

PRELIMINARY EXPLORATION  
(GEOLOGY, GEOCHEMISTRY AND GEOPHYSICS)  
ON THE

Au4 CLAIM

ROCK CREEK AREA  
GREENWOOD M.D.  
BRIDESVILLE, B.C.

11/86

for

NICKLING RESOURCES INC.

by

P. VAN ANGEREN, P. GEOL.  
W.G.T. CONSULTANTS LTD.  
CALGARY, ALBERTA

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**14,154**

SEPTEMBER 20, 1985

TABLE OF CONTENTS

	PAGE NO.
SUMMARY	i
INTRODUCTION	1
LOCATION AND ACCESS	2
HISTORY	5
GEOLOGY	6
MINERALIZATION	10
GEOCHEMISTRY	11
GEOPHYSICS	12
CONCLUSIONS	13
RECOMMENDATIONS	14
STATEMENT OF COSTS	15
CERTIFICATE	16
REFERENCES	17

LIST OF FIGURES

FIGURE 1	PROPERTY LOCATION	p. 3
FIGURE 2	CLAIM LOCATION	p. 4
FIGURE 3	GEOLOGY	Map pocket
FIGURE 4a	GEOCHEMISTRY Pb	Map pocket
FIGURE 4b	GEOCHEMISTRY Zn	Map pocket
FIGURE 4c	GEOCHEMISTRY Ag	Map pocket
FIGURE 4d	GEOCHEMISTRY Au	Map pocket
FIGURE 5	MAGNETOMETER SURVEY	Map pocket
FIGURE 6	PHASE II, GRID LOCATIONS	Map pocket

i.

SUMMARY

The Au4 which is held in trust for Nickling Resources Inc. was investigated for its base and precious metal potential.

The geology of the property consists of a thick sequence of andesitic tuffs and sediments, host to a thin horizon of very fine grained rhyolitic tuff and graphitic to cherty sediments deposited in a basin. Despite similarities to typical massive-sulphide deposit environments, the property has little potential for this type of mineralization on the basis of lack of appropriate alteration and lack of base-metal enrichments.

However, a combination of favorable geology, availability of silica, presence of propylitic alteration, presence of distinct fault structures, significant gold anomalies in soil and lack of silver or base-metal enrichments, indicates the property to have good potential for gold mineralization of the type encountered at the past-producing McKinney gold camp.

Recommended follow-up exploration consists of detailed soil and rock sampling in the vicinity of the gold anomalies. Favorable source structures would subsequently be trenched. Such a programme has already been initiated.

## INTRODUCTION

W.G.T. Consultants Ltd. has been retained by Nickling Resources Inc. of Vancouver, B.C. to evaluate the base and precious metal potential of their Au4 claim, situated in southern B.C.

A programme of preliminary geological, geochemical and geophysical exploration was carried out by a three-man crew between May 23 and June 11, 1985. The results of this investigation are the subject of this report.

