A Geometry Normalized Inphase Electromagnetic (GENIE) Survey

Accompanying Geochemical Soil Survey

Specific Claims Involved: Nimp Record No. 1067

Mining Division: Nanaimo

Specific N.T.S. Location: 92L/7W

Latitude and Longitude: 50° 25' N 126° 58'W

Owner of Claims: Mintek Resources Ltd.,

#1300 - 409 Granville St.,

Vancouver, B.C.

V6C 1T2

(Formerly Cathedral Minerals)

Operator: Mintek Resources Ltd.

Author: J. W. Morton

Date Submitted: January 23, 1984

GEOLOGICAL BRANCH ASSESSMENT REPORT

12,348

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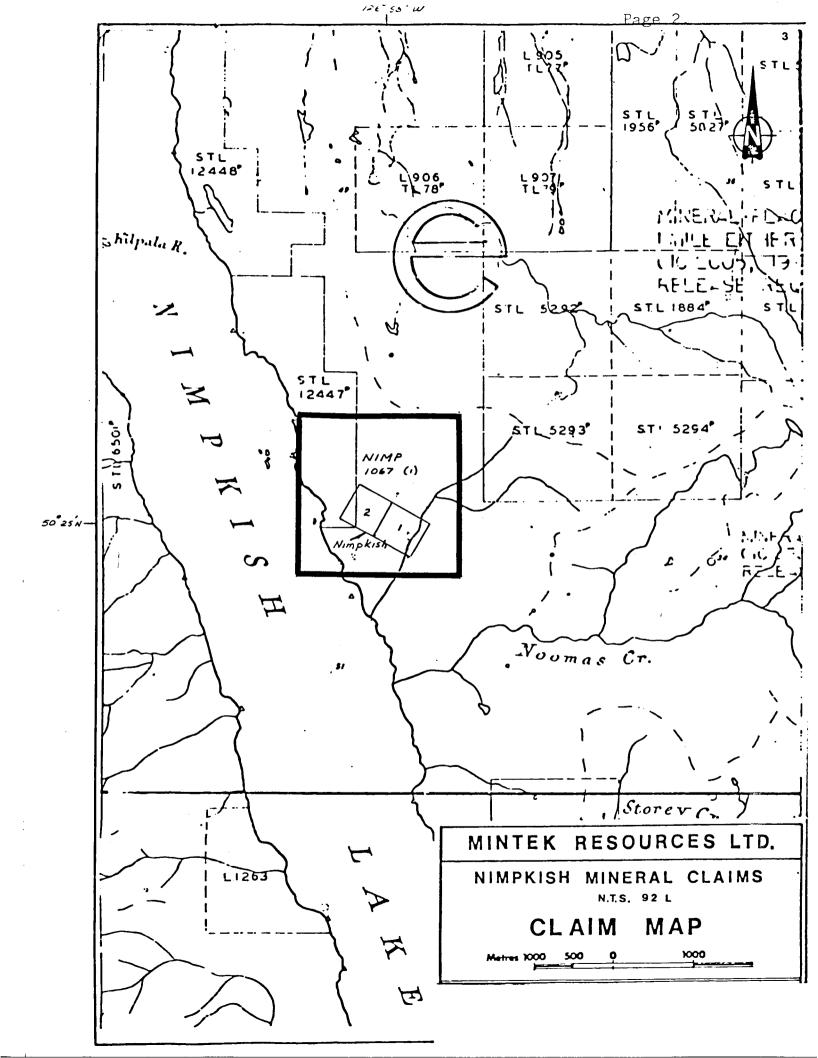
Introduction:

(i) The Nimp mineral claims are located on the west shore of Nimpkish Lake, north of Noomas Creek. Elevations on the claim vary between 65 feet (20 m.) and 1500 feet (490 m.) above sea level. The Nimp mineral claim is road accessible.

This region of Vancouver Island is tectonically located within the insular belt. The insular belt is characterized by rocks derived from a history of alternating effusive volcanism, varied sedimentation and later igneous intrusion. In the vicinity of the Nimp Claims, Upper Triassic basic volcanic rocks (The Karmutzen Group) and Upper Triassic marine carbonates (The Quatsino Formation) are in intrusive contact with Upper Jurassic granodiorite.

(ii) Numerous mineral occurrences have been previously located in the Nimpkish Valley. The bulk of known mineralization is of a skarn type. In this area, skarn mineralization most commonly occurs at the contact of Quatsino limestone with granodiorite. Skarn mineralization also occurs at the contact of Quatsino limestone and Karmutzen andesite, close to igneous intrusions. Mineralization is commonly best developed in limestone (exoskarn) but also occurs within volcanic and intrusive rock (endoskarn). In the Nimpkish area, at least four types of skarn can be distinguished on an economic basis: magnetite skarn, magnetite chalcopyrite skarn (plus gold), galena sphalerite (chalcopyrite) skarn and pyrrhotite pyrite skarn.

The Nimp Claim is currently owned and operated by Mintek Resources Ltd., of Vancouver, B.C. Previous to Mintek's ownership of the claim, NORANDA Exploration completed a geological mapping, magnetometer survey and trenching program within the area of the claim in 1953. In the early 1970's, Groundstar Resources Ltd. completed several geophysical surveys and drilled several short diamond drill holes on a geophysical target within the area of the present Nimp mineral claim.



Previous work by Noranda Exploration and Groundstar Resources (reports by Menzies and Brynelsen) describe impressive grades in the mineralized skarn including values to 6.6% Cu and 0.22 oz. /Ton Au.

