TECHNICAL REPORT

ON THE 1991

GEOLOGICAL, GEOCHEMICAL

AND

GEOPHYSICAL SURVEYS

ON THE

HURD LAKE PROPERTY

O'SULLIVAN LAKE AREA, N.W. ONTARIO

MAUN LAKE (G-362) STAKING SHEET

THUNDER BAY MINING DIVISION

ONTARIO PROSPECTORS ASSISTANCE PROGRAM

FILE NUMBER OP91-043

LAT -50°27'
LONG -86°59'
NTS - 42 L/7

Toronto, Ontario
December 1991

Michael Smith, B. Sc.

1.0 SUMMARY

The Hurd Lake Property, consisting as six unpatented mining claims and surrounding crown land, were the focus of a detailled geological mapping, geophysical surveying, and selective geochemical follow-up. Objectives of this work were to investigate further the environment of the New Athona copper - silver - gold occurrence and the Megan gold occurrence, which occur in a sheared and altered structural framework. These mineral occurrences are situated in or close to a northeast trending fault system associated with a 300 gamma magnetic anomaly.

The present program outlined a mineralized shear zone in rhyolitic to intermediate metavolcanic, located at B/L, 3+00E, about 200 m strike length. The shear zone was rock chip sampled at four different locations returning the following - 3340, 499, 356, ad 838 ppb gold. No zone width has been established in this area.

Another area of very anomalous gold in outcrop is located in porphyritic rhyolite near the north and of the gird on L2E, where two separate rock chips returned 932 ad 505 ppb gold respectively.

As expected, the New Athona copper - silver - gold occurrence returned very anomalous gold values in a fractured and mineralized rhyolite. The best value returned was 0.06 oz/ton (214.8 ppb) gold over 2 meters.

The shear zone gold occurrences on the grid baseline, situated along a large regional shear which also hosts the Megan gold occurrence 1.0 km to the northwest, warrants a program of follow up horizontal loop EM, detailed mapping and sampling to determine the nature of the shearing, presence of quartz veins and sulfide mineralization, and presence of economic grade.

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2.0 INTRODUCTION

This summary report was prepared to fulfil 1991 Ontario Prospectors Assistance Program requirements. The area of study, referred to as the Hurd Lake Property, is situated on the northeast arm of O'Sullivan Lake, about 37 km north northwest of Nakina, Ontario.

The present program consisted of cutting a grid, geological and geophysical surveys, followed by geochemical rock and soil sampling.

3.0 LOCATION AND ACCESS (see fig. 1)

The Hurd Lake Property is located immediately north of the north shore of the North East Arm of O'Sullivan Lake, 37 km NNW of Nakina, Ontario.

Access to the property is by plane or boat, but most practically by boat across O'Sullivan Lake, which is accessed via Hwy. 643 from Nakina, about 50 km away.

4.0 PROPERTY (see fig. 2)

The Hurd Lake property consists of 6 contiguous unpatented mining claims and their immediate environs, located on the Maun Lake (G-362) Staking Sheet, Thunder Bay Mining Division.

