TANAMI JOINT VENTURE

ZAPOPAN NL

KUMAGAI GUMI CO LTD

KINTARO METALS PTY LTD

EXPLORATION LICENCE 5420

MT SOLITAIRE

GRANITES - TANAMI REGION

NORTHERN TERRITORY

SECOND ANNUAL REPORT - 1991

CR91/345

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1. SUMMARY

A helicopter-borne geochemical sampling programme showed that most of the area covering magnetic anomalies was not conducive to reconnaissance sampling. Outcrops of prospective banded iron-formations were rare and no in-situ laterite profile remains. Scattered areas of lateritic and quartz gravel occur especially in the southern part and are typified by mulga scrub and red loamy soils. The rest of the areas are predominantly aeolian sand covered.

Two samples of gossanous chert/iron-formation returned Au values > 5 ppb. Two samples of quartz returned 170 ppb and 250 ppb Au.

2. INTRODUCTION

Exploration Licence 5420 was granted on 3 May 1989 to Harlock Pty Ltd. A 50% interest was subsequently transfered to Zapopan NL. Harlock's interest is held in trust on behalf of Kumagai Gumi Co Ltd (30%) and Kintaro Metals Pty Ltd (20%). Zapopan, Kumagai and Kintaro comprise the Tanami Joint Venture "TJV".

The EL covers an area of 1198 sq km, equivalent to 372 blocks, and is located approximately 90 - 130 km east of The Granites gold mine. There are no access roads into the area, the nearest road being at Mt Davidson Outstation, 30 km west of the licence area (Figures 1 and 2).

The EL is totally on Aboriginal land within the Central Desert Land Trust area.

The area is predominantly a sandplain with scattered low rises and pediments, red earth plains and quartz ridges.

A brief outline of previous geological work, local geology and landforms is to be found in the first annual report. Year 1 exploration comprised data acquisition and interpretation.

This report details exploration carried out in the second year of the licence which comprised laterite and rock chip sampling.

Prior to undertaking this sampling, the Central Land Council and Aboriginal Traditional Owners carried out a Sacred Site Clearance survey of the licence area.

3. PREVIOUS WORK

In the first year of EL 5420, the following exploration was completed:

- acquisition of colour aerial photography over the licence area.
- compilation and preliminary interpretation of available open-file reports, airborne magnetic data, aerial photography and Landsat imagery.

This work is detailed in the first annual report for EL 5420.

4. EXPLORATION COMPLETED IN YEAR 2

4.1 Geochemical Sampling

A helicopter-borne geochemical sampling programme was completed in August 1990. The aim was to sample any areas of prospective outcrop and subcrop, laterite and quartz-ironstone gravel.

A large part of EL 5420 has good magnetic character, however, reconnaissance showed that potential sampling media covered only a very small part of this area. Thus, the sampling completed did not adequately test any area covering the high magnetics. Totals of 122 laterite and 65 rock-chip samples were collected. All samples were submitted to Analabs for "Gold + 26" analyses and Cu, Pb, Zn and Ni by method 140.

Sample locations are shown on Figure 3. Sample descriptions and results are appended (Appendices I and II). Petrographic descriptions of 5 samples (80153, 80154, 80155, 80248 and 80279) are appended (Appendix III).

The few isolated outcrops that occur in the area of high magnetics show banded iron-formations with some quartz-mica schist and ferruginous phyllite. Associated with the iron-formations are various massive geothite-mica-quartz outcrops of unknown origins. In the central part of the broad magnetic zone, several generations of granitic rocks crop out as prominent features. On the north-east side of the magnetic zone a prominent quartz-filled fault line forms a ridge 6 km long and up to 50 m high. Much of the area over the magnetic zones is covered by aeolian sand and elluvium.

Anomalous gold > 5 ppb was only found in four samples, two of which were quartz. Sample 80246 from a quartz ridge in the south-west part of the licence area, occupying a possible thrust, returned 250 ppb Au, as well as anomalous As (278 ppm), Sb (24 ppm) and Pb (370 ppm).

5. EXPENDITURE

	$
Aerial Photography	681.00
Assaying	4900.77
Consumables	865.73
Drafting/Printing	143.20
Equipment Hire	216.81
Geological Consultants	384.17
Helicopter Hire	9450.00
Land Councils	3985.77
Report Preparation	500.00
Salaries and Wages	8428.85
Surveying and Gridding	2107.00
Travel and Accommodation	3050.00
Vehicle Expenses	3101.55
Administration Costs	3781.48
	41,596.33

6. FORWARD PROGRAMME

The proposed exploration programme for year 3 comprises follow-up geochemical sampling of specific targets covering magnetic anomalies. This work will comprise orientation sampling across areas of high magnetic character testing the various surface media present; laterite, aeolian sand, red loam, elluvium etc. A budget of $40,000 has been allocated for this work.

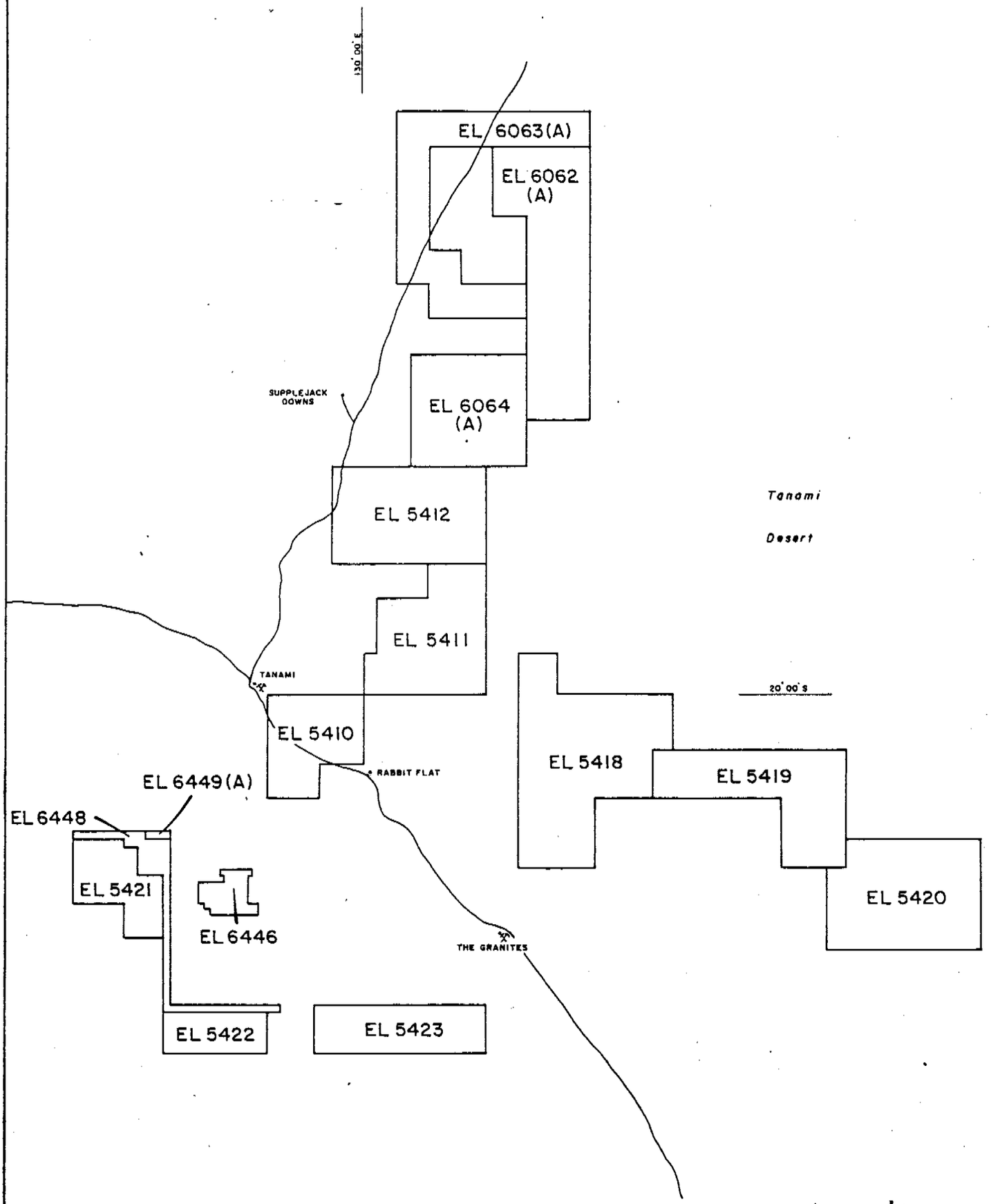

Figure 1

TANAMI JOINT VENTURE		
Scale: 1:1000000	Compiled: Drawn: C.S.M.	Date:
TENEMENTS		

Original reduced to A4

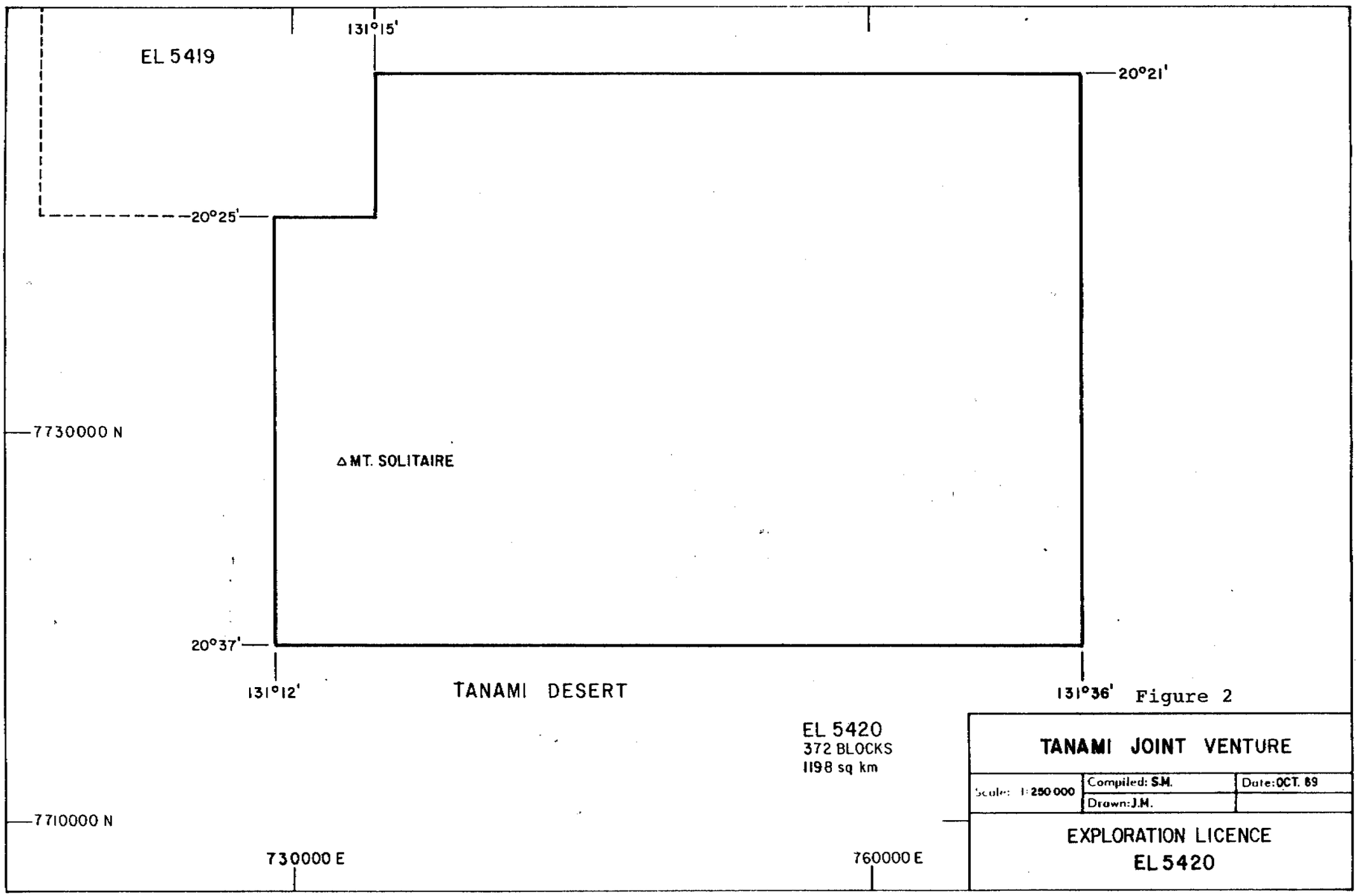
EL 5419
131°15'
20°21'
20°25'
7730000 N
△MT. SOLITAIRE
20°37'
131°12'
TANAMI DESERT
131°36'
EL 5420
372 BLOCKS
1198 sq km
7710000 N
730000 E
760000 E
TANAMI JOINT VENTURE
Scale: 1:250 000
Compiled: S.M.
Date: OCT. 69
Drawn: J.M.
EXPLORATION LICENCE
EL 5420