In 1982, Cathedral Minerals completed a helicopter input E.M. survey on the claim and, as a result, located an apparent conductor. In 1983, Mintek Resources completed an orientation survey to test the applicability of Scintrex's new Geometry Normalized Inphase Electromagnetic System to outline economic conductors on the ground.

- (iii) A summary of work completed in 1983 is as follows:
 - 1150 m. of ribboned and picketed control grid line established.
 - 750 m. of electromagnetic survey completed with stations on 12.5 m. centres and separations of 12.5 m. and 25 m.
 - 69 soil samples analyzed by I.C.P. methods for multielement composition.
- (iv) All work was completed on the Nimp mineral claim.

Detailed Technical Data and Interpretations

Theory of the S.E. 88 'Genie' Electromagnetic System:

Scintrex Geophysical Instrumentation has recently offered the new S.E. 88 Genie electromagnetic system. "Genie' is an acronym for geometry normalized inphase electromagnetic system. The Genie system was designed for rapid two person operation. The system minimizes geometrically derived errors that are a major problem with other in-and-out of phse, tilt angle or amplitude measurement systems commonly used. The measurement is based on the simultaneous transmission of two pre-selected, well-separated frequencies and the comparison of amplitudes of the two signals at the receiver. The two transmitted frequencies are picked up by a single receiving coil, amplified and noise

filtered. A proportional D.C. voltage (V signal for the higher frequency, V reference for the lower frequency) is obtained from each signal averaged over a selectable time period and the then computed result (V signal/V reference -1) x 100 is displayed in percent and is recorded. Resolutions of 0.1% are possible, depending on atmospheric noise, and amplitude ratio changes of 0.5% can be significantly differentiated.

Method of Interpretation:

Scintrex has completed an interpretation manual for the S.E. 88 Genie system. The manual consist of tables of theoretical response profiles for variations in conductor geometry. To use the manual, a comparison of field results to theoretically derived profiles is employed.

In the 1983 orientation survey of the Nimp mineral claim, a test profile was obtained over known mineralization to use as a comparison. A negative to positive crossover occurred over magnetite - chalcopyrite mineralization (See electromagnetic response line 1.5 S.E.). This type of response is now predicted to outline mineralization.

Results of Geochemical Soil Survey:

(See Map 1 - Gold and Arsenic and Map 2 - Copper)

Anomalous (single station) gold values of 30 to 60 p.p.b. occur at or within 15 meters of all exposed mineralization. Anomalous gold or arsenic values occur in soils at the S.E. ends of Lines 1NE and 2NE (probably associated with endoskarn).

Copper values are generally low with anomalous values (in excess of 100 p.p.m.) occurring near exposed mineralization and at the S.E. end of Line 2NE.

Station	Electromagnetic Anomaly	Comments
L 1.5 SW 1 + 37 SE	strong negative to positive crossover at 12.5M and 25 M separations	massive magnetite exposed in hand trench
L 1 SW 1 + 37 SE	weak negative to positive crossover at 25 M separation	
L O 1 + 46 SE	strong negative to positive crossover at 12.5M separation	2 meter wide massive magnetite pod exposed in road cut
L O 1 + 56 E	strong negative to positive crossover at 25 M separation	
L 1 NE L + 56 SE	negative to positive crossover at 25 M separation	
L 2 NE 1 + 25 SE	strong negative anomaly developing at beginning of line at 25 M separation	

