GEOLOGICAL SURVEY BRANCH ASSESSMENT REPORTS

ASSESSMENT REPORT

DATE RECEIVED MAY 2 8 1996

ON A

HEAVY MINERAL STREAM SEDIMENT

ROCK SAMPLING PROGRAM

ON THE

SWAN PROPERTY

SWAN and SWAN 1 to 3 MINERAL CLAIMS

KWANIKA CREEK AREA

FILMED

OMINECA MINING DIVISION, B.C. OLOGICAI BRANES SSESSMENT REPOR

NTS: LATITUDE: LONGITUDE: OWNER: OPERATOR: AUTHORS: DATE: 093N/11W 55° 30'N 125° 19' 45"W W.R. Gilmour Discovery Consultants T.H. Carpenter, P.Geo. February 20, 1996

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- APPENDIX B Rock Samples: Descriptions and Analytical Results
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SUMMARY

The Swan property is a developed prospect with an inferred reserve of 36,000,000 tonnes grading 0.2% copper. Mineralization comprises disseminated and fracture controlled pyrite and chalcopyrite in intrusives of the Hogem Intrusive Complex.

Exploration has been carried out in the area since 1937 but on the Swan property only since 1964. Between 1965 and 1973 work by various companies defined the mineralized reserves on the property.

In 1989 interest in the property was renewed after a coppergold affinity in the mineralization was demonstrated.

In 1995 a limited program of heavy mineral stream sediment sampling and rock sampling was carried out on the property.

LOCATION AND ACCESS

The SWAN property is centred at latitude 55°30'N and longitude 125°19'45"W, some 50 km south-southwest of Germansen Landing (Figure 1). The property is accessible from Fort St. James via various forest service roads north to the Takla-Manson Creek road at the northwest corner of Tsayta Lake. A road to the property leaves the Takla-Manson Creek road 9 km east along the Fall-Tsayta forest service road.

TOPOGRAPHY

The claims occupy a drift covered U-shaped glacial valley with elevations ranging from 900 metres to 1750 metres. Within the valley, topography is for the most part gentle with very little relief, the only exception being a steep slope on the west bank of Kwanika Creek. Most outcrops are located on Kwanika Creek. Elsewhere outcrop is scarce.



PROPERTY

The Swan property comprises one four-post and three two-post claims staked on May 18, 1995 by the author and recorded in Vernon on June 1, 1995 (Figure 2).

<u>Claim</u>	<u>Name</u>	<u>Record No.</u>	<u>Owner of Record</u>	<u>Anniversary</u> Date *
Swan		336366	W.R. Gilmour	May 18, 2000
Swan	1	336367	W.R. Gilmour	May 18, 1997
Swan	2	336368	W.R. Gilmour	May 18, 1997
Swan	3	336369	W.R. Gilmour	May 18, 1997

The claims are owned by W.R. Gilmour in trust for the Phoenix Syndicate.

Once the assessment work has been accepted, an Application for Inclusion of Claim will be filed on the Swan 1 - 3 claims.

* Pending acceptance of this report.



DWG-626-005

HISTORY

The first recorded exploration in the vicinity of Kwanika Creek occurred from 1937 to 1943 following the discovery of mercury at Pinchi Lake, 114 km to the south.

From 1943 to 1944 the Bralorne-Takla Mercury Mine, 4 kilometres northwest of the property, produced 132,088 lbs (60,040 kg) of mercury.

Placer operations for gold have been carried out intermittently on Kwanika Creek in the vicinity of the present claims.

The copper and molybdenum potential of the area was recognized in 1964 and in 1965 Hogan Mines completed a program of bulldozer trenching and limited diamond drilling.

In 1966 Canex Aerial Exploration Ltd. carried out extensive exploration including road building, line cutting, trenching, magnetometer and IP surveys and 855 metres of drilling.

Great Plains Development Company of Canada Ltd. carried out an exploration program in 1969 which included a magnetometer survey and 1319 metres of diamond drilling in seven holes.