Figure 2

APPENDIX I

EL 5420 - Sample Descriptions

EL 5420

Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80187	LAT	4/145		med ; poor Sample	
88	LAT	"		outcrop.	
89	LAT	"		m-c ; small sample site	
80190	LAT	4/145		coarse ; good Sample	
91	RC	3/132		white quartz	
92	LAT	3/132	20° 29' 07"S/131° 25' 19"E 7733031 N/752622E	ferricrete	
93	LAT	"	20° 28' 34"S/131° 25' 27"E 7733951N/752867E	m-c ; good sample	
94	LAT	"	20° 28' 55"S/131° 25' 55"E 7733293N/753669E		duplicate = 80354
95	LAT/FC	"	20° 29' 01"S/131° 25' 38"E 7733116N/753174E	ferricrete ; incl. haem-qz-mica rock frags.	POSITION IN DOUBT
96	LAT	"		m-c ; good Sample	on ridge.
97	LAT	"		"gritty" laterite — incl. sand.	
98	LAT	"		ferricrete	
99	LAT	3/132		ferricrete	
80200	RC	3/130	20° 30' 23"S/131° 26' 13"E 7730578N/754151E	ferruginized red-pu, onion-skin weath. granite?	strike 255 dip south
80202	LAT	"	20° 34' 23"S/131 26' 13"E 7723195 /754041E		
03	LAT	"	20° 34' 45"S/131° 26' 21"E 7722515N/754262E		
80204	LAT	3/130	20° 35' 11" 131° 26' 37"		

EL 5420

Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80205	LAT	3/128	20° 35' 31"S/131° 26' 34"E 7720971N/754616E	medium ; good sample	
06	LAT	3/128		medium; good sample	
07	LAT	3/128	20° 34' 21"S/131° 26' 25"E 7723251N/754389E	medium; good sample	
08	LAT		20° 30' 55"S/131° 27' 19"E 7729565N/756049E	medium ; good sample	
09	LAT		20° 29' 42"S/131° 27' 22"E 7731809N/756170E	medium; good sample	
80210	LAT		20° 29' 44"S/131° 27' 44"E 7731738N/756806E	ferricrete	
11	RC		20° 30' 20"S/131° 28' 12"E 7730619N/757601E	goethitic quartz breccia	fault infill
12	RC		— ditto —	goethitic quartz breccia	fault infill
13	LAT			includes goeth-musc. rock frags.	
14	LAT		20° 31' 25"S/131° 27' 54"E 7728627N/757049E	m-c ;	
15					
16					
17	LAT	4/145		m-c; good sample	
18	LAT	"		m-c; good sample	
19	RC	4/145		quartz + 10% fe. ox.	
80220	RC			quartz	
80221	LAT			coarse ; ferricrete	

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80222	RC	3/128		quartz - white	float
23	LAT	"		medium ;	
24	"	"		medium ;	
25	"	"		m-c ; "gritty" type	
26	"	"		m-c ; "gritty" type	
27	"	"		medium ; some cemented	small site.
28	"	"		m-c ;	even smaller site!
29	"	"	20° 37' 10"S/131° 25' 17"E 7718082N/752342E	medium ; "gritty" type	
80230	"	"			
31	"	"		outcrop.	duplicate = 80375
32	"	"		m-c ; incl - 5% quartz lag.	
33	"	"		m-c ; some cemented frags.	
34	"	"		m-c ;	
35	"	"		m-c ; good sample	
36	"	"		m-c ; good sample	
37	"	"		m-c ; good sample	
80238	LAT	"		m-c ; incl. ironstone frags.	

EL 5420

Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80239	RC	3/128	20° 37' 37" S/131° 29' 07" E 7717151N/758490E	goethitic ironstone	Strike 250° dip 60° N
80240	RC	3/128	20° 37' 29" S/131° 29' 19" E 7717392N/759342E	goethitic ironstone ; variable e-w strike	dip N.
80241	RC		20° 36' 10"/131° 30' 04"	sheared granite Strike 280°	
80242	RC	2/013	20° 35' 45" S/131° 30' 14" E 7720567N/760984E	white quartz	
80244	LAT	"	20° 37' 53" S/131° 31' 32" E 7716585N/763761E	ferricrete	
45	LAT	"	20° 37' 49" S/131° 32' 11" E 7716727N/762576E	m-c ;	
46	RC	2/013	20° 35' 29" S/131° 32' 59" E 7720985N/765771E	Quartz with Fe ox in fractures Dip 30° SSW	767550E ? Thrust?
47	RC	1/123	20° 35' 03" S/131° 34' 48" E 7721735N/768941E	haematite-quartz-mica rock.	
48	RC	"	20° 35' 06" S/131° 35' 33" 7721622N/770244E	? banded gneiss	
49	LAT	"		m-c ;	
80250	RC	1/123	20° 32' 55" S/131° 33' 34" E 7725707N/766859E	goethitic ironstone	Strike 280° dip N.
51	RC	2/015		goethitic ironstone	
52	LAT	2/015		Coarse ; good sample	
53	LAT	2/017		m-c ; incl. ferrug/lat. quartzite	
54	RC	2/017		goethitic, f.gr. sediment ?	
80255	RC	2/017		white quartz	
80256	RC	2/017		banded gneiss — flow banded, brecciated + garnets	Strike 080° dip 60° N
80257	RC	2/017		porphyritic granite porphs. aligned 150°.	

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80258	LAT	2/017		ferricrete incl. "gritty" type.	
59	RC	2/017		goethitic ironstone	
80260	LAT	2/020		m-c ; "gritty"	
61	"	"		medium ;	
62	"	"		m-c ;	
63	"	"	20° 20' 43" S/131° 32' 13" E 7748262N/764861E	medium ;	
64	"	"	20° 20' 35" S/131° 31' 24" E 7748530N/763443E	m-c ;	
65	LAT	2/020	20° 20' 57" S/131° 31' 07" E 7747861N/762939E	m-c ;	
80267	LAT	4/147	20° 36' 13" S/131° 21' 20" E 7719936N/745504E	m-c ; small sample site	large, open sandy plain.
68	LAT	"	20° 36' 36" S/131° 22' 08" E 7719209N/746883	m-c ; small sample site	
69	LAT	"	20° 36' 49" S/131 22' 31" E 7718799N/747544E	m-c ; small sample site	
70	LAT	"	20° 36' 20" S/131° 22' 51" E 7719683N/748136E	m-c ; small sample site	
71	LAT	"	20° 37' 01" S/131° 23' 32" E 7718404N/749305E	m-c ; 10% quartz	
72	LAT	"	20° 36' 50" S/131° 23' 45" E 7718737N/749686E	medium ; 15% quartz	
73	LAT	"	20° 36' 06" S/131° 24' 26" E 7720073N/750894E	medium ; 10% quartz ; small site	
74	LAT	"	20° 35' 45" S/131° 24' 35" E 7720715N/751164E	medium ; 25% quartz	
80275	LAT	4/147	20° 35' 44" S/131° 24' 51" E 7720739N/751628E	medium ; 20% quartz ; incl. ferrug. qzite	

Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80276	LAT	4/147	20°36'44"/131°25'05" 7718887N 752006E	medium; "gritty" 20% quartz	
80277	LAT	3/128	20°35'47" 131°26'04" 7720615N 753741E	medium;	
80278	LAT	3/128	20°35'05" 131°25'12" 7721929N 752254E	coarse; imeg;	
80279	RC	3/128		banded ferrug. quartzite Strike 120°	scree/float
80280	LAT	4/145		m-c; good sample.	
80350	RC			DUPLICATE OF 80153	
80351	RC			DUPLICATE OF 80149	
80352	RC			DUPLICATE OF 80279	
80353	LAT			DUPLICATE OF 80172	
80354	LAT			DUPLICATE OF 80194	
80355	LAT			DUPLICATE OF 80175	
80356	LAT			DUPLICATE OF 80145	
80358	LAT			DUPLICATE OF 80128	
80359	LAT			DUPLICATE OF 80119	
80360	LAT			DUPLICATE OF 80126	
80375	LAT			DUPLICATE OF 80231	

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80099	LAT	6/070		medium ; nodular	
80100	LAT	6/070		small-med.	
01	LAT	6/070		small-med.	
02	LAT	6/070		med-large ; "gritty" ; incl. ferrug. qzite frags.	
03	RC FLOAT	"		Ironstone ; goethite-quartz-mica rock.	
04	LAT	"		incl. lateritized ironstone ;	
05	LAT	"		medium ; incl. lat. ironstone.	
06	LAT	"		gritty/nodular ; incl. lat/ferrug. qzite.	
07	LAT	"		lateritized, ferrug. qz-rich rock.	
08	RC	"		goethitic ironstone; 5% Qz; folded outcrop on ridge.	
09	RC	"		as 80108	
80110	RC	"		as 80108	± 100m @ 050° from 80108
11	LAT	"		med-large ; incl. "gritty" ferrug. qzite.	
12	"	"	20° 27' 59"S/131° 14' 34"E 7735297N/733954E	med-large ; incl. ferrug. qzite.	
13	LAT+Q	"	20° 27' 49"S/131° 14' 38"E 7735603N/734074E	small-med ; inc. 40% fine qz.	
14	LAT	"	20° 27' 09"S/131° 14' 29"E 7736837N/733830E	small-med ; minor quartz	
80115	LAT	"	20° 26' 57"S/131° 14' 52"E 7737197N/734501E	medium ; inc. some lat. ferrug. qzite.	PD

Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80116	LAT	6/070	20° 27' 20"S/131° 15' 02"E 7736486N/734782E	medium.	
17	LAT	"		med - large	
18	RC	"		yw-cr-red-pu f.gr. mica-quartz rock	Strike 115° dip 60° South
19	LAT	"		med-large.	Duplicate = 80359
80120	RC	"		weathered, goethitic, yw-br, f.gr. micaceous sed.	
21	RC	"		goeth-ferrug. quartzite.	
22	LAT	"		coarse - incl. ferrug. rock frags.	
23	RC	"		banded goethitic ironstone	as 80122
24	LAT	"		incl. lat. ironstone frags.	base of profile.
25	RC	"		goethitic ironstone ; partly brecciated	
26	LAT	"			Duplicate = 80360
27	RC	"	20° 28' 20"S/131° 16' 14"E 7734611N/736843E	haem-quartz-mica rock - f.gr.	Similar to 80118
28	LAT	"		coarse.	Duplicate = 80358
29	RC	"	20° 28' 31"S/131° 16' 30"E 7734271N/737013E	fragments of ironstone	float
80130	RC	6/070	20° 29' 12"S/131° 15' 56"E 7733019N/736299E	brecciated b.i.f. with some specular haem.	
31	RC	6/073	20° 35' 17"S 131° 12' 20"E	goethitic b.i.f.	Strike 140° dip 60° NE
32	RC	6/073	7721878N 729887E	gossanous chert.	