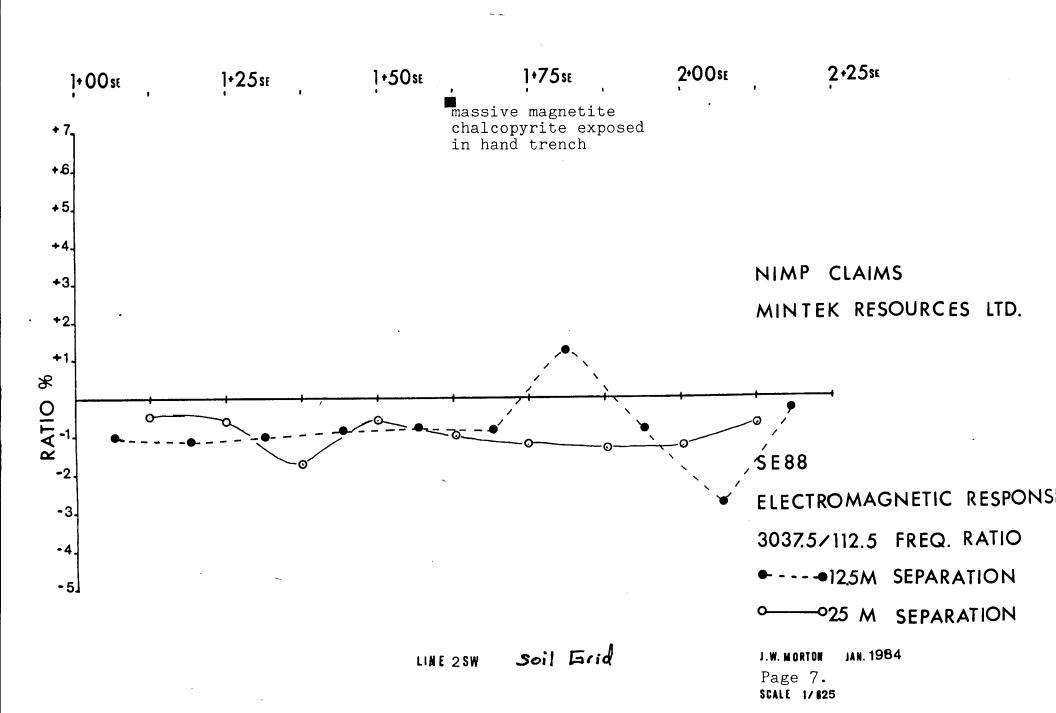
Conclusions

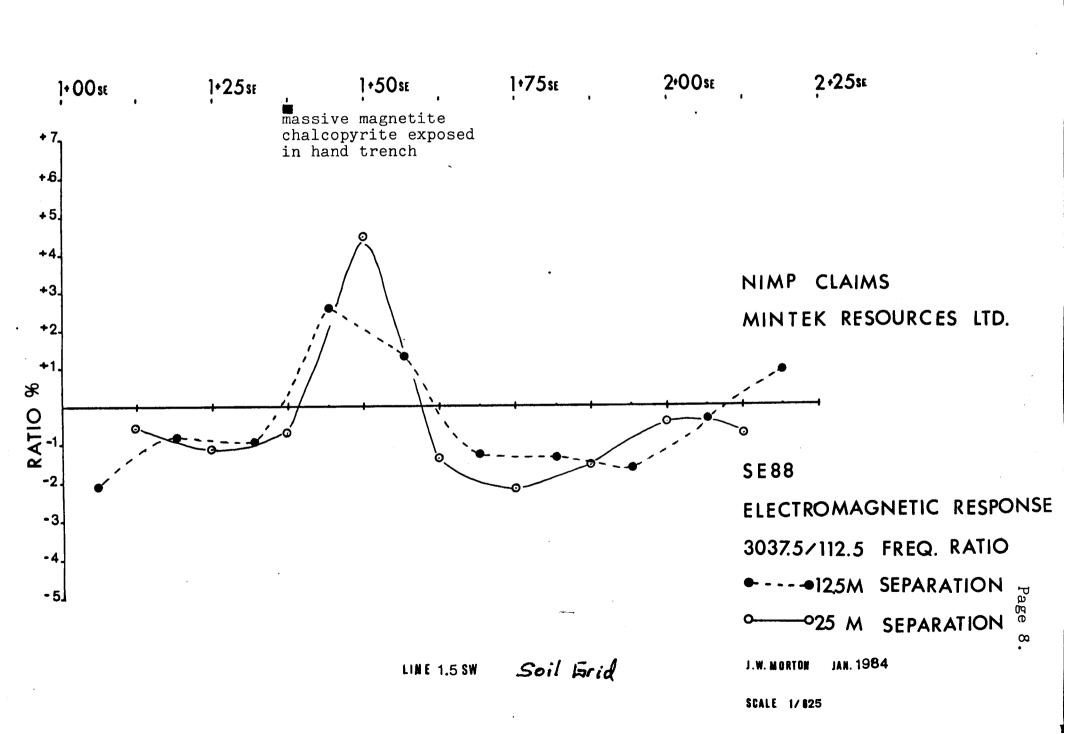
The S.E. 88 Electromagnetic System is an efficient and successful method that can be utlized to outline magnetite - chalcopyrite mineralization occurring on the Nimp mineral claim.

