteration.	618072	6.00	6.50	0.50	130	600	30	1	760
					Core slightly ~~magnetic~~ magnetic.	Much manganese, lesser limonite,	601706	6.50	8.50	1.90	210	660	28	<1	1400
						lining large vugs which may	601747	8.50	10.60	1.90	210	650	22	<1	1240
						have originally contained	601748	10.60	12.50	1.60	150	590	25	1	550
						sulphides.									
9.50	10.60	0.90			Ditto. Schistosity 50° to core axis. Numerous clayey shears	Less manganese and limonite.									
					Weakly magnetic.										
10.60	12.50	1.60 (corrected)			Very chloritic coarse grained acid volcanic c̄ qtz phenocrysts	1-4% magnetite. Manganese on									
					and conspicuous pink (potassic ?) alteration.	clayey shears									
12.50	14.00	1.50			Coarse grained chlorite schist c̄ finer grained bands. Possibly	3% sulphides, gn > pyrite.	601707	12.50	13.50	1.00	1650	900	38	2	4020
					after xyl tuff. Minor pink alteration.	2% magnetite - core strongly	601749	13.50	14.00	0.50	310	640	8	<1	710
						magnetic in places. Prominent									
						qtz-limonite-manganese vein									
						// core axis 12.50 - 13.20 m.									
						Limonitic qtz veins 10-30°/core axis									
14.00	19.30	5.30	BQ from 17.80 m.		Dark green chlorite schist after acid volcanic c̄ numerous small	3% magnetite 1% pyrite, lesser	601708	14.00	16.00	2.00	670	1640	18	<1	9570
					qtz phenocrysts. Some suggestion of pumice fragments and glass	galena. Several shears at low	601709	16.00	18.00	2.00	490	1080	20	<1	9850
					shards. Pink alteration throughout, minor calcic patches.	angle to core axis.	601710	18.00	19.30	1.30	330	520	22	<1	4700
					Schistosity 45° to core axis.										
19.30	24.90	5.30 (corrected)			Green, fine grained, altered, chloritic and sericitic tuff.	3% sulphides. Pyrite : gn 1:1. Locally	601711	19.30	21.30	0.80	950	1900	30	1	2880
					Qtz-calcite-chlorite veins // schistosity (50°/core axis - possibly	to 5%. Some vuggy qtz-chlorite	601712	21.30	23.00	1.70	560	970	48	1	2720
					bedding).	veins c̄ gn + cp 24.40 - 25.40 m.	601750	23.00	24.40	1.30	75	160	60	<1	2400
							601713	24.40	25.40	1.00	40	110	65	<1	520
24.90	27.90 (corrected)	3.00			Grey-green weakly altered vitric tuff c̄ beds of blue-grey graphitic?	1% pyrite, trace gn. Sulphides	601751 (corrected)	25.40	26.60	1.20	15	80	28	<1	2340
					tuff. Bedding 55° to core axis. Several qtz-calcite-chlorite	generally concentrated in rock	601714	26.60	27.70	1.10	20	90	20	<1	1540
					veins.	alongside calcite veins and patches									
							601715	27.70	29.90	1.80	28	190	65	<1	880
27.90	31.80	3.70			Very fine grained, light green vitric tuff. Slightly altered. Bedding	3% sulphides - pyrite c̄ minor gn	601716	29.90	32.00	2.10	70	180	110	<1	1360
					45° to core axis. Some calcic veins and patches. Core badly	and traces of cp below 31.40 m.	601717	32.00	34.00	2.00	10	50	40	<1	750
					broken from 28.90 - 29.90 c̄ 20 cm lost core.		601718	34.00	36.00	2.00	80	100	48	<1	1760
							601719	36.00	38.00	2.00	450	420	55	<1	1700
31.80	46.10	14.30			Brittle, very fine grained, vitric tuff-shale. Slightly altered -	31.80 - 38.90 m 1-3% pyrite c̄ minor	601752	38.00	39.00	1.00	640	1650	38	<1	920
					sericitic and chloritic. Graphitic interbeds. Bedding 45° to	gn. 38.90 - 46.10 m 3-5% pyrite,	601720	39.00	40.00	1.00	240	2220	45	<1	1260
					core axis - rather indistinct. Minor calcite veinlets, and	with up to 1-2% gn in places. ~~[illegible]~~	~~[illegible]~~	(40.00 - 41.00 lost core)							
					veins of qtz-chlorite c̄ pink potassic(?) alteration products.	~~[illegible]~~	601721	41.00	43.00	2.00	160	190	110	<1	2280
					Schistose and broken in places.	~~qtz vein~~	601753	43.00	45.00	2.00	32	490	110	<1	1800
							601722	45.00	46.00	1.00	830	2260	120	<1	1920
46.10	52.80	6.70			Ditto - altered vitric fine grained tuff. Numerous qtz-chlorite-	3% pyrite c̄ minor gn and traces	601754	46.00	47.00	1.00	1190	4320	80	1	820
					pink potassic(?) alteration veins. Rock increasingly chloritic	of sp + cp. Blebs of sp, gn + cp	601723	47.00	48.00	1.00	250	640	180	3	1000
					c̄ pink alteration towards base. Coincident indistinct	in qtz veins, 46.10 - 47.20 m.	601724	48.00	50.00	2.00	160	680	200	<1	850
					bedding and schistosity, at 45°/core axis. Qtz veins		601755	50.00	52.00	2.00	200	560	170	1	1500
					show no ~~pref~~ preferred orientation. Shearing at basal contact		601756	52.00	53.40	1.40	65	160	25	<1	1740
							618073	53.40	58.00	4.60	170	200	25	ND	1170
52.80	59.50	6.70			Chloritic sedimentary acid volcanic breccia. Semi-rounded	1% pyrite, trace basemetal sulphides.	618074	58.00	61.50	3.50	60	130	30	1	1350

SUMMARY AND: Chloritic altered acid volcanic (xyl (tuff?)) c̄ limonite and manganese stains to 19.30 m then

LOGGED BY: GP   DATE: 7.2.77

CRAE 117

DDH 77CC2
Azimuth 210°
Inclination 61°

Longyear
Mark 12

Drilled
4.2.77 - 9.2.77

Depth 164.10 m
Casing left 4.00 m

29 4018

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL CORE LOG

PROJECT CETHANA – WEST, TASMANIA. ELM/X

018

CO-ORDINATES _____ AZIMUTH _____ DRILLERS _____ COMMENCED _____ DEPTH _____ HOLE No. 77 CC2

RL COLLAR _____ INCLINATION _____ DRILL TYPE _____ COMPLETED _____ CASING LEFT _____ DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn	Au
					qtz pebbles and fragments in gritty felsic, chloritic matrix. Possibly a reworked vol tuff. Interbedded patches and bands of green fine tuff. A poorly-sorted, meso-transported sediment. Bedding very indistinct at 40°/axis. Numerous qtz-chlorite veins ~75°/axis. Increasingly tuffaceous towards base.											
							618075	65.80	68.70	2.90	90	180	45	ND	1250	
59.50	70.70	11.20	BQ		Green, altered, fine grained tuff. Interbeds of breccia and sandy tuff. Bedding 55°/axis at top, steepens to 75°/axis at basal contact. Qtz-chlorite-calcite veins 45°/axis, especially below 68.70m.	1-2% pyrite, trace gn + sp. Minor sp in thin qtz-chlorite veins. Mat sulphides // bedding.	601757	61.50	63.50	2.00	48	200	35	<1	1680	
							601758	63.50	65.80	2.30	45	160	42	<1	1720	
							601759	68.70	70.70	2.00	22	170	28	<1	2200	
70.70	77.80	6.90			Hard, well cemented, purplish-green, haematitic pebble breccia. Minor qtz pebbles in haematitic and chloritic matrix of gritty acid volcanic debris. Qtz-chlorite-calcite veins ± pink potassic(?) alteration material. Indistinct bedding 60°/axis. Clayey shear at base ~45°/axis.	3-5% specular haematite throughout 1-2% pyrite - usually associated ± haematite or calcic alteration patches	601725	71.00	73.40	2.40	5	42	28	<1	1960	<0.05
							601760	73.40	75.50	2.10	5	38	22	<1	440	
							618076	75.50	77.60		ND	40	25	ND	840	
							618077	77.60	82.00		20	50	45	ND	1100	
77.80	79.80	1.90			Dark green chloritic tuff ± calcite veinlets, passing gradually below 78.90 into breccia with qtz and tuff fragments in tuffaceous matrix, becoming coarser, and fragments more rounded towards base. At base - a pebble breccia of qtz pebbles to 1.5cm in diameter. Bedding 45°/axis	1% pyrite.										
79.80	81.80	2.00			Fine grained altered grey-green tuff ± minor calcite veinlets.	1-2% pyrite.										
81.80	99.60	17.80			Hard welded (?) pyroclastic - ash flow tuff? Altered to pink and green colour by potassic (?) alteration and chlorite. Very siliceous rock of small glass and pumice fragments and small qtz phenocrysts. Qtz-chlorite-calcite veins. Fragments with orientation 65°/axis. Qtz-calcite vein swarm at base.	5-10% pyrite 81.80-82.00m Otherwise only trace pyrite throughout.	601761	82.00	84.00	2.00	10	28	10	<1	640	
							618078	84.00	89.50		20	30	15	ND	1300	
							618079	89.50	95.60		20	60	15	ND	1100	
							618080	95.00	99.60		ND	30	20	ND	450	
99.60	102.40	2.80			Fine grained altered grey-green vitric tuff. Very indistinct bedding at 65°/axis. Thin calcite veinlets 90°/axis. Sedimentary contact 60°/axis at base	2% pyrite.	601726	99.60	100.10	0.50	42	35	170	1	2080	
							618081	100.10	104.60		20	70	45	ND	1700	
102.40	104.40	2.00			Sedimentary acid volcanic breccia. Fragments to 2cm - moderately rounded, poorly sorted - vague bedding at 60°/axis. Fragments include pyroclastics, pumice, qtz. Lenses of vitric tuff. Numerous qtz-calcite veins.	1% pyrite.										
104.40	113.30	8.90			Very fine grained grey-green vitric tuff. Minor breccia interbeds towards top and graphitic tuff interbeds towards base. Swirl patterns suggest rock was disrupted while plastic. Weak sericitisation. Calcite veinlets. Irregular bedding 68°/axis	2% pyrite. Trace sp.	601762	104.60	107.50	2.90	90	110	28	<1	2100	
							601763	107.50	109.00	1.50	90	120	42	<1	2500	
							618082	109.00	111.00		190	240	50	1	2400	
							601764	111.00	113.30	2.30	410	860	70	<1	3100	
113.30	118.50	5.20			Tuffaceous breccia-conglomerate. Purplish-green in colour due to haematite in pebbles and matrix. Pebbles and fragments up to 2cm. Core strongly magnetic in places. Several strong chloritic shears and qtz-chlorite-calcite veins, all at 10-25°/axis.	3% pyrite, trace cp. Abundant haematite and magnetite.	601765	113.30	115.00	1.70	38	85	75	<1	5500	
							618083	115.00	119.00		20	50	15	ND	440	
							618084	119.00	123.00		140	70	200	ND	4200	

CRAE 117

SUMMARY AND SPECIAL COMMENTS weakly altered tuffs and sedimentary breccia/conglomerate ±

LOGGED BY GP DATE 7.2.77

FT 2 OF 3

2940019

C.R.A. EXPLORATION PTY. LIMITED

PROJECT CETHANA - WEST, TASMANIA EL 10/76

019

DRILL CORE LOG

CO-ORDINATES ______ AZIMUTH ______ DRILLERS ______ COMMENCED ______ DEPTH ______ HOLE No. 77 CC2

RL COLLAR ______ INCLINATION ______ DRILL TYPE ______ COMPLETED ______ CASING LEFT ______ DPO No(s) ______

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	Pb	Zn	Cu	Ag	Mn
118.50	121.00	2.50	BQ		Green fine grained tuff with interbeds of tuffaceous grit and sandy tuff	2% pyrite.									
					Traces of haematite. Bedding 85°/axis. Pugqy shear zone 10-15cm										
					wide at base, numerous shears elsewhere. Thin stringers of qtz-calcite										
121.00	131.00	10.00			Green acid volcanic breccio-conglomerate. Slightly chloritic. ~~B~~ Purplish	5-10% magnetite/haematite	601766	123.00	125.00	2.00	8	42	8	<1	3850
					in colour in places due to magnetite/haematite in matrix and as	1-2% pyrite, trace basemetals.	601767	125.00	127.00	2.00	<5	48	15	<1	3850
					discrete fragments - form 10% of core around 124-129m - core is		618085	127.00	132.00		20	70	45	ND	3550
					highly magnetic.		618086	132.00	137.10		20	70	75	ND	2600
					Fragments in breccio-conglomerate are creamy vitric tuff, green										
					tuff, pink and purple-stained qtz, and magnetite/haematite.										
					Rock becomes coarser and more conglomeratic towards base c̄ pebbles										
					to 4cm. of pyroclastics, xyl tuffs, tuffs and magnetite. Below 130m										
					fines to a tuffaceous grit.										
131.60	132.40	1.40			Green tuff - gritty and sandy at top. ~~[illegible]~~ Irregular bedding	Minor pyrite, trace cp.									
					80°/axis										
132.40	141.10	8.70			Green tuffaceous breccia c̄ pebbles of acid volcanics. Essentially	1% pyrite, trace sp, gn, cp									
					unaltered - minor chlorite-qtz-calcite veinlets only. Several shears		601768	137.10	139.10	2.00	75	420	85	<1	2240
					// axis 137-140m. 10cm qtz-calcite-chlorite vein 65°/axis at		618087	139.10	140.40		70	120	65	ND	1900
					start of green tuff interbed from 140-140.40m. Basal contact		601769	140.40	141.10	0.70	70	810	30	<1	1690
					irregular bedding at 85°/axis.		618088	141.10	143.10		40	880	25	1	2550
											[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
141.10	155.10	14.0			Very fine grained, grey-green vitric tuff, tending to tuff-shale.	To 151m - minor pyrite, trace gn, sp.	618090	147.70	151.00		90	150	30	1	2200
					Veins and patches of qtz-calcite. Bedding 83°/axis - shows	Below 151m 1-2% pyrite c̄ minor	601770	143.10	145.10	2.00	150	180	25	<1	2160
					evidence of folding, and brecciation of rock while still plastic. Below	gn > sp > cp.	618089	145.10	147.70		70	400	30	1	2500
					146.50 bedding almost // to axis, below 153m 45°/axis		601771	151.00	152.00	1.00	65	230	25	<1	2160
							601772	152.00	152.60	0.60	210	380	18	<1	1730
155.10	164.10	9.00			Grey, fine grained vitric tuff shale. Slightly graphitic in places.	2% pyrite. Trace gn, sp & cp.	618091	152.60	156.00		190	470	30	1	1700
					Fine variable laminar bedding 45°/axis at top, 75°/axis		618092	156.00	158.50		50	200	30	ND	1350
					at base. Interbeds of tuffaceous grit 158-158.80m. Below		601773	158.50	160.50	2.00	80	220	22	<1	1950
					158.80m core increasingly sheared and broken c̄ abundant		618093	160.50	164.10		70	200	25	1	1450
					calcite veining. In places rock is a tuff breccia c̄ fragments										
					of tuff-shale in a tuffaceous matrix										
					END OF HOLE										
					Average of whole hole.					18.40	140	335	[redacted] 47	<1	2150

SUMMARY AND SPECIAL COMMENTS: Green tuff c̄ interbedded breccio-conglomerate, some c̄ up to 10% haematite/magnetite. Minor pyrite, traces of basemetals throughout.

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9.77

CRAE 117
PLAN No M414

294020

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL CORE LOG

PROJECT CETHANA-WEST, TASMANIA EL 10/76

020

CO-ORDINATES _____ AZIMUTH 20[redacted] DRILLERS LONGYEAR COMMENCED _____ DEPTH 190·00 HOLE No. 77 CC 3

RL COLLAR _____ INCLINATION 60° DRILL TYPE MARK 12 COMPLETED _____ CASING LEFT 4·00 m DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
0·00	2·20	–			Tricored – no core										
2·20	17·20	13·30 14·70	NQ		Creamy-white, leached and bleached, weathered qtz-sericite schist ± chlorite. Schistosity 45°/core axis. Rock mostly fine grained ± occassional qtz phenocrysts – after xyl tuff? Core broken in places. Qtz veins 7·40 – 7·50, 14·30 – 14·50 m. // core axis.	Abundant limonite after sulphides – 5–10% of core, primarily in bands // schistosity, but much as cubical pits after fine disperse pyrite. Yellow sulphur stains Mn stains, particularly below 13·90	601774	2·20	4·00	1·70	430	60	28	<1	800
							601775	4·00	6·00	1·80	1030	190	38	<1	700
							601776	6·00	8·00	2·00	560	70	32	<1	300
							601777	8·00	10·00	2·00	430	42	28	<1	45
							601778	10·00	12·00	2·00	540	20	8	<1	32
							601779	12·00	14·00	1·80	650	28	18	<1	42
17·20	21·30	4·10			Pale green fine grained chloritic qtz sericite schist ± patches of pink alteration. Fractured by small cracks containing Mn and limonite		601780	14·00	17·00	1·80	790	50	5	<1	3200
						Several 1–2cm wide gossanous zones // schistosity.	601781	17·00	19·00	2·00	330	430	20	<1	2540
							601782	19·00	21·30	2·30	160	430	12	<1	2060
							601784	21·30	22·20	0·90	230	75	10	<1	130
21·30	24·70	3·40			Creamy-white to pale green, leached and bleached qtz-sericite schist. Chlorite has been leached out. Schistosity 35°/axis. Core badly broken in places.	Highly brecciated by gossanous limonitic fractures ± boxworks after sulphides – probably 5% sulphides originally	601783	22·20	24·50	2·30	650	280	18	<1	2140
							601785	24·50	26·50	2·00	220	590	12	<1	2500
							601786	26·50	28·40	1·90	120	630	15	<1	2400
							601787	28·40	30·40	2·00	220	660	20	1	3450
							601788	30·40	32·20	1·60	180	670	18	<1	3320
24·70	36·40	11·70			Green chlorite-qtz-sericite schist. Schistosity 45°/axis. Generally fine grained – a tuffaceous rock ± bands of tuff breccia (?). Numerous qtz-limonite-Mn veins at all angles but mostly low angles/axis.	1–2% pyrite visible below 32m Veins generally gossanous ± botryoidal limonite.	601789	32·20	34·40	2·20	290	1050	35	<1	4000
							601790	34·40	36·40	2·00	260	460	18	<1	2620
							601791	36·40	38·40	2·00	570	1610	15	<1	6380
							601792	38·40	39·20	0·80	730	6700	60	1	8180
36·40	39·20	2·80			Green chlorite-qtz-sericite schist after tuffaceous grit(?) Patches and veins of calcic alteration.	1–2% pyrite ± 1% gn – especially around 38·30m where pyrite 2–3%, gn 1–2%, trace cp. Core weakly magnetic in places.	618094	39·20	42·70		170	850	20	1	8300
							618095	42·70	45·30		350	1130	25	1	6300
39·20	42·50	3·30	BQ		Chloritic qtz-ser schist after vitric tuff. Calcic alteration	2–3% pyrite, trace gn.									
42·50	48·50	6·00			Green, moderately chloritic qtz-ser schist after vitric tuff and xyl tuff (?) Schistosity 50°/axis. Core very broken.	2–3% pyrite, trace gn. Wide zone of qtz in creamy qtz-ser schist after tuff 45·20 – 45·70.	601793	45·30	45·70	0·40	490	820	5	<1	6700
							618096	45·70	50·50		490	1000	20	1	6350
48·50	67·70	19·20			Green chloritic and sericitic schist after tuffaceous breccia, xyl tuff and vitric tuff. Much calcic alteration ± thin calcite veinlets mostly at high angles to core axis. Schistosity 60°/axis. Large qtz-chlorite-calcite vein 56·90 – 57·30m 90°/axis. Very chloritic below 57·30m. Mostly tuffaceous schist below 64m – schistosity and banding of shards in tuff 50°/axis. Bedding contact at base.	1–2% pyrite trace gn+sp – especially in richer bleached zones from 51·50 – 52·10 m.	601794	50·50	52·10	1·60	200	770	5	<1	5950
							618097	52·10	57·30		220	420	10	1	3650
							601795	57·30	58·30	1·00	40	620	10	<1	3900
							618098	58·30	64·60		70	620	10	ND	5650
							618099	64·60	67·90		220	630	10	1	5100
67·70	70·30	2·60			Creamy bleached qtz-sericite schist after tuff ± minor qtz phenocrysts. A highly altered rock. Rather clayey and broken.	2% pyrite, minor gn.	601796	67·90	69·20	1·30	520	670	5	<1	6560
							618100	69·20	73·60		520	790	10	1	7600
70·30	79·70	9·40			Creamy-grey-green siliceous qtz-sericite schist ± minor chlorite. After siliceous tuff and xyl tuff. Pink potassic(?) alteration abundant at top, only trace at base. Schistosity 50°/axis. Some calcic alteration.	Minor pyrite, trace gn, cp.	601797	73·60	75·00	1·40	310	810	5	<1	9180
							601798	75·00	75·90	0·90	100	860	22	2	1·15%
							603456	75·90	79·70		340	560	10	1	8350
79·70	87·40	7·70			Series of unusual rocks. Creamy lime green and red, altered pyroclastic xyl tuff and unusual siliceous tuff – now siliceous qtz-sericite schists ± chloritic, calcic and potassic(?) alteration	1–2% pyrite; minor gn+cp – mainly associated with the calcic alteration.	601799	79·70	80·50	0·80	1290	890	5	<1	5250
							603457	80·50	81·70		290	290	10	ND	7150
							601800	81·70	83·60	1·90	480	2500	55	2	7000

SUMMARY AND Top 25m of core highly leached and bleached ± limonite after 5–10% sulphides. Chloritic schist below

LOGGED BY GP DATE

CRAE 117

BH 77 CC 3

2940021

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3

021

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL CORE LOG

PROJECT: CETHANA - WEST, TASMANIA EL 10/76

CO-ORDINATES ______ AZIMUTH ______ DRILLERS ______ COMMENCED ______ DEPTH ______ HOLE No. 77 CC3

RL COLLAR ______ INCLINATION ______ DRILL TYPE ______ COMPLETED ______ CASING LEFT ______ DPO No(s) ______

DDH 77 CC 3.
Az. 208°
Incl. 60°
Mark 12

Depth 190.00 m
Casing left 4.80 m

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES (WEATH., ALTERATION, FRACTURING, VEINING, MINERALIZATION)	SAMPLE No.	FROM (M)	TO (M)	REC (M)	Pb	Zn	Cu	Ag	Mn
					in variable patches. Schistosity // original layering at 55°/axis	[struck out]	601901	83·60	85·40	1·80	510	1540	22	1	8600
							601902	85·40	87·40	2·00	530	1640	10	1	1·2%
87·40	92·00	4·60			Green altered tuff c̄ pyroclastic bands. Bedding indistinct. Alteration	Below 90m 1% pyrite, trace gn.	603458	87·40	90·50		200	870	5	ND	8500
					mainly chlorite c̄ lesser sericite and calcite - numerous thin calcite	Some moderately magnetic	601903	90·00	92·00	2·00	630	1850	15	1	1%
					veinlets. Weakly schistose. Bedding 45°/axis. Rock strongly	purplish haematite/magnetite.	603459	92·00	96·50		330	1100	10	ND	7350
					carbonated in places. Small patches of red potassic(?) alteration.		603460	96·50	102·50		670	1730	55	ND	9850
92·00	102·50	10·50			Similar to above - altered, reworked pyroclastic c̄ distinctive	Minor pyrite.	~~601904~~	~~102·50~~	~~104·50~~						
					shards of glass. Some zones of strong bleaching to pale										
					creamy green. Chlorite - strongly in places, carbonated and										
					sericitized. Interbeds of tuff and tuffaceous breccia. Bedding										
					50°/axis.										
102·50	110·00	7·50			Green altered tuff - strongly chloritized and sericitized, moderately	Minor pyrite, trace gn + cp.	601904	102·50	104·50	2·00	670	1470	25	<1	7800
					carbonated. Interbeds of pyroclastics including xyl tuff.		603461	104·50	107·50		400	810	15	ND	7000
					Several qtz-chlorite-calcite veins 90°/axis, up to 7cm wide.		601905	107·50	109·40	1·90	720	1760	18	<1	7840
							603462	109·40	112·90		550	1280	125	2	7000
110·00	122·70	12·70			Reworked altered pyroclastic c̄ lineated glass and pumice fragments	Trace pyrite, gn + cp in places									
					at 55°/axis. 5-10% haematite in places giving rock a purplish-	where haematite not present.	601906	112·90	113·20	0·30	40	870	8	<1	5300
					red colour. Alteration mainly chlorite c̄ lesser sericite. Calcite		603463	113·20	118·80		50	840	10	ND	7000
					veins. Moderate schistosity. Extensive carbonate patches in		603464	118·80	122·80		50	860	10	ND	1%
					core 118-120m.										
122·70	124·60	1·90			Same rock except highly bleached. Pale creamy-green reworked	1% gn c̄ trace pyrite + cp.	601907	122·80	124·20	1·40	2220	2070	28	1	1·4%
					pyroclastic c̄ glass shards. More tuffaceous than interval		603465	124·20	126·60		70	600	10	ND	1%
					above. Large qtz-calcite vein 124·20-124·40m. Bedding 55°/axis		603467	132·00	137·00		430	1000	20	ND	5050
							603468	137·00	140·10		260	740	10	1	5500
124·60	162·00	37·40			Reworked altered pyroclastic or tuffaceous grit. Strongly chloritic c̄	2-3% specular haematite	601908	126·60	127·20	0·60	500	810	5	1	1·3%
					less sericite and calcite. Schistosity weak. Rock is more	throughout - up to 10% locally -	603466	127·20	132·00		150	700	10	ND	7250
					water-worked than before. Fragments of pumice up to 1·5cm	Core is weakly magnetic in these	601909	140·10	140·90	0·80	1010	1580	30	2	1·5%
					Numerous qtz-calcite veins - core highly carbonated in places.	places.	603469	140·90	144·90		300	570	10	1	1%
					Large qtz-chlorite vein 141-142m. More tuffaceous and strongly	Minor pyrite, gn + cp. Best	601910	144·90	145·70	0·80	3600	3510	100	5	1·2%
					chloritic and carbonated at base. Basal contact is an	~~minor~~ basemetal mineralisation	601911	145·70	146·80	1·10	2140	1430	85	5	1·2%
					unconformity at 70°/axis - truncates bedding. Bedding angles	associated with patches of	603470	146·80	147·80		330	790	45	1	1%
					45°/axis at 125m, 55°/axis at 135m, 50°/axis at 155m	calcic alteration.	601912	147·80	148·20	0·40	1720	1130	30	2	2·1%
					55°/axis at 160m.		603471	148·20	152·50		1210	1200	85	1	1%
							601913	156·50	158·50	2·00	870	1100	90	1	7680
162·00	172·30	10·30			Dirty green-grey fine grained calcic vitric tuff. Altered - chloritic,	1-2% pyrite. Trace gn, sp + cp.	603472	152·50	156·50		410	610	30	ND	5150
					sericitic and carbonated - possibly originally a limey tuff.		601914	162·00	163·00	1·00	250	1020	42	1	1200
					Bedding vague - 'swirl' and breccia patterns suggest		603473	158·50	162·00		50	300	15	ND	3300
					disruption. White plastic. Bedding at 171m 80°/axis.		601915	168·00	168·80	0·80	32	75	20	<1	1400
							603474	163·00	168·00		100	250	20	ND	900
172·30	173·30	1·00			Dike. Pale green, sericitized. Highly broken.	3% pyrite	603475	168·80	173·10		50	110	25	ND	800
							~~603476~~								
173·30	180·50	7·20			Breccia - angular fragments of qtz, vitric tuff, pumice and glass	1% pyrite, minor basemetals.	601916	173·10	175·00	1·90	50	75	15	<1	780
					in rock flour matrix which had been chloritized and sericitized.		601917	175·00	175·70	0·70	330	340	25	<1	770
					Dirty khaki-green. Rock is siliceous. Calcite veinlets in		601918	175·70	177·40	1·70	8	42	15	<1	660
					matrix. Structureless - reflects rapid deposition. Bedding		601919	177·40	179·20	1·80	<5	25	22	<1	440
					seen at 175m 70°/axis in a vitric tuff interbed. Several		601920	179·20	180·50	1·30	6	25	220	<1	820
					strong fractures // axis - core badly broken. - qtz-calcite-chlorite										

SUMMARY AND ... Weakly-moderately altered tuffs, reworked pyroclastics

LOGGED BY GP DATE ______

CRAE 117

294022

C.R.A. EXPLORATION PTY. LIMITED

PROJECT CETHANA-WEST, TASMANIA EL 10/76

DIAMOND DRILL CORE LOG

CO-ORDINATES _____ AZIMUTH _____ DRILLERS _____ COMMEN _____ DEPTH _____ HOLE No. 77 CC3

RL COLLAR _____ INCLINATION _____ DRILL TYPE _____ COMPLETED _____ CASING LEFT _____ DPO No(s) _____

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
					Vein in one of these fractures at 179.70m contains large blebs of chalcopyrite.										
180.50	190.00	9.50			Light brownish green, very fine grained siliceous cherty tuff ± interbeds of breccia up to 1.30m thick. Minor dark tuff bands with colour bleached off. Rock is sericitised and slightly chloritised & minor thin veinlets of calcite. Bedding very indistinct 60-80° to axis. Qtz veins at low angle to axis 187.50 – 188.10.	Very minor pyrite and basemetal sulphides - extremely fine grained, generally associated & small 'sweat-bands' of qtz-calcite.	601921	180.50	182.20	1.70	5	15	5	<1	660
							603476	182.50	187.50		ND	30	15	ND	400
							601922	187.50	188.00	0.50	30	65	15	<1	480
							603477	188.00	190.00		20	50	15	ND	700
					END OF HOLE	Average values for whole hole.					380	310	24	<1	570

SUMMARY AND Cherty tuff ± minor sulphides.