The Canex and Great Plains work defined a low grade copper deposit within an area measuring 500 metres by 300 metres.

Bow River Resources, formerly Hogan Mines Ltd., drilled six percussion holes for a total of 1800 feet (548 metres) in 1972.

In 1973 Pechiney Development Ltd. expanded the area of investigation in a southerly direction.

Pechiney's work included 9820 feet (2993 metres) in 30 percussion holes.

No further work was reported until 1988 when a copper-gold affinity in the mineralization was demonstrated. A joint-venture between Northair Mines Ltd. and Eastfield Resources Ltd. carried out a geological mapping, geochemical sampling and induced polarization survey on the property in 1989.

In 1991 Eastfield completed 4 diamond drill holes totalling 549 metres. These holes were drilled to the north and west of previously defined mineralization to test for gold mineralization peripheral to the copper zone and adjacent to the regional Pinchi Fault.

GENERAL GEOLOGY

The following description of geology is excerpted from Assessment Report #19,131 entitled Geochemical Sampling, Introduced Polarization Survey and Geological Mapping on the Kwah 1-6 and Swan 1-8 claims for Northair Mines Ltd./Eastfield Resources Ltd. by Buskas, Garratt and Morton, 1989.

The major geological features in the region of the Swan Property are the Triassic aged Takla Group meta sediments which are intruded by the various phases of the Hogem Batholith. Paleozoic aged Cache Creek Group rocks occupy the extreme western portions of the property. The Pinchi Fault, a major north northwest trending suture zone, separates the Paleozoic terrain from Mesozoic and Cretaceous aged units which occur to the east.

The Cache Creek Group in the vicinity of the Swan property is composed of limestones believed to be Permian in age. Ultramafics of unknown age have previously been included in the Cache Creek but are now believed to be younger. Outcrops of Cache Creek limestone occur on Kwanika Creek in the southern part of the property and to the west of the creek in the central part of the property. A linear trending band of Cache Creek ultramafics are present in the western regions of the property. The Upper Triassic Takla Group metasediments outcrop in two places on Kwanika Creek. The most significant occurrence of this package is in the central part of the property where argillites, greywackes, volcaniclastic/greywackes and conglomerates occur.

Two small outcrops of Takla argillite are present farther to the south.

The majority of rocks outcropping on the property belong to two of the intrusive phases of the Hogem Batholith. The first phase is lower Jurassic in age and was classified by Garnett of the B.C. Department of Mines (1978) as having three distinct rock varieties; a Monzodiorite to Diorite; a Monzonite to Quartzbearing Monzonite; and a Hybrid Quartz-bearing Monzonite. The second phase is Lower Cretaceous in age and was classified by Garnett as a Quartz Monzonite to Granite variety.

On the south part of Kwanika Creek are two outcrops of a Polymict Boulder Conglomerate. These were considered by Garnett to be Upper Cretaceous in age. The major structural lineament in the area is the Pinchi Fault which trends north-northwest and regionally varies from 100 to 1500 m wide. It separates the older Paleozoic rocks from younger Mesozoic rocks but cannot be directly observed as its surface trace is covered by glacial drift. The proximity of the Pinchi Fault to Kwanika Creek is evidenced by the presence of fractures, shears and faults in outcrops along the creek. It is speculated that this fault may have had significance in preparing adjacent terranes for ascending mineralizing hydrothermal systems.

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WORK COMPLETED

Work carried out on the property in 1995 comprised heavy mineral stream sediment and rock sampling.

1. Heavy Mineral Stream Sediment Sampling

a). <u>Program Parameters</u>

A total of 2 heavy mineral stream sediment samples was taken from the claim area. Sample locations are shown on Figure 3. Heavy mineral drainage sampling entails the sampling of gravels, sands and silts from creek beds. The material is sieved in the field until approximately 10 kg of -20 mesh material is obtained. The sample is then shipped to C.F. Minerals Ltd. of Kelowna for heavy mineral separation. Fractions are produced according to grain size, specific gravity and magnetic susceptibilities.