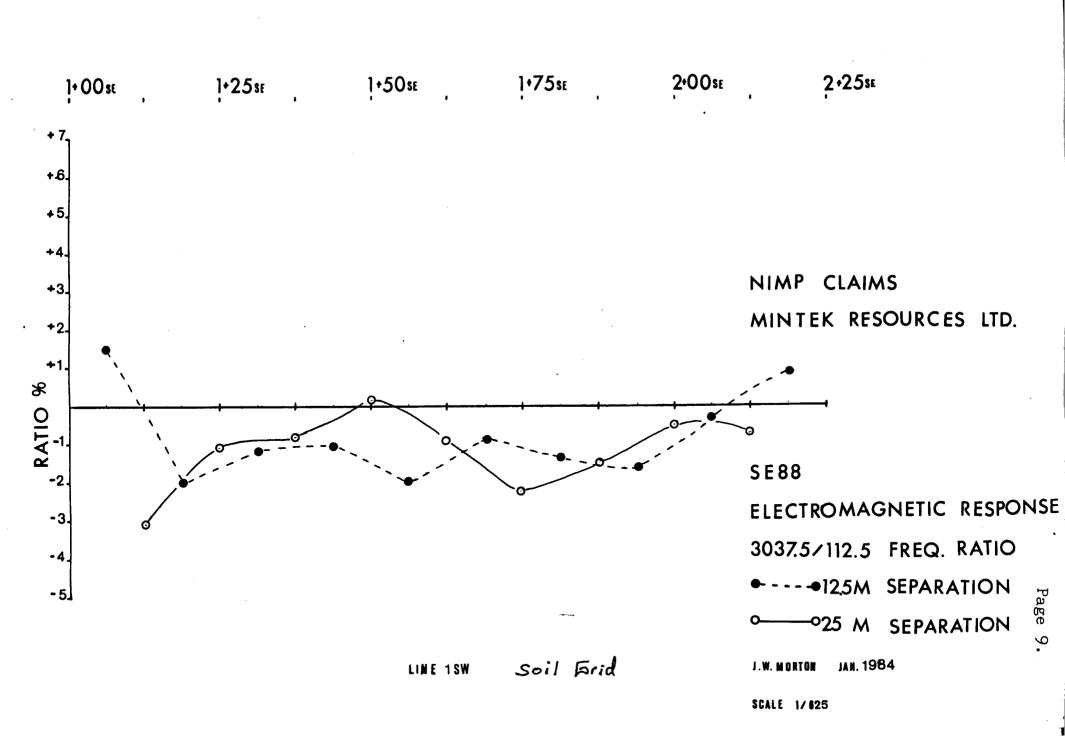
Recommendations

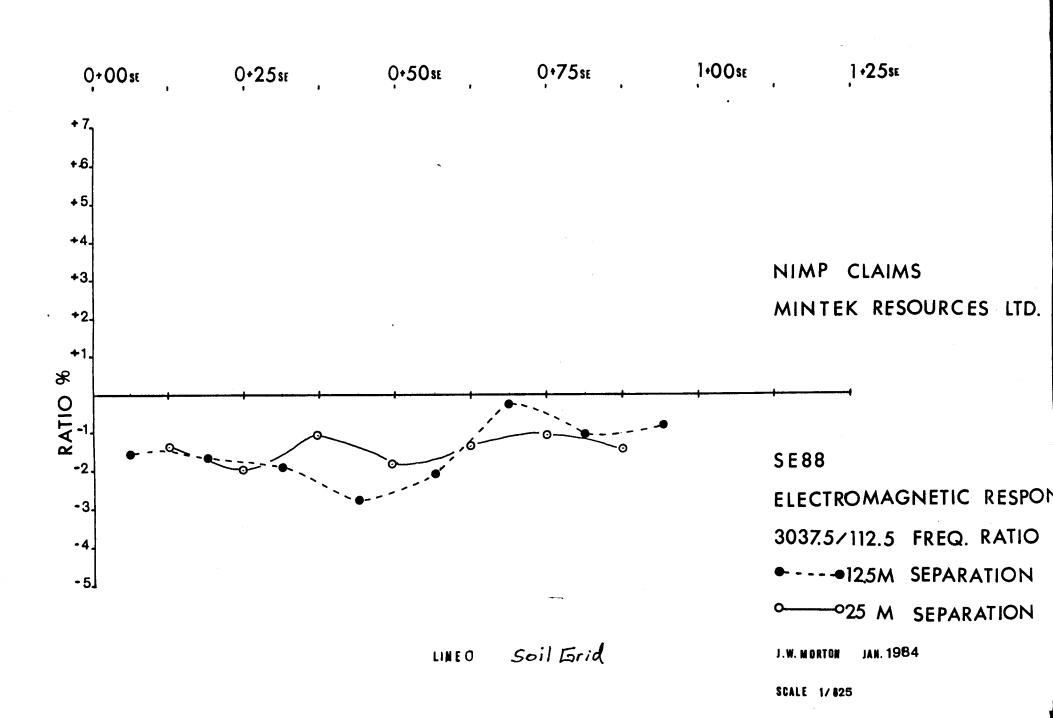
Copper - Magnetite - Gold mineralization such as has been identified at the Nimp mineral claim occurs in a similar environment and was formerly profitably mined at Benson Lake, south of Port McNeil (Empire Development Company Ltd., and the Coast Copper Company). A comprehensive program consisting of establishing a detailed grid along the contact and completing a detailed geochemical survey, a Genie electromagnetic survey and a detailed magnetometer survey would provide sufficient

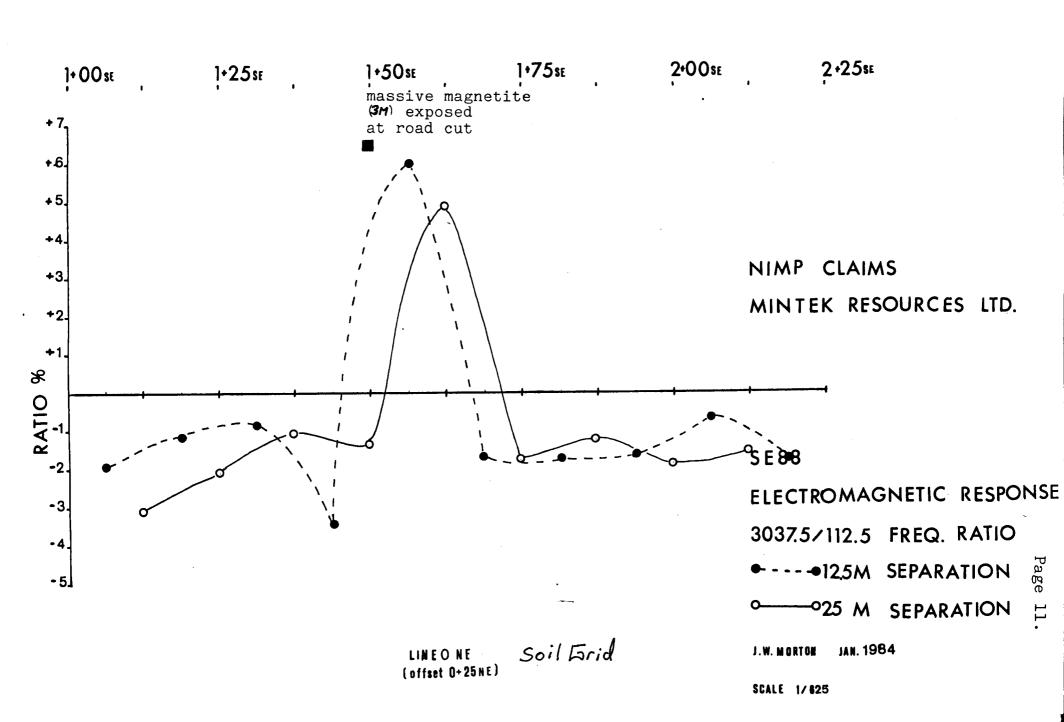
information to enable a systematic trenching and drilling program to follow. If the results of the survey fail to outline significant electromagnetic conductors (indicative of sulfide phases in the magnetite skarn) the potential for an economic deposit would be greatly diminished.