LOGGED BY GP DATE

SHEET 3 OF 3

CRAE 117

022

2940023

APPENDIX 2

024

294025

amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662, telex AA82520

Please address all correspondence to Frewville,
In reply quote: MP 3/1/6/0

28th September, 1976

C.R.A. Exploration Pty. Limited,
PO Box 138,
BURNIE, Tas 7320

Attention: J.G. Purvis

REPORT MP 938/77

YOUR REFERENCE:	D.P.O. No.17786
MATERIAL:	1 rock
IDENTIFICATION:	603017
DATE RECEIVED:	24-9-76
WORK REQUIRED:	Petrography

Investigation and Report by: Dr B.G. Steveson

Officer in Charge, Mineralogy/Petrology Section: Dr K.J. Henley

K.J. Henley

for F.R. Hartley
Director

c.c. C.R.A. Exploration Pty. Ltd.,
GPO Box 384D,
MELBOURNE, Vic 3001

mhb

EXAMINATION OF ONE QUARTZ SANDSTONE

Sample No. 603017; TSC16976

Rock Name:
Quartzite (quartz sandstone).

Hand Specimen:
A massive, fine-grained grey rock which has a somewhat veined and brecciated appearance.

Thin Section:
An optical estimate of the constituents gives the following:-

	%
Quartz	90-95
Dolomite	3
Chert	1-2
Opaques	trace-1
Muscovite	trace
Tourmaline	trace
Rutile	trace

The sample is a quartz-rich sandstone which has been cemented in part by the deposition of a little authigenic dolomite but mainly by partial recrystallization of the detrital quartz grains. The sample contains no feldspar (this was checked both optically and by staining a slab of the sample) and no identifiable volcanic rock fragments were seen in the thin section.

The quartz grains belong to two distinct grain size populations; one of these consists of grains which range in size from 0.25 mm to 0.6 mm and the other, more abundant, grain size population consists of quartz grains which are generally less than 0.1 mm in size. The larger grains are widely distributed throughout the rock and are not confined to one particular sedimentary horizon. Approximately 15-20% of the rock is occupied by these large grains and the remainder consists essentially of authigenic dolomite and grains less than 0.1 mm in diameter. Some of the larger quartz grains which consist of single quartz crystals show marked undulose extinction and there are a few polycrystalline grains which are clearly derived from granulated or high grade metamorphic quartzites. In addition, a few of the larger grains consist of chert and one characteristic grain is one millimetre in length and 0.3 mm in width; most of the larger grains have distinctly more equant shapes than this but few show subround shapes and most are subangular.

The smaller quartz grains have been compressed together during the compaction and lithification of this rock and hence few show well rounded shapes. The rock contains numerous long and concavo-convex grain boundaries and these have clearly resulted from the partial recrystallization of the

detrital quartz grains under the compaction forces which resulted in the lithification of this sand. Very little intergranular material can be identified in the thin section but it is possible that there are thin films of clay and opaque and semi-opaque material between some of the detrital quartz grains. Such material probably contributed little to the lithification of the sample. Authigenesis has resulted in the deposition of dolomite in the sample and this mineral comprises up to about 3% of the rock. A little of the dolomite forms subhedral or euhedral rhombs but most is extremely fine-grained material which forms small patches (less than 0.1 mm in size) throughout the rock. Some of the dolomite in the rock is associated with a thin veinlet which transects the thin section; this veinlet is less than 0.1 mm in width except in one place where it swirls to form an exceptional aggregate of dolomite which is 0.9 mm x 0.2 mm in size.

Tourmaline, opaques, rutile and muscovite are trace detrital components which form small grains. Muscovite flakes are commonly slightly distorted but the grains of tourmaline, opaques and rutile are equant subhedral and anhedral grains.

The bimodal grain size distribution of this sample is probably related to the fact that the detrital material is derived from two different sources with fundamentally different grain sizes. The presence of chert (which occurs in both the coarser and finer grain size distributions) indicates that some, at least of the detrital material was derived from a sedimentary source. The rock contains no feldspar and no volcanic rock fragments and hence it is unlikely that volcanic or plutonic rocks contributed much to the detritus. The presence of a few metamorphic quartzite grains suggests a significant derivation from metamorphic rocks. If, as is postulated, much of the detrital material was derived from a sedimentary source then one might expect that such recycled material would show rounding but in this case it is likely that well-formed round detrital grains have been partially recrystallized during the lithification and compaction of the rock. In summary, therefore, it is postulated that sedimentary rocks provided the major source of the detrital material of this bimodal quartz sandstone with a small but significant contribution from quartz-rich metamorphic rocks.

APPENDIX 3

028

294029

GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 1

TENEMENT EL 10/76 & 7/73 D.P.O. No.

AREA/PROSPECT CETHANA-WEST SAMPLE No's. GEOLOGIST G.P. DATE 9/76

PLAN REFERENCE ANALYSED BY ZC, ANDEL

Sample No.	Sn	Au	Metal Content in ppm. Pb	Zn	Cu	Ag	Mn	Na_2O %	Ba	Geological observations
603001	<4	<0.04	36	14	35	<1				s/c Pyritic black chert. } Near Devils Gate Dam.
02	<4	<0.04	5	11	16	<1	W<10 Mo<2			s/c Pale creamy chert }
03	<4	<0.04	57	250	22	<1				s/c. Siliceous sediment c sulphides
04	4	<0.04	19	11	18	1				s/c Siliceous sediment c sulphides.
05	8	<0.04	2	13	12	<1				s/c. Siliceous rock c minor sulphides
06		<0.04	280	184	47	1	60	0.038	<20	s/c. Quartzite c sulphides.
07		<0.04	34	27	25	<1	80	0.024	50	sub s/c. Quartzite c 5-10% sulphides
** 08		<0.04	28	196	8	<1	22000	0.012	20	sub s/c. Banded brown + white sediment
09		<0.04	69	350	13	1	30000	0.014	50	" " " " " " "
603010		<0.04	800	39	19	5	240	0.021	20	sub s/c. Quartzite c up to 25% sulphides
** 011		<0.04	210	16	25	<1	300	0.030	60	" " " " " " " "
012		<0.04	32	65	8	<1	570	0.044	340	s/c. Tuffaceous mudstone
013		<0.04	44	15	19	<1	30	0.029	140	s/c 20m chip. Quartzite c up to 25% sul
** 014		<0.04	32	36	18	<1	80	0.031	90	s/c. " " " " " "
015		<0.04	26	17	20	<1	270	0.027	60	s/c " " " " " "
016		<0.04	29	15	20	<1	20	0.027	70	s/c. 17m chip. " " " " "
017			Petrological sample							s/c from within 603014. Quartzite
018			45	15	16	<1			90	s/c. Vein quartz in quartz-sericite sch
019			530	1010	59	<1		0.136	1550	s/c Chlorite schist c limonite.
603020			56	108	16	<1		0.164	450	s/c. Siliceous sericite schist
021			46	102	10	<1		0.24	1900	s/c " " "
022			170	220	26	<1		0.146	820	s/c Tuff. c limonitic fractures.
023			34	16	24	<1		0.046	660	s/c. Siliceous tuff c minor sulphides
024			36	18	16	<1		0.040	560	s/c. Siliceous sericitic schist
025			120	15	15	<1		0.040	1100	s/c. Moderately altered vitric tuff
026			7	11	12	<1		0.24	430	s/c. Quartz-sericite schist.
027			17	30	13	<1		0.27	420	s/c. " " "
028			580	440	140	16		0.042	2950	s/c. Pyritic fracture filling in altered vo
029			61	80	22	<1		0.053	1350	Same s/c. Altered acid volcanic
603030			10	15	25	<1		0.105	1000	s/c. Siliceous tuff c limonitic fractu
031			320	167	69	<1		0.044	620	s/c. Vein qtz in quartz-sericite schist
032			41	89	36	<1		0.194	1350	s/c. Quartz-sericite schist c limonite
033			330	170	170	1		0.054	540	s/c. Vein qtz c limonite in qtz-sersch
034			64	26	13	<1		0.050	1050	s/c. Quartz-sericite schist.
035			59	150	44	<1		0.059	540	s/c. Altered acid pyroclastic

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GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 2

TENEMENT EL's 10/76 - 7/73 D.P.O. No.

AREA/PROSPECT CETHANA-WEST SAMPLE No's. GEOLOGIST GP DATE 9/76

PLAN REFERENCE ANALYSED BY ZC, AMDEL

Sample No.	Sn	Au	Pb	Zn	Cu	Ag	Mn	Na_2O %	Ba	Geological observations
			Metal Content in ppm.							
603036			290	240	38	<1	3700	0.062	1100	20m chip. Quartz-ser schist c̄ qtz vein
037			160	197	76	1	3700	0.063	1050	20m chip. " " " " "
038			420	120	180	1	7600	0.143	1000	20m chip. " " " " "
039			540	78	67	<1	5200	0.182	1450	20m chip. " " " " "
603040			57	62	19	<1	2200	0.20	1200	20m chip. More massive qtz-ser schist.
041			230	132	30	<1	2500	0.160	1250	20m chip. Altered acid volcanic.
042			130	78	27	<1	730	0.084	1600	20m chip. Weathered qtz-ser schist
043			130	50	24	<1	920	0.110	1250	20m chip. Massive qtz-ser schist.
044			200	44	15	<1	610	0.147	760	20m chip. Altered weathered acid volc
045			320	106	24	<1	1860	0.27	1200	20m chip. Altered acid volc c̄ limonite.
046			1500	630	29	<1	6400	0.29	1350	20m chip. " " " "
047			640	210	24	1	2300	0.37	1050	20m chip. Altered acid volc c̄ qtz vein
048			290	95	14	<1	700	0.45	1150	20m chip. " " " " "
049			300	85	17	<1	2500	0.48	1200	20m chip. Chloritic altered acid volc.
603050			770	280	25	1	5700	0.27	960	20m chip. " " " "
051			850	200	35	<1	2700	0.20	1300	20m chip. " " " "
052			120	38	11	<1	160	0.090	820	20m chip. " " " "
053			110	30	10	<1	80	0.041	580	20m chip. Weathered altered acid volc
054			130	52	17	<1	180	0.061	620	20m chip. " " "
055			470	65	13	<1	880	0.049	860	20m chip. Weathered chloritic acid volc
056			160	38	12	<1	440	0.38	680	O/c at 10m in 603046. Siliceous tuff
057			2000	710	31	<1	8800	0.26	1350	O/c at 10m in 603048. Qtz-limonite vein
058			190	62	16	<1	180	0.059	640	20m chip. Weathered chloritic acid volc
059			320	47	10	<1	500	0.037	440	20m chip. " " " "
603060			550	124	12	<1	2900	0.068	760	20m chip. " qtz-ser-chlorite a.v.
061			140	36	11	<1	220	0.039	450	20m chip. " " " " "
062			400	41	11	<1	1120	0.039	380	20m chip. " " " " "
063			330	71	12	<1	1080	0.044	500	20m chip. " " " " "
064			34	91	27	<1	250	0.174	660	20m chip. Chloritic altered pyroclastic
065			67	113	32	<1	1000	0.118	640	20m chip. " " "
066			38	98	29	<1	590	0.045	540	30m chip. " " "
067			52	132	65	<1	910	0.070	580	30m chip. " " "
068			Petrological sample at 15m in 603065. O/c. Chloritic altered pyroclastic							
069			23	58	15	<1	1150	0.040	560	20m chip. Weathered chloritic a.v.
603070			71	68	9	<1	810	0.045	720	20m chip. " "

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GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 3

TENEMENT EL's 10/76 & 7/73 D.P.O. No.

AREA/PROSPECT CETHANA-WEST SAMPLE No's. GEOLOGIST GP DATE 10/76

PLAN REFERENCE ANALYSED BY ZC, AMDEL

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn	Na_2O %	Ba	Geological observations
603071		270	127	14	1	610	0.047	600	20m chip. Weathered chloritic acid v/c.
072		230	31	17	<1	710	0.043	780	20m chip. Weathered altered acid v/c
073		130	38	7	<1	330	0.049	1000	20m chip. " " " "
074		140	41	11	<1	130	0.046	860	20m chip. " " " "
075		250	84	27	<1	50	0.043	800	30m chip. " " " "
076	*	90 (89)	30 (31)	10 (10)	<1 (<1)	60 (70)	0.040	680	30m chip. Very weathered altered a.v.
077		200	38	13	<1	110	0.043	560	30m chip. " " " "
078		220	51	17	<1	180	0.036	340	30m chip. Very weathered chloritic a.v.
079		180	88	11	<1	290	0.066	760	30m chip. " " " "
603080		170	59	8	<1	970	0.150	780	30m chip. Altered acid volcanic
081		140	55	13	<1	1460	0.20	660	30m chip " " "
082		47	59	10	<1	1250	0.170	700	30m chip. Weathered altered a.v.
083		54	36	8	<1	220	0.124	720	30m chip. Chloritic altered a.v.
084		430	163	27	<1	180	0.041	980	f/c. 5m tuff band in 603075.
085		150	74	26	<1	280	0.076	920	30m chip. - mostly sub f/c. Chloritic a.v
086		93	44	27	<1	200	0.106	740	30m chip. Altered a.v.
087		480	84	390	2	30	0.085	1000	30m chip. Altered vitric and siliceous tuff.
088		170	50	62	<1	80	0.051	1650	30m chip. Altered vitric + sandy tuff.
089		90	28	23	<1	120	0.050	1100	30m chip. " " " "
603090		42	20	23	<1	10	0.052	1350	30m chip. Qtz-ser schist after vitric tuff
091		68	104	62	1	40	0.094	1100	30m chip. " " " "
092		220	270	35	<1	2500	0.115	860	30m chip. Highly altered qtz-ser schist.
093		470	210	100	<1	1640	0.050	1250	30m chip. Qtz-ser schist c limonite
094		52	88	18	<1	180	0.070	1100	30m chip. Qtz-ser schist.
095		19	55	15	<1	60	0.048	940	30m chip. Qtz-ser schist.
096		31	670	27	1	6700	5.6		Float. Black graphitic schist.
097		See soil ledger - used for soil sample.							
098		380	27	33	<1	40	0.039		Scree: Quartzitic tuff or sinter.
099		48	38	25	<1	70	0.039		Scree: " " "
603100		14800	270	81	5	130	0.069		Float: Quartzite c galena in veins
101		18	20	22	<1	40	0.039		20m chip. Silicified ghite + unaltered a.v.
102		13	65	18	<1	280	0.028		20m chip. Unaltered pyroclastics
103		51	112	29	[redacted]	540	0.018		20m chip Chloritic dacitic pyroclastic
104	*	37 (33)	68 (65)	54 (46)	<1 (<1)	500 (500)	0.025		20m chip " " "
603105		17	29	33	<1	140	0.051		20m chip {10m brecciated chloritic volcanic {10m Black bedded tuff-shales c pyrite

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GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 4

TENEMENT EL's 10/76 + 7/73 D.P.O. No.

AREA/PROSPECT CETHANA - SAMPLE No's. GEOLOGIST G.P. DATE 10/76

PLAN REFERENCE WEST ANALYSED BY ZC

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn	Na_2O %		Geological observations
603106		17	22	19	<1	60	0·072		20m chip: Black siliceous tuff/shale. some py
107		38	19	23	<1	40	0·066		20m chip: Siliceous v.fine. tuff 1-2% py.
108		9	20	23	<1	20	0·078		20m chip: V siliceous tuff (silter?)
603109		63	29	34	<1	810	0·061		20 chip: 14m as above 6m chloritic pyritic
603110		59	57	41	<1	2200	0·045		20m chip: Unaltered av. lava(?) ± minor
111		120	75	50	<1	1630	0·144		20m chip: " " " "
112		31	42	21	<1	490	0·045		20m chip: " " " "
113		51	89	27	<1	120	0·043		20m chip: Weakly altered av. (ignimbrite?)
114	*	82 (85)	116 (145)	58 (57)	<1 (4)	190 (170)	0·073		20m chip: Weakly altered pyroclastic?
115		50	220	29	1	340	0·0[redacted] (0·063)		20m chip: " " " "
116		25	135	33	<1	290	0·25		20m chip: Weakly altered pyroclastic
117		170	98	120	<1	60			20m chip: Highly siliceous av. tuff
118		180	131	33	<1	1070			20m chip: Silicified av. lava(?) ± py qtz vn
119		31	86	7	<1	730			20m chip: Unaltered porphyritic a.v. lava
603120		29	230	19	<1	1340			20m chip: " " " "
121	*	1340 (1310)	3700 (4600)	160 (140)	1	1940 (1850)			Scree: V. gossanous qtz-ser schist.
122		150	136	17	<1	1680			Scree: Grey vitric tuff ± limonite.
123		15	77	12	<1	640			Float: Heavy dark tuffaceous shale
124		13	92	12	<1	480			o/c: Weakly altered tuffaceous grit.
125		130	300	18	<1	1220			Scree: A.V. ± chlorite, epidote + minor sulph
126		470	1600	42	4	+34%			Scree: Black + yellow massive Mn oxide
127		73	500	24	2	+40%			Scree: Black, heavy massive Mn oxide
128		150	620	29	2	+32%			Scree: " " " " "
129		340	1160	65	2	9300			Scree: highly gossanous schist.
603130		140	780	28	2	6500			Scree: Light brown gossanous iron.
131		520	39	42	1	60			o/c: Qtz-ser schist ± limonite after py
132		[redacted]							o/c. 10cm wide sulphide band in qtz-ser
133		1030	6600	120	3				Scree: gossanous qtz-ser schist.
134		660	4900	62	2				Scree: " " " "
135		5600	38000	220	56				Scree: gossan ± sulphides.
136		19	70	14	<1				o/c: Silicified qtz-ser schist.
137		50	80	19	<1	40			Sub o/c: qtz-ser schist ± limonite (py)
138		120	280	21	<1	2700			20m chip: Weakly alt. porphyritic a.v.
139		250	340	21	<1	700			20m chip: " " " "
603140		130	43	9	<1	40			Scree: qtz-ser schist ± limonite (py)

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GEOCHEMICAL ROCK SAMPLING LEDGER

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TENEMENT EL's 10/76 + 7/73 D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE No's. GEOLOGIST GP DATE 10/76

PLAN REFERENCE ANALYSED BY ZC

Sample No.		Pb	Zn	Cu	Ag	Mn	Na_2O %		Geological observations
		Metal Content in ppm.							
603141		470	34	18	1	40			scree: qtz-ser schist c̄ limonite after py.
142		35	16	14	<1	80			sub o/c " " " " " "
143		150	44	19	3	90			Float: Quartzite c̄ 10-20% sulphides.
144		220	25	29	1	20			o/c. Sm chip. Graphitic schist
145		1200	2300	47	2	2500			o/c. Graphitic schist c̄ minor py.
146		1700	1140	97	2	160			o/c. Sulphide band in qtz-ser schist
147		58	27	5	<1	30			sub o/c. Qtz-ser schist c̄ limonite after py
148		100	1000	13	<1	13200			o/c Qtz-ser schist c̄ limonite
149		570	1690	28	1	380			Scree: V. limonitic schist.
603150	↑	170	5	15	1	30			scree: Siliceous qtz-ser schist c̄ sulphides.
151		90	20	28	<1	18			scree: black graphitic schist
152	Eastern	290	28	20	3	20			scree: " " " c̄ limonite
153	Cethana	15	360	15	<1	320			scree: Vitric qtz-ser schist c̄ sulphides.
154		45	15	20	<1	15			Scree: Siliceous black schist after tuff.
155		10	60	35	<1	200			o/c. Very siliceous qtz-ser schist.
156		790	900	48	<1	4820			scree: Heavy ferruginous altered av
157		1940	3000	110	<1	12600			scree " " " "
158		930	1240	22	<1	26000			scree: Gossanous rock.
159		580	460	60	<1	1430			scree: qtz-ser schist c̄ limonite.
603160	↓	720	28	55	<1	65			scree: qtz-ser schist c̄ limonite after py.
161		240	450	20	<1	3980		10m chip	[illegible] Fe-Mn.
162		120	1570	22	<1	6800		"	Pale Gy. [illegible] - vert joints of Fe-Mn
163		2370	9500	55	4	11800		"	Very Sil. qtz-ser schist/[illegible]
164		690	1740	440	2	1200		"	Highly Sil. qtz-ser schist/brecciated qtz + limonite
165		370	1200	180	1	450		"	" " " " " c̄ limonite.
166		270	200	55	1	160		30m chip	alt. Sil. qtz ser schist c̄ limonite
167		530	420	110	<1	4500		10m chip	Sil pale green massive qtz-ser sch. c̄ lim
168		330	85	45	<1	48		"	qtz-ser schist - pale white-green/Sil
169		180	330	110	<1	220		"	Ditto c̄ minor limonite.
603170		150	310	120	<1	45		4m chip	Sil qtz-ser schist/pale green c̄ limonite.
171		230	90	130	<1	65		10m chip	Highly alt. qtz-ser schist c̄ limonite
172		80	40	32	<1	50		"	Ditto. highly siliceous.
173		140	70	55	<1	260		"	Ditto.
174		170	28	40	<1	25		"	White sil qtz-ser schist.
603175		180	35	28	<1	25		30m chip	White sil qtz ser schist.

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GEOCHEMICAL ROCK SAMPLING LEDGER

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TENEMENT EL5 10/76 & 7/73 D.P.O. No.

AREA/PROSPECT CETHANA-WEST SAMPLE No's. GEOLOGIST GP DATE 10/76

PLAN REFERENCE ANALYSED BY ZC

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn			Geological observations
603176		140	25	42	<1	15			20m chip. Silic qtz-ser schist after xtl tf
177		130	28	110	<1	25			20m chip: Qtz-ser schist after pyroclast
178		180	18	48	<1	38			20m chip: " " " "
179		200	28	50	<1	22			30m chip. Silic qtz-ser schist-rather m
603180		270	40	42	<1	220			20m chip. Qtz-ser schist after pyroclastic
181		110	42	65	<1	50			20m chip: " " " " "
182		170	48	22	<1	65			10m chip: Qtz-ser schist after vitric tff
183		140	48	48	<1	90			10m chip: Silic qtz-ser schist after pyrocl
184		570	270	32	1	1600			10m chip: " " " " "
185		10	28	5	<1	42			10m chip. Contorted siliceous qtz-ser schist
186		8	45	2	<1	65			10m chip: Siliceous qtz-ser schist.
187		10	100	5	<1	270			10m chip: " " " "
188		5	170	25	<1	1090			10m chip: " " " "
189		8	85	10	<1	110			10m chip: " " " "
603190		10	95	8	<1	130			10m chip: Siliceous qtz-ser schist ± limonit
191		12	160	65	<1	300			10m chip: Siliceous qtz-ser schist
192		15	100	28	<1	300			10m chip. Qtz-ser schist after vitric ash.
193		8	110	10	<1	350			10m chip. Qtz-ser schist ± limoniti
194		12	150	10	<1	2000			10m chip. " " " " "
195		8	95	8	<1	1980			20m chip: Qtz-ser schist ± limonite after tff
196		12	110	2	<1	3540			c-3m - massive specular hae 10m chip: 3-10m - Qtz-ser schist after tff
197		15	100	5	<1	400			10m chip: Qtz-ser schist ± limoniti
198		15	35	5	<1	70			10m chip: Qtz-ser schist in vitric tff.
199		45	150	18	<1	300			10m chip: Qtz-ser schist after vitric tf
603200		70	240	28	<1	620			10m chip. Moderately all a.v. ± pyrite
201	↑	28	10	22	<1	10			Scree: Felsic altered acid v/c ± limo
202	Eastern	22	12	10	<1	15			o/c: " " " " "
203	Cethana	420	18	90	2	12			Scree: Siliceous qtz-ser schist ± li
204	↓ See	see ledger							
205		20	300	15	<1	760			Scree: Gossanous iron.
206		20	110	8	<1	430			Scree: " " "
207		210	2700	48	<1	3400			o/c: Ferruginous schist-heavy.
208		130	1120	28	<1	1240			o/c: Qtz-ser schist ± qtz-limonite ve
209	Eastern	30	20	8	4	30			Scree: Qtz-ser schist ± limonite after
603210	Cethana ↓	85	15	38	<1	18			o/c: " " " " " "

034

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GEOCHEMICAL ROCK SAMPLING LEDGER

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TENEMENT EL5 10/76 + 7/73 D.P.O. No.