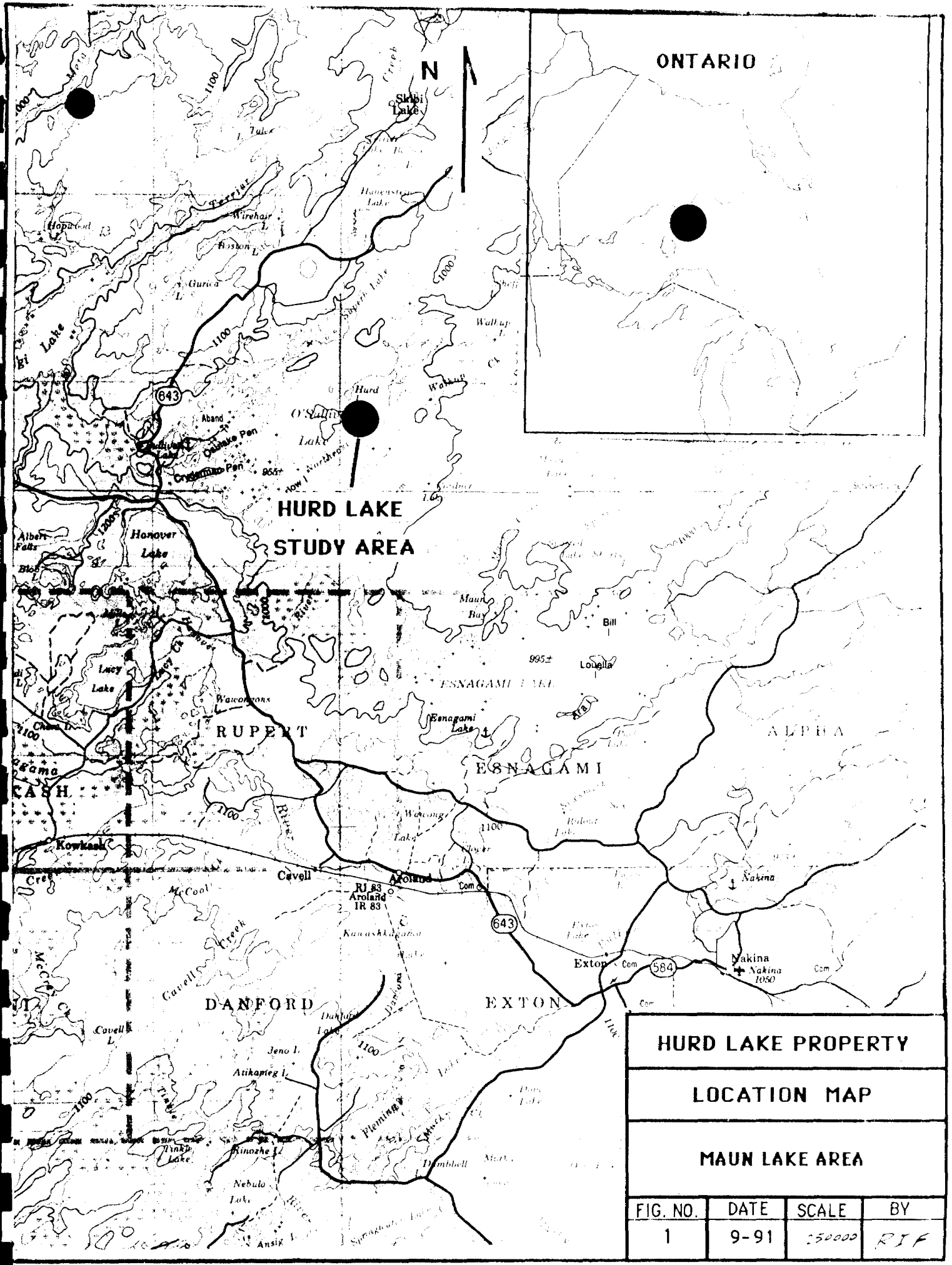
5.0 EXPLORATION HISTORY

The area has been mapped by the Geological Survey of Canada (Wilson and Collins, 1904) and the Ontario Geological Survey (Stott, 1984) as well as early mapping by the Ontario Department of Mines (Hopkins, 1916; Kindle, 1929; Moorehouse, 1955).

Gold and copper were first discovered in the O'Sullivan Lake area in the 1920's, centered on showings on the Osulak Peninsula and northeast of the lake, resulting in a rush after World War II, when Osulake Mines started to sink shaft and carry out underground development. Since that time, several operators have attempted to resurrect the property, and the most recent, by Mining Corp. of Canada, removed 90,500 tons of 0.33 oz/ton gold. Since 1950, both gold and base metals exploration has been undertaken along the belt around O'Sullivan Lake, but with only limited success to date.

In the immediate area of the Hurd Lake property, the New Athona Mines copper - silver - gold occurrence, located 200 m south west of Hurd Lake, was investigated by means of nine drill holes in 1955.

The showing consists of two mineralized fracture zones containing minor amounts of arsenspyrite, chalcopyrite, pyrite, marcasite and quartz veining, accompanied by carbonate alteration. No strike length was determined but most holes showed low copper values at depth.