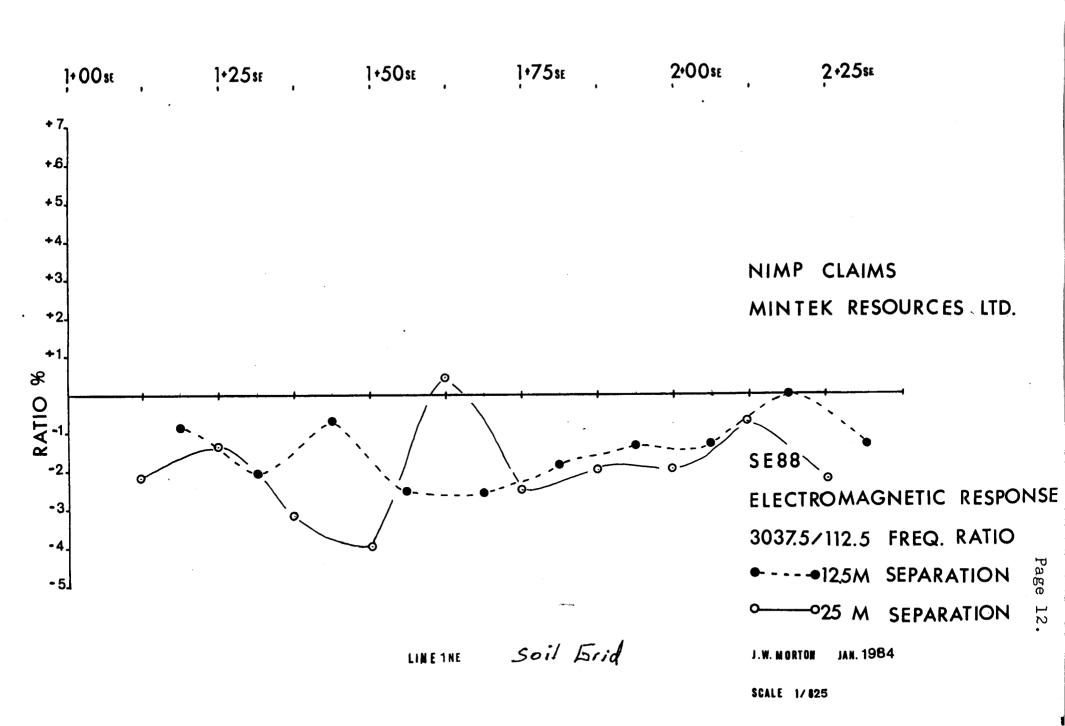


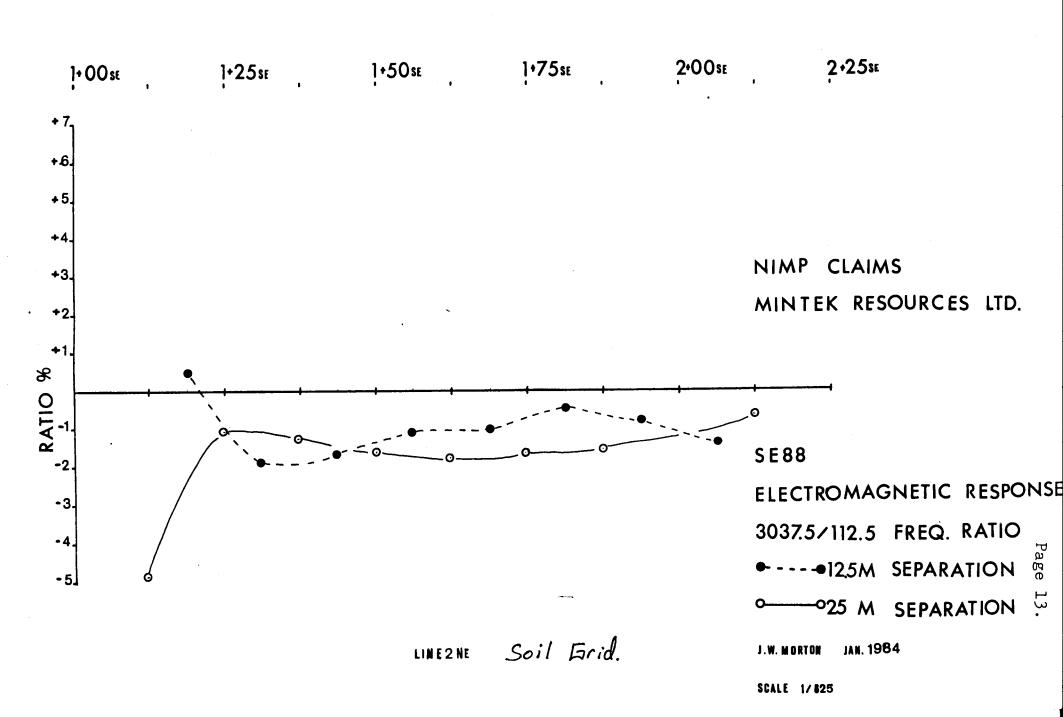












Itemized Cost Statement:

Wages: T. McKenz	ie - 4 days @ \$100/day July 3-6/83	\$ 400.00
J. Green	- 4 days @ \$100/day July 3-6/83	400.00
J. W. Mor	ton- 4 days @ \$200/day July 3-6/83	800.00
Room and Board:	- 12 man days @ \$50/day	480.00
Vehicle Expense:	- 4 days @ \$75/day	300.00
Equipment Rental:	Genie E.M. System - 4 days @ \$75/day	300.00
Analytical Costs:	<pre>I.C.P Multi-element - 69 samples @ \$10/sample</pre>	690.00
Report Writing an	d Drafting:	500.00
	TOTAL	\$3,870.00

Author's Qualifications

I, James W. Morton, certify the following:

I graduated from Carleton University in 1971 with a Bachelor of Science in Geology.