AREA/PROSPECT CETHANA-WEST SAMPLE No's. GEOLOGIST G.P.TE DATE 10/16

PLAN REFERENCE ANALYSED BY ZC

Sample No.	Sn	Au	Pb	Zn	Cu	Ag	Mn		Ba	Geological observations
			Metal Content in ppm.							
603211	Eastern Cethana	↑	450	8	15	2	15			o/c: Siliceous qtz-ser schist ± limonite
212			330	38	38	1	45			Scree: Gossanous iron ± qtz fragments
213			200	130	580	<1	45			o/c lithic tuff breccia ± limonite
214			230	1450	80	<1	190			o/c. Limonitic fracture zone in schist
215			45	470	20	<1	330			o/c " " " " "
216		↑	120	12	18	<1	22			Scree: Altered a.v. ± limonite after py.
217	Cethana		770	32	140	16	18			Scree: " " " " " "
218		↓	200	1360	60	<1	19000			Scree: Red ferruginous rock-laterite?
219	50	0.35	12	230	12	<1	5100		650	o/c Massive [illegible] haematite
603220	— Used on Rocky Cape Tin Survey.									
221			8	210	10	2	7600			3m chip: Massive specular haematite
222			90	190	20	<1	280			10m chip: Moderately alt pyroclastic
223			340	310	42	<1	130			10m chip: Moderately alt a.v. 1-2% py
224			190	350	15	<1	1960			30m chip: Moderately alt tuff
225			48	180	15	<1	1400			30m chip: Moderately alt pyroclastic
226			60	140	12	<1	1180			30m chip: Weakly alt a.v. lava (?)
227			130	140	30	<1	720			30m chip: " " welded pyroclastic
228			18	60	15	<1	1360			10m chip: Moderately alt pyroclastic, sulphide in joints
229			18	100	15	<1	560			10m chip: Moderately alt pyroclastic
603230			18	100	15	<1	210			10m chip: " " "
231			40	290	22	<1	640			10m chip: " " "
232			110	40	5	<1	40			20m chip. Rhyolite, wk alt. Rare qtz veins.
233			140	55	12	<1	140			20m chip. Rhy, sw alt, v.wk schistose.
234			400	20	10	<1	20			20m chip Rhy-lim ± sericitic alteration
235			340	35	18	<1	18			20m chip: As above ± glass shards & minor lim in joints
236			230	12	5	8	15			20m chip: Rhy, wk alt, sericitic, trace schistose.
237			330	18	8	1	15			20m chip: Rhy, glassy/microcryst ± mg. qtz.
238			520	10	15	2	20			20m chip: As above, wk alt (sericitic), glass shards
239			280	8	12	1	15			20m chip: Qtz-ser schist becoming mod schistose
603240			420	55	25	3	50			20m chip: A.v. qtz-ser, wk-mod schistose
241			260	140	25	2	230			20m chip: A.v., qtz-ser, mod schistose
242			330	550	160	<1	630			20m chip: Rhy, wk alt, 1m str lim + 2m chlor blk sh.
243			550	170	55	<1	160			20m chip: sh, wk alt, + tuff elst, chlor, lim + qtz-ser schist
244			320	85	30	<1	200			20m chip: Qtz-ser, mod schistose, veinlets ± lim boxwork
603245			300	270	15	<1	2040			20m chip: A.v, wk-mod alt, + lesser elst (? tuffaceous)

035

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GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 8

TENEMENT EL5 10/76 + 7/73 D.P.O. No.

AREA/PROSPECT CEIHANA - NEST SAMPLE No's. GEOLOGIST GP + TF DATE Nov 1976

PLAN REFERENCE ANALYSED BY ZC

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn			Geological observations
603246		260	120	10	<1	500			20m chip: Qtz-ser, wk-mod schistose
247		1370	600	20	<1	13000			20m chip: Qtz-ser, mod schistose + minor wk alt a.
248		970	700	18	<1	6300			20m chip: Qtz-chlor-ser, mod schistose
249		700	660	18	<1	3360			20m chip: A.v., chlor, mod schistose, ē f.g. fol
603250		1290	380	15	<1	4900			20m chip: As above, but mainly scree, lesser %v.
603251		160	163	7	<1	610			20m chip: Weakly alt pyroclastic
52	*	510 / 580	270 / 270	12 / 12	<1 / <1	2600 / 2600			20m chip: " " " ē limonite
53		230	73	7	<1	3400			20m chip: " " "
54		180	181	13	<1	1850			20m chip: " " " ē limonite
55		210	81	13	<1	980			20m chip: Weakly alt pyroclastic
56		270	141	12	<1	1190			20m chip: Weathered chloritic a.v.
57		290	133	9	1	2200			20m chip " " " lava?
58		210	230	8	1	1190			20m chip: " " "
59		170	250	8	1	690			20m chip: Very weakly alt pyroclastic
603260	*	610 / 600	170 / 171	15 / 14	<1 / <1	2000 / 2100			20m chip: Weakly alt a.v. (lava?)
61		470	153	12	1	1230			20m chip: Weakly alt weathered pyroclastic
62		450	300	19	<1	1780			20m chip: Hard, moderately alt pyroclastic
63		540	490	19	1	2600			20m chip: Weakly alt pyroclastic
64		680	310	15	<1	2100			20m chip: Moderately alt pyroclastic
65		310	340	19	<1	1910			20m chip: Weakly alt ash flow tuff(?)
66		380	220	8	<1	1590			20m chip: Moderately alt fine pyroclastic
67		480	178	15	<1	2400			20m chip: Moderately alt pyroclastic
68		770	410	8	<1	3400			20m chip: Mod alt a.v. ē limonite in fractures
69	*	270 / 270	44 / 44	7 / 5	<1 / <1	510 / 510			20m chip: V. weak, mod alt a.v. ē limonite + Mn
603270		320	50	6	<1	590			20m chip: Qtz-ser schist ē qtz-limonite - Mn v.
71		330	102	10	<1	730			20m chip: Mod alt a.v. Minor limonite
72		160	47	13	<1	480			20m chip: Scree: qtz-ser schist ē Mn(?)
73		1270	124	24	<1	2300			20m chip: Qtz-ser schist after pyroclastic. Limo
74		630	63	28	<1	1100			20m chip: Weathered mod alt a.v. ē limonite
75	*	420 / 380	62 / 69	20 / 20	<1 / <1	850 / 1000			20m chip: Weathered mod alt a.v. ē limonite
76		220	175	27	<1	1030			30m chip: Rhy (ash?) wackes + scree, 6m of v. wk alt
77		97	108	28	<1	420			30m chip: Wackes rhy + 2m silic seds Tr f.g. py
78		68	27	22	<1	40			30m chip: Qtzite, silic clst, silic conglom, silic tuffs, tr f.g. py
79		5-6	41	8	<1	480			30m chip: Clst, wk silic, gy-grn, grading to chert
603280		37	55	27	<1	300			30m chip: 15m R.C. scree, 15m wk silic clst + clst

036

294037

Page No. 9

TENEMENT EL5 10/76 + 7/73 GEOCHEMICAL ROCK SAMPLING LEDGER D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. GEOLOGIST G.P.T. DATE Nov. 1976

PLAN REFERENCE ANALYSED BY ZC

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn			Geological observations
603281		45	17	13	<1	50			30m chip: silic clst + a.v. tuff, wk alt (sericitic).
82		26	8	3	<1	20			30m chip: clst + slst, silic, tr tuff, + 15m scree sam
83		16	15	10	<1	30			30m chip: silic slst + clst, ē lesser sst + conglom.
84		34	31	23	<1	80			30m chip: Clst, silic, gy-grn.
85		12	15	17	<1	30			30m chip: Slst + clst, silic, gy-grn + purp.
86		10	6	10	<1	10			30m chip: clst + slst, silic, + qtzite from sst.
87		19	16	27	<1	60			30m chip: Slst + clst, silic, ē lim + py in vein qtz.
88	*	16 19	21 17	17 19	<1 <1	150 190			30m chip: Slst, silic, gy, mainly massive.
89		19	26	24	<1	60			30m chip: slst, v. silic, dk gy, ē py on fracs.
603290		47	17	22	<1	50			30m chip: Slst, silic, dk gy + lesser mg. sst.
91		16	15	27	<1	30			30m chip: slst, silic, lt gy + lt brn.
92		9	10	15	<1	10			30m chip: Slst, silic - non silic + minor conglom.
93		7	7	10	<1	10			30m chip: Slst (mainly non-silic) + lesser clst.
94		26	2	2	<1	10			30m chip: Slst, effish, thick + thin bedded.
95	East Cethana	450	5500	35	<1	6.3%			Floats. Geissanerys limonite cobble.
96		32	74	25	<1	260			Scree. Limonitic vein quartz.
97		110	27	30	<1	32			Scree. Large qtz boulder
98	[redacted]								Sample number not used.
99	Used on Rocky Cape Tin Survey.								
603300									
01									
02									
03									
04									
05									
06	Used by Gavin Thomas on Tin Survey.								
07									
08									
09									
603310									
11									
12									
13									
14									
15									

051

294038

Page No. 10

TENEMENT EL5 10/76 - 7/73 GEOCHEMICAL ROCK SAMPLING LEDGER D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. GEOLOGIST G.P. + T.E. DATE Dec 1976

PLAN REFERENCE ANALYSED BY ZC - AMDEL

Sample No.		Metal Content in ppm. Pb	Zn	Cu	Ag	Mn			Geological observations
603316		[redacted]							
17		Used by Gavin Thomas on Tin Survey.							
18									
19									
603320		[redacted]							
21		28	58	8	<1	470			Scree: Pink alt a.v. ē epidote, chlorite + qtz ve
22		570	18	8	<1	45			Float: Milky qtz ē limonitic veinlets
23		1370	4040	300	<1	1·18%			Sub o/c: Limonitic gossan boulder
24		300	3840	38	<1	2960			" " " " "
25		440	3350	65	<1	2200			" " " " "
26		1310	40	12	<1	40			Scree: Vein qtz ē sulphides
27		3380	120	80	<1	60			Scree: A.v. ē limonite after sulphides
28		110	18	45	5	40			Sub o/c: siliceous qtz-ser schist ē limonite
29		85	140	28	<1	1·54%			Float: V. weathered feldspar rich tuff
603330		38	340	5	<1	130			Float: Qtz containing hematite powder
31		18	200	8	<1	9900			Float: Amorphous red-brn silic limonite
32		10	270	10	<1	2040			Float: silic qtz-ser schist ē fine botryoidal
35		380	380	140	<1	7200			Scree: A.v, wkalt, chlor, some Mn, pink felsic
37		65	240	680	<1	290			o/c: A.v, wkalt, chlor ē fine limonitic veinlets
35		110	1330	12	<1	2560			Scree: A.v, chlor schistose ē Mn staining
36		80	800	32	<1	200			o/c: Qtz-ser schist, mod silic, ē vesicular cherty py?
37		740	1400	45	<1	5280			o/c: Mst, silic, v chlor, dk gy, 1% py, tr galena
38		160	80	30	<1	100			Scree: Rhyolite, dk gy, tr chlor, 5% mg py vn, some Mn
39		500	580	200	<1	155			o/c: A.v, str lim, str weath, wk alt
603340		490	7400	170	<1	9·6%			Sub o/c: Gossanous limonite and Mn
41		75	2370	50	<1	1200			o/c: Dark chloritic schist after tuff ē specula
42	East Cethana	330	1550	75	<1	1200			Scree: Vein qtz ē chlorite and haematite
43		Sample not used.							
44	East Cethana	30	252	8	<1	6100			Scree: Boulders of lateritic (?) iron.
45		150	50	15	1	75			Scree: Mod alt a.v. ē limonitic pits (py)
46		365	180	35	1	140			Scree: Ferruginous a.v
47		600	160	35	<1	110			" " "
48									
49									
50									

APPENDIX 4

U39

294040

TENEMENT EL 10/76 & 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 1

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 603501 – 531 — D.P.O. No. 17787

PLAN REFERENCE — GEOLOGIST G.P. — DATE SEPT 1976

A 9006 — ANALYSED BY ZINC CORP.

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Na_2O %	Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con-cealed	Est. Depth to	Pb	Zn	Cu	Ag			
LINE																			
18600E																		[redacted]	
23600S	603501	20	–	10	30	40	B	40	Brown				72	54	13	1		0·056	Qtz-sericite schist in scree.
23400S	502	10	–	–	40	50	B	80	"				62	55	12	1		0·066	" " " " "
23200S	503	10	–	10	40	40	C	90	Yellow brown				35	30	8	<1		0·047	" " " " "
23000S	504	20	–	20	30	30	C	90	"				47	51	12	1		0·050	" " " " "
22800S	505	20	–	30	30	20	C	90	"				30	64	30	1		0·180	Scree: well rounded qtz pebbles.
22600S	506	20	–	40	30	10	B	100	Brown				37	76	17	1		0·150	" " " " "
22400S	Creek																		Mainly phyllites - siltstones + sandstones in all
22200S	603507	30	15	20	25	10	B	60	Brown				26	41	3	1		0·71	Unaltered rhyolite & qtz veins - scree.
22000S	603097	10	10	20	25	35	A/B	40	Dark brown				16	38	1	<1			o/c + scree unaltered acid flow.
21800S	603505	30	10	30	20	10	B	60	Brown				25	41	2	1		0·47	Sdb o/c: " " "
21600S	509	20	10	20	40	10	A/B	50	Dark brown				54	49	3	1		0·57	scree: " " "
NORTHERN LIMIT OF LINE.																			
30400S	603510	50	10	20	10	10	C	50	Yellow brown				100	41	5	1		0·062	o/c: Weathered weakly altered acid flow.
30600S	511	40	–	10	20	30	B	60	Red brown				76	34	5	<1		0·068	scree: slightly schistose weakly altered acid
30800S	512	30	20	30	20	–	B	40	Dark brown				44	45	5	<1		0·046	o/c: chloritic acid volc & qtz + glass shards
31000S	513	30	10	20	20	20	B	60	Brown				150 (130)	165 (175)	5 (3)	1 (1)		0·096	Scree: " " " " Weakly altered
31200S	514	20	30	20	20	10	A	60	Brown/black				92	144	13	1		0·153	Scree: " " " & qtz + glass shards.
31400S	515	20	10	20	30	20	B	70	Brown				76	111	12	1		0·150	Scree: Chloritic schistose a.v & glass + qtz.
31600S	516	20	5	15	40	20	B	40	"				56	61	8	1		0·098	Scree: Variable - schist, grose tuff, a.v as above
31800S	517	20	–	10	30	40	C	100	Yellow				39	44	12	<1		0·055	Scree: Hard v. weakly altered rhyolite
32000S	518	30	–	10	30	30	C	70	Yellow brown				67	67	21	<1		0·058	Scree: " " " " "
32200S	519	20	10	10	30	30	B	40	Brown				40	24	5	1		0·077	Scree: " " " " "
32400S	603520	20	–	10	40	30	C	50	Yellow brown				600	174	19	<1		0·028	Scree: Hard quartzose tuff - sinter?
32600S	521	20	–	10	40	30	C	70	"				150	23	5	1		0·034	Scree: Weathered av & glass + qtz.
32800S	522	10	5	20	30	35	C	80	"				75	43	5	<1		0·029	Scree: Unaltered rhyolite.
33000S	523	60	10	–	10	20	B	40	Brown				200	45	9	<1		0·048	Scree: Schistose altered (qtz-ser) volc [redacted]
33200S	524	70	–	20	–	10	C	50	Yellow brown				56	24	13	<1		0·052	Scree: Weakly schistose altered volc pyroclastic
33400S	525	80	10	–	10	–	B	30	Black/brown				39	52	3	<1		0·182	Scree: Moderately " " "
33600S	526	60	10	10	10	10	B	20	Brown				49	35	4	1		0·23	[redacted] o/c: Weakly altered schistose "
33800S	527	50	–	10	20	20	B	60	Brown				140	41	15	<1		0·060	Scree: Moderately " " "
34000S	528	40	–	20	20	20	B	90	Brown				170	52	25	1		0·052	Scree: " " " "
34200S	529	50	10	10	10	20	B	60	Brown				200	43	23	1		0·048	Scree: Weakly " " "
34400S	603530	30	5	10	30	25	B	90	Brown				190	43	24	1		0·049	Scree: " " " " "
34600S	531	30	–	20	20	30	C	80	Brown			*	420 (400)	73 (71)	88 (80)	1 (<1)		0·034	Scree: " " " " "

* Check assay value.

040

TENEMENT EL 10/76 + 7/73 **GEOCHEMICAL SOIL SAMPLING LEDGER** Page No. 2

D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 603532 - 571 GEOLOGIST G.P. DATE 24.9.76

PLAN REFERENCE ANALYSED BY ZINC CORPORATION

A 9006

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Con-cealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag		% Na_2O	Geological observations
LINE 18600E																			
3480S	603532	40	10	10	20	20	B	90	Brown				200	46	38	1		0.048	Scree: Moderately schistose altered acid vitric pyroclastic
3500S	533	40	5	–	25	30	B	40	Brown				170	30	40	1		0.046	Scree: Weakly " " " "
3520S	534	30	10	–	20	30	C	60	Brown				160	28	25	<1		0.044	O/c: " " " "
[illegible]0S	535	40	5	–	20	35	C	60	Brown				160	33	16	<1		0.041	Scree: " " " "
3560S	536	30	15	–	25	30	B	30	Brown				120	55	24	<1		0.041	Sub O/c: " " " "
3580S	537	60	[illegible]	10	10	20	C	30	Grey				65	41	9	<1		0.041	O/c: Moderately " " "
3600S	538	30	–	20	20	30	C	100	Yellow				46	11	19	<1		0.072	Hole fragments: schist as above. Scree: Roland Cong.
3620S	539	60	–	30	10	–	C	20	Grey				1	3	1	<1		0.023	O/c Roland Conglomerate.
3640S	603540	50	15	20	15	–	A	30	Dark Grey				1	4	1	<1		0.034	O/c Roland Conglomerate. Sample contaminated by road fill (schist)
LINE 18200E																			
3200S	603621	20	5	10	50	15	B	2.5m	Brown				250 (*260)	85 (82)	94 (94)	2 (1)		0.062	scree bank: Moderately altered a.v. c̄ qtz phenocrysts.
3180S	603551	70	–	–	10	20	B	300	Brown			*	97 (91)	127 (119)	27 (24)	1 (1)		0.197	[illegible] of 3m scree bank. Weakly altered a.v.
3160S	603552	Rock chips of scree - sub o/c											13	78	8	<1		2.55	Scree - unaltered rhyo-dacite.
3140S	603553	20	–	10	50	20	B	40	Brown				150	97	7	1		0.166	O/c - as above - chloritic acid volcanic
3120S	554	20	–	–	50	30	B	80	"				180	131	5	2		0.148	O/c - chloritic acid volcanic c̄ qtz porphyroblasts
3100S	555	30	–	–	30	40	B	50	"				330	340	12	2		0.093	Scree - weakly altered a.v. as above.
3080S	556	30	10	–	40	20	B	40	"				330 (*350)	730 (590)	23 (20)	3 (2)		0.24	Scree " " av as above - a pyroclastic.
[illegible]60S	557	30	10	–	40	20	B	40	"				180	260	23	1		0.172	Scree: weakly altered tuffaceous av. Minor qtz
[illegible]0S	558	20	5	10	35	30	B	60	"				220	178	7	1		0.175	Scree: chloritic av - pyroclastic? Fragments of feldspar
3020S	559	20	–	10	40	30	C	60	Light brown				100	77	7	1		0.22	Scree: chloritic av - qtz ser schist.
3000S	603560	50	–	10	20	20	C	90	Yellow brown				200	62	15	<1		0.034	Sub O/c. Weathered a.v. c̄ small qtz phenocrysts
2980S	561	30	–	–	30	40	B	120	Red brown				89	340	12	1		0.048	Soil. No o/c or scree.
2960S	562	20	–	20	30	30	C	80	"				92	55	7	<1		0.051	Soil. Scree of qtz-ser-schist - a pyroclastic.
2940S	563	20	10	10	30	30	B	80	"				130	62	9	1		0.054	Soil. O/c at 2930 - Moderately altered qtz-ser-chlorite schist
2920S	564	40	–	20	10	30	C	70	Brown				130	125	9	1		0.046	Scree: Weathered qtz-ser schist.
2900S	565	30	10	10	30	20	B	50	"				170	64	4	1		0.052	Scree: Moderately altered qtz-ser schist
2880S	566	40	–	10	20	30	C	60	Light brown				320	210	23	1		0.048	Sub O/c: Qtz-ser-chlorite schist
2860S	567	30	–	20	30	20	B	60	Brown				200	64	8	1		0.054	O/c. Qtz-ser schist c̄ large qtz phenos + glass
2840S	568	10	–	10	40	40	B	80	"				310	189	9	1		0.050	Scree. Moderately altered qtz-ser schist.
2820S	569	30	–	20	20	30	C	80	Yellow brown				250	83	8	1		0.048	Scree: " " " "
2800S	603570	30	–	20	20	30	C	100	"				150	81	1	1		0.043	Scree: Qtz-ser-schist - a vitric tuff
2780S	571	20	20	10	20	30	B	90	Brown				54 (*53)	16 (18)	6 (1)	1 (<1)		0.035	O/c: Schistose vitric tuff - moderately altered

* Check assay value.

294042

041

TENEMENT E.L 10/76 + 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 3

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 603572 - 603607 — D.P.O. No.

PLAN REFERENCE — GEOLOGIST G.P. — DATE 24·9·76

A 9006 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm					Geological observations
LINE 18200E		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag	% Mn	
27605	603572	20	5	15	30	30	B	50	Brown				87	55	4	1	0·058	Scree: Moderately altered qtz-ser schist - vitric tuff.
27405	573	10	-	20	20	50	B	60	"				89	47	5	1	0·057	Scree · Altered welded pyroclastic ē qtz + glass.
27205	574	30	-	20	30	20	B	50	"				52	68	3	1	0·041	o/c : Altered slightly schistose a.v.
[redacted]05	575	20	5	10	40	25	B	40	"				110	50	13	2	0·039	Scree : " " " " - a pyroclastic?
26805	576	Rock chips - o/c.											20	30	10	<1	0·138	Unaltered? Welded tuff ē qtz phenocrysts.
26605	577	Rock chips - o/c.											*470 480	1210 1220	23 24	2 2	0·062	Unaltered? Acid volcanic ē qtz + glass
26405	578	5	5	10	50	30	B	60	Brown				32	23	7	<1	0·045	o/c. as above.
26205	579	20	10	10	40	20	B	40	"				37	51	13	<1	0·064	o/c as above. Some schistose zones
26005	603580	Rock chips - o/c											55	82	33	<1	0·099	Weakly altered and schistose a.v. ē qtz phenocrysts
25805	581	25	-	15	40	20	B	20	Light brown				30	13	4	<1	0·034	o/c as before - a.v. ē qtz + glass Highly schistose.
25605	582	30	10	10	30	20	C	70	Yellow brown				10	11	4	<1	0·039	o/c Very vitric a.v. Moderately altered slightly schistose
25405	583	30	10	20	30	10	B	40	"				16	15	9	<1	0·032	Scree. Moderately altered a.v. ē glass + qtz.
25205	584	40	5	10	25	20	B	40	"				19	8	4	<1	0·037	Scree · Vitric a.v. Moderately altered.
25005	585	10	-	10	40	40	C	100	Yellow				110	47	6	<1	0·033	Scree · Qtz ser schist - a pyroclastic.
24805	586	40	-	10	20	30	C	70	Brown				150	31	24	1	0·034	Scree · Moderately altered kff clayey schist.
24605	587	15	5	10	30	40	B	80	"				71	33	10	1	0·051	Scree · Weathered schistose a.v.
24405	588	10	5	5	40	40	B	60	"				66	33	11	1	0·054	Scree · " " "
24205	589	30	5	5	30	30	B	100	Dark brown				*74 66	44 47	28 27	1 1	0·042	Soil - no scree.
24005	603590	10	-	10	50	30	B	140	"				55	58	28	1	0·039	Qtz-ser-schist fragments in auger hole.
23805	591	25	15	20	20	20	B	90	"				61	61	16	1	0·048	" " " " " " "
23605	592	30	15	10	20	25	B	60	Brown				130	50	16	<1	0·058	" " " " " " " Highly alt.
[redacted]05	593	15	-	30	30	25	B	100	"				41	41	10	<1	0·068	Scree · Highly altered qtz-ser-schist.
[redacted]05	594	10	-	30	30	30	B	100	"				27	41	7	<1	0·073	Scree " " " " "
23405	595	20	-	20	20	40	C	50	"				19	36	7	1	0·033	Scree Kff clayey schist - fragments from auger hole
22805	596	30	5	20	15	30	C	80	Red brown				23	36	6	<1	0·028	Kff clayey schist - fragments from auger hole.
22605	597	20	5	20	25	30	C	100	Yellow brown				29	99	6	<1	0·023	Scree - Kff clayey schist - a Tuff?
22405	598	20	-	10	40	30	C	80	Red brown				22	74	5	1	0·038	fragments from hole - Kff clayey Tuffaceous schist
22205	599	40	-	30	20	10	C	100	Yellow				9	39	2	<1	0·084	Scree + lith frags as above
22005	603600	40	5	15	20	20	C	60	Yellow				22	28	6	<1	0·23	Scree + lith frags : as above
21805	603601	30	5	20	20	25	C	80	Yellow brown				22	47	3	<1	0·72	" " " " Highly altered qtz-ser schist.
21605	602	20	15	10	25	30	B	70	Brown				30	97	2	1	0·36	" " " " " " "
21405	603	35	15	10	20	20	A/B	60	"				22	31	2	<1	0·38	" " " " " " "
21205	604	Rock chips - Scree																Scree - basalt fragments.
21005	605	20	15	20	15	30	B	70	Dark brown				Not					Basalt soil + scree.
20805	606	30	-	20	25	25	Not		"				assayed.					Basalt soil + fragments
20605	603607	20	5	10	30	35	examined		"									Basalt soil + fragments

* Check assay value.

294043

042

TENEMENT EL 10/76 + 7/78 (Mimeo) GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 4

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 603608 - 603703 — D.P.O. No.

PLAN REFERENCE — GEOLOGIST G.P.TE DATE 9.10.76

A 9006 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm: Pb	Zn	Cu	Ag			Geological observations
LINE 1820E																			
20405	603608	Rock chips - scree?																	Unweathered basalt - scree?
20205	609	10	10	–	40	40			Dark brown										Basalt soil + fragments
20005	603610	Rock chips - scree?																	Basalt - scree?
[illegible]80S	611	"	"	"	"	"													" "
19605	612	–	15	20	30	35			Dark brown				N#						Basalt soil.
19405	613	–	5	20	35	40			"										Basalt soil.
19205	614	10	5	15	30	40			"				Assayed.						Weathered basalt (scree?).
19005	615	Rock chips - scree?																	Basalt - scree?
18805	616	10	25	5	30	30			Black brown										Basalt
18605	617	Rock chips																	Weathered basalt ± limonite vesicles.
18405	618	Rock chips:																	Basalt.
18205	619	20	10	10	30	30			Dark brown										Weathered basalt.
18005	603620	Rock chips																	Weathered vesicular basalt
END OF LINE																			
LINE 19000E																			
27005	No sample - road fill.																		
26805	603686	10	–	10	40	40	B	80	Brown		✓	2m	#470 490	51 48	66 61	<1 1			Scree: Qtz-ser schist
26605	687	30	–	10	20	40	B	60	"		✓	2·5m	270	61	92	<1			Scree: Silic qtz-ser schist
26405	688	10	–	20	30	40	B	70	"		✓	3m	200	51	75	1			Scree: Silic schistose tuff ± limonite fractures
26205	689	10	–	20	30	40	B	70	"		✓	3m	170	51	52	1			Scree: " " " "
[illegible]005	603690	10	–	30	20	40	B	70	"		✓	3·5m	260	135	120	1			Scree: Silic sericitic tuff, Hole frags: silic qtz-ser schist
[illegible]80S	691	20	–	20	20	40	B	70	"		✓	2m	140	89	57	<1			Hole frags: Qtz-ser schist
25605	692	10	–	10	40	40	C	70	Yellow brown		✓	1m	210	133	26	1			Scree + hole frags: Qtz-ser schist ± limonite
25405	693	20	5	20	40	15	B	80	"		✓	1·5m	160	193	22	1			Scree: limonitic qtz-ser schist, ± limonitic fg ser tuff
25205	Creek																		0/c Weakly altered schistose rhyolitic tuff/breccia
25105	694	30	15	20	30	5	A/B	30	Dark brown		✓	1·5m	100	188	18	1			Sample on boundary between alluvium + scree as also 0/c.
25005	695	20	10	20	30	20	B/A	40	"		✓	2m	74	173	5	1			Scree: chlor, ser schistose breccia; sed grits; schistose tuffs
24805	696	30	5	15	20	30	B/A	40	"		✓	1·5m	120	250	4	1			Scree: mostly dk grn acid flow ± 2·3 py; epidote
24605	697	20	10	20	30	20	B/A	40	"		✓	1m	140	200	4	1			Scree: Mostly chlor acid flow, some schistose ex.
24405	698	10	5	5	40	40	B	40	Brown		v	1m	150	220	4	1			Scree: Hard acid flow
24205	699	20	10	20	30	20	B	40	"	✓		90cm	180	200	4	1			Sub 0/c: Dk chlor dacite ± amph + fel phenos.
24005	603700	5	10	15	30	40	B	20	"	✓		5cm	180	195	4	1			0/c: Dacite ± minor sulphides + chlorite
23805	701	20	5	20	25	30	B	30	"		✓	1·5m	290	220	6	1			Scree: Schistose qtz-sericite, ± qtz pebbles in tuffaceous qtz-ser
23605	702	20	–	10	30	40	B	100	"		✓	2m	73	80	4	1			Hole frags: weathered (chlor?) schist ± small qtz pebbles.
23405	603703	30	–	10	20	40	C	100	Red Yellow		✓	1·5m	120	111	5	<1			Hole frags + scree: schist-ser tuff ± V small qtz pebbles.