### LOCATION AND ACCESS

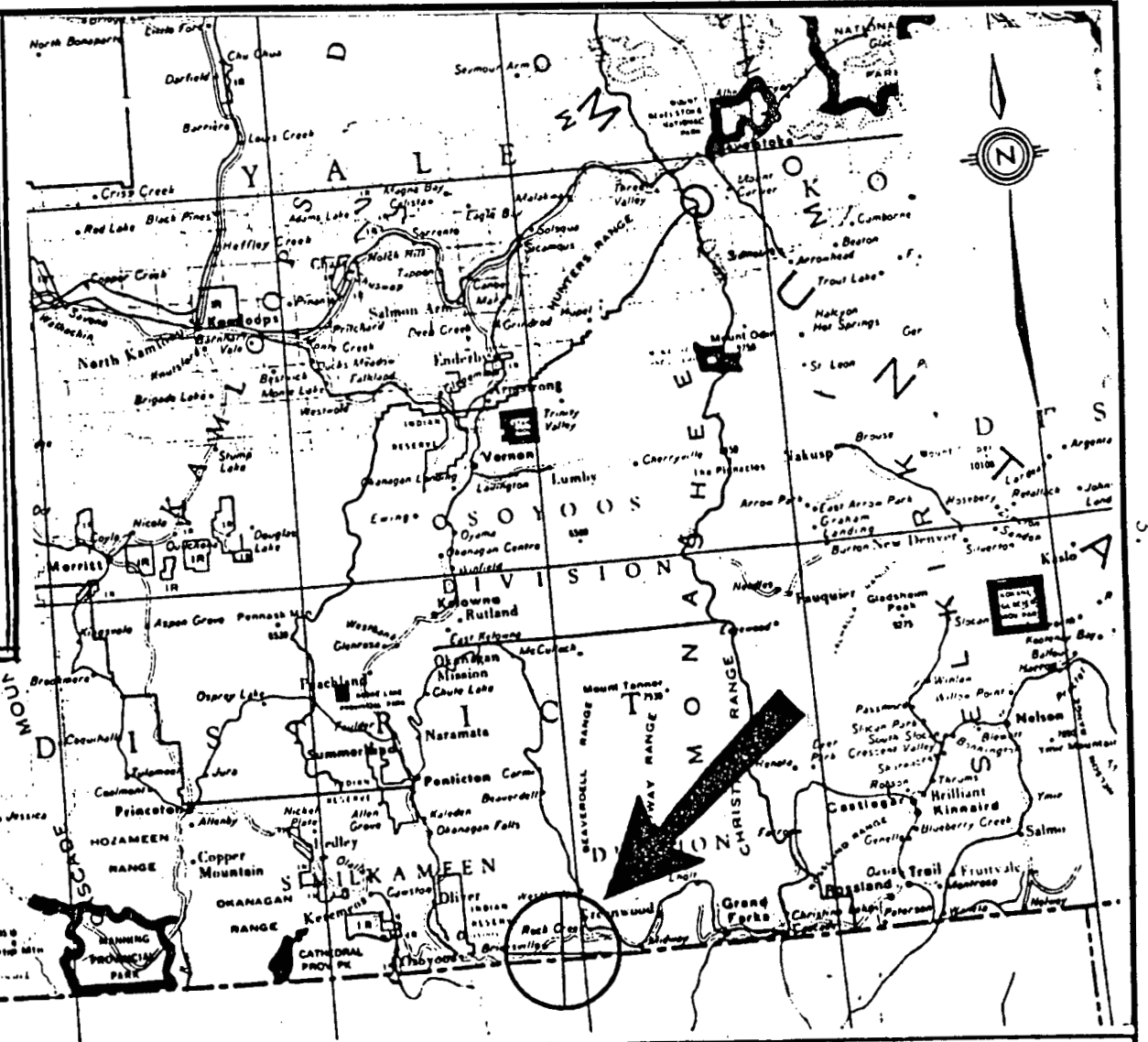
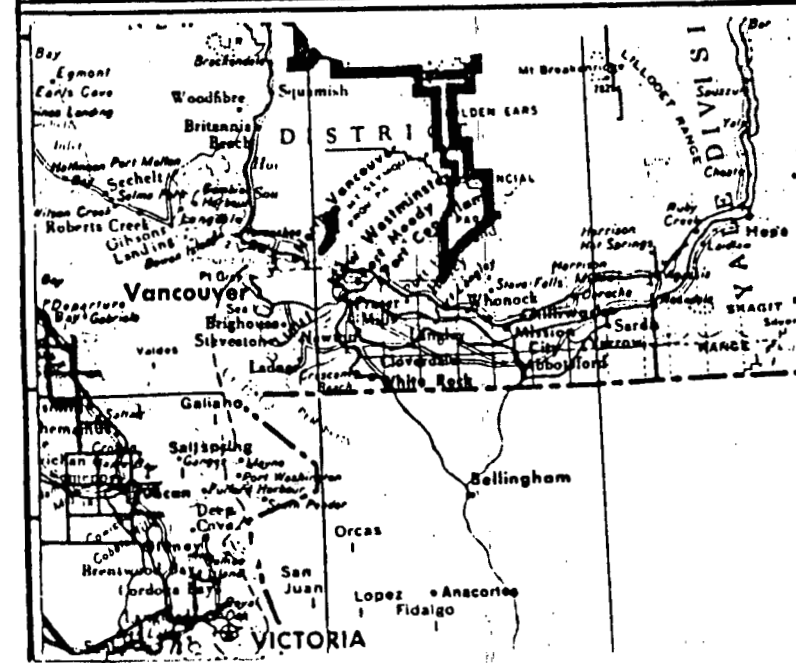
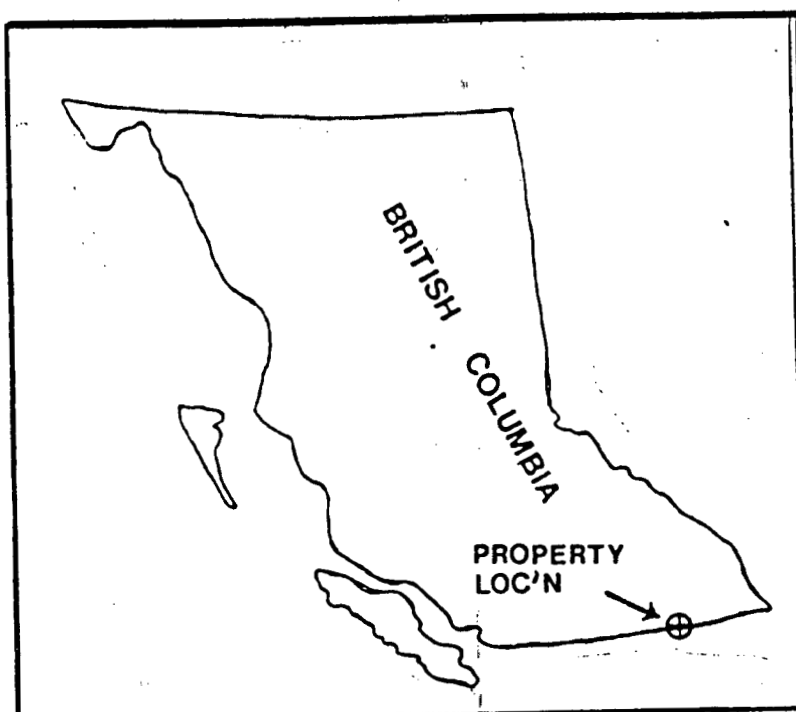
The Au4 claim is located on the U.S.-Canada border, approximately 25 kilometres east of Osoyoos, B.C. and three kilometres south of the Bridesville-Rock Creek bridge (Figures 1 and 2). This is at latitude 49°N, longitude 119°06'W in NTS map sheet 82E/3, Greenwood Mining Division.

Access is provided by a 10 kilometre all-weather gravel road from B.C. highway #3 at Bridesville. This dirt road traverses the center of the claim block.