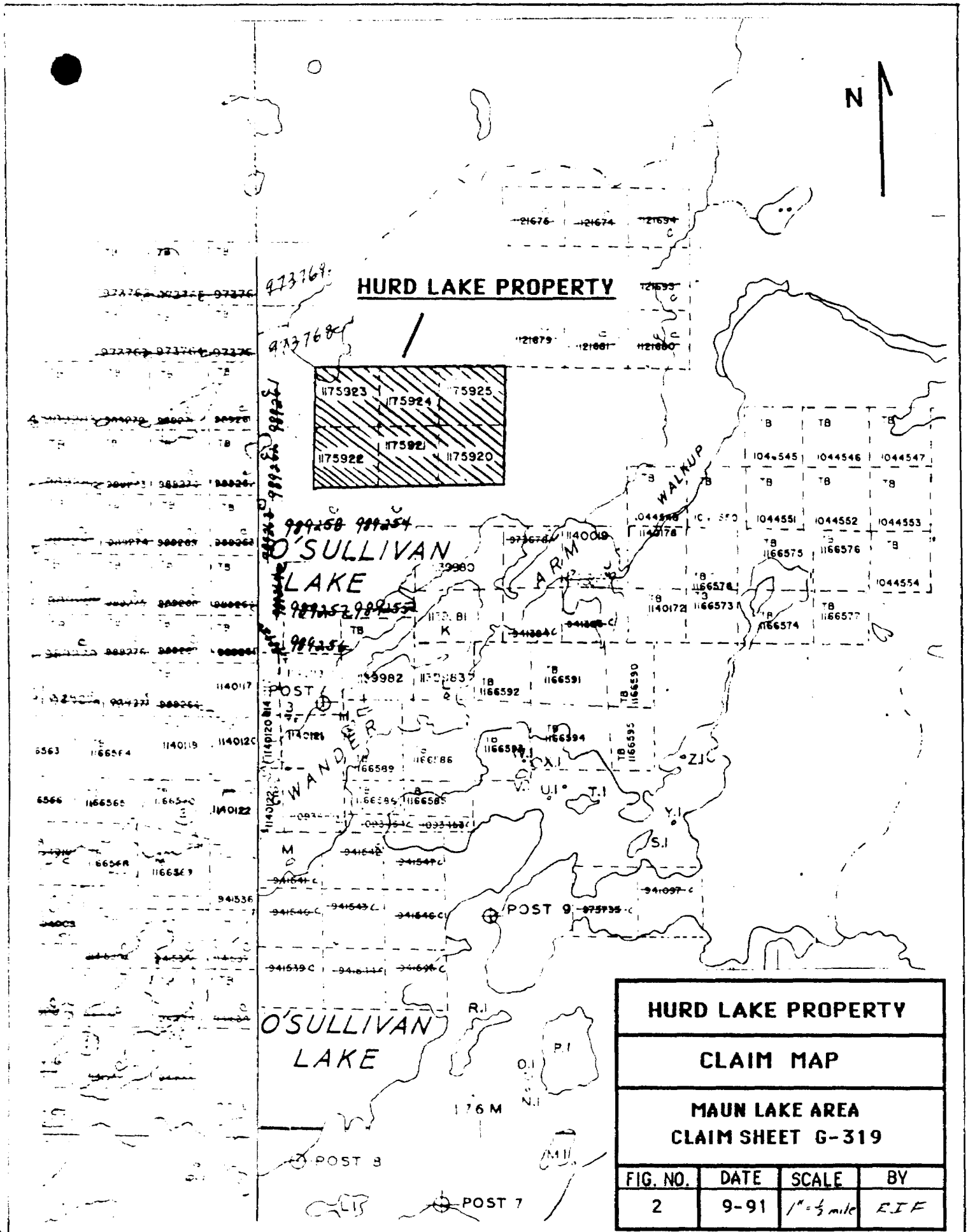
HURD LAKE PROPERTY			
LOCATION MAP			
MAUN LAKE AREA			
FIG. NO.	DATE	SCALE	BY
1	9-91	1:50000	RIF

About 400 m east of the claims an unknown operator drilled about four short holes into what is referred to as the Megan - Hurd gold occurrence. The drill target was a narrow sulfide rich shear zone or zones in felsic metavolcanies. Several trenches exposed similar mineralization on L22E, 1+00S. The Warren copper - nickel occurrences, located directly south of the property has been the focus of intermittent exploration activity since the 1950's.

All of the previous exploration activity has been sporadic in nature, but has resulted in significant polymetallic occurrences, confirming the mineral potential.

6.0 REGIONAL GEOLOGY

The Hurd Lake property is situated within the Kowkash Greenstone Belt, a fairly typical northeast trending greenstone sequence consisting of a mafic to felsic transition, younging to the north, intercalated with intermediate to felsic meta-sediments. The interflow sediments are mainly tuffs and siliceous meta sediments, which locally carry disscininated to massive iron and copper sulfides, with lesser sphalerite and magnetite.



HURD LAKE PROPERTY			
CLAIM MAP			
MAUN LAKE AREA CLAIM SHEET G-319			
FIG. NO.	DATE	SCALE	BY
2	9-91	1" = ½ mile	EIF

The greenstones are locally intruded by syn to post tectonic sills and dykes, mostly gabbro and diabase. Late stage granite to granodiorite hinterland is located to the north and south of the greenstone belt.

Metamorphic grades varies from lower greenschist facies in the centre of the belt to upper amphibolitic facies adjacent to the granitic hinterland.

Structurally, the Kowkash Belt has been mainly faulted, in a northeast trending strike slip fashion, resulting locally in strongly sheared, highly schistose volcanic units. Recent government airborne geophysics suggest fault offsets of greater than 600 metres.

7.0 PRESENT WORK PROGRAM

The 1991 field program was completed during the period July, 1991 and consisted of the following personnel:

Micheal Smith	Geologist/Geophysical operator
Robert Fogal	Geologist/line cutter
Graham Stone	Geophysical operator/line cutter

A total of 2.3 km of baseline cut, blazed, flagged and chained with stations every 50 m. A total of 15 km of lines were flagged and chained, with stations every 25 m. Following grid

preparation, routine ground magnetic and VLF-EM coverage was initiated. The VLF coverage was completed without incident, but instrument problems with the proton magnetometer prevented the collection of repeatable, ie. reliable magnetic data, and after three half days of effort, the magnetic survey was cancelled.