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80133	RC	5/050		purple micaceous sediment	Strike 240° dip vert. ?
34	RC	5/050		pegmatite – qz, fsp-musc.	
35	RC	5/050		f.gr. pink granite	
80136	RC	5/050		quartz	
80137	RC	5/050		banded gneiss + Fe/Mn boxworks	Strike 110° dip 80° N
80138	RC		80140 – foliated granite Strike 250°/vert.	foliated, f-m.gr. pink granite – 285°/vert.	
80139	RC			f.gr. biotite granite – foliated.	Strike 240° dip 60°SE
80141	LAT	5/050		large; incl. lat/ferrug. qzite frags.	
42	RC	"		goethitic b.i.f. in brown weath. mica. phyll.	
43	RC	"		goethitic b.i.f.	80143 – 80145 from northern ridge.
44	LAT	"		lat/ferricrete rubble; incl. b.i.f. frags.	
45	LAT	"		as 80144	Duplicate = 80356
46	LAT	"		as 80144	
47	RC	"		goeth. b.i.f. } Southern ridge	
48	RC	"		goeth. b.i.f. } Southern ridge	
49	RC	5/050		goeth. b.i.f } Southern ridge Duplicate = 80351	Strike 100° dip 60° N.
80150	LAT	5/048		med; inc. lat. frags of maroon, mica phyll.	
51	RC	4/143		br-red-pu micaceous phyllite Strike 110° dip vert ?	Similar to 80118

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80152	RC	4/143		banded ironstone	strike 140° dip 50° SW
53	RC	4/143		banded ironstone	Duplicate = 80350
54	RC	"		red-pu banded sediment ? strike 135° dip 75° SW	
55	RC	"		goethite-silica-mica-garnet rock.	
56	LAT	"		coarse.	
57	LAT	"	20° 27' 56"/130° 20' 34" 7736417N/744054E	coarse; poor sample; 50% quartz lag.	
58	LAT	"	20° 26' 36"S/131° 20' 23"E 7737704N/744426E	m-c; 5% quartz	
59	LAT	"	20° 25' 40"S/131 20' 23' 7739431N /744131E	med pisolitic; some goeth/ferrug. ironstone.	
80160	LAT	4/143	20° 25' 53"S/131° 20' 53" 7740195N/ 744636E	m-c nodular	
80161	RC	"	20° 27' 05" 131° 21' 11"	banded gneiss - strike 240°; dip 20° SE	
80162	RC	"	20° 27' 41" 131° 21' 28"	sheared porphyritic granite.	
80163	RC	4/143	20° 28' 30"/131° 21' 27" 7734176N/745912 E	ferrug. quartzite	
64	RC	"	20° 29' 05"S/131° 21' 22" 7733101N/745752E	goeth. ironstone	
65	LAT	"	20° 29' 22"S/131° 21' 08"E 7732584N/745338E	m-c; incl. lateritized qzite; ironstone frags	
66	LAT	"	20° 29' 39"S/131° 21' 15"E 7732058N/745534E	m-c; good sample	
67	LAT	"	20° 30' 07"S/131° 21' 40"E 7731186N/746246E	m-c; good sample	
68	LAT	4/143		m-c; good sample	
80169	LAT	4/145		m-c; incl. some cemented pisolites.	

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Sample Number	Type	Run No. Photo No	Co-ordinates	Description	Comments
80170	LAT	4/145	20° 31' 58"S/131° 22' 35"E 7617004N/746141E	m-c; "incl. some "gritty" type.	
80171	RC	4/143	20° 29' 23"/ 131° 22' 34" 7738054N 747911E	gneiss ; strike 075° dip 20° south	
80172	LAT	4/143	20° 26' 05"S/131° 23' 26"E 7738586N/749427E		duplicate = 80353
80173	RC	4/143	20° 27' 45" 131° 24' 06" 7735493N 750541E	granite	
80174	LAT	4/143	20° 28' 40"S/131° 24' 34"E 7733789N/751328E	m-c; ferricrete	
80175	LAT	4/143.	20° 28' 55"S/131° 24' 22"E 7733333N/750974E	m-c; ferricrete	duplicate = 80355
80176	RC	4/145	20° 31' 00" 131° 24' 14" 7729491N 750685E	banded gneiss strike 080° dip. 25° south	
80177	LAT	4/145		m-c; incl. "gritty" type.	outcrop
78	LAT	"		m-c; incl. ferrug. ironstone / quartzite	
79	LAT	"		m-c; incl. minor qz + quartzite	
80180	LAT	"		m-c; minor qz.	
81	LAT	"		m-c; small site	
82	LAT	"		m-c; good sample	
83	LAT	"		m-c; good sample	
84	LAT	"		medium ;	
85	RC	"		lateritized chert ?	
80186	RC	4/145		banded, brecciated ironstone	strike 120° dip 85° N

APPENDIX II

EL 5420 - Geochemical Sampling results

ANALABS

A Division of Inchcape Inspection and Testing Services. Australia. Pty. Ltd.

Division of Inchcape Inspection and Testing Services Pty Ltd

(089) 47 2355 | Cnr Coonawarra & Mataram Rds, Winnellie | Fax: (089) 84 3984

ANALYTICAL REPORT No. 999.16.21.04528

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:

TANAMI JOINT VENTURE
P.O.BOX 625

DARWIN NT 0801

ORDER No.	PROJECT
DN 50386	

DATE RECEIVED	RESULTS REQUIRED
04/09/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
16	08/10/90	1	89

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	RC Prep: 019	Cu,Pb,Zn,Ni/140
Various	RC	Au,Ag,As,Ba,Br,Ce,Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo

EL5420

RESULTS TO

STEVE MILNER
TANAMI JOINT VENTURE
P.O.BOX 625

DARWIN NT 0801

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04526	08/10/90	DN 50386	1 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80099	13.1	270	38.50	5	<5	20	15	<100	22
2	80100	20.2	566	36.30	6	10	30	20	<100	2[illegible]
3	80101	14.3	440	24.10	6	10	22	15	<100	19
4	80102	13.9	250	24.20	5	5	14	10	<100	2[illegible]
5	80103	36.2	280	37.60	9	25	152	85	<100	11
6	80104	18.0	310	27.70	6	10	16	15	<100	3[illegible]
7	80105	20.3	370	30.40	11	15	22	25	<100	1[illegible]
8	80106	27.9	260	38.00	8	5	78	25	<100	1[illegible]
9	80107	11.5	190	34.80	5	<5	30	15	<100	1[illegible]
10	80108	9.2	150	44.70	7	10	32	105	<100	<[illegible]
11	80109	[illegible]	150	41.50	9	[illegible]	70	135	100	[illegible]
12	80110	[illegible]	220	[illegible]	3	[illegible]	60	130	100	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	6	3	20	30	[illegible]00	3
14	[illegible]	[illegible]	120	[illegible]	[illegible]	[illegible]	26	[illegible]	<100	[illegible]
15	[illegible]	[illegible]	430	[illegible]	6	3	50	20	<100	[illegible]
16	80114	[illegible]	321	[illegible]	4	<5	14	17	<100	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	270	[illegible]	6	[illegible]	20	20	<100	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15	<100	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	16	15	<100	[illegible]
21	[illegible]	[illegible]	130	[illegible]	5	5	20	20	<100	[illegible]
22	[illegible]	[illegible]	[illegible]	41.70	<1	<5	52	10	<100	[illegible]
23	[illegible]	16.9	200	[illegible]	11	25	70	95	<100	[illegible]
24	[illegible]	[illegible]	250	[illegible]	5	17	60	25	<100	14
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	135	<100	[illegible]

Results in ppm unless otherwise specified
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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	2 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80124	28.1	280	35.20	6	15	76	25	<100	12
2	80125	12.1	120	43.90	14	25	90	120	<100	5
3	80126	20.7	390	35.30	6	10	30	20	<100	20
4	80127	13.1	520	28.10	2	5	40	15	<100	4
5	80128	26.5	330	36.80	5	5	38	15	<100	12
6	80129	24.4	2320	39.60	7	115	120	50	<100	12
7	80130	37.9	270	32.70	8	5	114	30	<100	4
8	80131	14.8	93	37.30	8	10	102	140	120	4
9	80132	7.0	350	16.20	4	15	110	80	<100	12
10	80133	15.1	290	4.40	3	5	26	10	<100	<2
11	80134	3.6	120	1.10	1	15	8	15	<100	<2
12	80136	2.1	601	1.20	2	10	6	5	<100	<2
13	80137	1.4	140	1.30	16	15	4	35	<100	<2
14	80141	5.9	280	17.20	3	5	16	10	<100	15
15	80142	10.7	190	31.80	10	15	84	65	<100	<2
16	80143	17.9	220	38.20	5	10	64	85	<100	5
17	80144	14.6	340	37.30	3	5	40	20	<100	12
18	80145	21.2	450	37.30	4	<5	46	20	<100	12
19	80146	16.3	380	37.40	4	<5	50	30	<100	5
20	80147	25.2	229	37.60	5	15	86	25	<100	3
21	80148	11.5	220	32.50	13	15	102	60	<100	8
22	80149	15.5	340	31.50	26	50	94	105	120	<2
23	80150	12.1	440	29.90	6	10	124	20	<100	36
24	80151	20.4	85	6.65	5	15	58	50	<100	<2
25	80152	12.4	204	29.80	14	10	164	55	<100	3

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TUBE No.	SAMPLE No.	Se	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80153	12.8	230	30.70	37	30	80	85	<100	8
2	80154	11.3	190	4.60	1	5	8	10	<100	<2
3	80155	13.4	110	43.70	16	35	42	200	210	52
4	80156	37.6	440	37.90	25	25	46	35	<100	16
5	80157	14.7	270	37.40	4	5	26	25	<100	18
6	80158	15.3	240	29.50	7	5	14	15	<100	43
7	80159	12.7	200	24.40	7	5	14	15	<100	22
8	80160	10.7	310	33.40	4	<5	16	15	<100	43
9	80163	9.4	250	34.30	2	<5	22	10	<100	39
10	80164	21.4	64	42.50	3	5	58	30	<100	24
11	80165	33.4	360	39.40	4	<5	70	20	<100	13
12	80166	12.5	750	39.50	7	15	65	30	110	27
13	80167	11.9	770	34.50	5	5	48	20	<100	20
14	80168	11.9	190	34.70	4	5	30	15	<100	21
15	80169	17.4	637	35.60	4	15	32	15	<100	17
16	80170	10.7	260	31.50	6	20	30	10	<100	27
17	80171	11.6	420	39.87	5	10	16	15	<100	32
18	80172	15.4	240	25.60	6	10	12	15	<100	27
19	80173	[illegible]	360	7.10	6	10	22	15	<100	29
20	80174	12.2	200	13.00	4	5	12	10	<100	17
21	80175	14.3	425	24.70	6	10	32	20	<100	14
22	80176	24.6	330	30.70	9	15	56	25	107	19
23	80177	16.2	669	31.30	8	10	22	20	<100	17
24	80178	18.5	440	21.40	12	25	42	20	100	19
25	80179	10.3	509	38.70	5	17	24	15	<100	15