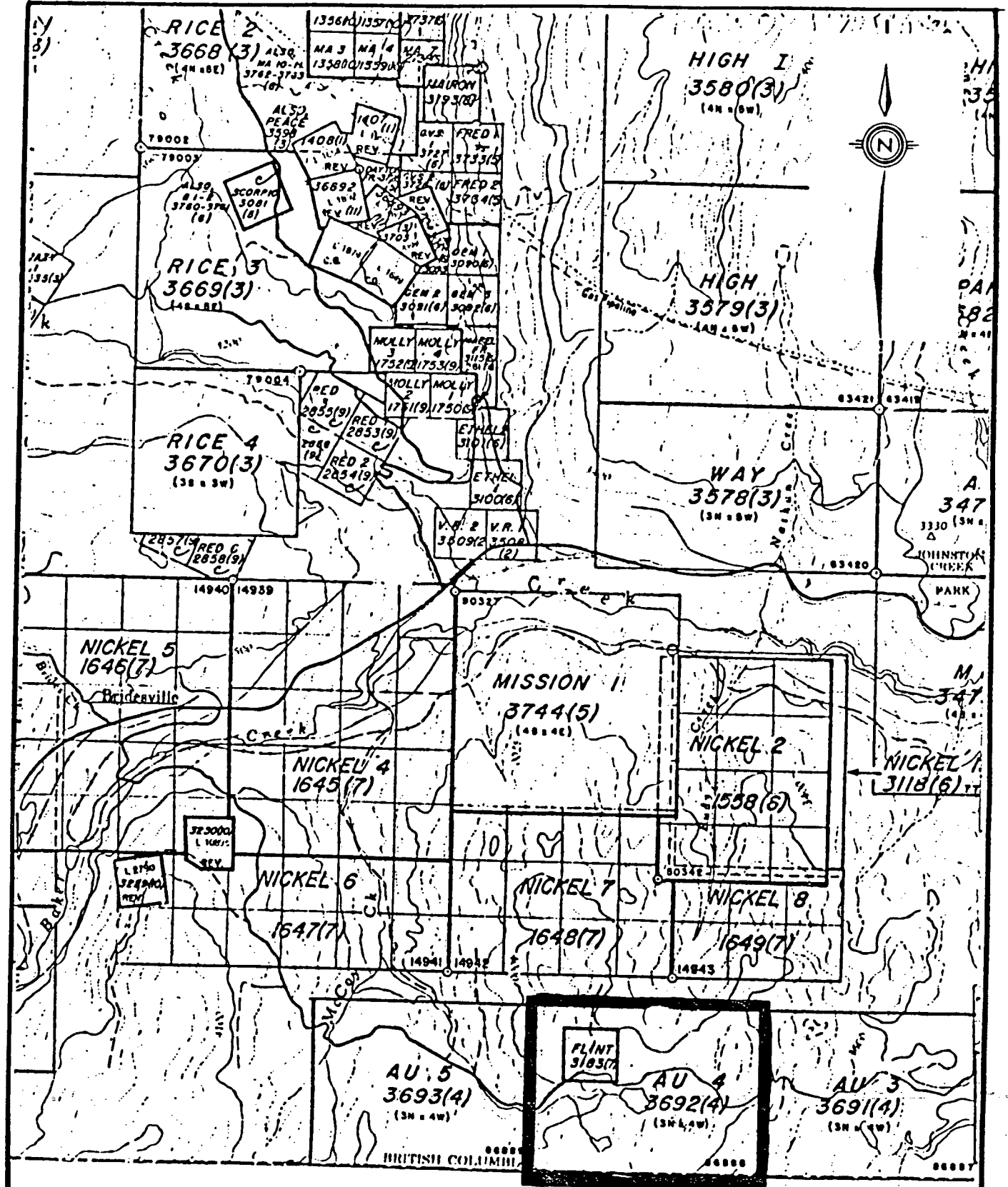
Topography is subdued; the relief being in the order of 150 metres (1,150 to 1,300 in elevation A.S.L.). The area represents part of a glaciated plateau, presently covered with till. Outcrops occur only on hill-tops. Approximately 60% of the property is cultivated but the remainder is covered with open pine and spruce forest.

The claim is held in trust for Nickling Resources Inc. of Vancouver, B.C. It consists of a 12-unit block, #3692, anniversary date April 8. The FLINT claim was staked for Nickling Resources on June 15th.

Legal aspects of the claims are unknown to the author, however, it should be noted that the legal corner post of the Au4 claim is located 450 metres westwards of that indicated on the governmental claim maps.



CLIENT: NICKLING RESOURCES INC.	
PROPERTY: AU 4	
<b>PROPERTY LOCATION</b>	
40	SCALE: 0 km 40
DATE: 01/84	DRG. NO.: 1
RPM	



WASHINGTON — U.S.A.

CLIENT:		NICKLING RESOURCES INC.	
PROPERTY:		AU 4.	
<b>CLAIM LOCATION MAP</b>			
SCALE: 0 km 1		DATE: 07/84	DRG. NO.:
DR: RPM		2	

## HISTORY

Exploration in the region dates back to the early 1870's when placer deposits were discovered in Rock, Rice and McKinney creeks. The McKinney gold-camp which is located 12 kilometres northwest of the Au4 claim, was discovered in 1897 and produced gold to 1904 and again from 1960 to 1962 (Krueckl, 1984).

Numerous similar deposits were discovered both north and south of the Au4 claim in the late 1800's and early 1900's. From 1910 to 1950, exploration was at a stand-still in the area. In the 1950's and 1960's, emphasis was on chromium and nickel and a few showings such as the Anarchist Chrome and Old Nick were found in the vicinity of the Au4 claim.