Using geophysical and airphoto interpretation as guides, the grid was mapped, in most areas both on and between grid lines. A suite of hand specimen and assay samples were collected, as well as fences of soil samples across selected VLF-EM targets. A total of 44 rock and 26 soils were collected and analyzed for gold.

The work program described in this report has been altered from the original project proposal by the deletion of the Melly Lake Grid, which constituted a proposed 10 km of grid. The deletion of the Melly Lake grid was caused by a reduction of project funding from $20,000 to $10,000.

8.0 PROPERTY GEOLOGY

Introduction

The Hurd Lake Property was acquired for its gold potential, based on evaluation of recent government helicopter geophysical results for the area, strong photolinear suggestion of a regional strike slip fault, and the presence of two gold showings in the project area.

The geological and geochemical surveys were conducted following delineation of target areas based on prospecting and geophysical data. The property has about 20% outcrop.

Geology

The Hurd Lake property is underlain by a north easterly trending sequence of mafic and intermediate volcanics, intercalated with small amounts of felsic pyroclastics, which appear mainly as thin discontinuous units under the western third of the claim block. Occasional narrow lensoidal to sill like gabbroic intrusions locally interfinger with the volcanics.

The mafic to intermediate rocks occur as unsubdivided andesitic to basaltic flows with no disernible top directions. Alteration minerals observed on the claims include perversive chlorite found along shear and cleavage planes. Magnetite is found as fine disseminations and ankerite along fractures, especially within the felsic pyroclastics.

The dacitic to rhyolitic units occur as narrow (1.5m) "pinch and swell" units, trending foliation parallel, forming thin interflow tuff horizons containing pyrite. There is a preferred orientation parallel to the northeast trending regional strike slip faults.

Structure

Deformation and metamorphism in the area has developed a strong northeast trending S1 foliation evidenced by well developed schistosity. Regional studies by the OGS point to a northerly younging direction but there is no evidence of tops on the property. All structural features are vertical and subvertical, including the quartz veins.

9.0 GEOPHYSICAL SURVEY

As stated in section 7.0 of this report, the proposed magnetic survey of the grid was cancelled due to instrument problems.

Routine VLF-EM coverage was completed over the grid at 2.5 and 12.5 m intervals. Station NLK in Seattle was used, and all readings were taken facing grid north normal to station direction.

DISCUSSION OF VLF-EM RESULTS

The data is extremely noisy, with high amplitude in phase swings. All of the conductors located are subparallel to the baseline, and few of the cross overs have a negative to positive quadrant component. Only one conductor, Conductor A has more than 2 lines continuity, starting at L10E, 2+60S extending to L16E, 3+50S. This area was mapped and sampled in detail, despite the very thick bush, but no sulfides, shearing, or alteration

noted in outcrop. The New Athona copper occurrences was not a VLF Conductor on Seattle or Annapolis.

There is a one line conductor at L4E, 0+50N, which is along strike to the gold anomaly found on L3+60E and 4+40E. Further detail follow up should be done to determine if the mineralized showing is conductive.

10.0 MINERALIZATION

Several noteworthy gold enriched mineral showings were noted during the present program.

1. The Hurd Lake copper - silver - gold occurrence was relocated on L6E, 6+00N. The showing is situated at the edge of the Hurd Lake pluton, a quartz - feldspar porphyry which has intruded a rhyolitic unit. The rhyolite has been shattered by a northeast trending fault which has resulted in a brittle kink fold of the rhyolite. The mineralized rhyolite is exposed in a series of four northwest trending trenches located between 5+75E and 7+05E, for a total strike length of 130 m. Width of the fractured mineralized zone averages 6 m, but pinches towards grid west and is covered by overburden to the grid east. Sulfide content varies from 2 - 25% and is composed mainly of chalcopyrite, pyrite and pyrrhotite. Carbonate alteration is common, as is quartz feldspar veining

parallel to the mineralized zone. Since the copper and silver values have been measured by numerous previous samplers, it was decided to assay the trench samples only for gold. Of the 11 rock samples taken, the highest value returned was sample number 910007, which returned 2148 ppb gold. Although this showing is probably uneconomic in itself, several random grab chip samples of unaltered intermediate to felsic metavolcanics along strike on L2E returned 932 and 505 ppb gold respectively. This indicates a potentially prospective gold enriched horizon which needs to be further explored.

2. At L3+50E, B/L, a new gold showing was located in rhyolite to intermediate volcanics containing 5 - 10% disseminated pyrite on fracture surfaces. The volcanic is in contact with a sheared system of quartz veins and a fine grained, equigranular intermediate intrusive over 100 m exposed strike length, and the width of the exposed shearing appears to be 20 metres. Values of 3340 and 497 ppb gold were returned. Seventy metres to the grid north of the above sample sites, a small outcrop silicified dacite containing 2% arsenopyrite returned 838 ppb gold. Carbonate alteration is evident in the shearing. Due to the nature of the survey, no further work was done to expose further outcrop, but the area is clearly gold enriched and further work is

needed to locate the source and extent of the mineralization.