Generally the -150HN fraction (-150 mesh, >3.2 specific gravity, non-magnetic) includes native gold, pyrite and many base metal sulphides as well as accessory minerals such as zircon. Para-magnetic (P) minerals include garnets, hornblende and epidote. The magnetic (M) fraction is generally exclusively magnetite. All remaining fractions are stored for further analysis or microscopic examination. The fraction selected for analysis (-150HN) is sent to Activation Laboratories for nondestructive analysis by neutron activation, followed by ICP analysis upon 'cooling'.

b). <u>Program Results</u>

Heavy mineral sampling results are contained in Appendix A,

analytical procedures in Appendix C and gold values are shown on Figure 3. Anomalous gold values were contained in both samples collected with 3180 ppb and 4580 ppb Au in samples 001 and 002 respectively. Both samples were collected from creeks draining areas to the west of the mineralized zone.

This area was tested in part by the 1991 drill program by Eastfield Resources which detected low Cu and Au values in a pyrite zone peripheral to the chalcopyrite-pyrite mineralized zone.

3. Rock Sampling

a). <u>Program Parameters</u>

Access to much of the property was denied at the time of the field program due to high water on Kwanika Creek. Consequently it was impossible to test the limited outcrop on the property for Au content. Sampling was therefore limited to testing mineralized pyritic, previously unsampled core and mineralized cupriferous core from core stored on the property. Much of the core in storage on the property has deteriorated and is unsuitable for sampling. In total fifteen rock samples were collected from the property, two float samples and thirteen samples from available core. The samples were sent to Bondar Clegg and Company Limited in North Vancouver, B.C. for Au and 34 element ICP analysis.

b). <u>Program Results</u>

Analytical results and sample descriptions are contained in Appendix B. Analytical procedures are contained in Appendix C.

The maximum gold value obtained in the rock samples was 73 ppb in sample TC-14 (Figure 3). This value corresponded to the maximum copper value of 2607 ppm. As is evident from the analytical results however the gold values are not directly proportional to the copper content of the samples. Similar results were noted in the 1989 field program.

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CONCLUSIONS

The Swan property is host to a developed prospect containing 36,000,000 tonnes of 0.2% copper.

Previous field work in 1989 on behalf of Northair Mines Ltd. and Eastfield Resources Ltd. indicated significant gold anomalies on creeks on the east side of Kwanika Creek. These anomalies have never been tested. The 1995 program has also indicated anomalous gold in drainages on the west side of Kwanika Creek.

The 1989 I.P. program also described a strong potential for extending the limits of the copper deposit to the south, west and north. The eastern edge of the anomaly appeared to be partly masked by thick overburden.

The 1991 drill program detected sporadic gold and copper mineralization in a pyrite zone containing 2 to 5% total sulphides peripheral to the chalcopyrite-pyrite zone.

RECOMMENDATIONS

Further exploration is recommended on the Swan property. Continued heavy mineral sampling is recommended to the east of the present claims to define significant gold values detected in previous silt sampling.

The gold content of the chalcopyrite-pyrite zone should be established and testing for additional extensions of this zone should be undertaken.

Respectfully submitted, FESSIO BOVINCE T. H. CARPEN BRITISH fter, P.Geo. Campé

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February 20, 1996 Vernon, B.C.