Exploration on the Au4 claim dates back to the late 1800's when a shaft and two adits were driven on a number of magnetite-rich, oxidized, quartzite structures. Between 1958 and 1962, Cominco Ltd. and G.E. Crippen & Associates investigated a quartzite showing on the FLINT claim, in an attempt to prove high-grade silica reserves for the Trail smelter. Results indicated non-adequate grades.

In 1967 and 1968, ground and airborne magnetometer surveys were conducted over the claims by Newmont Mining Corp. of Canada. Although a number of small anomalies were detected, no follow-up work appears to have been carried out since 1968, the property being dormant until 1985.



GEOLOGY

The regional geology has been described by Newmont Mining Corp. in their 1968 assessment report and may be summarized as follows:

"The geology of the Bridesville area consists of pre-Cambrian and Paleozoic sediments intruded by Cretaceous plutons. These formations are overlain by Cenozoic sediments and volcanics. Mineralization of note is confined to the Cretaceous and earlier rocks."

"Overlying the pre-Cambrian Monashee basement, is the Permo-Triassic Anarchist group of rocks comprised of greenstones, quartzites, siltstones and greywackes. The Anarchist group is tightly folded and faulted along semi-regional northwest trends."

"The Monashee and Anarchist groups are intruded by the Cretaceous Nelson and Valhalla intrusives. The Nelson plutonic rocks vary from ultramafic to felsic in composition, with diorites and monzonites dominating, whereas the later Valhalla bodies consist of granodiorite and granite."

"Pre-Cenozoic formations are unconformably overlain by remnant caps of the Paleocene-Eocene Kettle River formation. It comprises conglomerate, sandstone, shale and tuff commonly containing fragments of older rock."

The rocks underlying the Au4 claim have been described as belonging to the Anarchist group. These have been invaded in part by Nelson-type intrusives and have been metamorphosed to the lower greenschist facies.

There are five distinct rock types on the property (figure 3). Age relationships are unclear, but it appears that the siliceous and argillaceous units (units 1 through 3) are underlain and overlain by greenstones (unit 4).

Unit 1 consists of massive, grey-white, locally cherty quartzite upwards to 10 metres thick. The formation is highly shattered and is devoid of sulphides, feldspars, quartz crystals and fresh rock fragments. Grey "mottlings" appear to represent assimilated and pervasively silicified rock fragments. The unit has the appearance and texture of a bull-quartz vein, however, there is no observable wall-rock alteration. Furthermore, the upper contact of the quartzite is progressively more banded, much like a siliceous tuff, and often contains lenses of a crystalline siliceous dolostone (1b). In the southern half of the claim, unit 1 rarely exceeds a few metres in thickness and is totally enclosed within unit 2.

The above observations confirm the nature of the quartzite to be recrystallized, very-fine grained siliceous tuff unit.

Unit 2, a green, phyllitic, thinly bedded cherty mudstone may represent a tuffaceous, sedimentary unit laterally equivalent to the quartzite.

Unit 3, found both above and below units 1 and 2, varies from a black graphitic argillaceous siltstone (3b) to a green, coarser-grained calcareous greywacke (3a). The greywacke was observed most commonly at the contact between units 3 and 4.

Unit 4 is the dominant formation on the property. It comprises massive andesitic tuffs (4a) mixed with schistose, thinly bedded tuffaceous sediments apparently derived from andesitic sources (4b).

Unit 5 is a fine to medium-grained, fresh to weakly foliated diorite occurring as a small plug in the southeastern corner of the claim block, and as dikes elsewhere on the property. There is no significant metamorphic halo associated with the diorite.

The geology of the area represents cyclic andesitic volcanism and sedimentation which has been interrupted by an episode of felsic volcanism and quiescent sedimentation.

Structural continuity is disrupted by abundant faulting. The more obvious faults trend northeasterly and are represented by deep and narrow gullies and ravines.

Alteration on the property comprises large-scale propylitization (chlorite-calcite-epidote veining) and localized silicification (minor-quartz veining). Quartz veining is to be expected in the area, in light of the presence of unit 1 which acts as a source of silica.

**MINERALIZATION**

Economic and sub-economic concentrations of gold, chromium and nickel occur in the region.

Chromite pods and lenses containing up to 30% chromium occur in the Anarchist group sediments and serpentinites approximately 6.5 kilometres northwest of the property and 5 kilometres north of the McKinney camp (e.g. Anarchist Chrome property).

Disseminated pyrrhotite hosted by metasomatic quartzite associated with ultramafic intrusions occurs at the Old Nick showing a few kilometres north of the property. Nickel grades of 0.2% are encountered there.

At the McKinney camp, 137,184 tons of ore, grading 0.595 oz/T Au were mined from a bull-quartz vein containing free gold. Other similar auriferous quartz veins occur in a belt southwards from McKinney, through the property and into Washington State. Some of these, such as the Poland China, 4 kilometres south of the Au4 claim, are reputed to have grades of 0.3 oz/T Au and 1.0 oz/T Ag but do not have production figures available.

Mineralization on the Au4 claim comprises disseminated to banded-massive magnetite and pyrite in the quartzite and siltstones, of the southern half of the claim. These localized concentrations appear to be sedimentary in origin.

GEOCHEMISTRY

A total of 415 soils and 30 rock samples were collected on the Au4 claim (figures 4a to 4d). Thirty-four soil samples were taken on the FLINT claim as well. Soils were taken at 50-metre intervals on lines which were 100 metres apart. Rock chip samples were collected from various mineralized (pyritized) and stratigraphic units. Although all samples were analyzed for copper, lead, zinc, silver, gold and nickel, only those soil analyses for lead, zinc, silver and gold are indicated on figures 4a to 4d.