11.0 CONCLUSIONS

1. The model proposed for gold exploration on the property appears to be valid, all gold values on the claims are associated with northeast trending shear zones.

2. Two very anomalous areas have been defined; the trend from L2E, 5+00N, towards the New Athona mineralization, and the trend along the baseline from L3+30E. Both areas have grouped multi sample rock chips anomalies many orders of magnitude above background.

3. The VLF-EM survey may be responsive to the shearing at L3+30E/BL.

12.0 RECOMMENDATIONS

1. The mineralized trend SW from the New Athona showing should be investigated by means of detailled mapping on a 50 m grid, intensive prospecting, detailled magnetic and HLEM coverage, and 12.5 m geochemical coverage.

2. The rock chip anomaly trending from L3+30E, B/L to L5E, 0+50N should be investigated in a detailled manner as above.

3. The rock sequence from the baseline to the west boundary of the claim block is not well understood due to lack of outcrop. Much outcrop could be examined by minor grubhoe work and all of the grid from L0E to L7E should be gridded at 50 m intervals and mapped in detail.

13.0 REFERENCES

Hinzer, J. B. 1983. Preliminary Report on the O'Sullivan Lake Area, Ontario Property of Syngold Exploration Inc. MNDM Assessment File No. 2.6868.

Ministry of Northern Development and Mines. Selected Assessment Files. Toronto, Ontario.

Ontario Geological Survey. 1989. Airborne Electromagnetic and Total Intensity Magnetic Survey. Tashota - Geraldton - Longlac Area. District of Thunder Bay by Aerodat Limited for the Ontario Geological Survey. Geophysical / Geochemical Series Maps 81269, 81270 and 81282. Scale 1:20000. Survey and Compilation, June to December. 1988.

Stott, G. M. 1984. Ogoki Lake Sheet, Thunder Bay and Cochrane Districts: Ontario Geological Survey, Map P. 274 (Rev.) Compilation Series - Preliminary Map. Scale 1:126740. Compilation 1984.

APPENDICES

APPENDIX A

CERTIFICATE OF QUALIFICATIONS

AUTHORS CERTIFICATE

I, Michael D. Smith, of 70 - 23rd Street, Etobicoke, Ontario do hereby state -

1. That I have been a consulting geologist practising my profession from the above address since 1986, and have been engaged actively in mineral exploration since 1961.

2. That I hold a professional degree B. Sc (Hons.) in Geology.

3. That I am the author of the appended report of the Hurd Lake Property, and that I personally supervised and carried out the field program.

4. That the data contained in the report is true to the best of my knowledge.

Toronto, Ontario
December 1991

Michael Smith

Michael Smith

APPENDIX B

ANALYTICAL CERTIFICATES

CHAUNCEY ASSAY LABORATORIES LTD.

33 Chauncey Avenue, Toronto, Ontario M8Z 2Z2
Tel: (416) 239-3527 FAX: (416) 239-4012

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. MI-3220-01 DATE: NOVEMBER 6, 1991

SUBMITTED BY: Michael D. Smith

PROJECT: HURD LAKE

DATE RECEIVED: OCTOBER 30, 1991 SAMPLES OF: ROCK

PROJECT: HURD LAKE

ROCK SAMPLE NO.:	Au ppb
910001	932
910002	505
910003	3340
910004	499
910005	356
910006	838
910007	2148
910008	983
910009	455
910010	278
910011	23
910012	71
910013	98
910014	1852
910015	265

J. van Engelen Mgr

CHAUNCEY ASSAY LABORATORIES LTD.

33 Chauncey Avenue, Toronto, Ontario M8Z 2Z2
Tel: (416) 239-3527 FAX: (416) 239-4012

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. MI-3220-04 DATE: NOVEMBER 6, 1991

SUBMITTED BY: Michael D. Smith

PROJECT: HURD LAKE

DATE RECEIVED: OCTOBER 30, 1991 SAMPLES OF: SOILS

PROJECT: HURD LAKE

SOIL SAMPLE NO.:	Au ppb
910020	11
910021	9
910022	18
910023	15
910024	18
911023	5
911024	5
911025	31
911026	5
911027	5
911028	5
911029	16
911030	10
911031	5

J. van Engelen Mgr

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33 Chauncey Avenue, Toronto, Ontario M8Z 2Z2
Tel: (416) 239-3527 FAX: (416) 239-4012

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. MI-3220-02 DATE: NOVEMBER 6, 1991

SUBMITTED BY: Michael D. Smith

PROJECT: HURD LAKE

DATE RECEIVED: OCTOBER 30, 1991 SAMPLES OF: ROCK

PROJECT: HURD LAKE

ROCK SAMPLE NO.:	Au ppb
910016	541
910017	303
910019	61
910025	58
910026	53
910027	23
910028	15
911001	11
911002	9
911003	15
911004	10
911005	15
911006	58
911007	42
911008	25