Not Assayed

* Check assay value.

294044

043

TENEMENT 10/76 + 7/78 (ASARCO) GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 5

AREA/PROSPECT CETHANA – WEST SAMPLE Nos. 603704 – 603674 D.P.O. No.

PLAN REFERENCE A 9006 GEOLOGIST G.P.T. DATE October 1976

ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					% Na_2O	Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
LINE 19000E																			
2320S	603704	30	–	10	20	40	B	100	Yellow brown		✓	2·5m	86	100	5	<1			Hole frags + scree: Non-schistose tuff ± qtz pebbles
NORTHERN LIMIT LINE 19000E.																			
2720S	603541	60	–	10	20	10	B	40	yellow brown		✓	1	47	8	7	<1		0·038	o/c qtz-ser schist
[redacted]S	603542	50	5	10	25	10	B	40	Yellow brown		✓	1	170	21	16	<1		0·027	o/c Silic qtz-ser, moderately schistose limonite veins
2760S	603543	40	–	10	30	20	B/A	20	Grey		✓	1	4	4	1	<1		0·030	Scree: Silic qtz-ser schist
2780S	603544	10	–	10	50	30	B	70	Brown		✓	2	140	33	22	1		0·034	Hole Frags + scree: qtz-ser schist
2800S	603545	20	5	15	40	20	B	80	Brown		✓	2·5	230	39	17	<1		0·045	Hole Frags: Qtz. ser schist ± limonite
2825S	603546	10	–	10	30	50	B	30	Brown		✓	3–5	170	300	42	1		0·070	Old road: transported debris
2840S	603547	10	–	–	30	60	C	100	yellow Brown		✓	1·5	100	104	19	<1		0·093	Hole Frags: qtz-ser schist. Scree: gossanous iron oxide.
2860S	603548	10	–	–	40	50	C	80	yellow Brown				150	158	45	1		0·087	Hole frags: weath schist + gossan.
2880S	603549	10	–	20	30	40	B	100	Red Brown			3m	150	140	44	1		0·046	Scree: Qtz-ser schist. Minor gossanous + silic
2900S	603550	60	–	10	20	10	B	40	Yellow Brown		✓	2	170	18	19	<1		0·053	Hole Frags: ltod schistose qtz-ser ± ash frags.
2920S	603651	15	5	20	20	40	B	50	light Brown		✓	2	100	20	30	<1			ltole frags + Scree: Arcose pyroclastic breccia + wk schistose tuff.
2940S	603652	20	5	15	30	30	B	50	light Brown		✓	1·5	97	30	15	<1			Hole Frags + Scree: wk - mod schistose w.r.
2960S	603653	30	–	20	20	30	B	40	light Brown		✓	2	88	14	12	<1			Hole Frags: Qtz-ser schist (tuff)
2980S	603654	20	–	10	30	40	B	20	light Brown		✓	1·5	60	16	6	1			Hole Frags + Scree: Qtz-ser schist (tuff)
3000S	603655	20	5	10	30	35	B	20	light Brown		✓	1	70	22	8	<1			Sub o/c: Greasy qtz-ser schist ± limonite
3020S	603656	20	5	10	30	35	B	40	light Brown		✓	1·5	37	29	19	<1			Hole Frags + Scree: Greasy qtz-ser schist
3040S	603657	30	–	10	20	40	B	40	light Brown		✓	1	26	23	35	<1			o/c: wk schistose qtz-ser schist ± plentiful qtz phenos.
3060S	603658	40	–	10	10	40	B	50	Red Brown		✓	1·5	52	35	9	1			Hole Frags + scree: Qtz-ser schist ± qtz phenos
3080S	603659	40	–	10	10	40	B	40	Red Brown		✓	1	4250 270	46	12	1			Hole Frags + scree - Qtz-ser schist.
[redacted]S	603660	20	–	20	30	30	B	30	light Brown		✓	1·5	63	24	10	<1			Scree: wk-mod schistose pyroclastic qtz-ser.
3120S	603661	30	10	10	30	20	B	40	Grey		✓	·7	26	23	4	<1			o/c: Iron stained qtz-ser schist.
3140S	603662	30	–	20	30	20	C	20	Grey Brown		✓	·1	19	23	7	<1			o/c & Scree: Qtz-ser schist ± limonite
3160S	603663	100	–	–	–	–			Grey Brown	✓			160	45	35	<1			o/c: Chlor - qtz-ser schist Some lim after py
3180S	603664	40	5	20	20	15	C	10	Grey	✓			9	6	2	<1			o/c: Qtz. ser - chlor schistose tuff.
3200S	603665	30	–	10	40	20	C	40	Yellow Brown		✓	·7	88	25	4	1			o/c: Chlor-qtz-ser qtzose tuff, wk alt, mod schistose.
3220S	603666	20	–	20	40	20	C	50	light Brown		✓	·7	94	33	3	<1			o/c: As above. Some zones ± limonite after py
3240S	603667	20	–	20	40	20	C	20	light Brown				68	23	3	<1			o/c: As above. Some qtz veins.
3260S	603668	100	–	–	–	–			Yellow Brown	✓			130	135	14	<1			o/c: Schistose chlor-qtz-ser, wk alt
3280S	603669	20	–	20	30	30	B	60	Red Brown		✓	1·2	290	158	36	2			Scree: Schistose chlor-qtz-ser. Some vein qtz.
3300S	603670	20	–	10	40	30	B	60	light Brown		✓	1·2	170	130	23	1			Scree: chlor schist from qtz-tuff - wk alt.
3320S	603671	20	5	15	30	30	B	30	Brown		✓	1	180	220	36	1			Scree: Arcose wk schistose tuff - wk alt. Some ser schist + sst.
3340S	603672	20	5	15	30	30	B	50	Brown		✓	2	140	158	49	1			Scree: Slightly schistose tuffaceous schist (phyllite)
3360S	603673	40	–	10	20	30	B	50	Brown		✓	1	120	123	67	1			Scree: Qtz-ser, wk alt tuff (phyllite)
3380S	603674	30	–	20	40	10	B	40	Brown			·8	55	54	30	<1			Scree: Blk tuffaceous shales + sheets + wk alt qtz-ser tuffs.

* Check assay value.

J44

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 6

TENEMENT 10/76 + 7/73 (ASARCO)

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 603675 - 603640

PLAN REFERENCE

D.P.O. No.

GEOLOGIST [redacted] TR GP. DATE October 1976

ANALYSED BY ZC

A 9005

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to (M)	Metal Content in ppm.: Pb	Zn	Cu	Ag			Geological observations
LINE 19000E																			
3400 S	603675	40	-	20	40	-	B	50	Brown		✓	1	82	54	40	1			Scree: wk alt tuffaceous sst.
3420 S	603676	40	10	20	30	-	B	50	Grey		✓	·8	83	38	56	1			o/c: Finely bedded sh + slst.
3440 S	603677	20	10	10	40	20	B/A	50	Light Brown		✓	2	50	18	26	<1			Hole Frags + Scree: Sh + slst.
[illegible]S	603678	100	-	-	-	-	A	10	Grey	✓		0	17	20	19	<1			o/c: Finely laminated shales.
3480 S	603679	20	5	20	30	35	B/A	15	Brown	✓		0	64	20	36	1			o/c: Dark shales.
3500 S	603680	20	5	10	30	35	B	40	Brown		✓	2	52	23	27	1			Scree + Hole Frags: dark shales.
3520 S	River - no sample																		
3540 S	603681	30	10	10	30	20	B/A	50	Dark Brown		✓	2·5	45	24	30	1			Scree + Hole Frags: Finely laminated sh + slst.
3560 S	603682	25	5	10	30	20	B/A	40	Dark Brown		✓	2	32	73	18	1			Scree: mostly sh, some vitric tuffs + f.g. basic grits.
3580 S	603683	20	5	20	30	25	B	40	Dark Brown		✓	2·5	*61 [24]	59 [46]	45 [31]	2 [<1]	NB. This sample checked by ZC		Scree: Basic grits, pcp chy, vitric tuff, wk ser.
3600 S	603684	20	10	10	40	20	B/A	20	Dark Brown		✓	2·5	24	35	7	1			Scree: Mostly basic, mg., chlor rock, some v.f.g. vitric tuff.
3620 S	603685	30	5	20	20	25	B	60	Light Brown		✓	2.	21	32	6	<1			Scree: Basics as above, + some Roland conglom.
END OF LINE																			
LINE 19400E																			
2800 S	603622	70	-	-	10	20	C	60	Yellow	✓		0	260	1420	69	1			o/c silic qtz-ser schist, str alt. Scree: gossanous iron.
2780 S	603623	10	5	10	40	35	B	20	Brown		✓	1·5	77	38	5	<1			Scree: Only one piece gossan.
2760 S	603624	40	-	10	20	30	B	20	Dark Brown		✓	2	71	71	61	1			Hole Frags + Scree: Basalt.
2740 S	603625	40	-	10	20	30	B	90	Dark Brown		✓	3	32	55	69	2			Hole Frags + Scree: Basalt.
2720 S	603626	20	-	10	40	30	B	100	Dark Brown		✓	4	35	61	61	1			A basalt soil.
2700 S	603627	30	-	10	30	30	B	100	Brown		✓	4	19	54	74	2			Hole Frags: Basalt.
[illegible]80 S	603628	30	-	20	25	25	C	50	Brown		✓	·5	17	55	86	2			Hole Frags: Basalt
[illegible]0 S	603629	20	-	20	30	30	C	80	Yellow Brown		✓	·3	77	36	36	1			Hole Frags: Highly alt ax. Scree: some silic qtz-ser schist.
2640 S	603630	20	-	10	40	30	B	140	Red Brown		✓	3	30	47	48	1			Basalt soil
2620 S	603631	20	-	20	40	20	B	170	Brown		✓	3	35	52	50	1			Scree: Basalt + some v. silic qtz-ser schist (introduced)
2600 S	603632	10	-	30	30	30	B	150	Brown		✓	3	32	44	32	1			Basalt soil. Scree: qtz-ser schist.
2580 S	603633	20	-	20	30	30	B	200	Brown		✓	4	30	88	54	<1			Hole Frags: Basalt + two alluvial qtz pebbles.
2560 S	603634	20	-	30	30	20		100	Yellow				22	31	17	<1			Hole Frags: qtz gravel (old stream channel under basalt?)
2540 S	603635	40	-	20	20	20	B	60	Brown		✓	2	41	38	16	<1			Hole Frags + scree: f.g. vitric tuff, wk ser, non-schistose.
2520 S	603636	20	-	20	30	30	C	200	Red Yellow		✓	2·5	50	44	36	<1			Hole Frags: wk schistose, ser, a.v. vitric tuff.
2500 S	603637	30	-	10	40	20	B	50	Brown		✓	2	43	85	10	1			Hole Frags + scree: Str schistose qtz-ser, med alt.
2480 S	603638	40	10	10	30	10	B/A	40	Dark Brown		✓	1	25	104	5	1			No rocks.
END OF LINE TO NORTH																			
2820 S	603639	30	-	10	20	40	C	75	Yellow	✓		0	250	690	130	3			o/c: Qtz-ser schist, Minor ferrug material
2840 S	603640	20	-	20	20	40	C	30	Creamy Yellow	✓		0	210	103	89	<1			o/c: Str weath qtz-ser schist.
2860 S	No sample - road																		

* Check assay value.

294046

045

TENEMENT 10/76 & 7/73 (ASARCO) GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 7

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 603641 - 603769 D.P.O. No.

PLAN REFERENCE A 9006 GEOLOGIST G.P.+T.E DATE November 1976

ANALYSED BY ZC

Grid Co-ordinate LINE 19400E	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm: Pb	Zn	Cu	Ag			Geological observations
2880 S	603641	30	-	20	30	20	C	60	Brown		✓	1·5	* 470 490	31	24	3			Hole frags: V silic qtz-ser schist (introduced?)
2900 S	603642	30	5	10	35	20	B	40	Brown		✓	2	* 610	61	17	1			Scree: Mod alt. chlor-qtz-ser schist ± limonite
2920 S	603643	40	5	5	30	20	B	30	Brown		✓	2	* 480	61	10	1			Hole frags + scree: Qtz-ser schist ± limonitic stains.
2940 S	603644	50	5	20	15	10	C	50	Brown			·2	* 710	290	16	2			o/c: Chloritic schist ± some qtz-ser. " "
2960 S	603645	60	-	10	10	20	C	30	Brown			·5	220	134	37	1			Hole frags + scree: Strong alt. qtz-ser schist ± limonitic boxworks
2980 S	603646	30	-	10	30	30	B	40	Brown		✓	1·5	190	59	36	1			Hole frags + Scree: Chlor-qtz-ser schist.
3000 S	603647	40	-	10	30	20	B	30	Brown		✓	1	190	98	34	2			Hole frags + Scree: Strong alt qtz-ser schist ± limonitic boxworks
3020 S	603648	30	5	10	30	25	C	30	Brown	✓			* 360	79	13	2			o/c: Qtz-ser schist, wk silic, minor limonitic stains.
3040 S	603649	100	-	-	-	-	C	20	-	✓		0	* 780	171	22	<1			o/c: Silic chlor-qtz-ser vitric tuff, limonitic fractures.
3060 S	603650	100	-	-	-	-			-	✓			120	69	17	<1			o/c: Mod schistose, silic vitric tuff ± limonitic fractures.
3080 S	603750	30	5	20	40	5	B	40	Brown		✓	·7	* 380 410	96	21	1			o/c: Silic, chlor-qtz-ser vitric tuff.
3100 S	603751	100	-	-	-	-	C	20	Light Brown		✓	·5	63	82	16	<1			Scree: V.wk alt cherty tuff + lesser wk qtz q.v.
3120 S	603752	100	-	-	-	-	B	40	Light Brown		✓	1	71	56	14	1			Scree: Wk schistose, sericitised, vitric tuff.
3140 S	603753	100	-	-	-	-	B	50	Light Brown		✓	1·5	75	38	8	<1			Scree: wk schistose tuffaceous shist (phyllitic)
3160 S	603754	30	-	10	20	40	B	40	Light Brown		✓	2	180	126	34	<1			Hole frags + scree: Vitric tuffaceous shist, WK ser.
3180 S	603755	20	5	20	30	25	B	40	Light Brown		✓	2	180	123	31	1			Hole frags + scree: Slist, unaltered.
3200 S	603756	10	-	40	20	30	B	50	Light Brown		✓	1·5	200	220	49	1			Sub o/c: Vole grit, v wk sericitised.
3220 S	603757	20	-	20	30	30	B	50	Light Brown		✓	2·5	180	115	46	1			Hole frags + scree: Silic vitric tuff, minor ser grit + see q.v.
3240 S	603758	30	5	15	40	10	B	50	Brown		✓	2	120	77	35	1			Hole frags + scree: tuffaceous, shist, silic tuff; wk alt as.
3260 S	603759	40	-	20	40	-	B	30	Brown		✓	1·5	140	104	37	1			Hole frags + scree: Silic tuffaceous shale.
3280 S	603760	100	-	-	-	-			Dark Grey	✓			44	73	21	<1			o/c: V.f.g. tuffaceous sh, schistose (a phyllite)
3300 S	603761	100	-	-	-	-			Dark Grey	✓			68	35	20	<1			o/c: Dk gy sh ± qtz veins
3320 S	603762	20	-	20	30	30	B	30	Brown		✓	1·5	150	59	28	1			Hole frags + scree: Slist + dk sh
3340 S	603763	30	10	20	30	10	B	30	Dark Brown		✓	·7	81	77	21	1			Hole frags + scree: Blk tuffaceous sh
3360 S	603764	100	-	-	-	-	B	30	-		✓	2	290	185	12	<1			Hole frags + scree: Silic ser vitric tuff + qtz blk tuffaceous
3380 S	No sample - river alluvium																		
3400 S	No sample - river alluvium																		
3420 S	603765	20	-	10	30	40	B	40	Light Brown		✓	4	7	7	3	<1			Hole frags + scree: Shale
3440 S	603766	40	5	5	20	30	B	50	Light Brown		✓	4	15	18	2	<1			Hole frags + scree: Finely bedded pale + dk sh
3460 S	603767	30	10	20	30	10	B/A	30	Dark Brown		✓	5+	Not assayed.						Hole frags: Roland conglom. Scree: shale
3480 S	603768	100	-	-	-	-	B/A	30	-										Hole frags + scree: Roland conglom
3500 S	603769	100	-	-	-	-	A	20	-	✓									o/c: Roland conglomerate.
END OF LINE																			

* Check assay value.

294047

046

TENEMENT 10/76 + 7/73 (ASARCO) — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 8

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 603801 - 603833 — D.P.O. No. — GEOLOGIST G.P.+TE DATE November 1976

PLAN REFERENCE A 9006 — ANALYSED BY ZC

Grid Co-ordinate LINE 19800E	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag			Geological observations
2800S	603801	30	-	20	20	30	C	100	Yellow Brown	✓			75	139	6	<1			o/c: qtz-ser schist ± qtz phenos + pumice frags
2780S	603802	20	-	20	20	40	B	50	Brown		✓	1·5	14	15	2	<1			Hole frags + Scree: Wk alt + mod schistose qtz-ser a.v
2760S	603803	30	-	30	30	10	C	40	Grey Brown	✓			2	6	2	<1			o/c: wk-mod ser a.v, wk-mod schistose
2740S	603804	20	5	30	40	5	B/A	30	Grey Brown		✓	1	4	9	1	<1			Hole frags + scree: wk-mod alt + schistose a.v
2720S	603805	30	-	10	20	30	C	40	Yellow		✓	·8	14	20	2	<1			Hole frags + scree: Str alt qtz-ser schist
2700S	603806	20	10	20	30	20	C	40	Yellow		✓	·8	4	5	1	<1			Hole frags: str alt qtz-ser schist.
2680S	603807	20	-	20	30	30	C	60	Yellow		✓	·8	3	5	1	<1			Hole frags + Scree: Qtz-ser schist, mod alt.
2660S	603808	20	-	20	30	30	C	30	Yellow		✓	·6	6	10	2	<1			Hole frags: Qtz-ser schist, mod-str alt
2640S	603809	10	-	20	35	35	C	80	Yellow		✓	1·2	3	6	1	<1			Hole frags + scree: Qtz-ser schist, mod alt
2620S	603810	10	-	20	45	25	B	30	Brown		✓	1·5	*42 40	50 48	4 4	<1 <1			Hole frags + scree: chloritic pyroclastic, abund qtz
2600S	603811	10	5	20	35	30	B	50	Brown		✓	2·5	33	41	5	<1			Hole frags + scree: As above. wk schistose.
2580S	603812	20	-	20	40	20	B	60	Brown Red.		✓	2·5	17	45	6	<1			Hole frags + scree: Str weath, pyroclastic, v alt
2560S	603813	20	10	10	30	30	B	50	Brown		✓	2·5	17	30	4	<1			Hole frags + scree: Str weath a.v
2540S	603814	30	-	10	30	30	B	70	Light Brown		✓	2	15	30	8	<1			Hole frags: Chloritic a.v, wk alt, wk. schistose
2520S	603815	10	-	10	40	40	B	50	Light Brown		✓	2·5	10	23	5	<1			Hole frags: A.V., v wk alt - v alt.
2500S	603816	30	5	20	25	20	B	70	Light Brown		✓	1·5	7	11	4	<1			Hole frags + Scree: Fg. vitric tuff, wk ser.
END OF LINE TO NORTH																			
2820S	No sample - road																		
2840S	No sample - road fill																		
2860S	603817	20	5	20	35	30	B	40	Dark Brown	✓	-	·7	240	56	9	<1			o/c: Qtz-ser a.v, mod alt, flow rock, wk schistose.
2880S	603818	50	10	10	20	10	B	40	Brown Brown		✓	1·5	*330 430	350 350	25 22	<1 <1			Hole frags + scree: As above Silic ? Mod schistose.
2900S	603819	10	15	20	30	25	B	40	Brown		✓	2	220	151	15	1			Hole frags: Qtz-ser a.v, wk alt.
2920S	603820	30	5	20	45	-	B	60	Grey		✓	1·5	9	9	3	<1			Hole frags + scree: Mod alt + schistose Qtz-ser a.v.
2940S	603821	20	5	30	45	-	B	70	Grey		✓	1·5	17	4	1	<1			Hole frags + Scree: A.V as above, silic ?
2960S	603822	100	-	-	-	-			Grey	✓			*360 370	18 19	6 6	<1 <1			o/c: A.V., highly alt + schistose, qtz phenos
2980S	603823	30	10	30	10	20	C	30	Dark Grey.	✓			13	6	2	<1			o/c: A.V. as before, ± limonitic boxworks.
3000S	603824	10	5	25	20	40	B	90	Grey		✓	2	19	3	<1	<1			Hole frags + scree: Mod alt qtz-ser a.v. Occasion
3020S	603825	20	10	20	20	30	B	30	Light Grey.		✓	2	17	4	1	<1			Hole frags + scree: A.V. wk ser + schistose, qtz phenos plent
3040S	603826	30	10	30	20	10	B	30	Light Grey		✓	1·5	250	4	2	<1			Hole frags: As above.
3060S	603827	30	15	40	15	-	B	40	Light Grey.		✓	1·2	17	6	1	<1			Hole frags + scree: Mod alt qtz-ser schist, a.v
3080S	603828	20	10	20	30	20	B	70	Light Grey		✓	1·5	85	6	5	<1			Hole frags: As above
3100S	603829	20	-	20	30	30	B	100	Light Grey.		✓	2·5	76	3	1	<1			Hole frags + scree: Qtz-ser schist + qtz vein frags
3120S	603830	10	5	20	30	35		20	Light Grey		✓	1·2	21	7	1	<1			Hole frags: Qtz-ser schist ± qtz - mod alt.
3140S	603831	10	-	20	30	40	C	90	Yellow Brown		✓	1·5	150	22	23	2			Hole frags: Mildly ferrug qtz-ser schist, tr py
3160S	603832	20	-	10	30	40	C	70	Light Brown		✓	1	82	25	3	<1			o/c: Str alt qtz-ser schist ± lim + Mn stains
3180S	603833	10	-	25	30	35	B	60	Yellow Brown		✓	1·5	*230 260	155 183	12 14	<1 1			Hole frags: Qtz-ser-chlor ± lim + Mn stains

* Check assay value.

294048

047

TENEMENT EL 10/76 + 7/73 (ASARCO) GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 9

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 603834 - 603852 D.P.O. No.

PLAN REFERENCE A 9006 GEOLOGIST G.P.TE DATE November 1976

ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
LINE 19800E																			
3200S	603834	25	5	20	20	30	B	30	Light Brown		✓	1	76	25	5	<1			% : wk schistose, vitric, tuff, sericitised, limonitic fracture
3220S	603835	100	-	-	-	-			-	✓			15	13	17	<1			% : wk alt silic a.v. & minor limonite alter py.
3240S	603836	100	-	-	-	-			Grey	✓			23	18	22	<1			Scree: silic vitric tuff, mod ser, py schistose, mixed lim.
3260S	603837	20	5	20	30	25	B	60	Light Brown		✓	1·5	68	60	43	1			Hole Frags: Unalt vitric tuff (phyllite). Some Roland conglom
3280S	603838	50	-	30	20	-	B	40	Light Brown	✓			91	32	17	<1			%: mod alt & schistose qtz-ser altered a.v. tuff.
3300S	603839	10	5	20	35	30	B	40	Brown	✓		·8	42	66	10	1			%: Slightly alt. vitric tuffaceous sh, & wk ser
3320S	603840	10	-	20	40	30	B	30	Light Grey				6	5	1	<1			Roland conglom pebbles & debris
3340S	603841	15	5	20	30	30	B	70	Light Brown		✓	1·2	50 (51)	29	3	1			Hole Frags: vitric tuffaceous sh.
3360S	603842	20	-	20	30	30	B	70	Grey		✓	1·2	7	3	<1	<1			Hole Frags: Sericitised, slight. schistose vitric tuff
3380S	603843	10	-	30	30	30	B	40	Grey		✓	2	2	6	<1	<1			Hole Frags: Mod schistose, wk ser, acid vitric tuff
3400S	603844	20	-	20	30	30	B	60	Light Grey		✓	1·5	2	5	1	<1			Hole Frags & scree: Unalt but schistose vitric tuff
3420S	603845	100	-	-	-	-			Grey				9	7	4	<1			%: tuff, acid, wk ser, silic mod schistose
3440S	603846	100	-	-	-	-	B	20	Grey	✓			27	9	4	<1			%: tuffaceous sh, purp.
3460S	603847	40	-	30	30	-	B	40	Grey		✓	1·5	2	5	1	<1			Hole Frags: purp sh + Roland conglom pebbles
3480S	603848	40	5	25	30	-	B	50	Grey		✓	·8	4	3	<1	<1			%: purp sh/phyllite
3500S	603849	40	5	25	30	-	B	40	Grey		✓	1·5							Hole Frags & Scree: Roland conglom & purp sh.
3520S	603850	30	5	25	30	10	B	50	Grey		✓	1·5	Not assayed.						Hole Frags: Purp sh & minor Roland conglom.
3540S	603851	100	-	-	-	-			Grey										Roland conglom
3560S	603852	30	10	10	30	20			Grey										
END OF LINE																			
LINE 20200E																			
3000S	No Sample - road fill																		
2980S	603706	100	-	-	-	-			Yellow Brown				23	74	30	<1			%: wk schistose & sericitised a.v., greasy.
2960S	603707	20	-	30	10	40	B	60	Yellow Brown		✓	1·5	17	22	2	<1			Hole Frags: as above, v wk alt.
2940S	603708	20	-	30	10	40	C	60	Yellow Brown		✓	·8	19	19	3	<1			Scree: wk alt a.v. as above, & mod ser a.v.
2920S	603709	20	-	30	20	30	C	70	Light Yellow		✓	·8	2	9	<1	<1			Sub %: wk alt a.v. & qtz & ghosts
2900S	603710	20	5	30	10	35	B	70	Yellow Brown		✓	1·2	5	13	1	1			Hole Frags: Unalt welded pyroclastic, mid
2880S	603711	30	5	40	5	20	C	50	Light Brown		✓		13	22	2	1			Hole Frags: Wk sericitised pyroclastic.
2860S	603712	30	-	30	10	30	C	60	Light Brown			1·2	*10 (8)	27 (25)	4	<1 (<1)			Hole Frags: as above.
2840S	603713	20	5	30	20	25	B	70	Light Yellow		✓	1·5	5	12	1	<1			Hole Frags & Scree: Unalt pyroclastic/graniboire.
2820S	603714	30	-	40	10	20	C	60	Light Yellow		✓	·9	15	25	3	<1			Hole Frags: As above
2800S	603715	10	10	40	10	30	C	60	Light Brown		✓	·9	4	13	2	<1			Wk Frags: As above, some wk sericitised
2780S	603716	10	5	40	20	25	C	60	Light Yellow		✓	·8	8	16	1	<1			%: Unaltered acid pyroclastic
2760S	603717	30	10	30	20	10	B	60	Grey		✓	1·2	2	9	6	<1			Hole Frags: As above, wk sericitised

* Check assay value.