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TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80183	23.1	936	29.40	8	25	86	20	100	22
2	80184	29.4	380	29.70	6	10	42	20	<100	17
3	80185	2.3	250	6.70	5	20	12	35	<100	3
4	80186	15.5	240	37.20	5	5	124	60	<100	3
5	80187	39.6	531	38.60	9	15	72	35	250	17
6	80188	64.1	350	39.40	8	10	132	60	460	6
7	80189	20.0	310	31.20	14	20	66	40	<100	19
8	80190	27.9	440	27.00	10	15	42	20	140	16
9	80191	0.5	400	0.62	1	<5	4	5	<100	<2
10	80192	11.1	150	28.30	3	5	12	15	<100	13
11	80193	22.5	420	30.16	4	10	12	15	<100	24
12	80194	[illegible]	310	34.40	5	10	12	15	<100	21
13	80195	[illegible]	100	7.90	<1	<5	2	5	<100	11
14	[illegible]	[illegible]	[illegible]	[illegible]	5	5	24	15	<100	36
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	4.0	5	0.05	1	5	2	5	100	2
24	UNITS	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80099	<5	3	92	<5	<5	0.7	1	260	4.1
2	80100	<5	<2	85	<10	<5	0.8	2	170	5.6
3	80101	<5	<2	61	<5	<5	0.7	2	550	10.0
4	80102	<5	2	46	<10	<5	0.6	1	180	6.6
5	80103	<5	2	20	<5	<5	0.7	<1	150	6.5
6	80104	<5	<2	60	10	<5	0.5	<1	610	4.2
7	80105	<5	<2	54	<5	<5	<0.5	<1	210	7.4
8	80106	<5	2	80	15	<5	<0.5	<1	350	5.3
9	80107	8	<2	76	<5	<5	0.5	<1	170	4.1
10	80108	<5	<2	<20	<5	<5	<0.2	<1	380	17.0
11	80109	<5	<2	20	<5	<5	0.5	<1	400	19.0
12	80110	<5	<2	57	15	<5	<0.2	2	200	75.1
13	80111	15	3	50	<10	<5	0.8	1	280	3.7
14	80112	<5	<2	60	<10	<5	0.6	<1	110	7.[illegible]
15	80113	<5	3	60	<5	<5	0.7	3	<10	8.7
16	80114	<5	5	<20	<5	<5	0.7	<1	120	8.7
17	80115	<5	3	80	<5	5	<0.2	1	210	12.0
18	80116	<5	<2	72	11	<5	0.9	<1	<170	7.1
19	80117	<5	4	43	10	<5	0.5	<1	220	4.2
20	80118	<5	2	20	<5	<5	<0.2	<1	1700	27.[illegible]
21	80119	<5	[illegible]	64	11	<5	<0.5	<1	400	5.2
22	80120	<5	3	<20	<5	<5	<0.2	<1	560	6.0
23	80121	<5	<2	67	<5	<5	<0.5	<1	810	8.9
24	80122	<5	<2	63	13	<5	<0.5	<1	190	4.4
25	[illegible]	[illegible]	3	22	<5	<5	0.[illegible]	1	350	20.6

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TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80124	<5	<2	67	<5	<5	<0.5	<1	<100	5.4
2	80125	<5	<2	26	<5	<5	<0.2	<1	270	12.0
3	80126	<5	<2	57	<5	<5	0.5	1	<100	6.0
4	80127	<5	3	54	<5	<5	<0.2	1	920	6.3
5	80128	<5	<2	58	<5	<5	<0.2	<1	170	4.5
6	80129	<5	2	27	<5	<5	<0.5	<1	910	3.4
7	80130	<5	3	70	11	<5	<0.2	1	2400	4.8
8	80131	<5	<2	<20	<5	<5	<0.5	<1	<100	3.8
9	80132	5	<2	26	<10	<5	<0.5	<1	<100	1.9
10	80133	<5	<2	27	<5	<5	<0.2	<1	450	27.0
11	80134	<5	<2	290	<5	<5	<0.2	8	320	63.[illegible]
12	80136	<5	<2	<20	<5	<5	<0.2	<1	290	1.1
13	80137	<5	<2	46	<5	<5	<0.2	2	710	21.8
14	80141	<5	<2	6[illegible]	<5	<5	<0.5	<1	130	13.0
15	80142	<5	[illegible]	<20	<10	<5	<0.2	<1	220	2.[illegible]
16	80143	<5	4	<20	<5	<5	<0.2	<1	370	68.1
17	80144	<5	<2	38	<5	<5	<0.2	2	240	5.2
18	80145	5	<2	58	<5	<5	0.8	<1	120	4.6
19	80146	5	<2	77	<5	<5	<0.2	1	270	4.1
20	80147	5	2	<20	<5	<5	<0.5	1	750	5.6
21	80148	<5	3	42	11	<5	<0.2	<1	490	12.0
22	80149	<5	<2	76	15	<5	<0.2	<1	430	5.1
23	80150	7	<2	87	<5	<5	1.0	2	240	17.6
24	80151	<5	<2	45	<5	<5	<0.2	9	520	47.0
25	80152	[illegible]	<2	97	<5	<5	<0.2	<1	340	5.[illegible]

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TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80153	<5	<2	73	<5	<5	<0.2	<1	210	5.7
2	80154	<5	<2	<20	<5	<5	<0.2	<1	2200	37.0
3	80155	<5	2	71	<5	<5	<0.2	<1	<100	14.0
4	80156	<5	2	<20	<5	<5	0.7	<1	120	5.2
5	80157	<5	<2	<20	<5	<5	<0.5	2	430	51.7
6	80158	<5	<2	<20	<5	<5	0.6	<1	260	6.2
7	80159	<5	3	<20	<5	<5	0.7	2	190	8.9
8	80160	<5	<2	<20	<5	<5	1.1	<1	<100	6.1
9	80163	<5	2	<20	<5	<5	1.1	1	310	27.0
10	80164	<5	2	<20	<24	<5	<0.2	<1	330	19.0
11	80165	<5	2	<20	<5	<5	<0.2	1	<100	12.0
12	80166	<5	<2	57	<10	<5	0.7	<1	150	8.9
13	80167	<5	3	78	<10	<5	<0.2	<1	110	7.2
14	80168	<5	4	65	<10	<5	<0.5	<1	320	4.9
15	80169	<5	2	61	<5	<5	<0.5	<1	<100	7.7
16	80170	<5	<2	82	<5	<5	0.5	1	<100	4.5
17	80172	<5	<2	72	<5	<5	<0.5	<1	<100	10.0
18	80173	<5	<2	55	<5	<5	0.6	1	170	4.2
19	[illegible]	<5	<2	64	<5	<5	0.8	<1	<100	7.4
20	80177	<5	2	39	<10	<5	<0.5	<1	230	4.0
21	[illegible]	<5	<2	54	<5	<5	<0.5	<1	<100	5.3
22	[illegible]	<5	<2	77	<5	<5	<0.2	1	200	6.7
23	[illegible]	<5	<2	61	<5	<5	<0.5	<1	110	5.2
24	[illegible]	<5	<2	75	<5	<5	0.8	1	150	14.0
25		<5	<2	32	<5	<5	0.5	<1	<100	4.5

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TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80183	<5	<2	73	<5	<5	0.6	2	<100	5.4
2	80184	<5	<2	65	<5	<5	0.5	<1	100	4.4
3	80185	<5	<2	22	<5	<5	<0.5	<1	590	2.8
4	80186	<5	<2	<20	<5	<5	<0.5	<1	110	16.0
5	80187	<5	<2	86	<5	<5	<0.2	<1	<100	5.4
6	80188	<5	<2	88	<5	<5	<0.2	<1	210	3.5
7	80189	<5	<2	63	<5	<5	<0.5	<1	<100	8.4
8	80190	<5	<2	63	<5	<5	<0.2	<1	130	3.5
9	80191	<5	<2	<20	<5	<5	<0.2	<1	<100	15.0
10	80192	<5	<2	65	<5	<5	<0.2	2	530	29.0
11	80193	<5	<2	52	<5	<5	0.9	<1	120	5.[illegible]
12	80194	<5	2	74	<5	<5	<0.2	0	250	8.8
13	80195	<5	<2	110	<5	<5	<0.2	1	1400	30.0
14	80196	<5	<2	97	<5	<5	0.8	<1	170	3.5
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	2	20	10	5	0.5	1	100	0.5
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1301	1801	1801	1801	1301	1301	1801	1301	102

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TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80099	<10	1.3	<0.5	1.0	<0.2	5	<1	<2	<20
2	80100	15	1.5	<0.5	1.3	0.2	7	<1	<2	<20
3	80101	15	2.1	<0.5	2.5	0.4	10	1	<2	<20
4	80102	<10	1.4	<0.5	1.7	0.2	15	2	<2	<20
5	80103	<2	1.7	<0.5	1.2	<0.2	3	<1	<2	<20
6	80104	<10	1.3	<0.5	1.7	0.2	9	2	<2	<20
7	80105	15	1.6	<0.5	1.7	0.2	9	1	<2	<20
8	80106	<10	2.4	<0.5	1.0	<0.2	4	<1	<2	<20
9	80107	<10	1.3	<0.5	1.1	<0.2	5	<1	<2	<20
10	80108	11	1.9	<0.5	0.9	<0.2	1	1	<2	<20
11	80109	19	2.6	0.6	1.3	<0.2	<1	<1	<2	<20
12	80110	53	5.2	0.9	1.2	<0.2	4	<1	<2	<20
13	80111	<10	1.1	<0.5	1.0	<0.2	8	1	<2	<20
14	80112	13	1.3	<0.5	0.9	<0.2	5	1	<2	<20
15	80113	28	1.8	<0.5	0.8	<0.2	5	<1	<2	<20
16	80114	<10	1.5	<0.5	1.0	<0.2	7	2	5	<20
17	80115	19	2.3	0.5	1.0	<0.2	6	2	<2	<20
18	80116	<10	1.0	<0.5	1.0	<0.2	7	2	<2	<20
19	80117	<10	1.5	<0.5	1.0	<0.2	7	1	<2	<20
20	80118	29	1.5	<0.5	1.0	<0.2	5	1	<2	<20
21	80119	<10	1.5	<0.5	0.9	<0.2	5	1	4	<20
22	80120	<2	1.1	<0.5	<0.5	<0.2	4	<1	<2	<20
23	80121	<10	1.6	<0.5	1.0	<0.2	1	<1	<2	<20
24	80122	<10	1.6	<0.5	1.1	<0.2	4	1	<2	<20
25	80123	12	2.2	<0.5	1.3	<0.2	2	<1	<2	<20

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	10 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80124	<10	1.8	<0.5	1.0	<0.2	4	2	<2	<20
2	80125	<2	2.5	0.6	1.3	<0.2	<1	<1	<2	<20
3	80126	<10	1.5	<0.5	1.0	<0.2	8	1	<2	<20
4	80127	<10	2.2	<0.5	1.1	<0.2	3	2	<2	<20
5	80128	<10	1.5	<0.5	0.9	<0.2	6	1	<2	<20
6	80129	<2	1.2	<0.5	0.9	<0.2	3	<1	<2	<20
7	80130	<10	1.1	<0.5	0.6	<0.2	2	<1	<2	<20
8	80131	<2	1.7	<0.5	1.4	0.2	<1	<1	<2	<20
9	80132	<10	0.8	<0.5	0.6	<0.2	1	<1	<2	<20
10	80133	44	2.5	<0.5	1.0	0.2	7	<1	<2	<20
11	80134	58	4.1	0.7	<0.5	<0.2	4	22	7	<20
12	80136	<2	<0.2	<0.5	<0.5	<0.2	<1	<1	<2	<20
13	80137	41	4.9	<0.5	1.5	0.2	4	1	<2	<20
14	80141	12	1.7	<0.5	1.9	0.2	5	1	<2	<20
15	80142	<10	0.8	<0.5	0.6	<0.2	<1	<1	4	<20
16	80143	47	4.5	0.7	1.2	<0.2	<1	<1	5	<20
17	80144	<2	2.4	<0.5	1.0	<0.2	2	<1	7	<20
18	80145	<2	1.8	<0.5	0.8	<0.2	3	<1	<2	<20
19	80146	<2	1.8	<0.5	0.8	<0.2	3	<1	<2	<20
20	80147	<2	2.0	0.6	1.0	<0.2	3	<1	<2	<20
21	80148	10	1.2	<0.5	0.6	<0.2	2	<1	<2	<20
22	80149	15	1.6	<0.5	1.1	<0.2	<1	<1	8	<20
23	80150	25	2.5	0.6	1.8	0.2	5	1	<2	<20
24	80151	27	4.6	0.8	1.2	<0.2	5	<1	<2	<20
25	80152	<10	1.2	<0.5	0.8	<0.2	<1	<1	<2	<20