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. MI-3220-03 **DATE:** NOVEMBER 6, 1991

SUBMITTED BY: Michael D. Smith

PROJECT: HURD LAKE

DATE RECEIVED: OCTOBER 30, 1991 **SAMPLES OF:** ROCK

PROJECT: HURD LAKE

ROCK SAMPLE NO.:	Au ppb
911010	15
911011	25
911012	23
911013	23
911014	15
911015	11
911016	12
911017	15
911018	9
911019	20
911020	10
911021	11
911022	25
911032	.14 oz/ton
911033	.23 oz/ton
911034	761 ppb
911035	43 ppb

NOT HURD LAKE RESULTS

J. van Engelen Mgr

CHAUNCEY ASSAY LABORATORIES LTD.

33 Chauncey Avenue, Toronto, Ontario M8Z 2Z2
Tel: (416) 239-3527 FAX: (416) 239-4012

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. MI-3220-05 DATE: NOVEMBER 6, 1991

SUBMITTED BY: Michael D. Smith

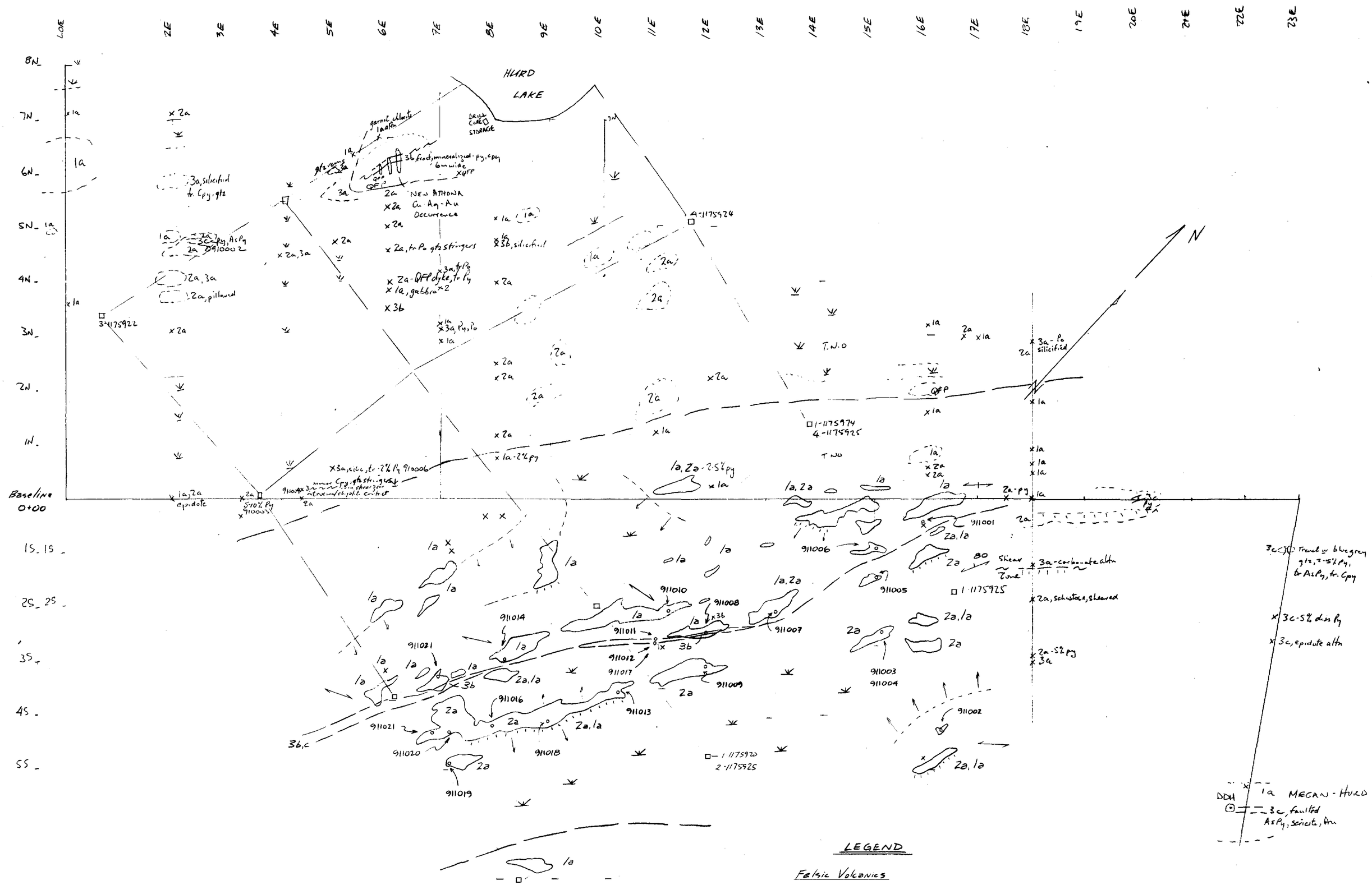
PROJECT: HURD LAKE

DATE RECEIVED: OCTOBER 30, 1991 SAMPLES OF: SOILS

PROJECT: HURD LAKE

SOIL	SAMPLE NO.:	Au ppb
	912001	12
	912002	5
	912003	9
	912004	15
	912005	16
	912006	19
	912007	15
	912008	23
*ROCK	912009	131