REFERENCES

British Columbia Ministry of Energy, Mines and Petroleum Resources (MEMPR) Annual Reports

> 1965 - pp. 105-106 1966 - pg. 119 1967 - pg. 119

British Columbia Ministry of Energy, Mines and Petroleum Resources - Geology, Exploration and Mining in British Columbia

> 1969 - pp. 105-106 1970 - pp. 180-181 1972 - pp. 440-447 1974 - pg. 276 1973 - pg. 365

British Columbia Ministry of Energy, Mines and Petroleum Resources -Assessment Reports #4577, 4773, 4826, 5266, 19131, 21648

CIM Special Volume #15 (1976), Table 1, #97

STATEMENT OF COSTS

1.	Professional Services T.H. Carpenter, P.Geo. Travel & field work 2.5 days @ \$380.00/day Report Writing 2.5 days @ \$332.21/day	\$ 950.00 <u>830.53</u>	\$ 1780.53
2.	Field Personnel J. Beggs - sampling & travel May 18 to May 20, 1995 2.5 days @ \$214/day		535.00
3.	Transportation Truck		322.95
4.	Lodging & Meals		300.14
5.	Geochemical Analysis a) Heavy Mineral samples Sample preparation 2 samples @ \$127.77 Sample analysis 2 @ \$20.76/sample b) Rock samples Preparation & analysis 15 samples @ \$17.80	\$ 255.54 41.52 <u>267.00</u>	564.06
6.	Drafting		222.75
7.	Data compilation, secretarial		333.97
8.	Field supplies and equipment r	rental	238.03
9.	Printing, data processing, tel shipping	ephone,	100.00

Total <u>\$ 4397.43</u>

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STATEMENT OF QUALIFICATIONS

I, THOMAS H. CARPENTER of 3902 14th Street, Vernon, B.C., VIT 3V2, DO HEREBY CERTIFY that:

- 1. I am a consulting geologist in mineral exploration associated with Discovery Consultants, Vernon, B.C.
- 2. I have been practising my profession for 24 years.
- 3. I am a graduate of the Memorial University of Newfoundland with a Bachelor of Science degree in geology.
- 4. I am a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of British Columbia.
- 5. This report is based upon knowledge of the SWAN property gained from supervision.
- 6. I hold no interest either directly or indirectly in the SWAN property.



February 20, 1996 Vernon, B.C.

APPENDIX A

Heavy Mineral Stream Sediment Survey

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Swan Heavy Mineral Sampling Results -150HN fraction

1995

Date of Report : 95.09.14 Reference : ALL-8601, 8712 (CFM95-614)

Sample ID	-20 mesh weight kg	-150HM wt g	-150HP wt g	-150HN wt g	-150H total wt g	iNAA Au ppb	Ац ру	INAA Ag ppm	ICP Ag ppm	INAA As ppm	ICP As ppm	INAA Sb ppm	ICP Sb ppm	ICP Cu ppm
626-001	7.8	2.44	5.40	1.14	8.98	3180	5	ধ্য	<0.2	9	<10	2	<5	38
626-002	9.3	2.42	4.26	0.68	7.36	4580	3	ধ্য	<0.2	7	<10	2	<5	24

Swan

Heavy Mineral Sampling Results (part 2)

													=====	=====	
Sample ID	INAA	ICP	ICP	ICP	INAA	ICP	INAA	ICP	INAA	INAA	ICP	INAA	ICP	INAA	ICP
	Zn	Zn	Pb	Cd	Mo	Mo	Fe	Fe	Hg	Ni	Ni	Cr	Cr	Co	Co
	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
626-001	<200	52	12	<0.5	<20	2	5.8	1.8	48	600	25	1100	22	29	8
626-002	<200	19	7	<0.5	<20	2	5.4	1.3	110	<200	47	1300	42	27	6

Swan

Heavy Mineral Sampling Results (part 3)

Sample ID	INAA	ICP	INAA	ICP	ICP	inaa	INAA	ICP	INAA	INAA	inaa	ICP	ICP	ICP
	Ba	Ba	W	W	Mn	Th	U	V	Ir	Ca	Sr	Al	Be	BI
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	%	%	%	ppm	ppm
626-001	420	58	25	<10	232	11	7	19	<50	13	<0.2	0.2	<1	<10
626-002	530	32	21	<10	123	15	0	19	<50	12	<0.2	0.2	<1	<10