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	11 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80153	10	1.7	<0.5	0.9	<0.2	<1	<1	<2	<20
2	80154	31	3.0	0.6	1.7	0.3	8	1	<2	<20
3	80155	<10	2.7	<0.5	1.2	<0.2	1	2	<2	<20
4	80156	<10	1.5	<0.5	1.0	<0.2	7	<1	<2	<20
5	80157	48	5.2	0.9	1.5	<0.2	6	<1	<2	<20
6	80158	<2	1.4	<0.5	1.5	0.2	10	2	6	<20
7	80159	<10	1.7	<0.5	1.8	0.3	10	2	<2	<20
8	80160	<2	1.7	<0.5	1.7	0.2	6	2	5	<20
9	80163	<2	1.9	<0.5	1.2	<0.2	7	2	<2	<20
10	80164	18	3.3	0.7	1.8	0.2	1	2	<2	<20
11	80165	<2	1.8	<0.5	0.8	<0.2	3	<1	<2	<20
12	80166	<2	1.7	<0.5	1.1	<0.2	6	3	<2	<20
13	80167	<2	1.4	<0.5	0.9	<0.2	6	1	<2	<20
14	80168	<2	1.2	<0.5	0.8	<0.2	6	1	<2	<20
15	80169	<10	1.9	<0.5	1.6	0.3	15	2	<2	<20
16	80170	<2	1.2	<0.5	0.9	<0.2	6	2	<2	<20
17	80172	<10	1.5	<0.5	1.1	<0.2	7	2	<2	<20
18	80174	<2	1.2	<0.5	1.4	0.3	11	1	<2	<20
19	80175	<2	1.5	<0.5	1.4	0.3	8	2	4	<20
20	80177	<2	1.6	<0.5	2.3	0.5	22	3	<2	<20
21	80178	<2	1.2	<0.5	1.1	<0.2	7	1	<2	<20
22	80179	<10	1.4	<0.5	0.8	<0.2	4	<1	<2	<20
23	80180	<2	1.0	<0.5	0.8	<0.2	6	3	<2	<20
24	80181	19	2.3	<0.5	1.2	0.2	5	2	<2	<20
25	80182	<2	1.0	<0.5	0.7	<0.2	5	1	<2	<20

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	12 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80183	<2	1.3	<0.5	0.8	<0.2	5	<1	<2	<20
2	80184	<10	1.3	<0.5	0.9	<0.2	5	1	<2	<20
3	80185	<10	0.7	<0.5	<0.5	<0.2	<1	<1	<2	<20
4	80186	<2	1.3	<0.5	0.6	<0.2	1	<1	<2	<20
5	80187	<2	1.3	<0.5	0.6	<0.2	4	2	<2	<20
6	80188	<2	1.5	<0.5	0.5	<0.2	3	<1	<2	<20
7	80189	23	1.9	<0.5	1.1	0.2	5	2	<2	<20
8	80190	<2	1.2	<0.5	0.8	<0.2	8	3	<2	<20
9	80191	15	1.5	<0.5	0.6	<0.2	<1	<1	<2	<20
10	80192	<10	3.3	0.7	1.2	0.2	11	<1	<2	<20
11	80193	<10	1.4	<0.5	1.2	<0.2	12	1	<2	<20
12	80194	<2	1.8	<0.5	1.0	<0.2	8	2	<2	<20
13	80195	<2	1.9	<0.5	1.3	0.2	5	1	4	<20
14	80196	<2	1.4	<0.5	1.9	0.3	9	2	<2	<20
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	10	0.2	0.5	0.5	0.2	1	1	2	20
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	13 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80099	<5	30	59.2	<2					
2	80100	<5	45	72.0	<2					
3	80101	<5	20	65.6	3					
4	80102	<5	20	36.0	2					
5	80103	<5	50	13.0	3					
6	80104	<5	35	51.5	<2					
7	80105	<5	30	87.1	<2					
8	80106	<5	30	22.0	<2					
9	80107	<5	30	40.0	<2					
10	80108	<5	20	3.8	6					
11	80109	<5	35	3.7	<2					
12	80110	<5	70	6.2	3					
13	80111	7	30	39.0	3					
14	80112	<5	30	58.9	<2					
15	80113	<5	35	63.3	<2					
16	80114	<5	35	84.5	<2					
17	80115	<5	30	38.0	<2					
18	80116	<5	20	47.0	3					
19	80117	<5	20	44.0	3					
20	80118	<5	25	15.0	<2					
21	80119	<5	25	31.0	2					
22	80120	<5	30	21.0	<2					
23	80121	<5	15	8.5	<2					
24	80122	<5	25	29.0	5					
25	80123	<5	60	6.6	<2					

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	14 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80124	<5	20	23.0	4					
2	80125	<5	25	5.2	3					
3	80126	<5	25	50.0	<2					
4	80127	<5	15	10.0	<2					
5	80128	<5	30	18.0	<2					
6	80129	<5	25	11.0	<2					
7	80130	<5	30	7.6	<2					
8	80131	<5	20	4.6	<2					
9	80132	11	15	1.8	<2					
10	80133	<5	5	15.0	<2					
11	80134	<5	65	4.1	<2					
12	80136	<5	<5	1.4	<2					
13	80137	<5	10	20.0	<2					
14	80141	<5	15	20.0	3					
15	80142	<5	15	2.3	20					
16	80143	<5	40	9.2	5					
17	80144	<5	20	14.0	7					
18	80145	<5	35	9.0	8					
19	80146	<5	25	6.1	7					
20	80147	<5	30	7.6	10					
21	80148	<5	20	16.0	7					
22	80149	<5	20	6.7	5					
23	80150	<5	35	43.0	2					
24	80151	<5	20	4.7	4					
25	80152	<5	15	10.0	2					

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	15 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80153	<5	10	7.3	3					
2	80154	<5	20	32.0	<2					
3	80155	<5	55	7.2	4					
4	80156	<5	25	33.0	7					
5	80157	<5	30	37.0	5					
6	80158	<5	25	79.0	3					
7	80159	<5	25	74.9	6					
8	80160	<5	35	62.6	5					
9	80163	<5	45	39.0	3					
10	80164	<5	35	7.9	13					
11	80165	<5	30	12.0	<2					
12	80166	<5	25	34.0	5					
13	80167	<5	20	47.0	5					
14	80168	<5	20	48.0	3					
15	80169	<5	25	68.0	<2					
16	80170	<5	25	28.0	<2					
17	80172	<5	30	97.4	4					
18	80174	<5	20	41.0	4					
19	80175	<5	20	47.0	4					
20	80177	<5	20	52.8	4					
21	80178	<5	25	61.0	<2					
22	80179	<5	25	40.0	3					
23	80180	<5	35	38.0	<2					
24	80181	<5	35	34.0	<2					
25	80182	<5	45	45.0	4					

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04528	08/10/90	DN 50386	16 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80183	<5	30	55.3	4					
2	80184	<5	30	40.0	6					
3	80185	<5	5	1.9	<2					
4	80186	<5	45	5.0	3					
5	80187	<5	25	14.0	2					
6	80188	<5	20	7.9	<2					
7	80189	<5	30	20.0	4					
8	80190	<5	30	55.2	<2					
9	80191	170	10	3.3	<2					
10	80192	<5	15	25.0	3					
11	80193	<5	25	74.7	4					
12	80194	<5	30	76.7	3					
13	80195	<5	5	16.0	<2					
14	80196	<5	15	72.2	4					
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	0.5	2					
24	UNITS	ppb	PPM	ppm	ppm					
25	METHOD	1801	140	1801	1801					

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A Division of Inchcape Inspection and Testing Services, Australia, Pty. Ltd.
Division of Inchcape Inspection and Testing Services Pty Ltd

RECEIVED 02 OCT 1990

(089) 47 2355 | Cnr Coonawarra & Mataraw Rds, Winnellie | Fax: (089) 84 3984

ANALYTICAL REPORT No. 999.16.21.04529

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
TANAMI JOINT VENTURE
P.O.BOX 625

DARWIN NT 0801

ORDER No.	PROJECT
DN 50386	

DATE RECEIVED	RESULTS REQUIRED
04/09/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
16	30/09/90	1	89

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	PC Prep: 019	Cu,Pb,Zn,Ni/140
Various EC5420	PC	Au,Ag,As,Ba,Br,Ce,Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo

RESULTS TO
STEVE MILNER
TANAMI JOINT VENTURE
GPO BOX 625

DARWIN NT 0801

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	1 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80197	14.4	270	29.90	3	<5	16	8	<100	29
2	80198	16.5	200	31.20	3	5	16	8	<100	16
3	80199	11.6	180	28.70	7	5	12	10	<100	27
4	80200	7.2	190	8.27	1	<5	8	8	<100	<2
5	80202	17.1	450	29.00	11	30	38	12	<100	21
6	80203	14.3	673	38.40	5	20	26	12	<100	17
7	80204	10.3	544	37.10	5	20	20	12	<100	20
8	80205	29.2	676	44.20	6	15	38	16	<100	16
9	80206	23.6	410	26.00	9	25	38	18	<100	17
10	80207	15.7	588	34.70	6	10	30	14	<100	25
11	80208	15.7	340	35.00	4	10	24	12	<100	30
12	80209	14.6	280	35.00	8	10	16	10	<100	32
13	80210	8.7	190	24.60	7	10	20	26	<100	37
14	80211	4.3	180	18.60	<1	<5	24	4	<100	3
15	80212	6.1	190	18.00	1	5	20	22	<100	30
16	80213	9.5	230	39.20	1	<5	20	4	<100	60
17	80214	10.2	210	32.40	2	5	18	8	<100	21
18	80215	15.1	280	34.40	6	10	18	10	<100	31
19	80216	23.6	430	26.70	8	30	40	20	<100	17
20	80217	17.0	380	22.60	8	25	28	14	<100	16
21	80218	16.1	360	17.10	11	25	26	14	<100	13
22	80219	21.6	330	10.00	14	15	24	46	<100	7
23	80220	0.7	170	0.44	<1	5	4	4	<100	<2
24	80221	15.5	390	35.10	3	15	30	18	<100	17
25	80222	0.6	509	0.81	1	5	2	2	<100	<2

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	2 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80223	14.8	300	35.10	6	15	40	20	<100	24
2	80224	21.1	490	31.00	9	20	28	20	<100	24
3	80225	16.9	2210	40.20	5	<5	74	26	<100	28
4	80226	18.1	638	30.40	7	15	20	12	<100	25
5	80227	13.7	450	21.50	11	15	24	18	<100	28
6	80228	14.5	480	22.30	12	15	24	20	<100	29
7	80229	15.6	543	24.70	17	10	16	14	<100	27
8	80230	10.3	380	14.70	16	15	24	14	<100	19
9	80231	16.2	583	28.80	12	15	26	16	<100	25
10	80232	10.9	400	21.10	8	10	22	18	<100	28
11	80233	22.4	858	37.30	7	20	26	22	<100	23
12	80234	12.3	380	18.10	16	10	36	14	<100	26
13	80235	24.4	647	30.10	4	15	30	18	<100	21
14	80236	11.8	604	28.30	4	10	18	14	<100	15
15	80237	25.3	1620	28.40	6	15	32	20	<100	16
16	80238	16.9	1000	34.80	8	25	20	14	<100	17
17	80239	11.6	88	45.80	32	80	172	290	270	<2
18	80240	22.7	240	37.60	13	65	92	150	200	<2
19	80242	2.5	340	1.30	2	5	2	8	<100	<2
20	80244	41.8	2900	37.60	3	20	58	16	<100	8
21	80245	15.4	953	21.40	6	10	26	16	<100	14
22	80246	2.4	240	11.80	<1	<5	26	14	<100	278
23	80247	13.6	4830	40.10	8	65	98	36	<100	7
24	80248	15.3	110	5.75	3	15	14	44	<100	<2
25	80249	14.3	526	37.50	3	15	32	16	<100	22