The reason being that all rocks contain background values for each element and that maximum soil values for copper and nickel are 68 and 91 ppm respectively. Maximum values for lead, zinc and silver are 37, 154 and 3.2 ppm respectively. These figures indicate that the property contains no significant enrichments of these elements.

Gold occurs in anomalous concentrations in a number of areas on the property however (fig. 4d). A few samples contain in excess of 100 ppb Au and further soil and rock sampling is required in the vicinity of these in order to determine their source. These gold anomalies are significant in that they indicate the presence of auriferous structures on the property.

GEOPHYSICS

A total of 29 line-kilometres of magnetometer survey using a SHARP-MF1 flux-gate magnetometer was completed (figure 5). Magnetic relief over the property is very uniform except in the areas where magnetite was observed in the rocks (south central and southwestern areas). Results indicate little correlation between stratigraphy, structure and magnetic response.

## CONCLUSIONS

The geological investigation suggests that the property overlies part of a felsic tuff/sedimentary basin developed during a hiatus in volcanism within an andesitic volcanic arc. In this respect, the geological environment is similar to that of the McKinney gold camp and to typical massive-sulphide/lode gold-producing regions in North America. However, despite a resemblance to massive sulphide environments, the Au4 claim holds little potential for this type of mineralization on the basis of lack of appropriate alteration and lack of base-metal enrichments.

The predominance of significant soil-gold anomalies combined with a lack of silver or base-metal enrichment suggests the presence of free-gold enriched structures on the property, possibly similar to the McKinney camp gold mineralization (free-gold in quartz veins).

The property contains numerous potential trap structures as typified by the abundance of fault and shear zones. The metamorphosed quartzite of unit 1 may have acted as a source of silica for quartz veining. The presence of both, quartz veining and propylitic alteration indicates that hydrothermal activity was present at some time.

All of the above-mentioned observations indicate that the property has potential for gold mineralization of the type encountered at the McKinney camp.



RECOMMENDATIONS

At the writing of this report, a recommended second phase of detailed soil and rock sampling in the vicinity of the gold anomalies had been initiated (figure 6). Trenching of fault features on grids 1 and 2 had also been initiated. A report on these follow-up results is forthcoming.

STATEMENT OF COSTS

The following is an outline of costs incurred while completing the exploration programme for the period May 23 to June 11 (field) and June 12 to June 19, 1985 (report preparation).

**A. FIELD**

P. Van Angeren, P. Geol.	22 days @ 300/d	\$6,600.00
R. Krause, Geologist	8 days @ 250/d	2,000.00
W. Timmins Jr., Assistant	19 days @ 200/d	3,800.00
Truck Rental		1,100.00
Accommodation, Gas, Equipment, etc.		2,500.00
Geochemistry - 549 soils, 30 rocks, bags, etc.		
	(TERRAMIN LABS)	7,000.00
	<b>TOTAL FIELD COSTS</b>	<b>23,000.00</b>

**B. REPORT PREPARATION**

P. Van Angeren, P. Geol.	7 days X 300/d	2,100.00
R. Krauze, Geologist	5 days X 250/d	1,250.00
Accommodation, Airfare (RK), etc.		700.00
Drafting, Typing, etc.		450.00
	<b>TOTAL REPORT COSTS</b>	<b>4,500.00</b>
	<b>TOTAL COST</b>	<b>\$27,500.00</b>

Respectfully submitted,

*Phil D. Van Angeren*

Phil D. Van Angeren, P.  
W.G.T. CONSULTANTS LTD.

September 20, 1985



CERTIFICATE

I, PHILIP D. VAN ANGEREN, residing at #506, 521-57th Avenue S.W., Calgary, Alberta, do hereby certify that;

1. I am a geologist having been practising my profession for eight years.
2. I am a graduate of McGill University, Montreal, Quebec, having received an Honours Bachelor of Science degree in geology, 1977,
3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta,
4. I have no interest, direct or indirect, in the property or securities of Nickling Resources Inc., nor do I expect to receive any such interest,
5. I am the author of this report which is based on personal knowledge of the area gained during the exploration of the property in May and June of 1985.

Dated at Calgary, Alberta, this 20th day of September, 1985.