I graduated from the University of British Columbia in 1976 with a Master of Science in Soil Science.

I have worked for various mining and exploration companies since 1968.

I am presently a permanent staff geologist with Mintek Resources Ltd. and Imperial Metals Corporation, both of Vancouver, B.C.

I supervised all of the work described in this report.

J. W. Morton Geologist

APPENDIX I

GEOCHEMICAL CERTIFICATES AND PROCEDURES

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS, VANCOUVER B.C. PH: 253-3158 TELEX: 04-53124 DATE REPORTS MAILED July 1983

ICP GEOCHEMICAL ANALYSIS

A .500 GRAM SAMPLE IS DIGESTED WITH 3 ML OF 3:1:3 HCL TO HNO3 TO H20 AT 90 DEG.C. FOR 1 HOUR. THE SAMPLE IS DILUTED TO 10 MLS WITH WATER.

THIS LEACH IS PARTIAL FOR: Ca,P,Ng,A1,Ti,La,Na,K,N,Ba,Si,Sr,Cr AND B. AU DETECTION 3 ppm.

AU= ANALYSIS BY AA FROM 10 GRAM SAMPLE.

SAMPLE TYPE - SOIL

ASSAYER _____ DEAN TOYE, CERTIFIED B.C. ASSAYER
MINTEK RESOURCES PROJECT # GROUP - NIMP FILE # 83-1123 PAGE# 1

THE THE POST OF						
SAMPLE	ppm Cu	PB PB	ZN ppm	AG ppm	AS PPM	Au* ppb
2NE 1SE 2NE 1+12.5SE 2NE 1+25SE , 2NE 1+37.5SE 2NE 1+50SE	41 17 8 23 31	9 5 18 6 5	39 50 89 26 50	. 1 . 4 . 1 . 1	20 12 29 9 17	<u> </u>
2NE 1+62.5SE 2NE 1+75SE 2NE 1+87.5SE 2NE 2+12.5SE 2NE 2+25SE	49 45 38 122 298	9 12 13 2 7	72 59 74 39 26	.1 .3 .2 .1	11 24 15 25 178	55555
1NE 1SE 1NE 1+12.5SE 1NE 1+25SE 1NE 1+37.5SE 1NE 1+50SE	11 52 21 9 14	17 11 11 14 12	105 51 45 53 44	.1 .2 .1 .1	18 22 11 7 2	55555
1NE 1+62.5SE 1NE 1+87.5SE 1NE 2+12.5SE 1NE 2+25SE 0+25NE 1SE	9 66 17 86 8	10 9 1 4 13	42 35 5 17 74	. 1 . 1 . 4 . 4	7 12 7 7 13	5 10 60 5
0+25NE 1+12.59 0+25NE 1+25SE 0+25NE 1+37.59 0+25NE 1+50SE 0+25NE 1+62.59	454 E 24 270	14 6 11 7 5	43 29 52 59 23	.1 .1 .5 .6	15 12 11 20 42	5 5 5 30
0+25NE 1+75SE 0+25NE 1+87.5S 0+25NE 2SE 0+25NE 2+12.5S 0+25NE 2+25SE	27	1 6 3 4	9 16 27 27 21	.1 .2 .1	5 10 8 9 7	55555
0 0SE 0 0+25SE 0 0+50SE 0 0+62.5SE 0 0+75SE	28 22 8 34 37	13 9 6 3 14	183 60 27 36 108	.1	20 15 13 20 14	55555
0 0+87.5SE 0 1SE STD A-1	27 9 29	15 16 40	90 69 184	.1 .1 .3	26 12 9	5 5 5

MINTEK RESOURCES PRO	JECT # GR	DUP - N	IMP FI	LE # 83-	-1123	PAGE#	2
SAMPLE		PB PB		AG ppm			
O 1+12.5SE 1SW 1SE 1SW 1+12.5SE 1SW 1+25SE 1SW 1+37.5SE	11 12 12 37 74	19 15 20 14 12	39 61 61 66 30	.2 .1 .1 .4	15 11 18 16	5 580 10 5 10	·
1SW 1+50SE 1SW 1+62.5SE 1SW 1+62.5SE ROCK 1SW 1+75SE 1SW 1+87SE	35 23 2 19 8	10 8 7 9 8	28 23 21 21 15	.2 .1 .2 .1	7 7 7 2 4	5 10 5 5 5	
15W 2SE 1SW 2+12.55E 1SW 2+25SE 1SW 2+37.5SE 1.5SW 1SE	24 87 2 31 11			.1 .2 .1 .3	7 9 2 4 11		
1.5SW 1+12.5SE 1.5SW 1+25SE 1.5SW 1+37.5SE 1.5SW 1+50SE 1.5SW 1+50SE ROCK	9 67 69 1 2847	17 9 8 8 14	87 34 16 3 6	.2 .1 .1 .7	7 14 8 39 53	5 10 50 20	₩ 49 pm
1.5SW 1+67.5SE 1.5SW 1+75SE 1.5SW 1+87.5SE 1.5SW 2SE 1.5SW 2+12.5SE	84 9 76 36	12 5 6 8 12	20 14 14 43 35	.3 .1 .1 .2	10 5 7 5	55555	
1.5SW 2+25SE 2SW 1SE 2SW 1+12.5SE 2SW 1+25SE 2SW 1+37.5SE	18 60 248 30			.2 .2 .2 .1	5 12 8 2 10	5 5 10 5	,
2SW 1+50SE 2SW 1+62.5SE 2SW 1+75SE 2SW 1+87.5SE 2SW 2SE	85 49 36 18 84	8 7 8 7 12	67 15 29 32 37	.2 .6 .1 .1	13 15 9 5 12	5 60 5 5 5	