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	3 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80250	24.0	48	44.50	13	30	100	74	<100	16
2	80251	7.9	120	47.90	1	<5	56	24	<100	22
3	80252	14.7	721	31.70	4	10	24	12	<100	21
4	80253	22.1	450	33.40	4	10	38	24	<100	26
5	80254	18.4	190	34.10	6	20	70	82	<100	16
6	80255	0.9	480	0.82	<1	5	2	2	<100	<2
7	80258	9.4	130	37.70	8	10	20	24	<100	30
8	80259	16.7	170	29.40	3	5	28	32	<100	9
9	80260	10.2	170	27.70	7	5	10	10	<100	44
10	80261	20.2	180	24.40	5	5	12	16	<100	22
11	80262	22.8	280	23.10	5	10	14	14	<100	28
12	80263	50.7	1260	31.40	9	15	24	20	<100	35
13	80264	22.5	150	30.80	5	5	14	12	<100	27
14	80265	11.5	190	32.80	5	5	14	12	<100	26
15	80267	14.2	360	14.70	60	50	28	22	<100	23
16	80268	10.4	350	14.40	14	20	24	16	<100	22
17	80269	12.1	390	14.00	23	30	22	18	<100	21
18	80270	12.5	360	14.70	26	25	42	20	<100	22
19	80271	10.4	380	15.70	12	20	24	16	<100	21
20	80272	14.2	543	25.00	14	20	26	16	<100	26
21	80273	11.4	460	13.40	11	20	20	18	<100	20
22	80274	19.7	682	34.80	6	15	30	18	<100	25
23	80275	20.9	570	27.10	21	35	38	20	<100	24
24	80276	17.4	622	26.70	15	20	30	20	<100	24
25	80277	13.0	561	29.50	6	15	22	14	<100	23

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AUTHORISED OFFICER

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	4 OF 16

TUBE No.	SAMPLE No.	Sc	Cr	Fe	Co	Ni	Cu	Zn	Zn	As
1	80278	22.7	410	26.30	8	15	30	10	<100	23
2	80279	23.4	190	37.20	13	40	120	92	<100	6
3	80280	18.0	290	15.60	9	10	32	16	<100	14
4	80350	14.7	170	33.70	40	35	110	76	<100	9
5	80351	13.2	290	32.40	24	45	128	116	130	3
6	80352	25.2	240	33.80	10	20	140	80	<100	9
7	80353	15.2	220	32.00	6	10	34	16	<100	27
8	80354	22.0	330	34.00	5	10	22	14	<100	21
9	80355	15.9	330	30.90	6	10	40	14	<100	30
10	80356	22.0	470	37.90	3	<5	42	24	<100	13
11	80358	25.0	350	37.50	5	5	34	14	<100	13
12	80359	10.9	130	33.20	5	5	30	16	<100	11
13	80360	21.3	350	35.30	7	10	26	18	<100	20
14	80375	12.2	470	24.10	12	15	26	20	<100	31
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.1	5	0.05	1	5	2	2	100	2
24	UNITS	ppm	ppm	%	ppm	PPM	PPM	PPM	ppm	ppm
25	METHOD	1801	1801	1801	1801	140	140	140	1801	1801

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AUTHORISED SIGNATORY

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	5 OF 16

TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80197	<5	<2	53	<5	<5	0.6	2	190	4.2
2	80198	<5	<2	66	<5	<5	<0.5	<1	100	23.0
3	80199	<5	4	68	<5	<5	0.7	<1	220	6.9
4	80200	<5	<2	35	<5	<5	0.7	1	480	3.6
5	80202	<5	2	68	<5	<5	0.7	<1	<100	6.9
6	80203	<5	<2	75	<5	<5	0.7	<1	230	7.7
7	80204	<5	<2	34	<5	<5	0.8	<1	<100	7.1
8	80205	<5	<2	22	<5	<5	0.5	1	<100	3.8
9	80206	<5	<2	56	<5	<5	0.6	<1	110	6.6
10	80207	<5	<2	80	<5	<5	<0.5	<1	<100	7.6
11	80208	<5	<2	86	<5	<5	0.8	<1	<100	13.0
12	80209	<5	<2	90	<5	<5	0.9	1	170	20.0
13	80210	<5	<2	98	<5	<5	0.7	3	120	17.0
14	80211	<5	<2	64	<5	<5	0.5	1	200	13.0
15	80212	<5	<2	44	<5	<5	<0.2	<1	220	10.0
16	80213	<5	3	110	<5	<5	<0.5	2	640	22.0
17	80214	<5	<2	73	<5	<5	<0.5	<1	<100	20.0
18	80215	<5	<2	88	<5	<5	0.7	1	160	20.0
19	80216	<5	3	57	<5	<5	<0.5	<1	<100	6.5
20	80217	<5	<2	51	<5	<5	<0.5	1	120	3.2
21	80218	<5	<2	40	<5	<5	<0.5	<1	130	3.1
22	80219	<5	<2	25	<5	<5	<0.2	<1	<100	16.0
23	80220	<5	<2	200	<5	<5	<0.2	4	410	10.0
24	80221	<5	<2	23	<5	<5	<0.5	<1	610	18.0
25	80222	<5	<2	<20	<5	<5	<0.2	<1	220	5.4

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AUTHORISED OFFICER

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	6 OF 16

TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80223	<5	3	83	<5	<5	0.9	2	170	5.2
2	80224	<5	<2	75	<5	<5	0.7	<1	<100	5.3
3	80225	<5	2	77	<5	<5	0.5	1	<100	2.8
4	80226	<5	<2	74	<5	<5	1.4	<1	150	8.3
5	80227	<5	<2	70	<5	<5	1.0	3	<100	25.0
6	80228	<5	<2	80	<5	<5	1.1	2	360	25.0
7	80229	<5	<2	88	<5	<5	1.0	<1	570	21.0
8	80230	<5	<2	65	<5	<5	0.6	2	410	20.0
9	80231	<5	<2	83	<5	<5	0.8	1	410	19.0
10	80232	<5	<2	67	<5	<5	0.9	1	380	18.0
11	80233	<5	<2	85	<5	<5	0.8	2	180	17.0
12	80234	<5	<2	60	<5	<5	0.9	2	480	27.0
13	80235	<5	<2	48	<5	<5	0.7	1	1100	12.0
14	80236	<5	<2	51	<5	<5	<0.5	1	<100	8.1
15	80237	<5	<2	80	<5	<5	1.4	<1	110	11.0
16	80238	<5	4	92	<5	<5	<0.5	<1	180	11.0
17	80239	<5	<2	28	<5	<5	<0.5	<1	1200	10.0
18	80240	<5	3	100	<5	<5	<0.2	<1	1300	20.0
19	80242	<5	<2	22	<5	<5	<0.2	<1	560	8.5
20	80244	<5	<2	110	<5	<5	<0.2	<1	<100	3.1
21	80245	<5	<2	52	<5	<5	<0.5	<1	<100	5.2
22	80246	<5	<2	22	<5	<5	24.0	<1	450	51.8
23	80247	<5	<2	29	<5	<5	<0.5	<1	200	2.6
24	80248	<5	<2	220	<5	<5	<0.2	12	1000	53.8
25	80249	<5	<2	73	<10	<5	<0.5	1	<100	9.2

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AUTHORISED OPERATOR

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	7 OF 16

TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80250	<5	<2	27	<55	<5	0.8	<1	<100	41.0
2	80251	<5	<2	23	<5	<5	<0.2	1	460	13.0
3	80252	<5	<2	62	<10	<5	0.6	1	<100	10.0
4	80253	<5	<2	56	<10	<5	0.7	2	<100	8.6
5	80254	<5	<2	90	<5	<5	<0.5	1	200	35.0
6	80255	<5	<2	<20	<5	<5	<0.2	<1	150	7.7
7	80258	<5	<2	76	<5	<5	0.5	1	210	12.0
8	80259	<5	<2	44	<13	<5	<0.2	<1	420	48.0
9	80260	<5	5	39	<5	<5	0.6	<1	190	7.9
10	80261	<5	<2	50	<5	<5	<0.5	<1	<100	14.0
11	80262	<5	<2	40	15	<5	0.5	<1	<100	4.4
12	80263	<5	3	65	<5	<5	1.7	<1	270	4.7
13	80264	<5	5	62	<5	<5	0.6	<1	140	5.5
14	80265	6	3	73	<5	<5	0.7	2	140	15.0
15	80267	<5	<2	69	<5	<5	0.9	3	570	30.0
16	80268	<5	<2	55	<5	<5	0.8	2	320	23.0
17	80269	<5	<2	64	<5	<5	0.8	3	560	28.0
18	80270	<5	<2	68	<5	<5	0.8	3	380	28.0
19	80271	<5	<2	66	<5	<5	0.7	3	160	21.0
20	80272	<5	<2	74	<5	<5	1.0	1	320	21.0
21	80273	<5	<2	71	<5	<5	0.8	3	210	24.0
22	80274	<5	<2	80	<5	<5	0.9	<1	<100	20.0
23	80275	<5	<2	97	<5	<5	0.8	3	280	30.0
24	80276	<5	<2	77	<5	<5	1.2	1	400	23.0
25	80277	<5	<2	72	<5	<5	1.0	2	<100	11.0

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AUTHORISED OFFICER

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	8 OF 16

TUBE No.	SAMPLE No.	Se	Br	Rb	Mo	Ag	Sb	Cs	Ba	La
1	80278	8	3	55	<5	<5	0.5	<1	180	3.2
2	80279	<5	4	50	14	<5	<0.2	<1	250	12.0
3	80280	<5	<2	39	<5	<5	0.7	<1	<100	5.8
4	80350	<5	3	75	<5	<5	<0.2	<1	430	5.4
5	80351	<5	<2	41	<10	<5	<0.2	<1	790	4.1
6	80352	<5	3	71	<5	<5	<0.5	<1	250	12.0
7	80353	<5	<2	77	<5	<5	0.7	<1	<100	12.0
8	80354	<5	3	68	<5	<5	0.7	<1	390	8.0
9	80355	<5	2	72	<14	<5	0.9	<1	<100	7.4
10	80356	<5	2	<20	<5	<5	0.8	1	200	5.1
11	80358	<5	<2	74	<5	<5	<0.2	<1	150	4.9
12	80359	<5	3	63	<5	<5	<0.5	<1	430	5.1
13	80360	<5	<2	70	<5	<5	<0.5	<1	<100	6.0
14	80375	<5	<2	66	<5	<5	1.3	3	210	19.0
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	2	20	10	5	0.5	1	100	0.5
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	9 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80197	<10	1.3	<0.5	1.5	0.3	7	1	<2	<20
2	80198	21	3.5	0.7	1.1	<0.2	6	1	<2	<20
3	80199	<2	1.7	<0.5	1.5	0.3	7	2	<2	<20
4	80200	<2	1.1	<0.5	2.5	0.5	4	1	<2	<20
5	80202	<2	1.7	<0.5	1.0	<0.2	7	1	<2	<20
6	80203	<2	1.4	<0.5	0.9	<0.2	6	2	<2	<20
7	80204	<2	1.1	<0.5	0.6	<0.2	5	1	<2	<20
8	80205	<2	1.3	<0.5	0.8	<0.2	4	1	<2	<20
9	80206	<2	1.5	<0.5	1.3	0.2	7	2	<2	<20
10	80207	<2	1.4	<0.5	1.5	0.2	9	1	<2	<20
11	80208	<10	1.7	<0.5	1.6	0.3	8	2	<2	<20
12	80209	22	2.9	<0.5	1.2	<0.2	6	1	7	<20
13	80210	10	2.2	<0.5	1.1	0.2	5	1	<2	<20
14	80211	<10	0.7	<0.5	<0.5	<0.2	1	<1	<2	<20
15	80212	<10	0.8	<0.5	<0.5	<0.2	<1	<1	<2	<20
16	80213	<2	2.2	<0.5	1.8	0.3	3	1	<2	<20
17	80214	<10	2.2	<0.5	0.8	<0.2	6	<1	<2	<20
18	80215	14	2.8	<0.5	1.1	<0.2	7	2	6	<20
19	80216	<10	1.6	<0.5	1.3	<0.2	7	1	<2	<20
20	80217	<2	1.1	<0.5	1.0	<0.2	7	1	<2	<20
21	80218	<2	0.9	<0.5	1.0	<0.2	6	1	<2	<20
22	80219	16	3.0	<0.5	0.7	<0.2	<1	<1	<2	<20
23	80220	15	2.0	0.6	1.3	0.3	<1	2	<2	<20
24	80221	<2	2.6	<0.5	0.9	<0.2	5	1	4	<20
25	80222	<10	0.8	<0.5	<0.5	<0.2	<1	<1	<2	<20