Swan

Heavy Mineral Sampling Results (part 4)

Sample ID	INAA	INAA	ICP	ICP	iCP	ICP	ICP	ICP	ICP	iNAA	INAA	ICP	ICP	ICP
	Br	Na	Na	Ca	K	Mg	TI	Zr	P	Se	Sc	Sc	Sn	Sr
	ppm	ppm	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
626-001	49	7920	0.01	0.6	0.0	0.3	0.02	1	2430	24	65	2	<10	18
626-002	19	6270	<0.01	0.3	0.0	0.3	0.03		971	<20	73	2	<10	11

Swan

Heavy Mineral Sampling Results (part 5)

Sample ID	INAA	INAA	INAA	INAA	INAA	iNAA	INAA	INAA	INAA	INAA	iCP	INAA	INAA
	Rb	Cs	La	Ce	Sm	Eu	Hf	Nd	Ta	Tb	Y	Yb	Lu
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
626-001	<50	8 Q Q	85	190	15	5	94	95	3	2	7	10	2
626-002	<50		168	400	25	7	46	164	6	4	5	10	1

APPENDIX B

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Rock Descriptions and Analytical Results

SWAN ROCK SAMPLES

- 626-TC-01 Float. 1m boulder of limonitic carbonate. Vugs after pyrite. 170m at 350° from Swan 3 FP.
 - 626-TC-02 700m north of Swan 3 FP. Float. Rusty limonitic rock (carbonate) with quartz.
 - 626-TC-03 Old drill core. High K alteration and quartz veining with 3-5% disseminated pyrite. Grab sample. <u>Unsplit</u> core. Location unknown.
 - 626-TC-04 Split core. Hole unknown. Potassic alteration cut by dark green chloritic alteration. 2-3% disseninated py and cpy.
 - 626-TC-05 Ax cove. Potassic alteration with limonitic fractures. Hole and depth unknown. 1% disseninated cpy.
 - 626-TC-06 DDH B-6? 192'or 352'? Weakly to moderately chloritized granodiorite with 1-3% disseminated py and cpy.
 - 626-TC-07 Hole B-5. 112'. Potassic and chloritic alteration with epidote stringers. Minor (<1%) disseminated py and cpy.
 - 626-TC-08 Hole B-2. 313-326'. Brown coloured granodiorite. (mafics chloritized and discoloured) with 2-4% disseminated py and cpy.
 - 626-TC-09 Hole A3. 44-56'. Ax core. Weak to moderate chloritic and potassic alteration. Limonite on fractures. Occasional quartz veinlets.

Hole A-4. Casing to 106'.

626-TC-10 A-4. 146-151'. Weak to moderate chloritic and potassic alteration. Granodiorite? Monzomite?

A-1 casing 15'.

- 626-TC-11 A-1. 332'-341'. Moderate to strong potassic and chloritic alteration. Occasional py and cpy healing fractures.
- A-2 casing to 49'. 626-TC-12 A-2(?). 62-72'. Strong potassic alteration with cpy and py stringers to 2-3mm. 3-4% py and cpy.

- 626-TC-13 A-3. 103'-112'. Moderate to strong potassic alteration with occasional quartz stringer and 1-3% disseminated py and cpy.
- 626-TC-14 B-2. 220-230'. Moderate to strong chloritic and potassic alteration with occasional disseminated py.
- 626-TC-15 A-3. 160'-170. Moderate to strong potassic alteration. Occasional K-spar stringers. Minor (~ 1%) disseminated py.

54 boxes of old core at old camp most of which are unreadable. Above samples collected from boxes with identification.