STD A-1

30 43 184 .3 11 5

APPENDIX II

FIELD NOTES

ļ

Reciever Station		aration ers	Reading #1	Reading #2	Reading #3	Reading Avg.	Notes
125W 1+1	355	12	-1.0	-1.0	-1.0	-1.0	Marble.
L 23W .1.1.	, ,	25	-	-	-		direction SE
1 1+	255E	.12	-1:4	-1.0	-1.1	-1.2	
	Entre M. Same	.75	-0.7	-0.4	-0.2	-0.4	
1+3	375€	12	-/3	-1.1	-0.5	-1.0	
	,,,,,	25	-07	-0.3	-0.5 .	-0.5	
1+	Suse.	.12	-10	-0.7	-0.7	-0.9	-2
	20,30	25	-1.9	-15	-1.6	-1:7	
7 -4	625E	12	-0.9	-0.5	-09	-0.0	Trench magnetit Cop
	0,230	25	-0.3	-0.5	-0.6	-0.5	, , ,
-	+75it		-68	-0.8	-0.7	-0.8	_
	1336	25	-/./	-0.9	-0.8	-0.9	
	1070		12	1.2	12	+1.2	gionodiosite
+	+878	25	-1.3	-1.0	-1.1	-1.1	
			-0.0	-0-7	-0.9	-0.9	
	+0256.		-12	-1.5	-1.1	-1.3	
	2.5.2.7	35		-2.3	-2.0	-2.3	
7	2+1257	12	-2.7	-1.2	-1.4	-1.3	
		75	-1.3	-0.3	-0.3	-03	
125W 3	1+755F		-0.4		-07	-0.8	
		25	-0.9	-0.8		0.8	
		1		3.4		-).0	direction SE
L105501 11	-125E	12	-16	-24	-2/	-,1.0	01/42/10K 3E
		25		i=			7 7
1 11	755E	12	-0.5	-0.4	-1.4	-0.5	limistone
		25	-09	-1.0	0.0		Trench
/:	+375E_	/2	-/- 2	-0.3	-0.9	-9:3	may be to to c
		2.5	-1.(-09	-0.9	- 1.0	
<i>i</i>	+505E	12	3_3	15	31	12.6	
		25	-0.2_	-05	-05	-06	
	+625E	/2	14	1.2	1.2	4/.3	
		35	31	51	4.7	+4.4.	······
1	+75%	2	-1.2	-1.4	-1.7	-/.5	
		25	-1.2	-1.3.	-1.4	-1.3	
	+875E	/2	-1.7	-1.2	-0.7_	-1.3	
Δ		95	-2.6	-2.1	-1.7	-2.1	
L. 155W 3	2+005E		-1.8	-1.8	-/-3	-1.6	
	ALEXADO.	34,	-1.6	-13	1.5	-1.5	

	Separation Meters	Reading #1	Reading #2	Reading #3	Reading Avg.	Notes
L1.55W 2+125	E 12	-03	-05	-0.2	-0.3	and the same of
	. 25	-0.4	-0.5	-0.4	-0.9	
615 SW 2+255	ie 12	.+09.	+07	+1.0	+09	
Ed. S. C Pad Lone	25	-0.6	-08	-07	-07	
LISW 1 tiase	12	+12	418	+19	+1.5	direction se
	25	_	-	_		
14255		-2.1	-1.6	-1:1	-1.9	
	75	-3.0	2.5	-3.7	-3 c	
1+375		- 07	-1.2	-1,3	-1.1	
	25	-09	-0.9	-/.3	-1.0	
1+50	STATE OF THE PARTY	-1.2	-0.8	-0.9	-1.0	
	25	-1.1	-1.2	10-1	-07	
1+628		-22	-2-1	-1.3	-1.5	
	75	to 1	+04	10.2	102	
/+75	376 50	-1.0	-0.3	-0.5	-0.8	
	25	-0.9	-08	-0.7	-08	
		-1.9	-1.2	-0.7	-1.3	
	25	-26	-21	-1.7	-2.2	
2 tot	36-12	-18	-1.8	-/.3	-1.6	
	25	-1.6	-43	-1.5	-1.4	
2+12	맛이 다른 얼마하는 아이트	-03	-05	-02	-0.3	
ZÌ	25	-0.4	65	-04	-0.9	
1 SW 2125		+09	+0?	+10	109	
	25	-0.6	-68	-07	-0.7	
LO 0+125	ic- 12	-14	-1.5	-1.6_	-1.5	Musble
Δ.	25			-		directionsE
0 +25		-1.6	-16	-1.6	-1.6	
	7.5	-/3	-1.2	-1.4	-1.3	
C + 325		-0./	-1.6	-1.6	-15	
	25	-1.9	-1.5	~1.5	-1.5	
0 tsa	ÿ- 12	-2.5	-15	2.8	-2.7	
V	25_	-09	-1.0	-1.1.	-1.0	
40 Otes	sc /2	-23	-20	-4.7	-20	
and the same of th	25	-1.8	-1.7	-1,7	7.7	