*Philip D. Van Angeren*

P. D. Van Angeren, P. Geol.

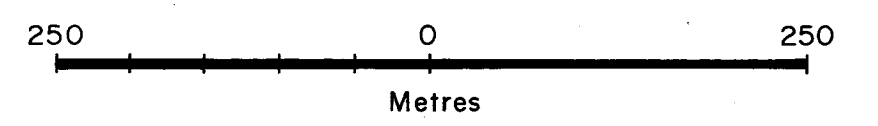
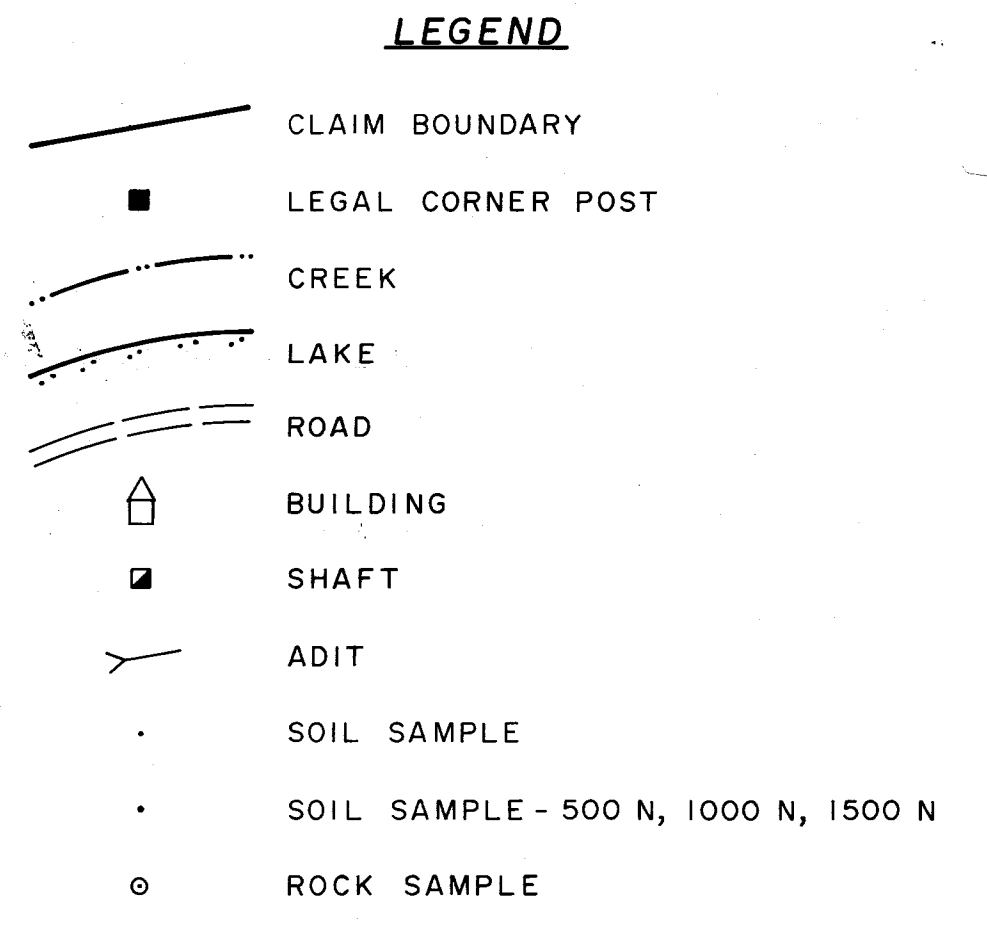
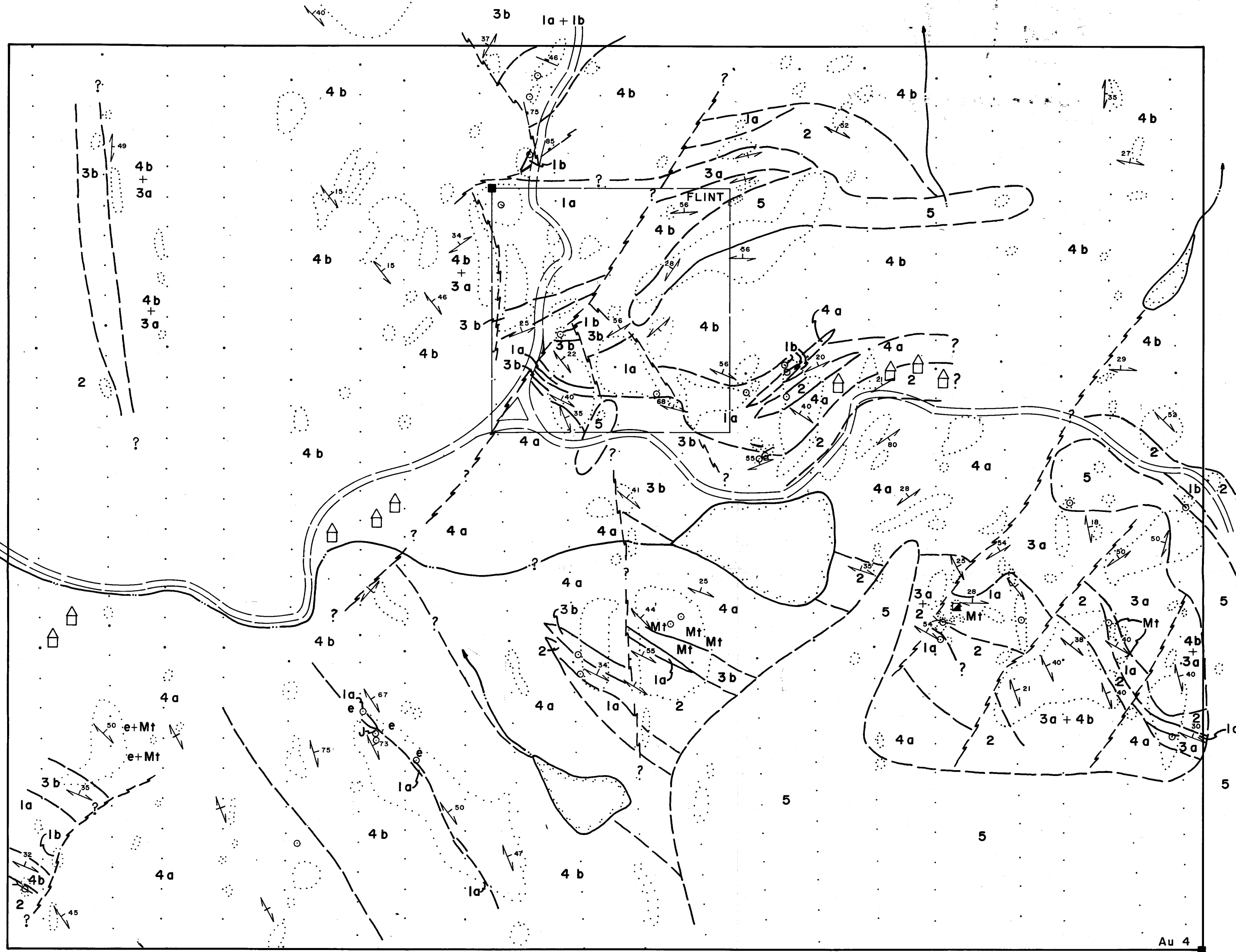
W. S. T. CONSULTANTS LTD.