NQ core from SW 91-1, 91-2, 91-3 and 91-4. Core all split and sampled. status: Final

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Swan

Rock Sampling Results 1995

Reference : v95-00579.0

Date of Report: 95.06.15

Sample ID	Au 30	Ag	Cu	Pb	Zn	Cd	Мо	As	Sb	Bi	Ni	Со	Cr	Fe
	ррь	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
626-TC 01	<5	<0.2	7	4	18	<0.2	5	143	<5	<5	677	36	406	2 09
626-TC 02	<5	0.2	23	3	21	<0.2	6	192	14	<5	272	22	374	2 44
626-TC 03	9	0.8	809	10	66	<0.2	22	137	5	<5	12		60	2.42
626-TC 04	13	<0.2	253	6	27	<0.2	20	<5	<5	<5	17	12	103	1.72
626-TC 05	6	<0.2	349	9	44	<0.2	-8	14	<5	<5	11	12	68	2.70
626-TC 06	29	0.6	792	8	44	<0.2	6	5	<5	<5	3	9	44	2.35
626-TC 07	25	0.6	831	6	30	<0.2	9	<5	<5	<5	4	6	71	2.49
626-TC 08	14	0.4	629	3	40	<0.2	9	99	8	5	7	11	68	4.91
626-TC 09	19	0.7	748	54	113	<0.2	9	<5	<5	<5	3	8	93	2.49
626-TC 10	8	<0.2	221	4	48	<0.2	9	<5	<5	<5	13	12	63	2.50
626-TC 11	11	0.3	179	8	37	<0.2	6	10	<5	<5	7	10	91	2.32
626-TC 12	25	0.7	567	9	41	<0.2	16	41	<5	<5	4	15	99	2.78
626-TC 13	17	1.8	2442	22	125	0.4	18	<5	<5	<5	4	7	81	1.78
626-TC 14	73	1.6	2607	5	30	<0.2	132	7	<5	<5	7	9	83	2.64
626-TC 15	39	0.8	923	6	69	<0.2	9	59	<5	<5	4	13	84	2.73
Duplicate:														
626-TC 10	7	0.2	225	4	51	<0.2	9	<5	<5	<5	13	12	65	2.57

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Sample ID	Ba ppm	Mn ppm	V ppm	Sr ppm	Y ppm	La ppm	Te ppm	Sn ppm	W ppm	AI %	Mg %	Ca %	Na %	K %
626-TC 01	<10	383	10	7	<1	4	61	<20	<20	0.05	3.68	0.17	<0.01	0.01
626-TC 02	<10	550	12	34	<1	4	48	<20	<20	0.08	3.94	0.78	< 0.01	0.02
626-TC 03	<10	1411	26	80	5	6	121	<20	<20	0.42	0.89	4.51	0.02	0.23
626-TC 04	<10	277	44	39	6	5	81	<20	<20	0.83	1.14	1.03	0.06	0.21
626-TC 05	<10	780	60	86	9	9	53	<20	<20	0.80	1.31	2.49	0.05	0.23
626-TC 06	<10	656	63	206	5	6	26	<20	<20	2.40	1.23	1.43	0.12	0.13
626-TC 07	<10	520	63	111	5	7	83	<20	<20	1.68	0.94	1.14	0.19	0.24
626-TC 08	<10	780	32	39	5	9	40	<20	<20	0.85	0.81	0.90	0.03	0.47
626-TC 09	<10	1449	60	107	6	8	64	<20	<20	1.33	1.10	1.18	0.10	0.49
626-TC 10	<10	612	68	114	6	7	50	<20	<20	0.74	0.76	1.11	0.06	0.22
626-TC 11	<10	432	59	169	7	7	114	<20	<20	1.14	0.83	1.35	0.09	0.26
626-TC 12	<10	597	45	90	7	9	68	<20	<20	0.83	0.67	2.00	0.06	0.23
626-TC 13	<10	959	78	174	7	8	88	<20	<20	0.60	0.82	1.44	0.06	0.24
626-TC 14	<10	549	64	58	5	6	51	<20	<20	1.24	0.90	0.94	0.10	0.28
626-TC 15	<10	814	58	109	7	8	63	<20	<20	0.92	0.93	1.08	0.10	0.28
Duplicate:														
626-TC 10	<10	625	72	128	6	7	42	<20	<20	0.68	0.77	1.17	0.06	0.23