APPENDIX 5

294050

049

TENEMENT	ELs 10/76 + 7/73	GEOCHEMICAL SOIL SAMPLING LEDGER	Page No. 1
AREA/PROSPECT	CETHANA - WEST	SAMPLE Nos. 601101 - 601128	D.P.O. No.
PLAN REFERENCE	[redacted] SECOND PHASE GRID		GEOLOGIST [redacted] GP + T.E. DATE Dec 1976
A 9006			ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
LINE 100E		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con-cealed	Est. Depth to	Pb	Zn	Cu	Ag			
0 N	No SAMPLE [redacted]	No Sample							[redacted]	[redacted]									%: A.v, wk alt, c qtz phenos
20 N	601101	15	5	10	30	40	C	20	Y/B		✓		110	32	12	<1			%: A.v, mod alt, mod schistose, clayey, c qtz phenos
40 N	601102	20	0	5	30	45			Yell. Brown	✓			110	37	25	<1			%: A.v, mod alt, mod schistose, clayey, qtz phenos
[illegible] N	601103	20	10	5	30	35	B	50	Brown		✓		55	21	6	<1			Hole Frags: As above
[illegible] N	601104	30	5	10	20	35	B	40	Br.		✓		110	37	10	<1			Hole Frags: As above, minor limonite
100 N	601105	25	10	20	20	35	B	20	Br.	✓			110	33	31	<1			% + Scree: Qtz-ser, mod-str schistose, [illegible]
120 N	601106	15	5	15	30	35	B	20	Br.		✓		57	18	17	<1			Hole Frags: Qtz-ser schist c Mn
140 N	601107	15	5	10	30	40	C	20	Br.	✓			46	22	26	<1			%: Qtz-ser schist. Some limonite
160 N	601108	10	10	5	35	40	B	30	Br.	✓			240	63	68	1			%: Qtz-ser schist c Mn. Increasing [illegible]
180 N	601109	20	–	5	30	45	C	70	Yell Br.		✓		*140 140	52 51	40 48	✓ <1			Hole Frags: Qtz-ser schist c lim [illegible]
200 N	601110	20	–	20	30	30	C	100	Yell. Br.		✓		76	47	41	<1			Hole Frags: A.v, wk-mod alt, fragmental, mod schistose
220 N	601111	10	–	20	30	40	B	60	Brown		✓		110	52	29	<1			Hole Frags: A.v, mod qtz-ser sh, [illegible] lim
240 N	601112	15	–	15	30	40	B	80	Red Brn.		✓		88	46	26	<1			Scree: As above, Euhedral qtz eyes
260 N	601113	10	5	25	20	40	B	50	Br.		✓		76	55	24	<1			Scree: As wk alt, Abund qtz eyes in fragmental [illegible]
280 N	601114	10	–	20	30	40	B	80	Br.		✓		71	58	23	<1			No scree or hole frags
300 N	601115	20	5	15	30	30	C	40	Br.		✓		79	63	17	<1			Scree: A.v, wk alt, c abund qtz eyes in fragmental [illegible]
320 N	601116	20	5	20	35	20	A/A	10	Dk. Brn.		✓		52	103	28	<1			Hole frags: Volc, wk alt, schistose, [illegible]
340 N	601117	10	10	25	20	35	B	30	Dk. Brown		✓		79	270	10	1			Scree: Volc sed, wk [illegible], clayey, shaley
360 N	601118	10	5	25	20	40	B	60	Red Brown		✓		79	230	9	1			Scree: Dacitic, chlor, epidote, [illegible]
380 N	601119	10	5	25	20	40	B	80	Red. Brn.		✓		58	240	13	<1			Scree: As above
400 N	601120	15	5	20	30	30	B	40	Dk. Brown		✓		63	161	5	<1			Scree: Dacite, wk alt, [illegible]
420 N	601121	20	5	20	30	25	B	50	Lt. Br.		✓		66	270	8	<1			Hole Frags: Sh. Scree: Dacite lava from E.
[illegible] N	601122	20	–	20	30	30	B	70	Br.		✓		94	135	4	<1			Hole Frags: Shaley + gritty sed. Scree: Dacite?
460 N	601123	25	–	20	25	30	C	70	Red Br.		✓		110	124	8	<1			Hole Frags: Tuffaceous Sh. Scree: lava, [illegible]
480 N	601124	20	–	15	25	40	C	60	Red Brown		✓		91	92	5	<1			As above
500 N	601125	20	–	20	20	40	C	80	Red. Br.		✓		65	52	7	1			Hole Frags: Tuffaceous arg seds. Scree: Dacite
END OF LINE [redacted]																			
[redacted]																			
LINE 200E																			
0 N	No sample																		
20 N	601126	100	–	–	–	–			–				150	137	13	<1			%: Hard weakly alt a.v. c qtz phenocrysts
40 N	601127	25	5	20	25	25	B	20	Brown				120	56	8	1			Scree: Weakly alt a.v. c qtz phenocrysts
60 N	601128	35	5	20	20	20	B	30	Light Brown				100	53	4	<1			Scree: " " "

* Check assay value.

294051

050

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 2

TENEMENT EL5 10/76 - 7/73 D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 601129 - 601159 GEOLOGIST GPrTE DATE Dec 1976

PLAN REFERENCE [redacted] SECOND PHASE GRID ANALYSED BY ZC

A 9006

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
LINE 200E																			
80N	601129	25	5	20	30	20	B	60	Yell. Brown				*88 89	49 50	5 5	<1 <1			Scree · Weakly alt. a.v (lava?)
100N	601130	100	-	-	-	-			-				260	55	12	<1			O/c · Hard sil weakly alt av. pyroclastic(?)
120N	601131	10	5	15	30	40	C	60	Yell. Brown				60	37	4	1			Scree · Weakly-mod alt pyroclastic ± limonite
[redacted]0N	601132	15	10	10	30	35		50	Yell. Brown				48	19	2	<1			Scree : " " " " " "
160N	601133	15	10	10	30	35	C	40	Yell. Brown				15	12	1	<1			Scree : Very sil weakly alt a.v. (lava?)
180N	601134	20	5	20	20	35	B	50	Lt. Brown				150	65	17	<1			Scree : Sil. mod alt a.v.
200N	601135	20	5	20	20	35	B	40	Lt. Brown				70	38	6	<1			Scree : Mod alt a.v. ± qtz-limonite veins.
220N	601136	20	5	25	20	30	B	10	Lt. Brown				110	34	6	1			O/c : Qtz-ser schist ± limonite
240N	601137	20	5	25	25	25		10	Lt. Brown				65	33	16	<1			O/c Weakly alt tuffaceous pyroclastic
260N	601138	10	5	20	30	35	B	40	Red.				170	49	47	1			Scree Mod alt vitric ± sil tuff ± limonite
280N	601139	10	5	20	30	35	B	60	Red.				65	31	18	<1			Float frags Mod alt pyroclastic ± qtz veinlets.
300N	601140	10	10	20	30	30	B	70	Br.				68	30	9	<1			Float frags : " " " " " "
320N	601141	15	5	20	25	35	B	40	Brown				74	43	9	<1			Scree + float frags : " " " " " "
340N	601142	10	5	20	30	35	B	90	Brown				100	84	34	1			" " " " " " ± limonite + Mn
360N	601143	20	5	20	25	30	B	50	Brown				150	81	39	1			Scree · Qtz-ser schist ± [redacted] pyroclastic.
380N	601144	20	5	15	30	30	B	20	Brown				130	125	52	1			Scree : Qtz-ser schist ± limonite.
400N	601145	15	5	15	25	40	B	40	Dark Brown				110	101	37	1			Scree " " " " " "
420N	601146	15	5	15	25	40	B	80	Red.				140	86	30	<1			Scree : Qtz-ser schist.
440N	601147	15	5	20	25	35	B [redacted]	70	Dark Red				150	135	20	<1			One boulder qtz-ser schist. No scree.
460N	601148	15	10	20	30	25	B/A	30	Lt. Brown				76	139	8	1			Scree · Weakly alt v/c grit ± pebbles
480N	601149	100	-	-	-	-			-				*53 55	122 118	330 270	<1			O/c · Weakly alt v/c grit + breccia.
[redacted]00N	601150	15	5	20	30	30	C	60	Brown				94	270	8	1			Float frags · Weakly alt tuffaceous grit.
[redacted]20N	601151	20	10	10	30	30	B	10	Dk Brown				140	350	4	1			" " Tuff shales + laminated grit
540N	601152	20	10	20	20	30	C	50	Brown				91	260	7	<1			" " " " " "
560N	601153	20	-	10	30	40		60	Brown				130	240	6	1			Scree : Tuff shales + tuffaceous grit.
580N	601154	20	10	20	20	30	B/A	20	Dk Brown				45	84	3	<1			Scree : Tuffaceous grit
600N	601155	100	-	-	-	-	-	20	-				45	260	13	1			Scree : Soft clayey felsic v/c grit.
620N	601156	15	5	15	25	40	B	60	Brown				87	159	2	<1			Scree : Clayey v/c grit. some dacite
640N	601157	15	5	20	20	40	B/A	30	Dk. Brown				29	141	2	1			Scree . Weathered grit - clayey.
660N	601158	20	5	10	25	40	[redacted]	40	Brown				58	230	1	1			Float frags : " " "
680N	601159	100	-	-	-	-			-				85	147	19	1			Sub o/c : Green dacitic lava ± traces Py.
END OF LINE																			
LINE 300E																			
0 N	No sample																		Road foundation
20N	No sample																		Scree from road construction.

* Check assay value.

294052

051

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 3

TENEMENT EL5 10/76 + 7/73

AREA/PROSPECT CETHANA - WEST   SAMPLE Nos. 601160 - 601191

PLAN REFERENCE [redacted] SECOND PHASE GRID.

A 9006

D.P.O. No.

GEOLOGIST GP+TE   DATE Dec 1976

ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm: Pb	Zn	Cu	Ag			Geological observations
300 E																			
40 N	601160	10	5	15	30	40	B	30	Red Brown		✓		45	39	7	<1			Scree: Av, wk alt, chlor, med schistose, pink f.g. fel
60 N	601161	10	5	20	25	40	B	40	Yell. Br.		✓		310 (*290)	196 (188)	100 (110)	1			Scree: Av, wk alt, wk ser, wk schistose, m.g. qtz
80 N	601162	10	5	20	20	35	B	30	Brown		✓		85	103	48	1			Scree: Av, pyroclastic, wk alt, wk chlor, Mn staining
100 N	601163	10	5	25	30	30	B	40	Brown		✓		61	51	1	1			Scree: Av, wk alt, med schistose, chlor, tr [illegible]
120 N	601164	20	10	20	30	20	A/B	20	Brown		✓		190	106	75	1			Scree: Av, wk alt, med schistose, tr chlor, tr ser
140 N	601165	20	–	20	30	30	C	50	Brown		✓		130	137	63	1			Hole frags & Scree: Av, mod alt, qtz-ser schist, wk lim
160 N	601166	25	5	15	30	25	B	40	Yell. Brown		✓		110	90	53	1			Scree: Av, qtz-ser schist, mod alt & schistose, [illegible] Mn
180 N	601167	100	–	–	–	–	B	70	–		✓		150	107	45	1			Scree: As above, ĉ tr Mn
200 N	601168	20	15	20	25	20	B	50	Dark Brown		✓		240	139	53	1			Scree: Av, pyroclastic, mod alt & schistose, tr Mn
220 N	601169	25	10	30	25	10	A/B	40	Dark Brown		✓		290	200	42	<1			Scree: Av, wk-mod alt, wk schistose, minor qtz veining
240 N	601170	25	10	15	20	30	A/B	30	Dark Brown		✓		280	240	26	1			Scree: Altered sed?, wk schistose, silic, lt olive-green
260 N	601171	10	5	15	30	40	B	50	Dark Brown		✓		74	182	7	1			Scree: Grir, c.g., med chlor, wk schistose, + gritty sh
280 N	601172	10	5	15	30	40	B	50	Dark Brown		✓		79	196	2	<1			Hole frags: Reworked tuffs, wk schistose, wk alt, + m.g. dacite
300 N	601173	20	10	10	30	30	A/B	40	Dark Brown		✓		90	136	3	<1			Scree: Dacite, ĉ m-c.g. fel, minor m.g. hbl, tr mag
320 N	601174	15	5	15	30	35	B	30	Brown		✓		76	147	2	1			Scree: Dacite, f.g.
340 N	601175	20	5	35	30	10	B	20	Brown		✓		110	230	2	<1			Scree: Dacite, f.g.
360 N	601176	20	5	20	30	25	B	20	Brown		✓		130	185	2	1			Scree: Dacite, f.g. ĉ some qtz lenses
380 N	601177	20	5	25	25	25	B/C	50	Brown		✓		33	118	2	<1			Hole frags & Scree: Str weath, str schistose, chlor, m.g. fel
400 N	601178	10	5	15	35	35	B	30	Red Brown		✓		150	103	2	<1			Hole frags: weath av schist, Scree: wk schistose, str [illegible], m.g. fel
420 N	601179	10	–	15	35	40	C	50	Red/Br.		✓		170	103	3	<1			Hole frags: weath schistose sed? Scree: m.g. qtz-fel grit
440 N	601180	15	5	15	30	35	B	40	Yell. Brown		✓		190	125	3	1			Scree: As above, + glassy dacite
END OF LINE																			
LINE 400E																			
0 S	No sample																		
20 S	601181	30	–	10	30	30			Yell. Brown	✓			130	22	15	<1			%: Av, qtz-ser, med schistose, tr lim
40 S	601182	100	–	–	–	–			–	✓			150 (*140)	1540 (1510)	30 (29)	<1 (21)			%: Av, vfg-microcryst, ĉ qtz-ser alt, med schistose
60 S	601183	15	5	15	30	35	C	50	Yell. Brown		✓		110	50	14	<1			Hole frags & float: As above.
80 S	601184	20	5	15	30	30	B	20	Yell. Brown		✓		130	65	11	<1			Hole frags + float: Av, wk schistose, chlor, minor Mn
100 S	601185	20	5	20	25	30	C	50	Lite yell.		✓		29	22	5	<1			Hole frags + float: Av, chlor, wk seric, wk schistose
120 S	601186	20	–	20	25	35	C	70	Lite yell.		✓		58	24	6	<1			Hole frags: Av, chlor, wk schistose, f.g. qtz
140 S	601187	25	5	15	20	35	C	30	Lite Grey		✓		1	5	1	<1			Hole frags: Qtz-ser, med silic, med schistose
160 S	601188	35	10	20	20	15	C	20	Yellow		✓		8	11	3	<1			Hole frags: Ash(?), vfg, wk schistose, chlor(?)
180 S	601189	40	5	10	25	20	C	80	Yell. Brown		✓		29	20	4	<1			Float: Av, f.g., silic, wk schistose, chlor(?)
200 S	601190	100	–	–	–	–			–	✓			49	240	210	<1			%: Av, f.g., ĉ f-m.g. qtz, silic, wk schistose, chlor(?) tr Mn
220 S	601191	20	10	15	25	30	C	30	Yellow Brown		✓		180	70	25	<1			Hole frags: As above, but str weath & non-silic.

* Check assay value.

294053

052

Page No. 4

GEOCHEMICAL SOIL SAMPLING LEDGER

TENEMENT: ELS 10/76 + 7/73
AREA/PROSPECT: CETHANA - WEST
SAMPLE Nos. 601192 - 601222
PLAN REFERENCE: [redacted] SECOND PHASE GRID
A 9006

D.P.O. No.
GEOLOGIST: GP+TE DATE: Dec 1976
ANALYSED BY: ZC

Grid Co-ordinate	Sample No.	Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Depth cm.	Colour	Outcrop	Con-cealed	Est. Depth to	Pb	Zn	Cu	Ag	Geological observations
LINE 400E																	
240 S	601192	20	15	30	15	20		30	Dark Grey		✓		52	19	5	<1	Scree: As above
260 S	601193	20	5	15	30	40	B/C	30	Yell. Brown		✓		57	11	4	<1	Scree: Qtz-ser sch, mod-str schistose, qtz veinlets c lim
280 S	601194	30	5	15	30	20	B	40	Lite Grey		✓		20	16	2	<1	Hole frags: As above?, weath.
300 S	601195	30	5	10	25	30	A/B	30	Lite Grey		✓		11	8	1	<1	Scree: A.v., chlor, wk schistose, f-m.g. qtz phenos
END OF LINE TO SOUTH																	
20 N	601196	40	–	10	25	25		•	Lite Brown		✓		160 (150)	62 (56)	100 (110)	<1 (<1)	Scree: A.v., wk alt, chlor, mod schistose, minor lim after py.
40 N	601197	40	5	5	20	30	B	40	Grey		✓		42	9	11	<1	Scree: A.v., wk alt, chlor, mod schistose, minor m.g. qtz
60 N	601198	30	5	5	30	30	C	30	Brown		✓		260	64	120	<1	Scree: A.v., v.f.g., wk-mod qtz-ser alt, minor lim veinlets
80N	601199	15	–	20	30	35	C	90	Brown		✓		220	78	78	1	Hole frags + Scree: A.v., qtz-ser, mod schistose, some lim
100 N	601200	10	5	20	20	45			Brown		✓		130	58	33	1	Scree: Qtz-ser, wk schistose, str silic...
120N	601201	20	5	20	20	35	B	30	Brown		✓		150	63	36	1	Hole frags: Str weath qtz-ser schist
140N	601202	10	5	20	20	45	B	60	Brown		✓		150	125	40	1	Scree: str weath qtz-ser schist. Minor non-schistose c f.g. fel.
160N	601203	15	5	20	30	30	B	40	Brown		✓		160	175	20	<1	Scree: A.v., wk alt, wk schistose, [illegible] qtz-ser, c m.g. qtz phenos.
180 N	601204	25	15	20	20	20	B	60	Brown		✓		110	147	17	<1	Scree: Silic qtz-ser schist c fine qtz veining.
200 N	601205	15	10	15	25	35		•	Dark Brown		✓		88	165	7	<1	Scree: A.v. pyroclastic f-m.g. fel, minor f.g. qtz crystals?
220N	601206	10	5	15	30	40	A/B	30	Brown		✓		*97 (97)	191 (200)	6 (5)	1 (1)	Scree: Reworked c.g. fel tuff, ? dacite
240N	601207	15	10	15	25	35	A/B	30	Dark Brown		✓		130	240	4	1	Scree: Dacite c minor m-c.g. fel in microcryst groundmass.
260N	601208	100	–	–	–	–		•	–		✓		[illegible] (120)	[illegible] (750)	[illegible] (23)	[illegible] (1)	Scree: Dacite
280N	601209	100	–	–	–	–		•	–	✓			52	185	13	<1	O/C?: Dacite
300N	601210	10	–	25	30	35	B	30	Brown		✓		270	230	3	1	Scree: Dacite
320N	601211	20	5	15	30	30	B	40	Brown		✓		150	185	5	1	Scree: Dacite
340N	601212	100	–	–	–	–		•	–		✓		12	106	8	<1	Scree: A.v., pyroclastic, chlor, c m.g. qtz + fel
360N	601213	20	–	20	25	25	C	60	Lite Brown		✓		21	46	1	<1	Hole frags: Sh, weath, thinly laminated
380N	601214	20	–	20	25	35	B/C	20	Lite Brown		✓		13	11	2	<1	Hole frags: As above.
400N	601215	35	5	25	15	20	B	50	Lite Red		✓		59	25	2	<1	Hole frags + Scree: Sh, weath, thinly laminated
END OF LINE																	
LINE 500E																	
0 N	No sample									✓							O/C: A.v., microcryst, chlor, wk schistose.
20 N	601216	20	5	15	20	30	?	?	Lite Yell.		✓		100	40	18	<1	Scree: Qtz ser, mod schistose, str weath
40 N	601217	20	5	20	30	25	B	20	Lite Yell.		✓		97	34	20	<1	Scree: Qtz-ser, str schistose, str weath.
60 N	601218	20	–	10	30	40	B	30	Yell. Brown		✓		*540 (*680)	240 (240)	69 (69)	1	Scree: Qtz-ser, mod schistose, c.g. qtz phenos
80 N	601219	15	10	35	15	25	B	30	Lite Brown		✓		*490 (*500)	191 (200)	9 (7)	1 (<1)	Hole frags + Scree: Qtz-ser, str schistose
100 N	601220	15	5	20	30	30	B	50	Brown		✓		140	72	6	1	Scree: Sh + v.f.g. schistose, tuffaceous sh.
120 N	601221	10	5	30	20	35	B	40	Red Brown		✓		190	69	8	1	Hole frags + Scree: Sh, tuffaceous, f.g.
140N	601222	20	10	20	30	20	A/B	?	Dark Brown		✓		52	48	4	<1	Scree: Sltst, arg., g'j + red.

* Check assay value.

294054

053

TENEMENT ELs 10/76 + 7/73	**GEOCHEMICAL SOIL SAMPLING LEDGER**	D.P.O. No.	Page No. 5
AREA/PROSPECT CETHANA - WEST	SAMPLE Nos. 601223 - 601267	GEOLOGIST GP+TE	DATE Dec 1976
PLAN REFERENCE [redacted] SECOND PHASE GRID		ANALYSED BY ZC	

A 9006

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Con-cealed.	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag			Geological observations
LINE 500E																			
160N	601223	100	–	–	–	–	A/B	20	–		✓		28	84	6	<1			Hole frags + Scree: As above, + sst, fg, arg, fel
180N	601224	10	–	20	30	40	?	?	Grey		✓		1	2	1	<1			Scree: Sltst, silic, gg, + sst, fg, fel, + pyroclastics, reworked, fg.
200N	601225	30	10	20	25	15	A/B	30	Black Brown		✓		13	31	1	1			Hole frags + scree: sst, tuffaceous, fg, + sltst. Minor pyroclastic
[illegible]0N	601226	20	5	20	30	25	?	?	Brown		✓		27	47	4	<1			Scree: Mst, silic, gg, thinly laminated.
240N	601227	10	5	30	25	30	B	40	Dark Brown		✓		24	31	2	<1			Scree: As above
260N	601228	25	5	30	25	15	B	40	Lt Brown		✓		63	48	1	1			Hole frags + Scree: As above but more silty.
280N	601229	5	5	40	20	30	B	60	Lt Brown		✓		79	76	3	1			Hole frags + Scree: Pyroclastic, m.g. fel, 5-10% f.g. qtz.
300N	601230	15	5	15	25	30	B	40	Yell. Brown		✓		75	103	1	1			Hole frags + Scree: As above, c 10% m.g. qtz.
END OF	LINE TO	NORTH.																	
20S	601231	100	–	–	–	–			–	✓			42	6	18	<1			%: A.v, microcryst, silic, chlor, wk schistose
40S	601232	100	–	–	–	–			–	✓			45	31	37	1			%: A.v, microcryst, chlor, mod schistose
60S	601233	10	5	15	30	40	C	40	Lt Yell		✓		250	41	48	<1			Float: A.v, chlor, str schistose, c.g. qtz phenos
80S	601234	10	5	20	30	35	B	50	Lt Yell		✓		30	6	1	<1			Float: As above but mod schistose, minor glass shards
100S	601235	25	10	20	15	25	A	30	Lt Grey		✓		21	4	1	<1			Float: Mst, v silic, + sst, vfg, wk schistose
120S	601236	25	5	20	15	30	B	20	Brown		✓		63	36	6	1			Float: A.v c 30% c.g. qtz, chlor schist
140S	601237	60	5	10	15	10	B	30	Dark Grey		✓		66	21	6	<1			Float: A.v c 20% c.g. qtz, chlor, mod schistose, pyroclastic
160S	601238	20	5	20	30	25	B	20	Yell Brown		✓		230	46	20	1			Float, Pyroclastic c 10% qtz, wk alt fg fel, wk schistose
180S	601239	15	–	10	30	45	C	50	Yell.		✓		140	200	71	1			Hole frags + Float: A.v. chlor schist c minor qtz phenos, tr. lim.
200S	601240	30	5	15	20	30	B	40	Dark Brown		✓		95	51	13	1			Hole frags: A.v, chlor, wk schistose, rare qtz phenos
220S	601241	10	10	20	30	30	A/B	20	Dark Brown		✓		150	75	33	1			Float: A.v, chlor, silic, wk schistose, plentiful c.g. qtz phenos
240S	601242	30	5	15	20	30	B	20	Brown		✓		150	49	32	<1			Float: As above but mod schistose.
260S	601243	20	5	15	30	30	B	20	Brown		✓		80	34	28	1			Float: A.v, chlor, silic, mod schistose.
280S	601244	20	5	25	20	30	B	60	Brown		✓		73	31	26	<1			Hole frags + Float: A.v, pyroclastic, chlor, mod schistose.
300S	601245	100	–	–	–	–			–	✓			13	107	33	<1			%: A.v. c f.m.g. qtz, silic, chlor, non-schistose.
320S	601246	100	–	–	–	–			–		✓		26	50	70	<1			Float: As above
END OF	LINE																		
LINE	600E																		
0S	No Sample																		%: A.v, chloritic schist.
20S	601261	20	5	20	20	35	C	30	Lt Yell		✓		*16	24	3	<1			Float: A.v, mod schistose, chlor, ser, c m.g. phenos.
40S	601262	20	5	20	20	35	C	40	Lt Yell.		✓		27	19	2	<1			Hole frags + Float: A.v, mod schistose, chlor, ser, fel.
60S	601263	15	5	20	20	40	C	40	Yell. Brown		✓		110	26	13	<1			Hole frags: As above, but no fel
80S	601264	15	–	20	30	35	C	60	Brown		✓		190	41	32	1			Hole frags + Float: A.v, mod schistose, chlor.
100S	601265	10	–	20	30	40	B	20	Brown		✓		130	41	20	<1			Float: A.v, mod schistose, chlor, ser, mod silic, rare qtz eyes
120S	601266	10	5	20	30	35	B	70	Brown		✓		190	320	28	1			No hole frags + Float
140S	601267	20	–	30	30	20	B/C	110	Brown		✓		62	46	23	<1			As above.

* Check assay value.

294055

054

TENEMENT EL 5 10/76 + 7/73

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 6

D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 601268 - 601284

GEOLOGIST G.P+TE DATE Dec 1976

PLAN REFERENCE [redacted] SECOND PHASE GRID

ANALYSED BY ZC

A 9006

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Con-cealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag			Geological observations
LINE	600E																		
160S	601268	20	5	25	25	25	B	70	R/B		✓		93	54	23	1			Float: Av, mod schistose, chlor, rare py cavs.
180S	601269	20	5	20	25	30	B	50	R/B		✓		* 310 320	133 121	63 62	3 4			Hole Frags: Av, str weath chlor schist.
200S	601270	20	10	20	30	20			Black Brown		✓		210	92	30	<1			Float: Av, mod-str schistose, chlor, minor lim in voids
220S	601271	20	5	20	30	25	B	10	Brown		✓		130	74	30	1			Float: Av, mod schistose, chlor, rare qtz eyes
240S	601272	15	5	25	30	25	B	20	Dark Brown		✓		190	41	15	<1			Float: Av, qtz-chlor + qtz-ser schists + esilic metaslst
260S	601273	30	—	20	30	20	C	40	Lt. Brown		✓		170	30	44	<1			Hole Frags + Float: Av, qtz-chlor-ser, str schistose, rare qtz phenos
280S	601274	100	—	—	—	—			—	✓			36	24	15	<1			%: Av, pyroclastic, chlor, wk schistose, qtz phenos, glassy shards.
300S	601275	60	—	20	15	5	C	100	Lt. Yell		✓		84	22	15	<1			Hole Frags: Av, qtz-ser, str schistose.
320S	601276	20	5	15	30	30	C	80	Yell Brown		✓		84	22	9	<1			Hole Frags: Av, qtz-ser, mod schistose
END OF	LINE TO	SOUTH.																	
20N	601247	50	—	5	10	35	B	20	Lt. Yellow		✓		5	12	2	<1			Hole Frags + Scree: Av. schist, chlor?, f-m.g. qtz.
40N	601248	40	5	15	15	25	C	100	Lt. Yellow		✓		17	17	2	<1			Hole Frags: Mst, yell.
60N	601249	20	5	20	25	30	B	50	Lt. Yellow		✓		21	15	3	<1			Hole Frags + Scree: Mst, thinly laminated, yell + pink
80N	601250	5	5	10	40	40	B	10	Pale Brown		✓		7	10	1	<1			Hole Frags + Scree: Mst c̄ occas f-m.g. ash rich bands
100N	601251	10	5	20	30	35	B	20	Brown		✓		15 [illegible]	2 [illegible]	2 [illegible]	<1			Hole Frags + Scree: Mst as above.
120N	601252	30	5	5	30	30	A/B	20	Brown		✓		9	10	1	<1			Hole Frags + Scree: Mst, thinly laminated, pink
140N	601253	40	15	5	20	20	B	20	Dark Brown		✓		14	29	2	1			Hole Frags + Scree: Mst, silty, lt yell
160N	601254	100	-	—	—	—	[illegible]	[illegible]	—		✓		11	75	4	<1			Scree: Mst, silic, gy, thinly laminated
180N	601255	100	—	—	—	—			—	✓			13	134	10	<1			%: Av pyroclastic, m.g. 10% qtz, occas clst frags, wk schistose
200N	601256	100	—	—	—	—			—	✓			15	106	7	<1			%: As above
220N	601257	—	10	30	20	40	B	10	Brown		✓		68	123	3	<1			Scree: Pyroclastic, m.g., reworked?
240N	601258	15	5	20	25	35	A/B	20	Brown		✓		* 38 34	147 188	5 3	1 1			Hole Frags + Scree: Av pyroclastic, chlor, wk-mod schistose
260N	601259	20	5	35	20	20	B	40	Brown		✓		62	183	3	<1			Hole Frags + Scree: Av pyroclastic, f-m.g. fel, 10% qtz
280N	601260	20	—	15	25	40	B	10	Grey		✓		250	12	2	<1			Scree: Qtz-ser, mod schistose, 30% m.g. qtz (pyroclastic)
END	OF LINE																		
LINE	700E																		
0S	No Sample																		Float: Av, qtz-ser, mod schistose, tr f.g. qtz.
20S	601277	20	5	20	25	30	B	40	Lt. Brown		✓		60	29	13	<1			Float: As above
40S	601278	30	—	10	30	30	B/C	40	Yellow Brown		✓		85	22	13	<1			Float: As above
60S	601279	30	—	10	30	30	C	70	Yellow Brown		✓		65	49	18	<1			Hole Frags: As above.
80S	601280	20	15	10	35	20	B	20	Dark Brown		✓		70	48	15	<1			Float: Qtz pebbles
100S	601281	10	5	20	35	30	A/C	20	Brown		✓		75	92	8	1			Float: Qtz pebbles
120S	601282	10	—	20	30	40	C	90	Red Brown		✓		150	80	14	1			Hole Frags: Av, chlor schist + vein qtz frags
140S	601283	10	—	20	30	40	C	80	Yellow Brown		✓		130	33	10	<1			Hole Frags: Av, qtz-ser schist
160S	601284	10	—	20	30	40	B/C	30	Brown		✓		230	15	6	1			Hole Frags: Av, chlor schist, weath.