J. van Engelen Mgr



LEGEND

Felsic Volcanics

3a Unsubdivided Dacitic to Rhyolitic flows
3b Quartz-Feldspar porphyritic flows
3c Pyroclastic Rocks

Intermediate Volcanics

2a Unsubdivided Andesitic flows

Mafic Volcanics

1a Unsubdivided Basaltic flows

○ Rock sample location
911081, <1 Sample number, assay Au (ppb)
Shistosity, foliation
Trenching

63.6249

HURD LAKE AREA

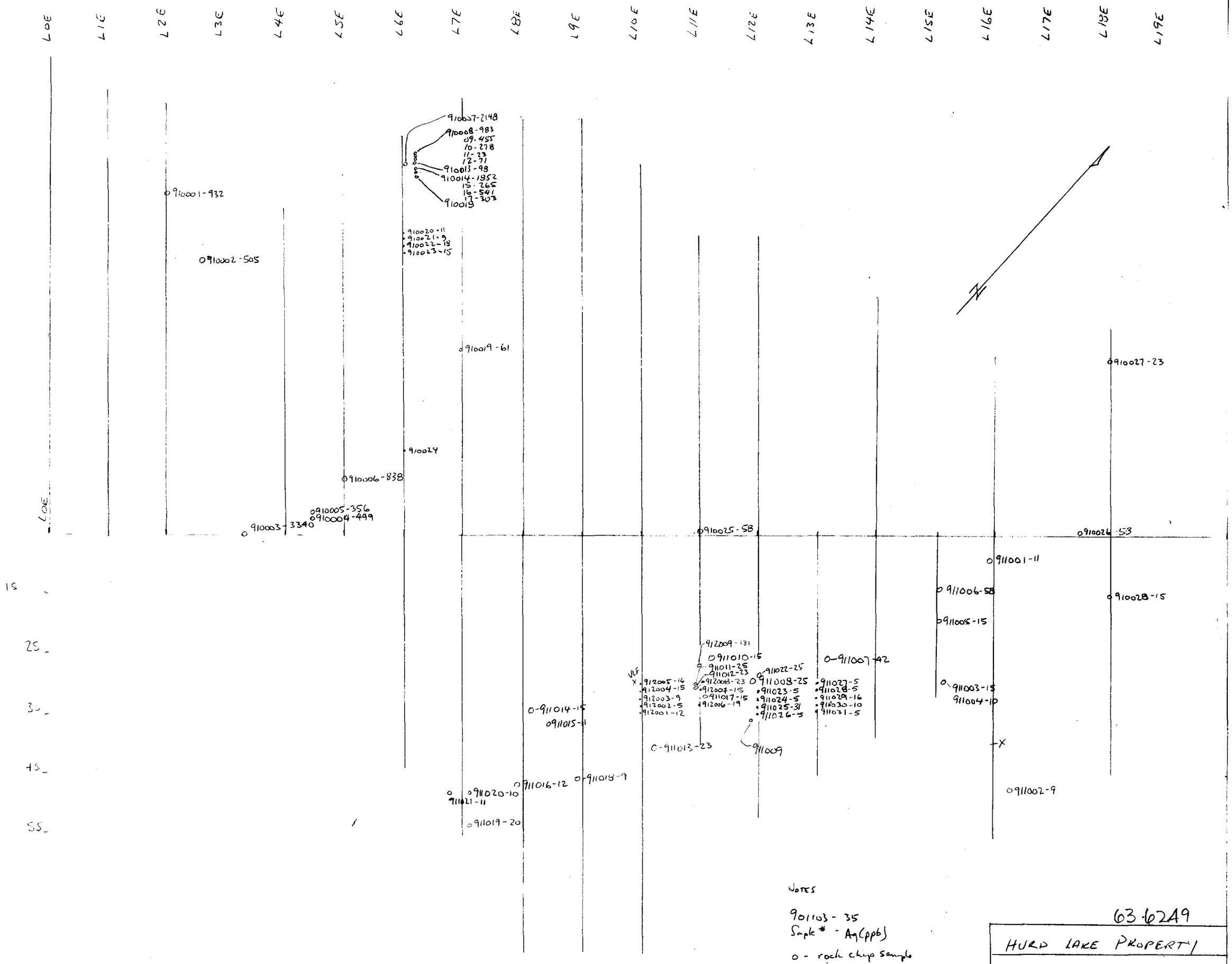
GEOLOGY PLAN MAP

MICHAEL SMITH

Drawn	Date	Scale	Fig. No.
M.S/R.F Int. MS	Nov/91	1:5000	3

42L07NW8040 63.6249 MAUN LAKE

200



NOTES

901103 - 35
Sample # - Ag (ppb)