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Rock Sampling Results (part 3)

		======					=====:
Sample ID	Ga ppm	Li ppm	Ti %	Ta ppm	Sc ppm	Nb ppm	Zr ppm
						-	
626-TC 01	<2	3	<0.01	<10	<5	<1	<1
626-TC 02	<2	<1	<0.01	<10	<5	<1	<1
626-TC 03	~2	2	<0.01	<10	<5	<1	1
626-TC 04	<2	11	0.04	<10	<5	<1	3
626-TC 05	<2	6	<0.01	<10	<5	<1	2
626-TC 06	<2	15	0.08	<10	<5	<1	1
626-TC 07	<2	16	0.07	<10	<5	<1	1
626-TC 08	<2	5	<0.01	<10	<5	<1	2
626-TC 09	<2	22	0.04	<10	<5	<1	2
626-TC 10	<2	6	0.04	<10	<5	<1	2
626-TC 11	<2	8	0.08	<10	<5	<1	3
626-TC 12	<2	7	<0.01	<10	<5	<1	2
626-TC 13	<2	10	<0.01	<10	<5	<1	1
626-TC 14	<2	14	0.05	<10	<5	<1	1
626-TC 15	<2	15	0.02	<10	<5	<1	1
Duplicate:							
626-TC 10	<2	6	0.05	<10	<5	<1	2

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APPENDIX C

Analytical Procedures

Geochemical Analysis

by Bondar-Clegg :

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		LOWER		
ELEMEN	Π	DETECTION LIMIT	EXTRACTION	METHOD
Au	Gold	5 ppb	fire-assay	atomic absorption
Ag	Silver	0.2 ppm	HNO ₂ -HCl hot extr	ind. coupled plasma
AJ*	Aluminum	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
As	Arsenic	5 ppm	HNO ₂ -HCI hot extr	ind. coupled plasma
Ba*	Barium	5 ppm	HNO ₂ -HCI hot extr	ind. coupled plasma
Bi	Bismuth	5 ppm	HNO ₃ -HCl hot extr	ind. coupled plasma
Ca*	Calcium	0.01 %	HNO ₃ -HCl hot extr	ind. coupled plasma
Cd	Cadmium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Co*	Cobalt	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Cr*	Chromium	1 ppm	HNO ₂ -HCI hot extr	ind. coupled plasma
Cu	Copper	1 ppm	HNO ₂ -HCI hot extr	ind. coupled plasma
Fe*	Iron	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Ga	Gallium	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Hg∎	Mercury	10 ppb	HNO ₃ -HCI leach	cold vapour atomic absorption
K*	Potassium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
La*	Lanthanum	1 ppm	HNO ₂ -HCI hot extr	ind, coupled plasma
Li	Lithium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Mg*	Magnesium	0.01 %	HNO ₃ -HCl hot extr	ind. coupled plasma
Mn*	Manganese	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Mo*	Molybdenum	1 ppm	HNO ₃ -HCl hot extr	ind. coupled plasma
Na*	Sodium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Nb	Niobium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Ni*	Nickel	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Pb	Lead	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sb*	Antimony	5 ppm	HNO3-HCI hot extr	ind. coupled plasma
Sc	Scandium	5 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sn*	Tin	20 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sr*	Strontium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Та	Tantalum	10 ppm	HNO ₂ -HCI hot extr	ind. coupled plasma
Te*	Tellurium	10 ppm	HNO3-HCI hot extr	ind. coupled plasma
Ti	Titanium	0.01 %	HNO ₃ -HCl hot extr	ind. coupled plasma
V*	Vanadium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
W*	Tungsten	20 ppm	HNO ₃ -HCl hot extr	ind. coupled plasma
Y	Yttrium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Zn	Zinc	1 ppm	HNO ₃ -HCl hot extr	ind. coupled plasma
Zr	Zirconium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma

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- Please note: certain mineral forms of those elements above marked with an asterisk will not be soluble in the HNO₃/HCl extraction. The ICP data will be low biased.
- Please note: Hg will only be analysed upon request.