* Check assay value.

294056

055

TENEMENT ELS 10/76 - 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 7

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 601285 - 601312 — D.P.O. No. GP + TE

PLAN REFERENCE [redacted] SECOND PHASE GRID — GEOLOGIST [redacted] — DATE DEC 1976

ANALYSED BY ZC.

A 9006

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag	
LINE	700E																
180S	601285	10	–	20	30	40	B/C	80	Brown		/		100	26	11	1	Float: Ab, chlor, silic, non-schistose.
200S	601286	10	5	15	30	40	C	85	Red Brown		/		110	18	6	1	Subcrops + Float: Ab, qtz-ser, qtz schistose, rare mg, qtz
220S	601287	5	–	30	35	30	S	30	Lt. Grey		/		5	2	1	<1	No rock chips.
240S	601288	10	–	20	30	40	C	80	Red Brown		/		210	23	9	1	Float/Frags: Ab, qtz-ser, mod schistose.
260S	601289	15	5	20	30	30	C	50	Yellow Brown		/		230	14	6	<1	Float/Frags: Ab, qtz-ser schist.
280S	601290	100	–	–	–	–			–	/			89	52	12	<1	100% Ab, qtz-ser, qtz schistose.
300S	601291	100	–	–	–	–			–	/			150	35	12	<1	100% Ab above, to Fg. qtz.
END OF LINE.																	
Line 800E.																	
0S	No sample																
20S	601292	20	10	20	20	30	B	40	Brown				*410 420	230 720	130 150	1	Disturbed ground. V limonitic schist + limonite boulders.
40S	601293	10	5	15	30	40	B	30	Red Brown				260	470	82	<1	Sub Oc: Limonitic gossan
60S	601294	10	–	20	30	40	B	20	Pale Grey				52	20	9	<1	Float/Frags: V. sil-qtz-ser schist + vein qtz.
80S	601295	15	5	20	30	30		40	Lt. Grey				7	1	1	<1	Transported soil - grey qtz sand. No scree.
100S	601296	20	5	20	20	35		30	Dark Grey				10	1	1	<1	" " " " " " "
120S	601297	25	5	20	20	30	C	60	Grey				280	1	4	<1	Float/Frags: V highly alt sil-qtz-ser schist (Oc)
140S	601298	20	5	25	20	30	C	10	Grey				36	6	3	<1	Oc: Siliceous schist.
160S	601299	10	5	25	20	40	B	30	Grey				62	4	2	<1	Float/Frags: Highly alt qtz-ser schist.
180S	601300	10	15	25	20	30	A/B	10	Dark Grey				69	15	3	1	Scree: Chloritic qtz-ser schist.
200S	601301	15	–	20	35	30	C	30	Yellow Brown				150	18	8	1	Scree: Qtz-ser schist.
220S	601302	10	5	20	25	40	B	30	Lt Brown				130	26	15	<1	Float/Frags: " " " Chloritic in places.
240S	601303	100	–	–	–	–			–				13	120	19	<1	Oc Weakly alt chlorite-qtz-ser schist
260S	601304	100	–	–	–	–			–				18	37	7	<1	Oc: " " " " " " c limonite.
280S	601305	100	–	–	–	–			–				33	94	10	<1	Oc Weakly alt chloritic tuff c limonite
300S	601306	100	–	–	–	–			–				24	88	3	<1	Oc Weakly-mod alt chloritic a.v. c limonite
END OF LINE.																	
Line 900E																	
0S	No sample																
20S	601307	10	10	25	25	30	C	60	Lt Grey				*320 350	10 10	4 4	2' 1'	Float/Frags: Siliceous schist
40S	601308	30	5	30	20	15	C	20	Yellow Brown				* 610 620	46 65	11 13	1' <1	Float/Frags: Qtz-ser schist c limonite.
60S	601309	100	–	–	–	–			–				98	200	10	1	Oc: Highly chloritic schist.
80S	601310	15	5	30	30	20	B	20	Brown				* 650 1550	158 158	9 8	2'	Scree: Qtz-ser schist
100S	601311	15	10	25	30	20	B	20	Brown				* 380 370	172 172	8 8	1'	Scree: Qtz-ser schist c limonite + qtz veins
120S	601312	25	5	10	30	30	B	40	Brown				* 380 370	200 210	12 11	1'	Scree: Qtz-ser schist c qtz-chlorite veins.

* Check assay value.

294057

056

TENEMENT EL's 10/76 - 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 8

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 601313 - 601341 — D.P.O. No.

PLAN REFERENCE [redacted] SECOND PHASE GRID — GEOLOGIST G.P. & T.E. DATE DEC 1976

A 9006 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
Line 960E																			
140S	601313	20	15	30	20	15	B	30	Brown				1250	65	10	1			Scree · Qtz-ser-chlorite schist.
160S	601314	30	10	15	30	15	B	20	Brown				200	35	12	<1			Scree : Qtz-ser-chlorite schist
180S	601315	50	–	20	20	10	B	20	Pale Brown				57	15	7	<1			Scree : Mod-highly alt v.fl v vitric av (tuff?)
200S	601316	100	–	—	–	—			—				220	114	6	<1			o/c : Mod alt fl v vitric tuff
220S	601317	10	10	20	30	30	B	40	Brown				*330 310	93 89	6 5	<1 <1			Scree · Chlorite-qtz-ser sdust after vitric tuff
240S	601318	100	—	—	–	—			—				*440 420	170 160	20 18	<1 <1			o/c : Weakly alt vitric tuffaceous grit.
[redacted] END OF LINE TO SOUTH																			
20N	601319	30	–	30	30	10	C	60	Pale Yellow				200	5	4	<1			o/c · Highly alt siliceous qtz-ser schist.
40N	601320	15	–	20	25	40	C	50	Brown				78	77	16	<1			Hole frags: " " " " "
60N	601321	20	–	30	30	20	B	40	Grey				8	1	1	<1			" " Siliceous schist - vein qtz
80N	601322	10	–	30	30	30	B	10	Grey				8	1	1	<1			Hole frags: V small sil schist, vein qtz. No scree.
100N	601323	5	–	30	50	15	B	30	Lt. Grey				2	1	1	<1			Hole frags: Sil schist after tuff + much vein qtz
120N	601324	25	15	30	15	15	B	30	Black				13	42	3	<1			Hole frags: Dk fg - v.fine schist, much vein qtz
140N	601325	10	–	30	30	30	C?	70	Lt. Grey				6	1	1	<1			Hole frags: Sil schist + vein qtz No scree
160N	601326	5	–	30	50	15	B	40	Lt. Grey				3	1	1	<1			Hole frags. Fine ghitic schist. Much vein qtz
180N	601327	10	–	30	30	30	B	20	Lt. Grey				5	5	1	<1			Hole frags. " " " "
200N	601328	20	10	20	20	30	B	50	Dark Brown				62	36	12	<1			Scree + frags · Various - qtz-ser schist, river cobble (River deposit?)
220N	No sample																		
240N	601329	10	5	30	30	25	B	20	Grey				3	3	2	<1			Hole frags : Vein qtz
260N	601330	20	5	30	20	25	B	30	Lt. Yellow		✓		3	3	1	<1			Hole frags & float : pebbles of milky qtz.
280N	601331	10	5	15	40	30	B	30	Lt Grey		✓		8	8	2	<1			Hole frags: Av, silic qtz-ser schist, str weath
300N	601332	20	5	15	20	40	C	30	Yellow Brown		✓		57	17	2	<1			Hole Frags: Qtz-ser schist, wk silic. Rare float cherty th qtz m
320N	601333	5	5	30	30	30	B/C	40	Dark Grey		✓		2	1	1	<1			Hole frags: Fine chips silic qtz-ser schist?
340N	601334	5	5	30	30	30	B/C	30	Lt. Grey		✓		2	1	1	<1			No rock chips.
360N	601335	30	5	30	20	15	B	40	Grey		✓		3	1	1	<1			Hole frags : Rare milky qtz.
380N	601336	30	5	30	20	15	B/C	30	Dark Grey		✓		<1	1	1	<1			Hole frags : Fine chips qtz-ser schist? str weath
400N	601337	20	5	30	25	20	B	50	Dark Grey		✓		<1	1	1	<1			Hole Frags: Rare qtz-ser, str schistose, trace milky qtz
420N	601338	15	10	25	25	25	B	30	Grey		✓		<1	1	1	<1			Hole Frags: Rare milky qtz.
440N	601339	25	10	20	20	25	B	40	Dark Grey		✓		7	3	1	<1			Hole Frags: Rare silic qtz-ser schist
460N	601340	10	5	25	30	30	B	60	Lt Grey		✓		12	8	1	<1			Hole frags & Float: Av. qtz-ser, silic, str schistose, str weath.
480N	601341	10	5	25	30	30	B/C	70	Lt Grey		✓		6	1	1	<1			As above.
END OF LINE																			

* Check assay value.

294058

057

TENEMENT EL's 10/76 & 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 9

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 601343 - 601373 — D.P.O. No.

PLAN REFERENCE SECOND PHASE GRID — GEOLOGIST GP & TE DATE Dec. 1976

A 9006 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
Line	1000 E	Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
20 N	601343	60	5	5	20	10			Yellow Brown	✓			*550 550	40 38	92 89	<1 <1			% : A.v, qtz-ser, str schistose, wk silic
40 N	601344	20	5	35	25	15	C	80	Yellow Brown		✓		200	11	69	1			Hole frags: as above
60 N	601345	10	5	25	30	30	B	40	Grey		✓		12	1	1	<1			Hole frags + float : crystalline milky vein qtz
80 N	601346	20	–	25	30	25	A/B	20	Grey		✓		5	<1	1	<1			Hole frags + float : crystalline milky qtz
100 N	601347	10	-	40	20	30	A/B	30	Grey		✓		2	1	1	<1			Hole frags : crystalline milky qtz
120 N	No Sample										✓								Float : as above
140 N	601348	10	5	15	30	40	A/B	20	Grey		✓		2	1	<1	<1			Float : as above
160 N	601349	5	-	30	35	30	B	20	Grey		✓		<1	<1	<1	<1			Hole frags + float : as above
180 N	601350	10	5	25	35	25	A/B	40	Grey		✓		<1	1	<1	<1			Float : 1 piece gg chert . Bulldozed ground.
200 N	601351	10	5	20	35	30	B	40	Grey		✓		2	1	<1	<1			Hole frags + float : crystalline milky qtz
220 N	601352	10	5	20	35	30	A/B	20	Grey		✓		2	1	1	<1			Hole frags : A.v, v. silic qtz-ser schist
240 N	601353	30	5	20	25	20	B	40	Grey		✓		2	1	<1	<1			Hole frags + float : A.v, qtz-ser, str schistose, mod silic.
260 N	601342	10	5	25	30	30	B	20	Light Grey		✓		2	1	1	<1			Hole frags + float : as above
280 N	601354	10	5	20	25	40	B	20	Grey		✓		3	1	1	<1			Float : rare crystalline milky qtz
300 N	601355						A/B	30			✓								Hole frags + float : as above
320 N	601356	40	5	20	15	20	B	30	Grey		✓		2	<1	2	<1			Hole frags : A.v, qtz-ser, mod-v silic, str schistose
340 N	601357	10	5	20	30	35	B	30	Grey		✓		2	12	13	<1			Hole frags + float : A.v, silic qtz-ser, str schistose
360 N	601358	10	10	20	30	30	B	60	Grey		✓		6	3	3	<1			Hole frags + float : as above
380 N	601359	10	10	25	25	30	B	40	Grey		✓		3	3	3	<1			Hole frags + float : A.v, v silic qtz-ser, str schistose
400 N	601360	10	10	25	25	30	B	40	Grey		✓		1	1	2	<1			Float : as above. Hole frags : silic, thinly laminated
End of	Line to	North																	
0S	No Sample																		
20 S	601361	100	-	-	-	-			-	✓			* 610 570	480 480	15 17	<1 <1			% : A.v, qtz-ser, str schistose . Minor lim + M
40 S	601362	20	10	10	30	30	B	50	Grey		✓		12	6	4	<1			Hole frags + float : A.v, qtz-ser schist, wk silic
60 S	601363	15	15	20	30	20	B	20	Black Grey		✓		7	6	2	<1			Hole frags + float : A.v, qtz-ser schist, str silic
80 S	601364	10	10	30	25	25	B	30	Brown		✓		* 290 310	115 109	46 41	1 2			Hole frags : A.v, qtz-ser, mod silic, mod schistose
100 S	601365	15	10	25	20	30	B	40	Red Brown		✓		280	138	82	1			Hole frags + float : A.v, qtz-ser, mod silic str schistose
120 S	601366	100	-	-	-	-			-	✓?			2200	660	12	<1			Float or %? : A.v, chlor, wk-mod schistose
140 S	601367	100	-	–	-	–			–		✓		170	490	29	<1			Float : A.v, chlor, mod schistose, weathered
160 S	601368	100	-	-	-	-			–		✓		1310	290	14	<1			Float : As above M common on foliation
180 S	601369	60	5	10	10	15	B	20	Black Grey		✓		220	15	1	<1			Hole frags + float : A.v, chlor, ser, mod schistose
200 S	601370	100	-	-	-	–			—	✓?			650	1040	10	1			Float or %? : A.v, micro cryst, chlor, wk schistose
220 S	601371	100	—	—	-	–			—		✓		32	10	3	<1			Float + hole frags : A.v, chlor, wk silic, wk schistose
240 S	601372	100	—	—	—	–			—		✓		430	60	27	<1			Hole frags + float : A.v, str schistose qtz-chlor-ser
260 S	601373	100	—	–	–	–			–	✓			28	31	5	<1			% Rhyolite lava, wk chlor, microcryst, rare qtz eyes

* Check assay value.

294059

053

TENEMENT EL's 1076 & 1073 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 10

AREA/PROSPECT GETHANA – WEST — SAMPLE Nos. 601374 – 601404 — D.P.O. No.

PLAN REFERENCE SECOND PHASE GRID — GEOLOGIST G.P. & T.E. DATE DEC 1976.

A 9005 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag			
LINE 1000E																			
280 S	601374	100	–	–	–	–			–		✓		86	87	5	<1			Float: as above, but no qtz eyes
300 S	601375	100	–	–	–	–			–		✓		380	490	35	<1			Float: A-v, qtz chlor-ser str schistose
320 S	601376	100	–	–	–	–			–		✓		84	153	30	<1			Float: A-v, chlor wk-mod schistose
340 S	601377	100	–	–	–	–			–		✓		*290 310	132 126	9 9	<1 <1			Scree: as above, non schistose rhyolite
END OF	LINE																		
LINE 1100E																			
0 S	NO SAMPLE																		Road foundations
20 S	601378	100	–	–	–	–			–	✓	✓		120	370	38	<1			o/c: A-v, qtz-ser, wk-mod schistose
40 S	601379	100	–	–	–	–			–	✓	✓		190	126	94	<1			o/c: Rhyolite lava, chlor 5% mg qtz
60 S	601380	100	–	–	–	–			–	✓	✓		80	148	55	<1			o/c: A-v, chlor, wk schistose
80 S	601381	100	–	–	–	–			–	✓?			47	100	37	<1			o/c? A-v, chlor, 5-10% fg qtz Reworked pyroclastic?
100 S	601382	100	–	–	–	–			–		✓		50	74	51	<1			Scree: A-v, chlor, mod schistose, 10% fg qtz
120 S	601383	100	–	–	–	–			–		✓		160	290	70	<1			Scree, as above, weak schistose (lava)
140 S	601384	100	–	–	–	–			–		✓		410	310	28	<1			Scree: A-v, chlor, ser, mod schistose, silic
160 S	601385	100	–	–	–	–			–		✓		130	150	10	<1			Scree: A-v, chlor, mod schistose, rare fmg qtz
180 S	601386	20	10	20	30	20			Brown		✓		*630 630	540 530	59 54	2 2			Scree: Rhyolite lava, chlor, mod schistose, 10% fg qtz.
200 S	601387	100	–	–	–	–			–	✓?			360	32	73	<1			o/c? Rhyolite, non schistose, mods Mn staining
220 S	601388	100	–	–	–	–			–	✓			28	94	9	<1			o/c: Rhyolite lava, wk chlorite, silic
240 S	601389	100	–	–	–	–			–	✓?			75	104	16	<1			o/c? M st silic, gy-grn, tr lim cavs after py
260 S	601390	100	–	–	–	–			–		✓		320	195	42	1			Scree: Rhyolite, wk chlor, microcryst
280 S	601391	100	–	–	–	–			–	✓			23	94	8	<1			o/c: Rhyolite, wk chlor, v f.g.
300 S	601392	100	–	–	–	–			–	✓			1380	770	24	2			o/c: Sltst tuffaceous, silic, rare lim fracture fillings
320 S	601393	100	–	–	–	–			–		✓		30	50	5	<1			Scree: Rhyolite, v silic, microcryst ± f.g qtz
340 S	601394	100	–	–	–	–			–	✓			44	90	11	<1			o/c: v silic mst/chert, gy-grn
360 S	601395	100	–	–	–	–			–	✓			41	70	7	<1			o/c: M st mod silic, orange-grey, v wk foliation
380 S	601396	15	10	25	25	25	A/B	20	Dark Brown	✓			210	122	16	1			o/c: sltst wk silic
400 S	601397	100	–	–	–	–			–	✓			23	33	5	1			o/c: rhyolite, non-chlor, mod silic, microcryst
END OF	LINE TO SOUTH																		
20 N	601398	100	–	–	–	–			–	✓			75	28	40	<1			o/c: A-v, qtz-ser, silic str schistose
40 N	601399	20	10	40	10	20	C	10	Light Yellow		✓		*480 510	29 26	20 19	1 1			Hole frags + float: A-v, qtz-ser, str schistose.
60 N	601400	100	–	–	–	–			–	✓			8	160	9	<1			o/c: A-v, qtz ser mod schistose, mod silic
80 N	601401	25	5	25	20	25	B	20	Grey		✓		3	1	<1	<1			Hole frags + float: A-v, qtz-ser, mod silic, str schistose
100 N	601402	25	5	25	20	25	B	20	Grey Yellow Brown		✓		1	1	<1	<1			Hole frags + float: A-v, qtz-ser, str silic, str schistose
120 N	601403	15	5	25	25	30	B/C	40	Light Brown		✓		3	4	2	<1			Hole frags + float: A-v, qtz ser schist, mod silic, lim common
140 N	601404	20	5	25	20	30	B	20	Light brown		✓		3	10	2	<1			Hole frags + float: A-v, qtz-ser schist, silic, weath

* Check assay value.

294060

059

TENEMENT EL's 10/76 + 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 11

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 601405 - 601435 — D.P.O. No.

PLAN REFERENCE SECOND PHASE GRID — GEOLOGIST G.L. & T.E. DATE DEC 1976

A 9006 — ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Sample: Colour	Bedrock: Outcrop	Bedrock: Concealed	Bedrock: Est. Depth to	Metal Content in ppm: Pb	Zn	Cu	Ag			Geological observations
LINE 1100 E																			
160 N	601405	20	-	25	25	30	B	70	Yellow Brown		✓		15	45	3	1			Hole frags : A.v, qtz-ser, silic, str schistose
180 N	601406	20	10	25	25	20	A/B	40	Black Grey		✓		1	2	<1	<1			Float, A.v, qtz-ser, v.silic, str. schistose
200 N	601407	10	5	25	30	30	B	70	Grey		✓		1	2	<1	<1			Hole frags : A.v, qtz-ser schist, silic, weath
220 N	601408	25	10	30	25	10	B	60	Grey		✓		3	2	<1	<1			Hole frags + float : A.v, qtz ser, str schistose + mod silic
240 N	601409	15	-	30	30	25	B	60	Yellow Grey		✓		3	4	1	<1			Hole frags : Slt st, silic, sheared + rare qtz ser schist
260 N	601410	10	-	30	30	30	A/B	10	Grey	✓			4	2	<1	<1			% A.v, qtz-ser, str schistose + silic. Bulldozed.
280 N	601411	20	-	30	40	10	A/B	20	Grey	✓			5	1	<1	<1			% A.v, qtz-ser, mod silic, str schistose
300 N	601412	100	-	-	-	-			-	✓			7	12	28	<1			% A.v, qtz ser, mod silic, str schistose
320 N	601413	20	-	30	30	20	B	20	Grey	✓			3	2	1	<1			Soil bulldozed % : as above
340 N	601414	10	5	25	20	40	A/B	10	Grey		✓		2	2	1	<1			Soil bulldozed. Scree : silic qtz-ser schist
360 N	601415	100	-	-	-	-			-	✓			11	138	16	<1			% A.v, qtz ser, str schistose, mod silic
380 N	601416	10	10	30	30	20	?	20	Grey		✓		3	2	<1	<1			Bulldozed soil with silic qtz-ser schist
400 N	601417	10	10	30	20	30	B	20	Grey		✓		1	2	1	<1			Hole frags : rare milky qtz. Scree : rare silic qtz-ser schist
END OF	LINE																		
LINE 1200	E																		
20 N	601418	100	-	-	-	-			-	✓			91	590	4	<1			% : A.v, qtz-ser, mod silic, mod schistose
40 N	601419	20	5	25	30	20	A	20	Grey		✓		27	35	2	<1			Scree : chert + lesser silic qtz - ser schist
60 N	601420	100	-	-	-	-			-		✓		8	210	8	<1			Float, qtz-ser, v.silic, wk schistose
80 N	601421	100	-	-	-	-			-	✓			130	26	14	<1			% : A.v, qtz-ser, mod silic, mod schistose, qtz eyes
100 N	601422	100	-	-	-	-			-	✓			23	270	19	<1			% : as above
120 N	601423	100	-	-	-	-			-		✓		*310 330	21 19	15 17	<1 <1			Float : Qtz ser schist, gy chert. Bulldozed ?
140 N	601424	25	10	20	20	25	A/B	10	Light Grey		✓		29	5	2	<1			Float : Qtz-ser schist, v silic, cherty
END OF	LINE TO NORTH																		
0s	NO SAMPLE																		Road foundations
20 S	601425	100	-	-	-	-			-		✓		27	77	15	<1			Scree : Qtz-ser schist from road
40 S	601426	100	-	-	-	-			-		✓		3	15	3	<1			Scree : As above
60 S	601427	30	5	20	20	25	B	30	Red Brown		✓		23	62	6	<1			Scree : Av, qtz-ser, mod schistose, wk silic
80 S	601428	SAMPLE RESECTED					A/B	20			✓								Scree : Av, qtz-ser, str schistose, wk silic, rare lim
100 S	601429	40	5	20	25	10	B	50	Brown		✓		18	120	8	<1			Scree : Av, qtz-ser, mod - str schistose
120 S	601430	30	5	20	35	10	A/B	10	Red Brown		✓		120	130	5	<1			Hole frags : Av, qtz-ser, str schistose, wk silic
140 S	601431	30	5	30	25	10	B	30	Pale Red		✓		*630 600	450 430	28 28	1 1			Hole frags : As above but no trace of limonite
160 S	601432	30	5	40	20	5	B	30	Pale Red		✓		65	50	7	1			Hole frags : As above
180 S	601433	100	-	-	-	-			-	✓			29	61	7	<1			% : A.v, qtz-ser, mod schistose, mg. qtz
200 S	601434	100	-	-	-	-			-	✓			59	65	4	<1			% : Av, qtz-ser, wk schistose, mg. qtz.
220 S	601435	100	-	-	-	-			-	✓			*280 310	115 107	39 39	<1 <1			% : Chert, highly fractured

* Check assay value.