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	10 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80223	<2	1.6	<0.5	1.1	<0.2	7	<1	<2	<20
2	80224	<10	1.4	<0.5	1.3	<0.2	7	1	<2	<20
3	80225	<2	0.9	<0.5	0.7	<0.2	3	1	<2	<20
4	80226	12	1.4	<0.5	0.9	<0.2	6	1	<2	<20
5	80227	35	2.7	<0.5	1.5	0.3	7	<1	<4	<20
6	80228	44	2.8	<0.5	1.6	0.3	8	<1	<2	<20
7	80229	81	2.8	<0.5	1.9	0.3	7	1	<2	<20
8	80230	40	2.6	<0.5	1.6	0.3	7	1	<2	<20
9	80231	43	2.6	0.6	1.6	0.2	7	2	<2	<20
10	80232	12	2.1	<0.5	1.4	0.3	6	1	<2	<20
11	80233	23	2.5	0.5	1.5	0.2	7	<1	<2	<20
12	80234	46	3.2	0.5	1.8	0.3	7	1	<2	<20
13	80235	<10	1.9	<0.5	1.2	<0.2	6	<1	<2	<20
14	80236	<2	1.4	<0.5	1.3	0.2	7	1	<2	<20
15	80237	<2	1.9	<0.5	0.9	<0.2	6	1	<2	<20
16	80238	<10	2.0	<0.5	1.0	<0.2	5	1	<2	<20
17	80239	<2	1.9	<0.5	1.3	<0.2	<1	<1	<2	<20
18	80240	<10	1.7	0.6	1.2	<0.2	2	<1	<2	<20
19	80242	13	1.2	<0.5	<0.5	<0.2	<1	<1	<2	<20
20	80244	<2	1.3	<0.5	0.7	<0.2	3	<1	<2	<20
21	80245	<10	1.3	<0.5	2.2	0.4	9	3	<2	<20
22	80246	70	4.8	0.6	<0.5	<0.2	<1	<1	<2	<20
23	80247	<2	0.9	<0.5	0.5	<0.2	1	<1	<2	<20
24	80248	74	7.9	1.5	2.8	0.4	5	2	<2	<20
25	80249	<10	1.6	<0.5	1.0	<0.2	3	2	<2	<20

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	11 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80250	51	9.0	1.3	2.3	0.3	<1	<1	<2	<20
2	80251	<2	2.7	<0.5	0.9	<0.2	2	<1	<2	<20
3	80252	26	1.8	<0.5	1.5	<0.2	7	1	<2	<20
4	80253	<10	1.6	<0.5	1.0	<0.2	5	<1	<2	<20
5	80254	70	3.2	0.6	1.5	<0.2	3	1	<2	<20
6	80255	14	1.2	<0.5	<0.5	<0.2	1	<1	<2	<20
7	80258	17	2.8	<0.5	1.3	<0.2	7	1	<2	<20
8	80259	66	3.7	<0.5	1.1	<0.2	2	1	<2	<20
9	80260	12	1.7	<0.5	1.5	0.2	12	2	<2	<20
10	80261	24	2.3	<0.5	1.1	<0.2	11	3	<2	<20
11	80262	13	1.6	<0.5	1.6	0.2	11	4	4	<20
12	80263	<10	1.7	<0.5	1.1	<0.2	5	1	<5	<20
13	80264	<10	1.7	<0.5	1.9	0.2	8	2	<2	<20
14	80265	13	2.3	<0.5	1.6	0.2	8	2	<2	<20
15	80267	381	3.8	0.6	2.1	0.4	7	1	<2	<20
16	80268	100	3.3	0.6	2.1	0.3	8	1	<2	<20
17	80269	219	3.8	0.7	2.4	0.4	9	<1	<2	<20
18	80270	150	3.6	<0.5	2.2	0.4	8	2	<2	<20
19	80271	64	2.8	<0.5	1.9	0.3	8	<1	<2	<20
20	80272	93	2.9	<0.5	2.0	0.3	7	<1	<2	<20
21	80273	76	2.9	0.6	1.8	0.3	8	1	<2	<20
22	80274	33	2.4	<0.5	1.3	<0.2	7	1	<2	<20
23	80275	120	4.6	0.8	2.4	0.4	8	1	<2	<20
24	80276	74	3.0	<0.5	1.9	0.3	8	2	<2	<20
25	80277	12	1.6	<0.5	1.4	<0.2	9	2	<2	<20

Results in ppm unless otherwise specified
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AUTHORISED OFFICER

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	12 OF 16

TUBE No.	SAMPLE No.	Ce	Sm	Eu	Yb	Lu	Hf	Ta	W	Ir
1	80278	<10	1.2	<0.5	2.1	0.3	8	2	<2	<20
2	80279	13	1.5	<0.5	0.9	<0.2	1	<1	<2	<20
3	80280	13	1.5	<0.5	1.4	0.2	9	2	<2	<20
4	80350	11	1.9	<0.5	0.9	<0.2	1	<1	<2	<20
5	80351	14	1.4	<0.5	1.0	<0.2	<1	<1	<2	<20
6	80352	<10	1.1	<0.5	0.8	<0.2	<1	<1	<2	<20
7	80353	17	1.9	<0.5	1.2	<0.2	8	2	<2	<20
8	80354	14	1.9	<0.5	1.0	<0.2	9	2	<2	<20
9	80355	11	1.8	<0.5	2.0	0.3	8	2	<2	<20
10	80356	<2	2.0	<0.5	0.7	<0.2	3	<1	<2	<20
11	80358	<10	1.7	<0.5	1.0	<0.2	6	1	<2	<20
12	80359	<10	1.5	<0.5	0.8	<0.2	5	<1	<2	<20
13	80360	<10	1.5	<0.5	1.2	<0.2	8	<1	<2	<20
14	80375	25	2.5	<0.5	1.7	0.3	7	1	<2	<20
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	10	0.2	0.5	0.5	0.2	1	1	2	20
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	13 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80197	<5	15	65.5	3					
2	80198	<5	25	61.0	4					
3	80199	<5	25	81.8	3					
4	80200	<5	5	22.0	<2					
5	80202	<5	20	40.0	<2					
6	80203	<5	30	39.0	<2					
7	80204	<5	<5	60.2	3					
8	80205	<5	40	36.0	4					
9	80206	<5	20	75.8	3					
10	80207	<5	35	74.0	3					
11	80208	<5	25	68.5	4					
12	80209	<5	35	93.3	5					
13	80210	<5	20	28.0	<2					
14	80211	<5	15	7.0	<2					
15	80212	<5	10	7.6	<2					
16	80213	<5	25	49.0	<2					
17	80214	<5	10	42.0	2					
18	80215	<5	35	92.2	7					
19	80216	<5	20	78.8	2					
20	80217	<5	35	87.6	<2					
21	80218	<5	30	61.0	<2					
22	80219	<5	5	0.8	<2					
23	80220	<5	5	2.7	<2					
24	80221	<5	30	30.0	<2					
25	80222	<5	5	0.9	<2					

Results in ppm unless otherwise specified
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	14 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80223	<5	10	39.0	3					
2	80224	<5	20	34.0	2					
3	80225	<5	15	30.0	2					
4	80226	<5	25	34.0	<2					
5	80227	<5	35	29.0	<2					
6	80228	<5	40	32.0	3					
7	80229	<5	35	37.0	3					
8	80230	<5	35	20.0	<2					
9	80231	<5	25	47.0	<2					
10	80232	<5	35	20.0	<2					
11	80233	<5	40	80.4	2					
12	80234	<5	25	18.0	<2					
13	80235	<5	5	56.2	<2					
14	80236	<5	20	60.5	<2					
15	80237	<5	20	62.6	<2					
16	80238	<5	35	64.5	<2					
17	80239	<5	45	8.9	<2					
18	80240	<5	50	17.0	<2					
19	80242	<5	<5	2.2	<2					
20	80244	<5	20	44.0	<2					
21	80245	<5	15	83.6	3					
22	80246	250	370	4.0	<2					
23	80247	<5	15	28.0	<2					
24	80248	<5	25	11.0	6					
25	80249	<5	10	34.0	9					

Results in ppm unless otherwise specified
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	15 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80250	<5	55	5.2	30					
2	80251	<5	45	50.0	7					
3	80252	<5	40	100.0	3					
4	80253	<5	20	54.4	4					
5	80254	<5	50	13.0	4					
6	80255	<5	<5	2.8	<2					
7	80258	<5	10	42.0	4					
8	80259	<5	40	62.2	6					
9	80260	<5	45	91.7	2					
10	80261	<5	25	87.5	<2					
11	80262	<5	25	201.0	2					
12	80263	<5	25	62.6	<2					
13	80264	<5	20	154.0	4					
14	80265	<5	30	82.7	3					
15	80267	<5	70	18.0	3					
16	80268	<5	35	16.0	3					
17	80269	<5	45	19.0	2					
18	80270	<5	45	16.0	3					
19	80271	<5	25	16.0	<2					
20	80272	<5	45	40.0	<2					
21	80273	<5	35	17.0	<2					
22	80274	<5	40	75.3	<2					
23	80275	<5	45	43.0	3					
24	80276	<5	45	48.0	<2					
25	80277	<5	25	82.3	4					

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	999.16.21.04529	30/09/90	DN 50386	16 OF 16

TUBE No.	SAMPLE No.	Au	Pb	Th	U					
1	80278	<5	30	43.0	4					
2	80279	<5	130	6.3	<2					
3	80280	<5	25	95.2	3					
4	80350	<5	10	8.2	<2					
5	80351	<5	25	7.8	7					
6	80352	<5	120	7.1	<2					
7	80353	<5	30	109.0	5					
8	80354	<5	30	88.4	3					
9	80355	<5	15	50.1	6					
10	80356	<5	30	8.7	9					
11	80358	<5	25	19.0	<2					
12	80359	<5	20	30.0	2					
13	80360	<5	20	51.7	2					
14	80375	<5	25	23.0	<2					
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	0.5	2					
24	UNITS	ppb	PPM	ppm	ppm					
25	METHOD	1801	140	1801	1801					

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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APPENDIX III

EL 5420 - Petrographic Descriptions

Pontifex & Associates Pty. Ltd.

L. (08) 332 6744
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26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 5734
by A.C. Purvis, PhD
and I.R. Pontifex, MSc.

October 16th, 1990

TO :	Mr S. Milner Senior Geologist Tanami Joint Venture Level 1 48 Woods St DARWIN NT 0800
YOUR REFERENCE :	Your letter SAM:NA:90.66
MATERIAL :	Rock samples
IDENTIFICATION :	80021 to 80095
WORK REQUESTED :	Section preparation, petrographic description
SAMPLES & SECTIONS :	Returned to you with this report.

I.R. Pontifex
Pontifex & Associates Pty Ltd

INTRODUCTION

This report covers 12 rock samples from the Tanami Complex, Northern Territory. [Note that sample 80095 was received but not included in your list of comments.]