	eparation etérs	Reading #1	Reading #2	Reading #3	Reading Avg.	Notes
10 01755E	12	0.0	0.2	03	02	direction SE
4	25	-1.5	-1.1	-1. 3	-1.3	
019758	/2	-1.1	-09	-0.6	-0.9	Tar Laborator III
4	25	-09	-10	-1.1	-1.0	
10 14005		-0.3	-08	-0.7	-08	
	25	-1.6	-1.5	-1.1	-1.4	
LO(0125NE) 1+1255	.1.2.	-1.8	-1.9	-2.0	-1.9	direction SE
	25					
142555	12	-1.9	-09	- 6 7	-/-/	
	25	-3/	-29	- 3 /	-30	
1+3.250		-1.0	-0.6	-09	-0 E'	
	25	-2.0	-15	-2.7	-2.0	
1.+5050		-31	-33	-3.4	- 3 - 3	massine magnetite
	75	-1.0	-1.0	-1.0	-1.0	road itsutel wish
1+625		15.6	+6.0	163	16.0	
	25	-/. 3	- 1.3	-1.2	-13	L.
		-1.4	-1.6	-1.7	-1.6	
	25	+4.5	14.6	146	+46	
	SF 12	-1.5_	-1.7	-1.7	-1.7	
	25	-1.8'	-1.4	-1.6	-17	
2+60	150 14	-1.8	-1.6	-1.1	-1.6	,
	25	-1.3	-1.1	-/./	-1.2	
1 14/3	56 /2	-0.2	-0.7	-1.0	-0.6	diorite
77	25	-1.8	-1.7	-1.9	-1.8	
LO (0+75 NE) 2+25	,	-2.0	-/-7	-1.3	-17	
	25	-1.3	-1:6	-1.7	-1.5	
- 1441						
41, 45 1+1256	12					dilichia se
_A	25				-	mishe
17355		-09.	-0.7	-0.7	-0.5	
	25	-2.1	-2 /	-20	-3./_	
14 37 50	12	-24	-1.9	-1.7	-2.0	
1/2	25	-/-3	-1.3	-1.9	-1.3	
LI, NE 1+50 S		-05	-05	07	-06	
	25	-3 2	-3.2	-28	-31	

Reciever Station		aration ers	Reading #1	Reading #2	Reading #3	Avg.	
LI NE 1462	se-	/2	-24	-2.5	-25	-2.5	mable.
,		25	-3 9	- 3.9	-3.8	-3.1	
/+7:	556	(3	-2-5	2.5	-24	-25	masble
		25	02	0.5	0.9	+05	
1+0	THE	12	-2.1	-17	-1:4	=1:7	epidate
		25	-2.5	-2.2	·73	-2.4	
2+	-vose	./2	-1.4	-1.3	-/2	7.3	
		25	-2.0	-19	-1.9	-1.9	······································
2.	+ 1255	12	-1.1.	-1.1	-1.7	-1.3	dionite will
		95	421	-1.7	-1.5	-1.5	
0.	425SE	12	-07	-0.7	.+1 7	0.0	
A		25	-1.0	-0.4	-07	-0.7	
11, N= 21	375E	12	-14	-/-3	-1.3	-1.3	dion te
		25	-2.3	-2.2	-2.1	-2. Q	
L2 NG 1+1	1256	12	-1· Z	-/. Z	-1.4	~/. 3	muray
and the second second second second		25	_		_	_	direction
A 1,20	-55E	12	0.4	07	06	+06	
4 - 25%	275	25	-41	-4.8	-4.7	-4.6	
/+	375	12	-1.5	-1.8	-1.9	-1.8	
	.,.	25 '	-07	-1.1	-1./	-1.0	
	So SE	12	-1.5	-1.5	-1.4	-1.6	mulile
	30.30-	25	-1.3	-1-4	-1./	-1.3	
	WISE	/)	-10	-1.3	-07	-1.0	
		35	-2.0	-1.1	-1.8	-1.6	
	t.75.35	The state of the s	-1.2	-1.0	-0.8	-1.0	mille
	-15.50	25	-1.8	-1.7_	-/-5	-1.7	
	1+9216	10,740,000	-06	-03	-0.3	-0.4	skain
	man death (%)	25	2.0	-15	-1.3	-1.6	
	2+000	P-17520 - 1	-07	-6.9	-08	-0.7	
		25	-1.7	-14	-/4	-1.5	
	2+128		-/3	-1.3	-/3	-13	
V	-11.4X	25	_		_		
12 1:5	2+258		_	_	_	_	
43 NE	- 1:5Y		-1. 4	-0.8	-65	-06	
		25	-69	-0.8			

A GEOMETRY NORMALIZED INPHASE ELECTROMAGNETIC (GENIE) SURVEY ACCOMPANYING GEOCHEMICAL SOIL SURVEY

Date of Report: January 23, 1984

Supplementary Appendix: Sampling Procedures

Samples were dug with a mattock to a depth of approximately 0.4 meters and where possible the samples were collected from the Bf horizon. Samples were placed in Kraft brown paper bags and were air dried before shipment to Acme Analytical Labs in Vancouver.

REPORT #84 - 29

Who 12

GEOLOGICAL BRANCH ASSESSMENT REPORT

12,348
NIMP CLAIMS
Soil Geochemistry - Gold & Arsenic

p.p.**b.** Au

LCP.
NIMP
1650m
at 3100
From this
point. 5 0 +25 SE 5 Q+50 SE 5 0+75 SE

GEOLOGICAL BRANCH ASSESSMENT REPORT

MAP#2

NIMP CLAIMS
Soil Geochemistry - Copper

00+25 SE 0+75 SE LO 25 NE ⊕1+25 SE

1+25 SE 0

1+50 SE 085

2+00SE ()84

2+25SE 1