o - rock chip sample
• - soil sample

63·6249

HURD LAKE PROPERTY

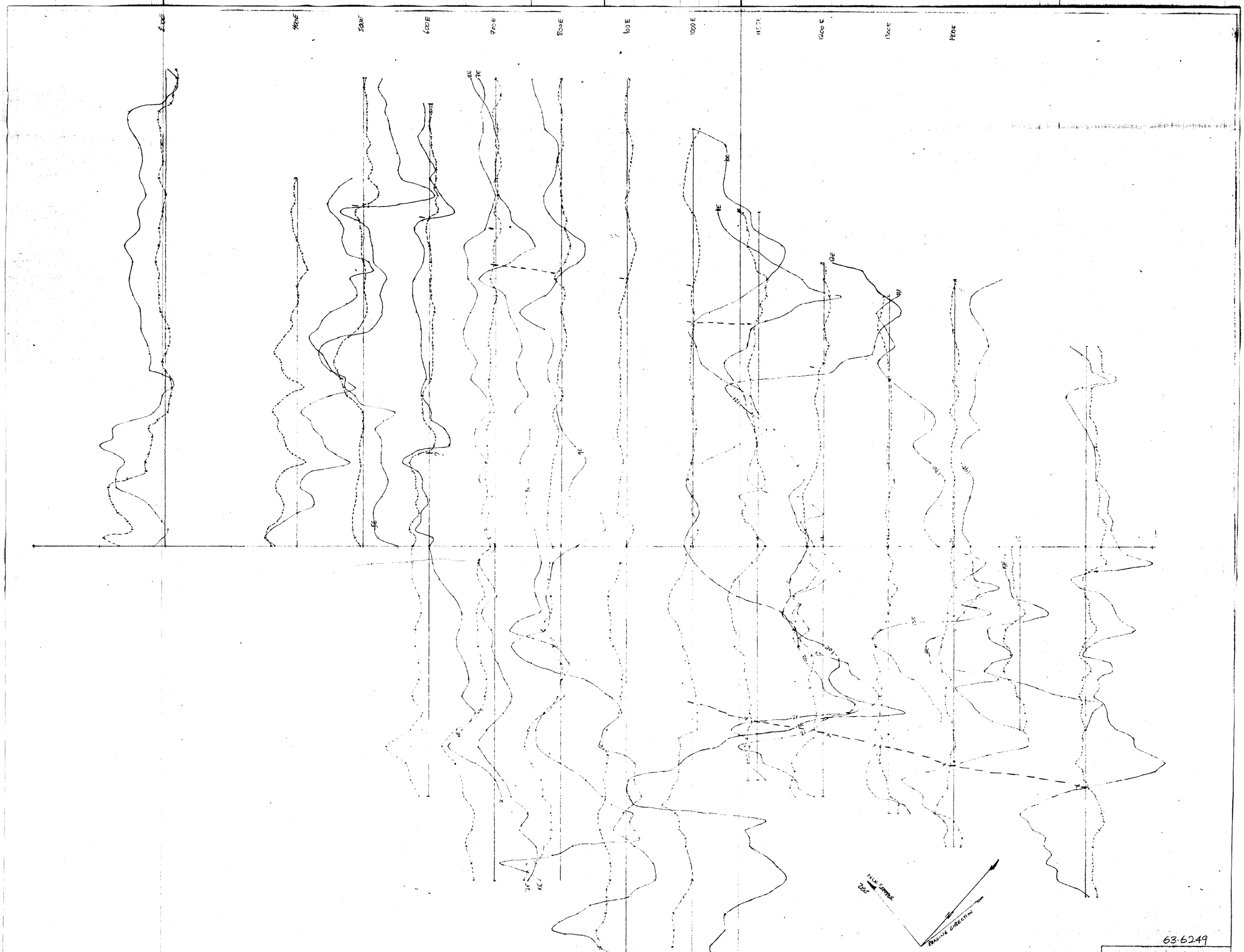
GEOCHEMICAL SAMPLE PLAN
O'SULLIVAN LAKE, N.W ONT

Dec/91

DRWN	SCALE	FIG:
MS	1:5,000	4

42L07NW8040 63.6249 MAUN LAKE

210



Notes
1) Horizontal Scale 1:2500
Vertical Scale - 1cm = 10%
2) —— In Phase
----x Quadrature
3) Instrument - EM 16 VLF-EM

63.6249

HURD LAKE PROPERTY

VLF-EM PROFILES

O'SULLIVAN LK AREA, N.W.O.N.T.

THUNDER BAY MINING DIV.

NTS 42L/7

Drawn: G.S.	Scale: 1:2500	No. 5