294061

060

TENEMENT EL's 10/76 & 7/73 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 12

AREA/PROSPECT GETHANA - WEST — SAMPLE Nos. 601436 - 601465 — D.P.O. No. — GEOLOGIST G.P. & T.E — DATE DEC 1976

PLAN REFERENCE SECOND PHASE GRID — ANALYSED BY ZC

A 9006

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag			Geological observations
LINE 1200E																			
240 S	601436	100	–	–	–	–			–		✓		80	57	200	<1			Scree: Rhyolite tuff, wk chlor, microcryst
260 S	601437	100	–	–	–	–			–		✓		260	121	48	<1			Scree: Rhyolite, mod chlor microcryst ± 10% m.g. qtz
280 S	601438	100	–	–	–	–			–		✓		400	33	42	<1			Scree: Rhyolite lmst wk chlor
300 S	601439	100	–	–	–	–			–	✓			390	1420	34	2			% : Mst, silic, str chlor 1% fmg qz, tr galena
320 S	601440	40	5	15	20	20	A/B	30	Dark Brown		✓		*910 860	770 800	360 330	3 ½			Hole frags: Mst, silic, ± lim, + some rhyolite
340 S	601441	100	–	–	–	–			–	✓			260	460	14	<1			% : Rhyolite, ± mg. fel + qtz (pyroclastic?)
360 S	601442	100	–	–	–	–			–	✓			220	530	13	<1			% : As above
380 S	601443	100	–	–	–	–			–	✓			440	138	16	1			% : Rhyolite pyroclastic, vmatt, 5% mg. qtz.
400 S	601444	100	–	–	–	–			–		✓		*430 400	680 650	21 19	1 1			Scree: As above, wk chlor + wk schistose
420 S	601445	100	–	–	–	–			–		✓		*1350 1350	1240 1210	54 50	1 1			Scree: As above ± Mn in fractures
440 S	601446	100	–	–	–	–			–		✓		12	31	3	<1			Scree: Mst, wk-mod silic, lt gy + rhy
460 S	601447	100	–	–	–	–			–		✓		12	92	67	<1			Scree: Mst, silic, + rhy pyroclastic
480 S	601448	100	–	–	–	–			–	✓?			43	89	13	<1			%? Rhy pyroclastic/tuff, 10% m.g. qtz
500 S	601449	100	–	–	–	–			–		✓		150	270	17	<1			Scree. Rhy pyroclastic/tuff, chlor 20% fmg. qtz.
520 S	601450	100	–	–	–	–			–		✓		210	183	18	1			Scree: Mst silic + lesser rhyolite
540 S	601451	15	10	15	30	30	A/B	10	Brown		✓		200	320	18	2			Scree. : as above
560 S	601452	100	–	–	–	–			–	✓			47	141	15	<1			% : Mst, wk silic gy
580 S	601453	100	–	–	–	–			–		✓		173	74	5	<1			Scree. : Mst silic gy + rare rhyolite
600 S	601454	100	–	–	–	–			–		✓		42	48	2	<1			Scree. : Mst, silic + rhyolite
END OF	LINE																		
LINE 1300E																			
0 S	No SAMPLE										✓								Road foundations
20 S	No SAMPLE										✓								Scree from road construction
40 S	601455	100	–	–	–	–			–	✓			70	128	8	<1			% : Rhyolite, mem schistose, 10% m.g. qtz
60 S	No SAMPLE										✓								Scree from road construction
80 S	601456	40	5	15	20	20	B	20	Brown		✓		180	160	18	<1			Scree: as at 40S
100 S	601457	25	10	20	30	15	A/B	20	Black		✓		440	520	24	1			Scree: Alv, qtz-ser, str schistose
120 S	601458	30	10	15	25	30	A/B	20	Brown		✓		770	84	46	7			Float, Alv, qtz-ser schist, mod schistose
140 S	601459	40	5	25	20	10	A/B	20	Black Grey		✓		180	28	5	1			Scree: As above
160 S	601460	10	10	30	30	20	A/B	20	Black Grey		✓		1010	140	22	9			Scree: Alv, qtz-ser, wk schistose
180 S	601461	20	5	25	30	20	B	70	Brown		✓		1100	76	37	10			Hole frags + scree: Alv, qtz-ser, mod schistose
200 S	601462	30	10	30	20	10	B	40	Dark Brown		✓		180	39	8	1			Scree: Alv, chlor + qtz-ser, str schistose
220 S	601463	100	–	–	–	–			–	✓			93	183	44	<1			% : Alv, chlor Scree: Qtz-ser bdl wk-mod schistose
240 S	601464	100	–	–	–	–			–	✓			300	43	32	<1			% : Alv, wk chlor + wk schistose, vfg fel
260 S	601465	20	10	20	30	20			Brown		✓		220	142	32	1			Scree: Mst. chlor + tuffaceous silic mst

* Check assay value.

294062

061

TENEMENT EL'S 10/76 + 7/73

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 13

D.P.O. No.

AREA/PROSPECT CETHANA - WEST SAMPLE Nos. 601466 - 601479

GEOLOGIST G.P. + T.E. DATE DEC 1976

PLAN REFERENCE SECOND PHASE GRID

ANALYSED BY ZC

A 9006

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.						Geological observations
LINE 1300 E		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con-cealed	Est. Depth to	Pb	Zn	Cu	Ag			
280 S	601466	30	5	15	30	20	A/B	20	Brown		✓		330	107	38	2			Hole frags: Mst v chloritic mod schistose
300 S	601467	25	15	20	25	15	A/B	20	Dark Brown		✓		500	270	10	2			Hole frags: A.v, qtz-ser mod schistose
320 S	601468	10	5	15	30	40	B	50	Brown		✓		310	145	4	<1			Hole frags: A.v, qtz-ser, str schistose
340 S	601469	20	10	30	30	10	B	20	Brown		✓		240	147	3	<1			Hole frags: A.v, wk-str chlor, wk-mod schistose
360 S	601470	5	10	25	40	30	A/B	30	Dark Brown		✓		* 420 400	198 193	3 3	<1 1			Scree: chlor, rhy, wk schistose
380 S	601471	100	–	–	–	–			–	✓			* 310 320	580 580	16 15	1 <1			O/c: rhy. chlor c v.f.g. fel groundmass
400 S	601472	100	–	–	–	–			–	✓?			130	540	4	<1			O/c? As above c 10% f.g. qtz. Scree same
420 S	601473	20	5	20	30	25	B	20	Brown				470	470	11	2			Scree: A.v, chlor, str schistose
440 S	601474	100	–	–	–	–			–	✓			110	54	65	<1			O/c: vfg - microcryst silic tuffaceous sed or chert
460 S	601475	100	–	–	–	–			–	✓			4	29	6	<1			O/c: vfg, silic, slightly tuffaceous sed ?
480 S	601476	100	–	–	–	–			–	✓			* 300 320	66 60	34 29	<1 <1			O/c: clst mod silic, yell or pink brn
500 S	601477	100	–	–	–	–			–	✓			120	127	41	1			O/c: Rhyolite c microcryst or glassy groundmass
520 S	601478	100	–	–	–	–			–		✓		81	31	8	<1			Scree: clst, wk silic, gy + rhy, vfg c m.g. py cavs
540 S	601479	100	–	–	–	–			–	✓			110	58	15	<1			O/c: sltst, mod silic
END OF	LINE																		

* Check assay value.

294063

062

TENEMENT EL 10/76 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 1

AREA/PROSPECT CETHANA – WEST — SAMPLE Nos. 601653 – 601833 — D.P.O. No.

PLAN REFERENCE PHASE II GRID SOIL SAMPLING – EXTENSIONS — GEOLOGIST GP — DATE Dec. 1976

ANALYSED BY Robertson Research

A 9006

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag	Mn	Geological observations
LINE 1300E				Resampling				Line 1300E.										
40S	601653	50	10	10	20	10	B	20	Brown	✓			180	160	30	2	1400	o/c. Mod alt massive pyroclastic.
60S	601654	20	5	20	25	30	B	20	Brown		✓		520	310	50	2	9200	Scree. Mod alt massive a.v.
220S	601655	10	10	20	30	30	B/A	20	Brown	✓			190	110	140	4	2870	Some organic material.
240S	601656	10	20	20	20	30	A/B	10	Brown	✓			260	110	145	2	2500	Much organic material.
380S	601657	10	10	20	30	30	B/C	20	Brown	✓			560	400	15	2	7300	
400S	601658	20	10	15	25	30	B	20	Brown	✓			500	390	15	4	2720	o/c Mod alt chloritic-qtz-ser a.v.
420S	601659	10	5	20	25	40	B	20	Brown				560	640	25	4	2450	
440S	[illegible]	5	5	15	15	70	B	20	Grey	✓			30	20	5	1	60	o/c Tuffshales - finely bedded.
460S	601661	20	10	20	20	30	B	10	Grey	✓			20	10	5	1	50	o/c. Tuffaceous pebble breccia.
480S	601662	10	10	30	20	30	B	10	Yellow brown	✓			190	30	20	1	80	Scree. Tuffaceous qtz-breccia o/c Tuffshales.
500S	601663	20	10	20	30	20	B/C	10	Brown	✓			250	130	60	2	200	o/c Tuffaceous sediment i rounded qtz.
520S	601664	20	10	20	15	35	B	30	Brown	✓			310	100	60	2	500	o/c Vitric tuffshale
540S	601665	30	20	10	20	20	A/B	20	Dark brown	✓			190	60	40	2	800	o/c Finely bedded tuffshale.
END OF LINE.																		
Line 1200E				Resampling				Line 1200E.										
20S	601817	25	-	20	20	35	B	20	Brown				50	240	10	4	4670	8m south of previous site 601425.
40S	601818	30	10	20	20	20	B	40	Grey				20	40	5	2	190	5m south of previous site 601426.
60S	601819	50	10	5	10	25	B	20	Red-grey				30	60	10	2	470	7m " " " " 601427.
80S	601820	40	5	15	20	20	B	30	Brown				50	90	10	2	2030	6m " " " 601428.
100S	601821	40	5	15	20	20	B	40	Brown				130	350	40	2	>1%	7m " " " " 601429.
120S	601822	40	5	15	20	20	B	30	Brown				440	300	15	2	>1%	9m " " " " 601430.
140S	601823	30	10	20	20	20	B/A	40	Brown				390	590	50	5	>1%	8m " " " " 601431.
160S	601824	30	10	20	20	20	B	20	Brown				40	50	10	2	140	10m " " " " 601432.
180S	601825	40	10	20	15	15	B/C	20	Grey				40	60	15	1	520	12m " " " " 601433.
200S	601826	30	10	15	20	25	B	20	Brown				120	100	50	2	130	17m " " " " 601434.
220S	601827	20	-	20	30	30	B/A	10	Brown				200	110	95	2	160	16m " " " " 601435.
240S	601828	30	10	20	20	20	B/A	15	Brown				220	170	95	2	380	16m " " " " 601436 M. 601437.
260S	601829	40	10	10	15	25	B	30	Brown				280	120	160	4	710	At 601438
280S	601830	10	5	30	25	30	B	[illegible]					900	3000	420	6	>1%	4m south of previous site 601439 Limonitic soil.
300S	601831	20	20	30	15	15	A/B	20	Brown				520	590	380	5	9500	6m " " " " 601440
320S	601832	40	15	5	20	20	A/C	10	Dark brown				670	390	160	5	4220	9m " " " " 601441
340S	601833	10	10	20	30	30	A/C	40	Dark brown				600	400	100	5	9000	13m " " " " 601442

* Check assay value.

294064

063

GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 2

TENEMENT EL 10/76 — D.P.O. No.

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. 601834 - 601652 — GEOLOGIST G.P. — DATE Dec 1976

PLAN REFERENCE PHASE II GRID SOIL SAMPLING - EXTENSIONS — ANALYSED BY Roberton Research

A 9005

Grid Co-ordinate	Sample No.	Soil Composition: Rock %	Organic %	Sand %	Silt %	Clay %	Soil Horizon	Sample: Depth cm.	Colour	Bedrock: Outcrop	Concealed	Est. Depth to	Metal Content in ppm.: Pb	Zn	Cu	Ag	Mn		Geological observations
Line 1100E																			
360S	601834	50	10	5	15	20	B/A	10	Dark brown				380	190	45	2	3150		14m south of previous site 601443.
380S	601835	20	20	10	20	30	A/B	20	Dark brown				460	370	75	4	71%		16m " " " " 601444.
400S	No sample - creek.																		17m " " " " 601445. AA 601446
420S	601836	25	60	5	10	30	B/A	10	Dark brown				220	380	155	4	8000		AA 601447
440S	601837	10	10	20	30	30	B/A	20	Dark brown				920	930	95	6	4600		2m south of previous site 601448
460S	601838	30	10	20	20	20	B	30	Brown				200	80	25	2	500		" " " " " 601449
480S	601839	20	10	20	20	30	B	20	Brown				460	620	65	5	2300		3m " " " " 601450
500S	601840	50	10	10	15	15	B/A	10	Dark brown				220	280	55	4	2830		5m " " " " 601451
520S	601841	60	10	15	15	-	A/B	10	"				190	260	55	4	4050		7m " " " " 601452
540S	601842	60	10	15	15	-	B/A	30	"				40	140	35	2	2000		9m " " " " 601453
	END OF LINE.																		
								Resampling Line 1100E:											
20S	601634	20	5	10	25	40	B/C	10	Brown	✓			50	50	30	1	220		O/c. Mod alt qtz-ser schist.
40S	601635	5	5	10	20	60	B/C	10	Brown	✓			30	20	20	1	70		O/c Mod alt a.v. ± qtz phenocrysts.
60S	601636	30	5	20	20	25	B/C	10	Brown	✓			70	40	40	1	90		O/c Mod alt chlorite-qtz-ser a.v ± limonite.
80S	601637	5	5	10	20	60	B	20	Brown		✓		50	60	30	1	80		Sub O/c: Qtz-ser-chlorite schist.
100S	601638	20	10	10	30	30	B	30	Brown	✓			80	50	20	1	70		O/c - Mod alt a.v ± qtz phenocrysts.
120S	601639	15	5	25	25	30	B	20	Brown		✓		300	200	130	6	120		Scree: Mod alt a.v ± qtz phenocrysts.
140S	601640	30	5	20	20	25	B	30	Brown	✓			230	90	50	2	120		O/c: Mod alt a.v ± pits after py.
160S	601641	20	30	10	10	30	B	20	Dark brown		✓		340	200	25	2	1360		Scree: " " " ± limonite ± kaolin
180S	601642	10	30	10	20	30	B	30	Brown		✓		630	510	85	4	3570		Sub O/c: Weakly alt chloritic a.v - pyroclastic.
200S	601643	10	10	20	30	20	B	10	Brown		✓		460	470	75	4	1430		Scree: Weakly alt chloritic a.v
220S	601644	5	20	20	25	30	A/B/C	10	Dark brown	✓			420	460	65	2	4400		O/c: Very hard, v. weakly alt a.v (lava?)
240S	601645						A	10	Black	✓		Sample rejected.							O/c: Grey-green vitric tuff-shale
260S	601646	20	20	10	10	40	B/C	10	Brown	✓			500	60	30	2	790		O/c: Unaltered green a.v. [redacted] pebble breccia
280S	601647	10	60	10	10	10	A/B/C	20	Dark brown	✓			1100	130	80	4	6500		O/c: Massive unaltered a.v - pebble breccia.
300S	601648	-	80	-	-	20	A/B	10	Black	✓			1180	630	225	4	3000		O/c. Grey-green tuff-shale ± qtz veins
320S	601649	30	30	20	10	10	B	20	Brown		✓		230	100	55	2	490		Scree: Unaltered pebble breccia
340S	601650	10	10	20	30	30	B	20	Dark brown	✓			300	120	60	2	2600		O/c: Finely bedded tuff shale.
360S	601651	30	10	20	20	20	B	30	Brown	✓			230	110	45	2	840		O/c: " " " "
380S	601652	30	10	20	20	20	B/C	20	Dark brown	✓			220	120	50	2	3470		O/c: " " " "
	END OF LINE.																		

* Check assay value.

294065

064

TENEMENT EL 10/76 — GEOCHEMICAL SOIL SAMPLING LEDGER — Page No. 3

AREA/PROSPECT CETHANA - WEST — SAMPLE Nos. — D.P.O. No.

PLAN REFERENCE PHASE II GRID - SOIL SAMPLING - EXTENSIONS. — GEOLOGIST GP — DATE Dec 1976

ANALYSED BY Roberton Research.

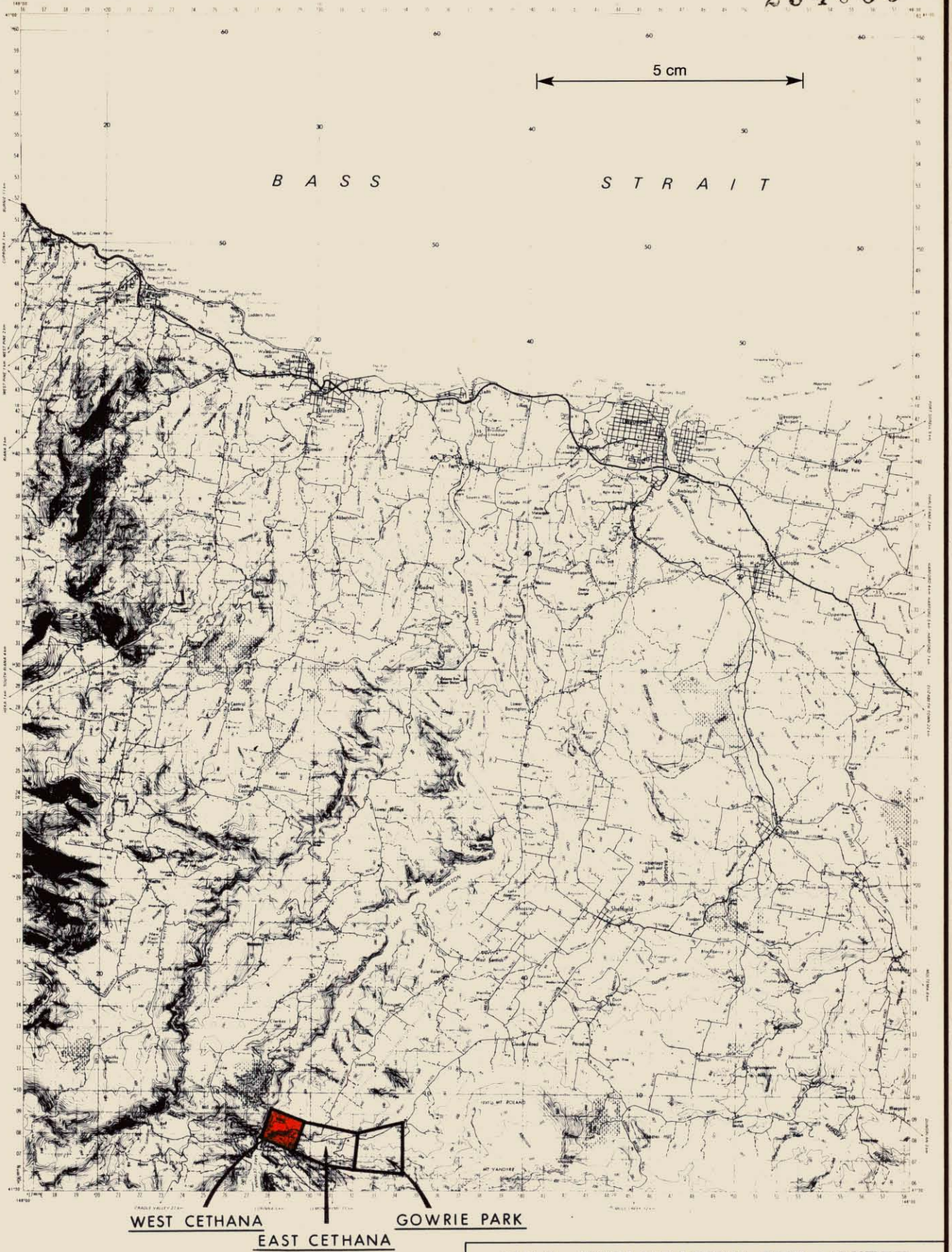
A 9006

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn	
Line 1000E						Resampling		Line	1000E									
0S	No sample																	
20S	601801	20	30	10	20	20	A/B	10	Dark Brown				170	70	20	2	7300	At previous site 601361
40S	601802	20	10	10	20	40	B	15	Grey				20	10	5	1	30	3m south of previous site 601362.
60S	601803	-	5	10	20	65	B	30	Grey				30	10	5	ND	30	5m " " " " 601363.
80S	601804	30	5	15	20	30	B	30	Fawn				70	30	35	ND	40	4m " " " " 601364.
100S	601805	20	-	20	25	35	B	20	Brown				390	90	30	1	190	4m " " " " 601365.
120S	601806	20	30	20	15	15	B	10	Brown				520	400	20	2	1520	4m " " " " 601366.
140S	601807	15	15	20	20	30	B	15	Brown				590	190	15	4	380	8m " " " " 601367.
160S	601808	10	-	30	30	30	B	15	Brown				500	230	15	4	200	9m " " " " 601368
180S	601809	20	10	10	20	40	B	20	Brown				300	50	10	2	60	8m " " " " 601369
200S	601810	20	10	20	25	25	B	15	Brown				350	70	15	2	100	8m " " " " 601370
220S	601811	30	10	20	20	20	B	20	Yellow Brown				360	80	25	4	130	7m " " " " 601371
240S	601812	40	10	20	15	15	C	10	Brown				590	70	20	2	80	7m " " " " 601372
260S	601813	40	5	20	20	15	B	15	Brown				130	50	20	2	130	7m " " " " 601373
280S	601814	30	5	15	20	30	B	20	Brown				440	100	30	4	840	9m " " " " 601374
300S	601815	20	10	15	20	35	B	15	Brown				380	180	35	4	1620	9m " " " " 601375
320S	601816	20	15	10	25	30	B	20	Brown				320	140	35	2	2200	10m " " " " 601376.
	END OF LINE																	
Line 1400E							New	Line	1400E									
0S	No sample.																	
20S	No sample.																	
40S	601845	10	10	20	25	35	B	20	Brown	✓			390	70	15	1	955	O/c: Qtz ser schist.
60S	601846	15	5	20	25	35	B	30	Brown				90	40	15	1	60	Scree: Qtz ser schist ± limonite
80S	601847	15	10	15	25	35	B	10	Brown	✓			200	40	10	1	140	O/c: Pale green sericitic schist ± Mn stain
100S	601848	10	10	20	25	35	B	30	Brown	✓			470	650	15	2	5400	O/c: Chlorite schist ± Mn + minor limonite
120S	601849	10	10	25	30	25	B	30	Brown	✓			1560	830	55	10	9800	O/c: Chlorite schist ± Mn
140S	601850	15	20	25	20	20	B	20	Pink Brown				1310	530	45	4	8550	Scree: Chlorite schist after ferruginous gnt.
160S	601851	15	15	25	25	20	B	30	Pink Brown				1090	520	30	4	9750	Scree: Chlorite schist ± limonite
180S	601852	15	10	20	20	35	B	30	Brown				340	230	20	1	1900	Scree: Chlorite schist ± Mn + limonite
200S	601853	15	10	20	20	35	B	30	Brown	✓			310	300	40	2	1900	O/c: Bedded vitric tuff shale.
220S	601854	15	10	20	25	30	B	30	Pink Brown				390	300	60	2	5000	Scree: Weakly alt a.v. + chlorite schist
240S	601855	15	10	20	25	30	B	30	Pink Brown				390	210	50	1	3500	Scree: Alt. vitric tuff shale
260S	601856	15	10	25	25	25	B	30	Brown	✓			420	200	50	1	4100	O/c: Unbedded alt. vitric tuff ± limonite
280S	601857	25	20	25	20	10	B	30	Pink Brown				340	250	50	1	7800	Scree: Weakly alt pebble breccia.
300S	601858	25	25	20	20	10	A/B	20	Black				420	340	65	1	7800	Scree: Tuff shales + pebble breccia.
	END OF LINE																	

* Check assay value.

065

294066



INDEX TO 1:250000 SHEETS

C.R.A. EXPLORATION PTY. LIMITED

LOCATION MAP

BURNIE SK 55-3

geologist: J.G.P.	scale: 1:250 000	report no: 9041
drawn: N.A.P.	date: Nov.'77	plan no: Tc89

294067

LEGEND

TERTIARY
- Tb — Basalt

ORDOVICIAN
- Orc — ROLAND CONGLOMERATE
  Massive, coarse siliceous conglomerate

CAMBRIAN

ALTERED ACID VOLCANICS AND ASSOCIATED SEDIMENTS
(NOT NECESSARILY LISTED IN STRATIGRAPHIC ORDER)

- €ss — Siliceous quartz-sericite schists representing very highly altered acid volcanics Predominately after vitric and siliceous tuffaceous rocks
- €qs — Quartz-sericite schist after moderately to strongly altered acid volcanics
- €cs — Chlorite schist and highly chloritic moderately altered acid volcanics
- €va — Weak to moderately altered undifferentiated acid volcanics — predominately pyroclastics with minor tuffs and probable ignimbrites
- €vu — Unaltered to very weakly altered undifferentiated acid volcanics
- €ta / €tg / €t — Vitric tuff-shale, tuffaceous siltstone, black tuff-shale Minor pyroclastic interbands, rare beds of quartzose sandstone
  €t_s Sedimentary volcanic grit breccia and conglomerate
  a weakly to moderately sericitically altered
- €ce — CETHANA SANDSTONE
  Well bedded quartzose sandstone, siltstone and shale
  Some pyritic black shale
  Gradational boundary with Unit €t above from which it differs only by lesser tuffaceous and greater sedimentary character
- €L — Chemical sediments or possible sinters
- €dl — Rhyodacite lava — appears at least partly intrusive Very weakly chloritised and epidotised
- €dx — Chloritic dacitic crystal tuff and fine pyroclastic

- Dip and strike of bedding Arrow shows direction of facing
- Dip and strike of schistosity
- Dip and strike of primary volcanic lineation
- Fault showing dip of fault plane
- Inferred fault
- Diamond drillhole
- Geological boundary

N approx

LAKE BARRINGTON

EL 7/73 ASARCO - CRAE JOINT VENTURE
EL 10/76 - CRAE

5 cm

1860

CRA EXPLORATION PTY LIMITED

GEOLOGICAL MAP

CETHANA WEST - E.L. 10/76 & E.L. 7/73

NORTH - WEST TASMANIA

BURNIE SK 55-3

SCALE 1 5000(approx)

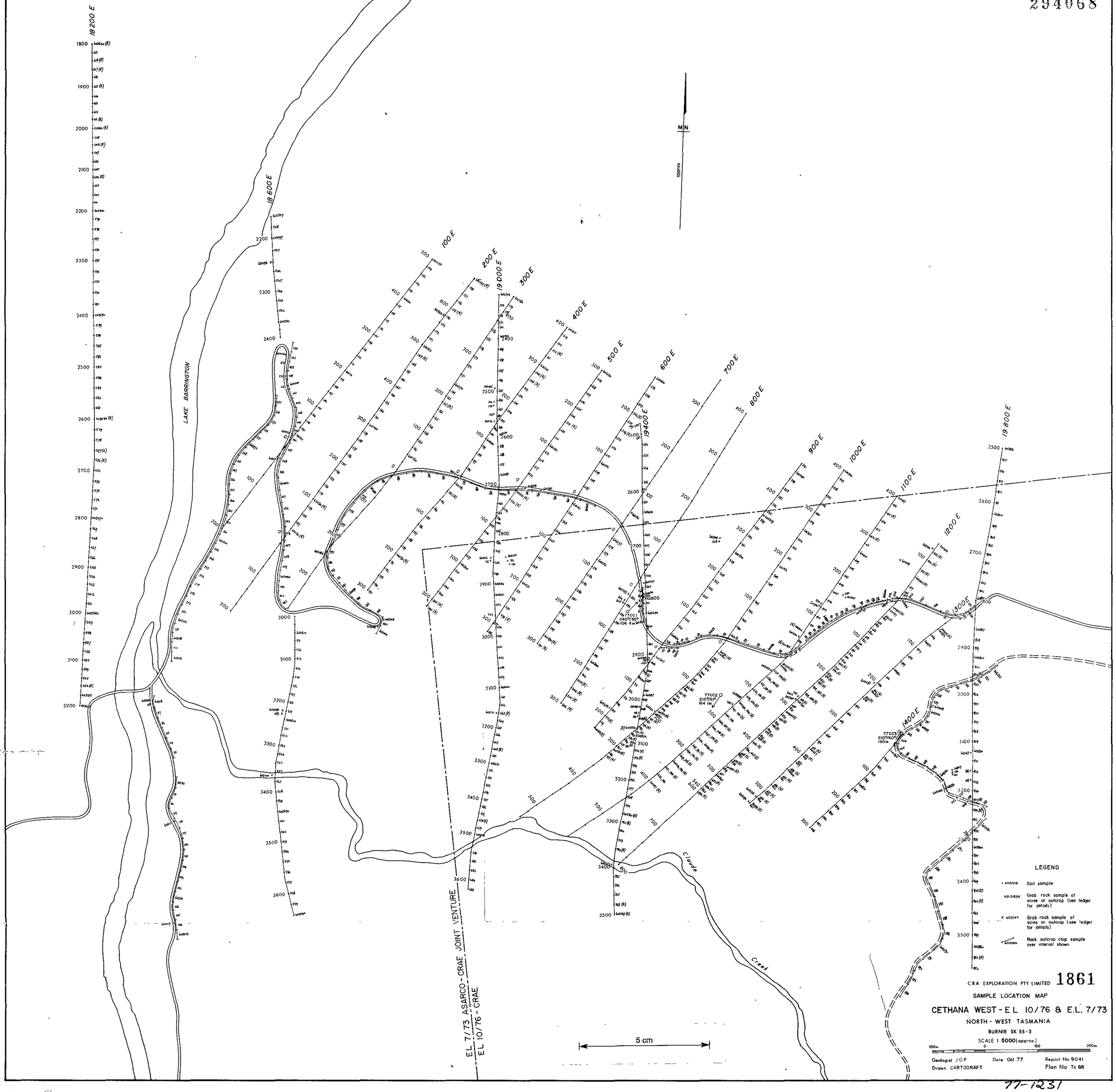
100m 0 100 200m

Geologist J.G.P. Date Oct 77 Report No 9041

Drawn CARTODRAFT Plan No Tc 85

77-1231

294068



77-1231

294069

LAKE BARRINGTON

MN

approx

LEGEND

Results in ppm

- 131 Soil sample
- 18 (a) Rock chip sample (scree or outcrop)
- x 23 Rock grab sample (scree or outcrop)
- 140 Rock outcrop chip sample over interval shown