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ANALYTICAL PROCEDURES

INAA Analysis

by Activation Laboratories :

		LOWER		
ELEMENT		DETECTION LIMIT	EXTRACTION	METHOD
Au	Gold	5 ppb		INAA
Ag	Silver	5 mag 2		INAA
As	Arsenic	2 ppm		INAA
Ba	Barium	200 ppm		INAA
Br	Bromine	5 ppm		INAA
Ca	Calcium	1 %		INAA
Ce	Cerium	3 ppm		INAA
Со	Cobalt	5 ppm		INAA
Cr	Chromium	10 ppm		INAA
Cs	Cesium	2 ppm		INAA
Eu	Europium	0.2 ppm		INAA
Fe	Iron	0.02 %		INAA
Hf	Hafnium	1 ppm		INAA
Hg	Mercury	5 ppm		INAA
lr	Iridium	40 ppb		INAA
La	Lanthanum	1 ppm		INAA
Lu	Lutetium	0.1 ppm		INAA
Мо	Molybdenum	20 ppm		INAA
Na	Sodium	500 ppm		INAA
Nd	Neodymium	10 ppm		INAA
Ni	Nickel	200 ppm		INAA
Rb	Rubidium	50 ppm		INAA
Sb	Antimony	0.2 ppm		INAA
Sc	Scandium	0.1 ppm		INAA
Se	Selenium	20 ppm		INAA
Sm	Samarium	0.1 ppm		INAA
Sr	Strontium	0.2 %		INAA
	Tantalum	1 ppm		INAA
ID Th		2 ppm		
IN		0.5 ppm		
	Uranium	U.S ppm		
99 Vh	Vttabium	4 ppm		
10 7-	TILEDIUM	0.2 ppm		
∠n	ZINC	200 ppm		IINAA

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ANALYTICAL PROCEDURES

ICP Analysis

by Activation Laboratories:

ELEMENT		LOWER DETECTION LIMIT	EXTRACTION	METHOD
Ag	Silver	0.2 ppm	HNO3-HCI hot extr	ind. coupled plasma
Al*	Aluminum	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
As*	Arsenic	5 ppm	HNO3-HCI hot extr	ind. coupled plasma
Ba*	Barium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Be*	Beryllium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Bi	Bismuth	5 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Ca*	Calcium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Cd	Cadmium	0.5 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Co*	Cobalt	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Cr*	Chromium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Cu	Copper	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Fe*	Iron	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
K*	Potassium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Mg*	Magnesium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
Mn*	Manganese	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Mo*	Molybdenum	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Na*	Sodium	0.01 %	HNO ₃ -HCl hot extr	ind. coupled plasma
Ni*	Nickel	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
P*	Phosphorus	5 ppm	HNO3-HCI hot extr	ind. coupled plasma
Pb	Lead	2 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sb	Antimony	5 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sc*	Scandium	10 ppm	HNO3-HCI hot extr	ind. coupled plasma
Sn*	Tin	5 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Sr*	Strontium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Ti*	Titanium	0.01 %	HNO ₃ -HCI hot extr	ind. coupled plasma
V*	Vanadium	1 ppm	HNO ₃ -HCl hot extr	ind. coupled plasma
₩*	Tungsten	10 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Y	Yttrium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Zn	Zinc	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma
Zr	Zirconium	1 ppm	HNO ₃ -HCI hot extr	ind. coupled plasma

 Please note: certain mineral forms of those elements above marked with an asterisk will not be soluble in the HNO₃/HCl extraction. The ICP data will be low biased.