REFERENCES

1. Krueckl, G.P., P. Eng. and Dickson, M.P., P. Eng., 1984

"Report on the Au4 Property, Rock Creek Area, Greenwood Mining Division, Bridesville, B.C."

Report for NICKLING RESOURCES LTD. dated February 3, 1984.



**LEGEND**

<b>5</b>	DIORITE	<b>e</b>	EPIDOTE ALTERATION
<b>4</b>	GREENSTONE	<b>J</b>	JASPEROID SEDIMENTS
	<b>a</b> MASSIVE, TUFF	<b>Mt</b>	MAGNETITE
	<b>b</b> FOLIATED TUFFACEOUS SEDIMENT		FOLIATION
<b>3</b>	ARGILLITE		FAULT (ASSUMED)
	<b>a</b> CALCAREOUS ARGILLACEOUS GREYWACKE		JOINTING
	<b>b</b> ARGILLACEOUS SILTSTONES		LIMITS OF OUTCROP
<b>2</b>	CHELT		
	SILICEOUS, TUFFACEOUS SEDIMENT		
<b>1</b>	QUARTZITE		
	<b>a</b> BULL QUARTZ		
	<b>b</b> SILICEOUS DOLOSTONE		
	GEOLOGICAL CONTACT (DEFINED, APPROXIMATE)		

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**14,154**

W. G. T. CONSULTANTS LTD.

NICKLING RESOURCES INC.

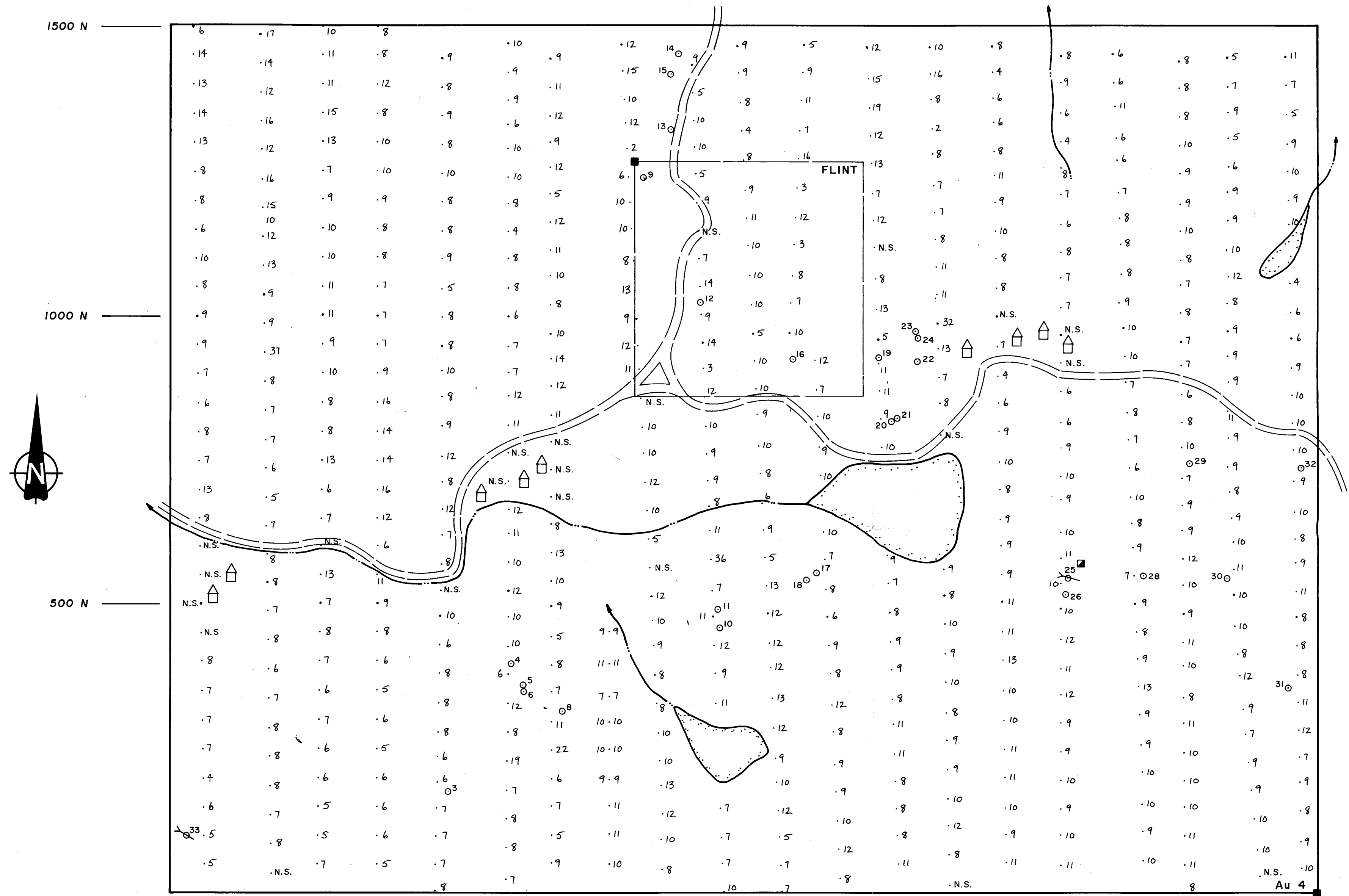
**Au 4 CLAIM**

BRIDESVILLE, ROCK CREEK AREA

GREENWOOD M. D., B. C.