Of these samples, nine were made into thin sections and three, with significant secondary iron oxides, (which were possibly gossanous), were examined in polished thin sections. The transmitted light study of the thin sections was augmented by examination in low angle incident light to discriminate minor graphite in some samples; and one sample (No. 80021) was stained for potassium felspar.

Six of the rocks appear to be of regional amphibolite facies, with quartz, mica and graphite variably present. Silver-grey crystalline graphite occurs in 80021, 42, and 83. Possible andalusite is present in 80021 and 83, although this andalusite differs from the contact metamorphic andalusite in 80292. Garnet occurred within boudinaged layers in 80154.

Two of the rocks were initially low grade metasediments rich in graphite (80095, 80292), but have abundant tourmaline (80095), or randomly oriented 'matchstick-like' andalusite crystals (80292), altered to sericite. The sample 80095, a very fine, folded and laminated graphitic quartz tourmaline schist, is an unusual rock, which may be a primary chemical facies or a pervasively metasomatised slate, originally similar to 800292. Sample 80292 formed by contact metamorphism.

One of the rocks (80248) was a quartz-poor, granitoid gneiss.

The three samples with relatively abundant and concentrated limonite examined in polished thin section, are (rather tentatively) interpreted as:

80153 quartzose, biotite-bearing skarn, (with patches of 'gel-limonite' of broadly lateritic genesis).

80155 (?felspar)-quartz-mica schist, altered and limonitised (meta sediment or possible meta fine granitoid)

80279 original BIF, with minor (oxidised) magnetite, abundant quartz (with minute inclusions) and abundant leached and oxidised silicate minerals.

Introduction continued :

The possible skarn, as well as the BIF, represent iron rich sediments, and as recorded in the literature, iron-rich sediments, particularly in a graphitic sequence, can react with dissolved AuHS complexes to precipitate gold and sulphide.

The anomalous zinc values reported in Nos 80021, 42, are common in graphitic sediments and may be accompanied by Ni and Cu, as in No. 80042. The zinc in No. 80031 is less easily accounted for, but could possibly derive from a spinel phase or from biotite. The zinc in 80155 could also be in biotite.

80153 Heterogeneous, vaguely layered (?and veined) clay quartz limonite rock; with limonite replicas after ?mica and ?garnet (possibly biotite-skarn); also patches of 'gel-limonite' of unspecified 'lateritic' genesis.

Field Note : Banded iron formation.,

This rock is not clearly banded as in a typical BIF, but has limonitic masses alternating with more quartz rich areas. The limonitic masses also contain limonite stained kaolin pseudomorphs after :

(1) a minor lamellar mineral probably biotite and
(2) a granular fractured mineral, possibly garnet, pyroxene (or olivine?), as grains about 0.5mm in size.

Similar limonitic clays occur on fractures in quartz, enclosed in the limonite.

Quite extensive irregular patches of limonite have a spongy-cellular, micro-oolitic composition, with individual cells in the aggregate about 0.5mm. These may have a limonitic clay matrix, but most areas are massive, and micro-oolitic to cellular in texture, with no matrix. This cellular limonite is commonly known as gel-limonite, of broadly lateritic genesis, but not specifically diagnostic of any particular precursor mineral.

The original rock may have been a biotite-bearing skarn.

80154 Weathered, laminated fine quartz-?biotite schist, with rare limonite after garnet porphyroblasts.

Field Note : Maroon phyllite
What is white mineral - part of the bedding or due to shearing?

The white mineral in this rock appears petrographically to be kaolin, derived from mica (?biotite) and highlighted in limonite-poor areas. The rock is highly weathered but was a strongly laminated relatively high grade schist, (but not a phyllite - the phyllite appearance is due to weathering).

Laminae 0.05 to 0.5mm wide, were alternately rich in quartz and in mica, probably biotite and now altered to kaolin ± limonite ± leucoxene.

A single boudinaged quartz rich layer with boudins to 10x4mm, contains limonite after somewhat skeletal garnet porphyroblasts to 8x4mm in size. Rare kaolinised possible felspar grains occur nearby.

Most of the quartz-rich laminae are elongated and ribbon-like and the rock is almost certainly of amphibolite facies grade.

80155 Apparent (?felspar)-quartz-mica schist [or micro-gneiss]; completely altered and ferruginised, and quartz grains fractured; accessory fine ilmenite, trace zircon.

Field Note : Geothite-garnet-mica rock.
Any clues on origin? The outcrop also included very coarse muscovite plates up to 3cm across. Sample is anomalous in Zn.

This rock has a fairly homogeneous gross texture and composition. At least 30% of it consists of quartz, as individual grains about 0.3mm and small commonly elongated aggregates to 2mm across, with a fairly even and vaguely layered distribution through a limonitic matrix (which forms most of the other 70% of the rock). The quartz grains are commonly fractured.

Slightly more than one half of the limonitic 'matrix' appears to completely replace former, more or less schistose micas.

A subordinate amount of the limonite forms poorly defined patches, similar in size-range to the quartz. These are massive and micro-porous, without any distinctive replica shape or form, but they do conceivably represent original felspars which have been altered to clay-sericite, then subsequently limonitised.

Accessory (<1%), very small (<0.1mm) grains of leached ilmenite are scattered, and a single zircon grain was seen.

The rock is interpreted as a (?felspar)-quartz-mica schist (or micro-gneiss), it could be a metasediment or meta-granitoid. There is no evidence of pre-existing sulphides, magnetite or garnet; and no mineralogical explanation for anomalous zinc.

[There are no fresh coarse flakes of muscovite in this sample submitted, as suggested in your field notes].

80248 Weathered probably granitoid gneiss; with quartz, muscovite, weathered biotite and kaolin derived from felspars.

Field Note : Red-yellow gneissic rock.
What is the red mineral ? Granitic or sedimentary origin?

The lensoidal nature of the quartz aggregates scattered through clay-sericite alteration products strongly suggest that the original rock was a granitoid rather than a metasediment.

These quartz lenses are 2-10mm long, but constitute only 10-15% of the rock, indicating a relatively silica poor granitoid, e.g. in the quartz-monzonite to quartz diorite range. Weathered biotite is common (25%) and there is moderately abundant fresh muscovite, possibly of retrograde origin. These micas are weakly schistose.

The remainder of the rock has a broadly gneissic-granulose relict texture, and consists of kaolin after felspar(s). This includes red patches of fine kaolin plus hematite dust, of uncertain origin, but possibly original potassium felspar as some of them contain irregular small quartz inclusions and may have been myrmekitic.

80279

Oxidised and leached BIF, with quartzosed layers intercalated with layers of limonite boxwork/replica after ?garnet, amphibole, carbonate, oxidised magnetite (possible pyroxene), and local ? pyrrhotite. Accessory inclusions in quartz, including trace fresh pyrrhotite.

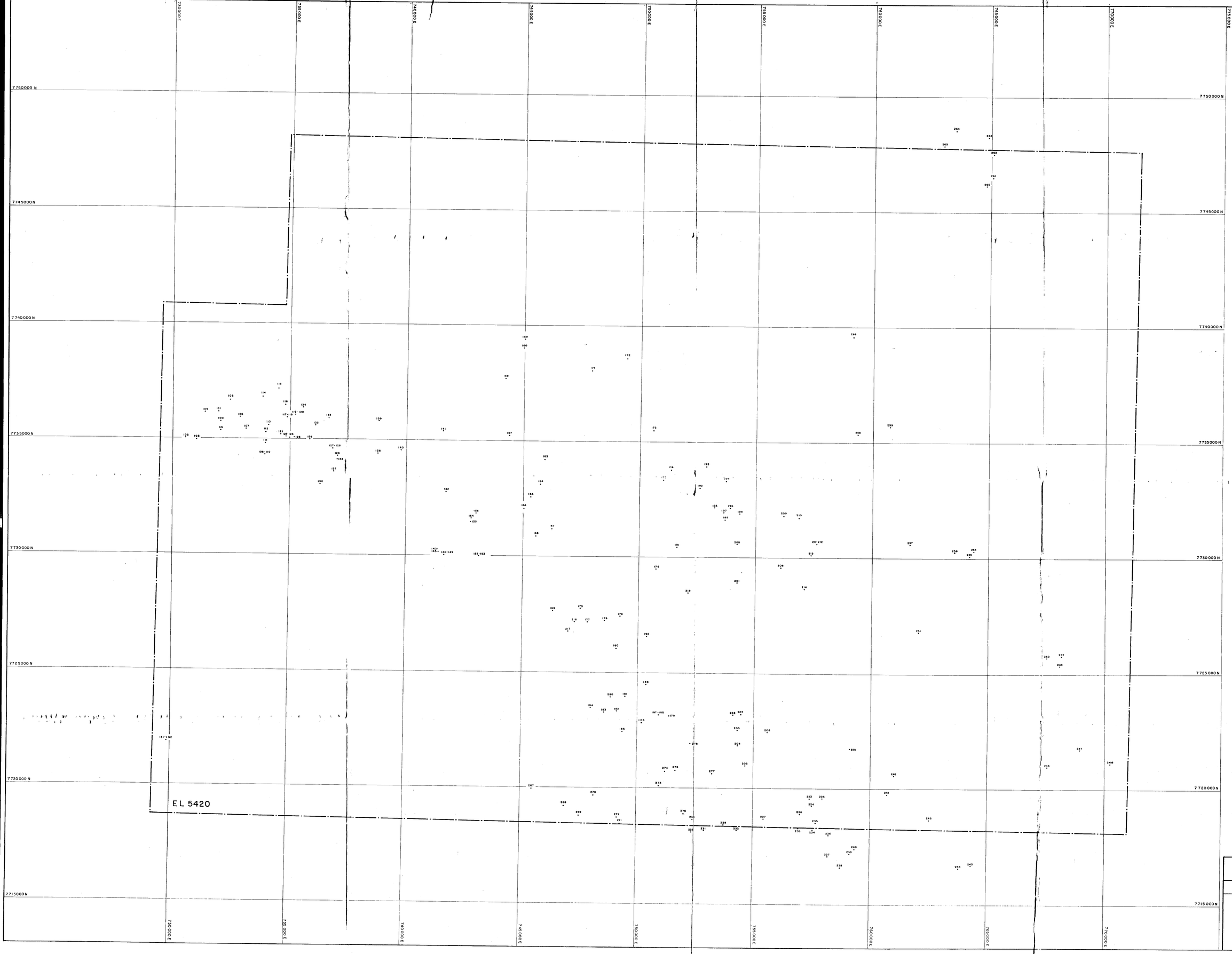
Field Note : Banded iron-formation.

About 30% of this rock consists of quartz dominated layers, variably 2 to 10mm thick. These are intercalated at irregular intervals with more abundant limonite-rich layers up to 20mm thick, and including minor fine grains of martitised magnetite.

The quartz layers consist of an irregular granoblastic mosaic of medium to coarse grained quartz. The coarser quartz has resulted from exaggerated grain growth. Some grains contain minute inclusions, which are difficult to identify, but could include hornblende, apatite, ?tourmaline; also rare fresh pyrrhotite, and rare very fine oxidised magnetite. Fluid inclusions are common.

The intercalated limonite-rich layers contain up to 30% fine metamorphic quartz grains; also scattered grains of martitised magnetite, forming 5-7% of a given layer. The oxidised magnetite grains range up to 0.5mm size, and most are fractured.

Most of these limonite-rich layers however, consist of aggregates of original granular silicate minerals, which were almost centainly Fe-rich. These have been leached and oxidised, with relict textures suggesting original garnet, amphibole, localised probable carbonate (and possible pyroxene). Quite corse pyrrhotite may also have been present, now represented by 'grains' of limonite with an internal, domainal curve-lamellar texture.



LEGEND

249 Sample Location
80 (prefix)

TANAMI JOINT VENTURE			
Scale: 1 : 50000	Compiled: S.A.M.		Date: MAY 1990
	Drawn: C.S.M.		

EL 5420

CR91/345