Contouring primarily based on soil sampling

E.L. 7/73 ASARCO - CRAE JOINT VENTURE
E.L. 10/76 - CRAE

Cloude Creek

5 cm

CRA EXPLORATION PTY LIMITED

GEOCHEMICAL MAP - ppm LEAD

CETHANA WEST - E.L. 10/76 & E.L. 7/73

NORTH - WEST TASMANIA

BURNIE SK 55-3

1862

SCALE 1 5000 (approx)

100m 0 100 200m

Geologist J.G.P. Date Oct 77 Report No 9041

Drawn - CARTODRAFT Plan No Tc 87

77-1231

294070

LAKE BARRINGTON

LEGEND

Results in ppm

- 120 Soil sample
- 94(R) Rock chip sample (scree or outcrop)
- × 4040 Rock grab sample (scree or outcrop)
- 120 Rock outcrop chip sample over interval shown

Contouring primarily based on soil sampling

EL 7/73 ASARCO - CRAE JOINT VENTURE
EL 10/76 - CRAE

5 cm

C.R.A EXPLORATION PTY LIMITED

GEOCHEMICAL MAP - ppm ZINC

CETHANA WEST - E.L 10/76 & E.L 7/73

NORTH - WEST TASMANIA

BURNIE SK 55-3

1863

SCALE 1 5000(approx)

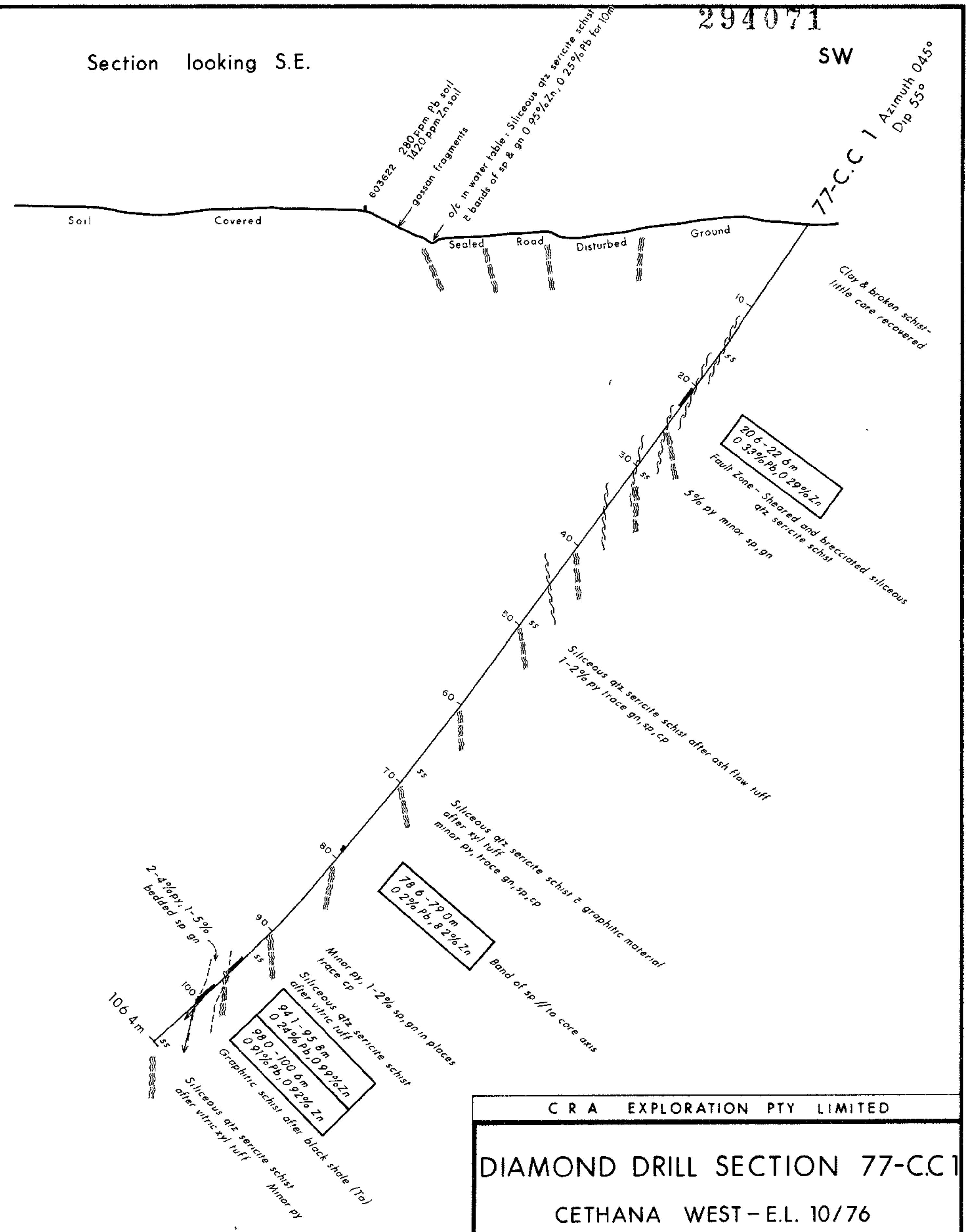
100m 0 100 200m

Geologist J.G.P Date Oct 77 Report No 9041

Drawn CARTODRAFT Plan No Tc 86

77-1231

SAMPLE No	FROM (M)	TO (M)	REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag	Mn			
601666	5 00	7 00	0 40	42	32	35	<1	45			
601667	8 00	9 40	0 30	210	940	300	<1	25			
601668	8 00	12 60	sludge	90	190	180	<1	160			
601669	12 60	14 00	sludge	80	80	65	<1	50			
601671	14 00	15 00	0 40	270	550	80	<1	18			
601670	14.00	15 00	sludge	100	230	75	<1	65			
601672	15 00	15 60	0 60	710	740	12	<1	15			
601673	15 60	17 00	sludge	270	780	50	<1	45			
601674	17 00	19 20	2 00	260	540	48	<1	4300			
601675	19·20	20 60	1 40	250	730	70	<1	4560			
601679	20 60	22 60	1 80	3310	2880	150	2	4950			
601677	22 60	23 30	0 70	130	200	20	<1	4900			
601676	23 30	24 30	0 90	980	720	48	2	3600			
601678	24 30	25 20	0 90	800	180	22	<1	3380			
601681	25 20	28 20	1·70	240	190	22	<1	3640			
601682	28·90	30 50	1 60	680	1040	38	1	3650			
601683	30 50	31 60	1 00	950	770	120	1	5620			
601684	31 60	33·20	1 00	400	610	42	<1	7800			
601685	33 20	36 20	2 10	140	230	25	<1	6800			
601686	36 20	37 60	1 40	70	180	20	<1	7380			
601727	37 60	38 90	1 30	90	130	10	<1	5780			
601687	38 90	41 00	2 10	190	390	20	<1	4400			
601688	41 00	43·00	1 90	200	430	38	<1	5500			
601689	43 00	45 00	1 80	190	270	28	<1	6000			
601690	45 00	47 00	1 90	85	170	48	<1	4300			
601728	47 00	48 20	1 20	25	270	65	<1	5840			
601729	48 20	49 80	1 60	35	270	28	<1	4880			
601730	49 80	51 30	1 50	60	210	28	<1	5080			
601691	51·30	51 60	0 30	80	160	48	<1	2500			
601731	53 00	55 00	2 00	35	220	45	<1	3840			
601732	55·00	57 30	2 30	70	190	55	<1	4320			
601692	57 30	58 90	1 60	150	180	40	<1	4200			
601733	58 90	61 00	1 90	80	200	330	<1	5800			
601734	61 00	62 70	1 70	320	180	150	1	5750			
601693	62 70	64 50	1 40	95	940	260	<1	5000			
601735	64 50	67 80	2 70	110	140	100	<1	4480			
601736	67 80	70 70	2 80	60	270	50	<1	5160			
601737	70 70	72 00	1 30	38	160	10	<1	3840			
601694	72 00	72 30	0 30	140	380	38	<1	4440			
601738	72 30	74 40	2 10	38	180	15	<1	3200			
601739	74 40	76 00	1 60	140	340	22	<1	4400			
601695	76 00	78 60	2 60	410	1530	65	<1	5060			
601696	78 60	79 00	0·40	1970	8·2%	340	3	1 0%			
601697	79 00	79 40	0 40	160	3170	110	<1	3020			
601740	79 40	81 20	1 80	80	740	18	<1	3900			
601741	81 20	83 00	1 80	500	850	80	<1	5720			
601698	83 00	85 30	2 30	220	410	48	<1	4460			
601742	85 30	87 00	1 70	200	660	18	<1	5160			
601743	87 00	88 60	1 60	60	110	18	<1	2760			
601699	88 60	89 80	1 20	570	990	110	<1	1 06%			
601700	90 00	92 00	2·00	390	910	45	<1	5640			
601701	92 00	94 10	2 10	330	1220	65	<1	4720			
601702	94 10	95 80	1 70	2380	9900	180	5	4520			
601703	95 80	98 00	2 20	150	2000	110	<1	4700			
601704	98 00	100 00	2 00	1 03%	1·09%	190	12	5950	98-100 60		
601705	100 00	100 60	0 60	8300	3600	120	7	8900	9100 Pb 9200 Zn		
601744	100 60	101 50	0 90	150	150	28	<1	3920			
601745	101 50	104·00	2·50	30	130	18	<1	2640			
601746	104·00	106 40	2·40	75	190	18	<1	2800			



Dip of shearing

Dip of schistosity

Dip of bedding

Geological boundary

5 cm

C R A EXPLORATION PTY LIMITED

DIAMOND DRILL SECTION 77-C.C 1

CETHANA WEST – E.L. 10/76

NORTH WEST TASMANIA

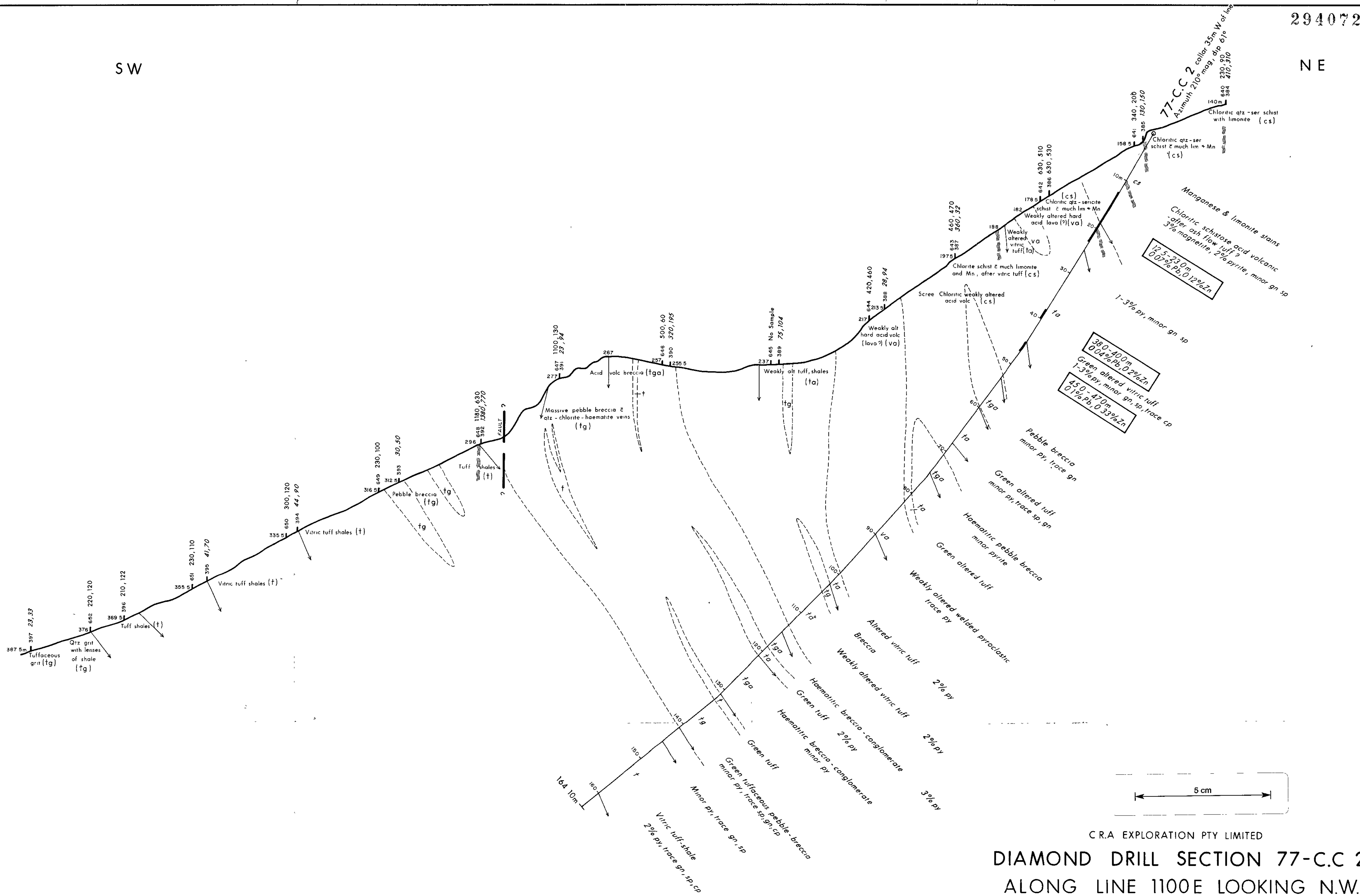
77-1231

1864

Ref BURNIE SK 55-3	Scale 1:500
Geol. J G P.	Report No 9041
Traced: N A.P.	Plan No Tc 49

294072

SAMPLE No	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Pb	Zn	Cu	Ag	Mn
601706	6 50	8 50	1 90	210	660	28	<1	1400
601747	8 50	10 60	1 90	210	650	22	<1	1240
601748	10 60	12 50	1 60	150	590	25	1	550
601707	12 50	13 50	1 00	1650	900	38	2	4020
601749	13 50	14 00	0 50	310	640	8	<1	710
601708	14 00	16 00	2 00	670	1640	18	<1	9570
601709	16 00	18 00	2 00	490	1080	20	<1	9850
601710	18 00	19 30	1 30	330	520	22	<1	4700
601711	19 30	21 30	0 80	950	1900	30	1	2880
601712	21 30	23 00	1 70	560	970	48	1	2720
601750	23 00	24 40	1 30	75	160	60	<1	2400
601713	24 40	25 40	1 00	40	110	65	<1	520
601751	25 40	26 60	1 20	15	80	28	<1	2340
601714	26 60	27 70	1 10	20	90	20	<1	1540
601715	27 70	29 90	1 80	28	190	65	<1	880
601716	29 90	32 00	2 10	70	180	110	<1	1360
601717	32 00	34 00	2 00	10	50	40	<1	750
601718	34 00	36 00	2 00	80	100	48	<1	1760
601719	36 00	38 00	2 00	450	420	55	<1	1700
601752	38 00	39 00	1 00	640	1680	38	<1	920
601720	39 00	40 00	1 00	240	2220	45	<1	1260
601721	41 00	43 00	2 00	160	190	110	<1	2280
601753	43 00	45 00	2 00	32	490	110	<1	1800
601722	45 00	46 00	1 00	930	2260	120	<1	1920
601754	46 00	47 00	1 00	1190	4320	80	1	820
601723	47 00	48 00	1 00	250	640	180	3	1000
601724	48 00	50 00	2 00	160	680	200	<1	850
601755	50 00	52 00	2 00	200	560	170	1	1500
601756	52 00	53 40	1·40	65	160	25	<1	1740
601757	61 50	63 50	2 00	48	200	35	<1	1680
601758	63 50	65 80	2 30	45	160	42	<1	1720
601759	68 70	70 70	2 00	22	170	28	<1	2200
601725	71 00	73 40	2·40	5	42	28	<1	1960
601760	73 40	75 50	2 10	5	38	22	<1	440
601761	82 00	84·00	2 00	10	28	10	<1	640
601726	99 60	100 10	0 50	42	35	170	1	2080
601762	104 60	107 50	2 90	90	110	28	<1	2100
601763	107 50	109 00	1 50	90	120	42	<1	2500
601764	111 00	113 30	2 30	410	860	70	<1	3100
601765	113 30	115 00	1 70	38	85	75	<1	5500
601766	123 00	125 00	2 00	8	42	8	<1	3850
601767	125 00	127 00	2 00	<5	48	15	<1	3850
601768	137 10	139 10	2 00	75	420	85	<1	2240
601769	140·40	141 10	0 70	70	810	30	<1	1690
601770	143 10	145 10	2 00	150	180	25	<1	2160
601771	151 00	152 00	1·00	65	230	25	<1	2160
601772	152 00	152 60	0 60	210	380	18	<1	1730
601773	158·50	160 50	2·00	80	220	22	<1	1950



Sample site with values in ppm - soils 220, 120 (Pb, Zn)
- rocks *23, 33*
Sample number 397 (N B all sample N^os prefixed by 601)

Bedding dip

Schistosity dip

C.R.A EXPLORATION PTY LIMITED

DIAMOND DRILL SECTION 77-C.C 2
ALONG LINE 1100E LOOKING N.W.
CETHANA WEST - E.L. 10/76
NORTH - WEST TASMANIA
BURNIE SK 55-3

SCALE 1 500

10 m 0 10 20 30 40 50 m

Geologist J G P | Date March 1977 | Report No 9041

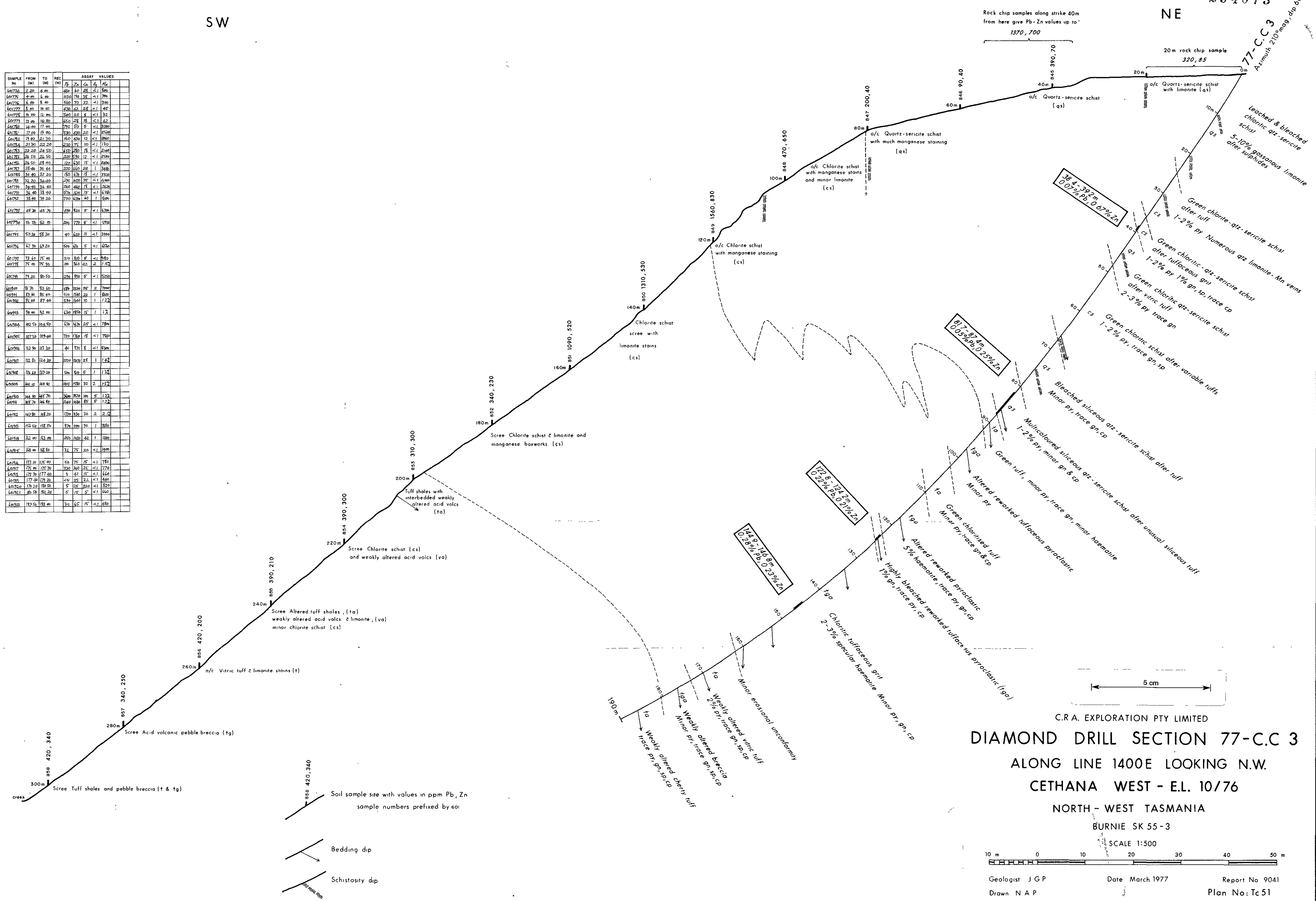
Traced N A P | Plan No - Tc 50

77-1231

1865

294073

SAMPLE No	FROM (M)	TO (M)	REC (M)	Pb	Zn	Cu	Ag	Mn		
601774	2 20	4 00		430	60	28	<1	800		
601775	4·00	6 00		1030	190	38	<1	700		
601776	6 00	8 00		560	70	32	<1	300		
601777	8 00	10 00		430	42	28	<1	45		
601778	10 00	12 00		540	20	8	<1	32		
601779	12 00	14 00		650	28	18	<1	42		
601780	14·00	17 00		790	50	5	<1	3200		
601781	17 00	19 00		330	430	20	<1	2540		
601782	19 00	21 30		160	430	12	<1	2060		
601784	21 30	22 20		230	75	10	<1	130		
601783	22 20	24 50		650	280	18	<1	2140		
601785	24 50	26 50		220	590	12	<1	2500		
601786	26 50	28 40		120	630	15	<1	2400		
601787	28·40	30 40		220	660	20	1	3480		
601788	30 40	32 20		180	670	18	<1	3320		
601789	32 20	34·40		290	1050	35	<1	4000		
601790	34·40	36 40		260	460	18	<1	2620		
601791	36 40	38 40		570	1610	15	<1	6380		
601792	38 40	39 20		730	6700	60	1	8100		
601793	45 30	45 70		490	820	5	<1	6700		
601794	50 50	52 10		200	770	5	<1	5950		
601795	57·30	58 30		40	620	10	<1	3900		
601796	67 90	69 20		500	670	5	<1	6560		
601797	73 60	75 00		310	810	5	<1	9180		
601798	75 00	75 90		100	860	22	2	1 15%		
601799	79 20	80·50		1290	890	5	<1	5250		
601800	81 70	83 60		480	2500	55	2	7000		
601901	83 60	85 40		510	1540	22	1	8600		
601902	85 40	87 40		530	1640	10	1	1 2%		
601903	90 00	92 00		630	1850	15	1	1%		
601904	102 50	104 50		670	1470	25	<1	7800		
601905	107 50	109·40		720	1760	18	<1	7840		
601906	112 90	113 20		40	870	8	<1	5300		
601907	122 80	124 20		2220	2070	28	1	1 4%		
601908	126 60	127·20		500	810	5	1	1 3%		
601909	140 10	140 90		1010	1580	30	2	1·5%		
601910	144 90	145 70		3600	3570	160	5	1 2%		
601911	145 70	146 80		2140	1430	85	5	1 2%		
601912	147·80	148 20		1720	1130	30	2	2 1%		
601913	156 50	158 50		870	1100	90	1	7680		
601914	162 00	163 00		250	1020	42	1	1200		
601915	168 00	168 80		32	75	20	<1	1400		
601916	173 10	175 00		50	75	15	<1	780		
601917	175 00	175 70		330	340	25	<1	770		
601918	175 70	177 40		8	42	15	<1	660		
601919	177 40	179 20		<5	25	22	<1	440		
601920	179 20	180 50		5	25	220	<1	820		
601921	180 50	182 20		5	15	5	<1	660		
601922	187·50	188 00		30	65	15	<1	480		



SW
NE
77-C.C 3
Azimuth 210° mag, dip 60°
Rock chip samples along strike 40m from here give Pb-Zn values up to 1370, 700
20m rock chip sample 320, 85
o/c Quartz-sericite schist with limonite (qs)
o/c Quartz-sericite schist (qs)
o/c Quartz-sericite schist with much manganese staining (qs)
o/c Chlorite schist with manganese stains and minor limonite (cs)
o/c Chlorite schist with manganese staining (cs)
Chlorite schist scree with limonite stains (cs)
Scree Chlorite schist ē limonite and manganese boxworks (cs)
Tuff shales with interbedded weakly altered acid volcs (ta)
Scree Chlorite schist (cs) and weakly altered acid volcs (va)
Scree Altered tuff shales, (ta) weakly altered acid volcs ē limonite, (va) minor chlorite schist (cs)
o/c Vitric tuff ē limonite stains (t)
Scree Acid volcanic pebble breccia (tg)
Scree Tuff shales and pebble breccia (t & tg)
creek
845 390, 70
846 90, 40
847 200, 40
848 470, 650
849 1560, 830
850 1310, 530
851 1090, 520
852 340, 230
853 310, 300
854 390, 300
855 390, 210
856 420, 200
857 340, 250
858 420, 340
Leached & bleached chloritic qtz-sericite schist
5-10% gossanous limonite after sulphides
Green chlorite-qtz-sericite schist after tuff 1-2% py Numerous qtz limonite-Mn veins
Green chloritic-qtz-sericite schist after tuffaceous grit 1-2% py 1% gn, sp, trace cp
Green chloritic qtz-sericite schist after vitric tuff 2-3% py trace gn
Green chloritic schist after variable tuffs 1-2% py, trace gn, sp
Bleached siliceous qtz-sericite schist after tuff Minor py, trace gn, cp
Multicoloured siliceous qtz-sericite schist after unusual siliceous tuff 1-2% py, minor gn & cp
Green tuff, minor py, trace gn, minor haematite
Altered reworked tuffaceous pyroclastic Minor py
Green chloritised tuff Minor py, trace gn & cp
Altered reworked pyroclastic 5% haematite, trace py, gn, cp
Highly bleached reworked tuffaceous pyroclastic (tga) 1% gn, trace py, cp
Chloritic tuffaceous grit 2-3% specular haematite Minor py, gn, cp
Minor erosional unconformity
Weakly altered vitric tuff 2% py, trace gn, sp, cp
Weakly altered breccia Minor py, trace gn, sp, cp
Weakly altered cherty tuff trace py, gn, sp, cp
38.4-39.2m 0.07% Pb, 0.67% Zn
81.7-87.4m 0.05% Pb, 0.25% Zn
122.8-124.2m 0.22% Pb, 0.21% Zn
144.9-146.8m 0.28% Pb, 0.23% Zn
190m
5 cm
Soil sample site with values in ppm Pb, Zn sample numbers prefixed by 601
Bedding dip
Schistosity dip

C.R.A. EXPLORATION PTY LIMITED

DIAMOND DRILL SECTION 77-C.C 3

ALONG LINE 1400E LOOKING N.W.

CETHANA WEST - E.L. 10/76

NORTH - WEST TASMANIA

BURNIE SK 55-3

SCALE 1:500

Geologist J G P

Drawn N A P

Date March 1977

Report No 9041

Plan No: Tc 51

77-1231.

1866