**GEOLOGY**

SCALE: 1:5,000	DATE: SEPT. 85.	N.T.S. 82 E/3 E	FIGURE: 3	DRAFTED BY: B. D. S.
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**LEGEND**

- CLAIM BOUNDARY
- LEGAL CORNER POST
- CREEK
- LAKE
- ROAD
- 🏠 BUILDING
- SHAFT
- Y ADIT
- SOIL SAMPLE
- SOIL SAMPLE - 500 N, 1000 N, 1500 N
- ROCK SAMPLE

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

14,154  
Metres

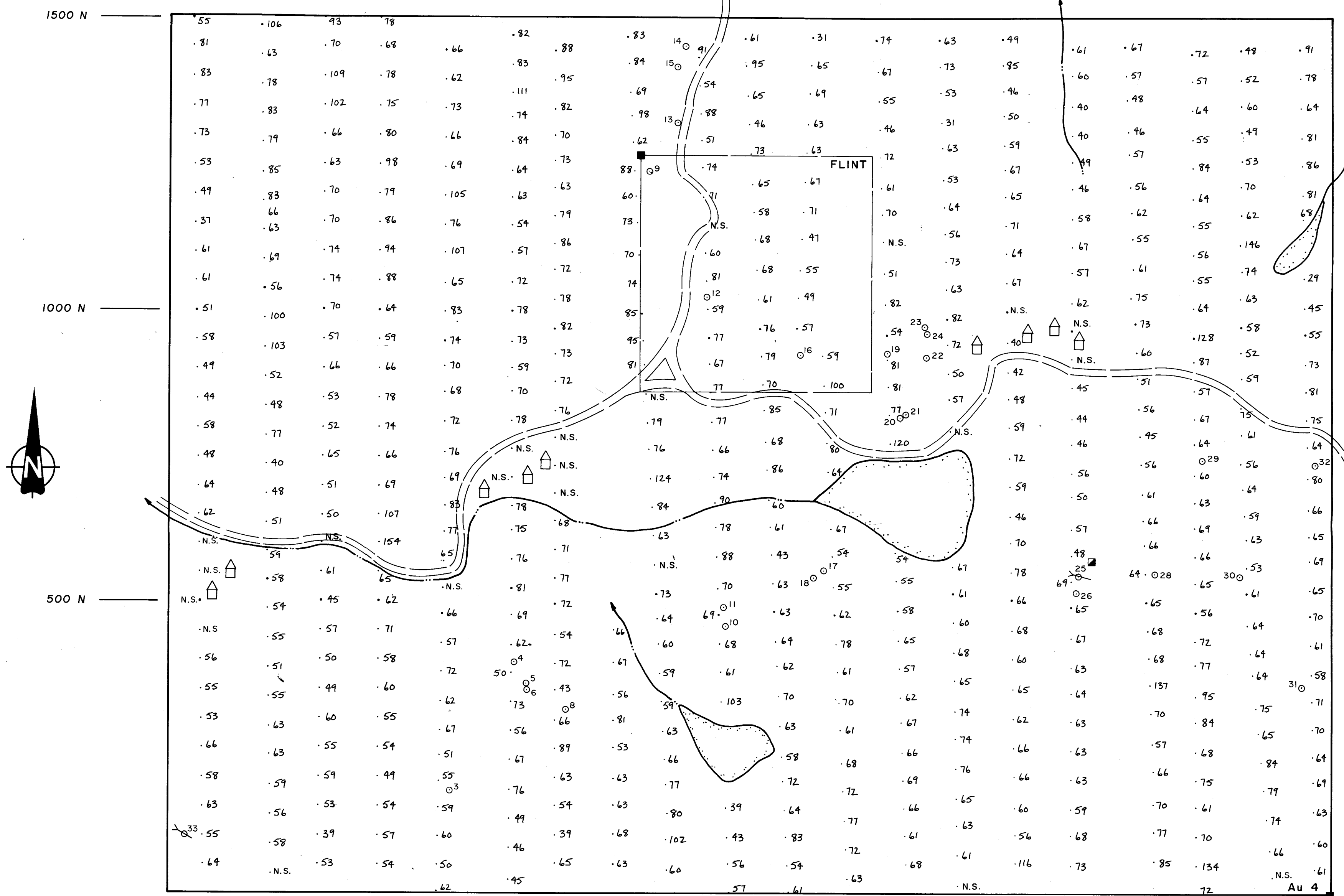
W. G. T. CONSULTANTS LTD.

NICKLING RESOURCES INC.

**Au 4 CLAIM**  
BRIDESVILLE, ROCK CREEK AREA  
GREENWOOD M.D., B. C.

**GEOCHEMISTRY**  
LEAD - ppm

SCALE: 1:5,000	DATE: SEPT. 85.	N.T.S. 82 E/3 E	FIGURE: 4a	DRAFTED BY: B. D. S.
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**LEGEND**

- CLAIM BOUNDARY
- LEGAL CORNER POST
- CREEK
- LAKE
- ROAD
- BUILDING
- SHAFT
- ADIT
- SOIL SAMPLE
- SOIL SAMPLE - 500 N, 1000 N, 1500 N
- ROCK SAMPLE
- NO SAMPLE

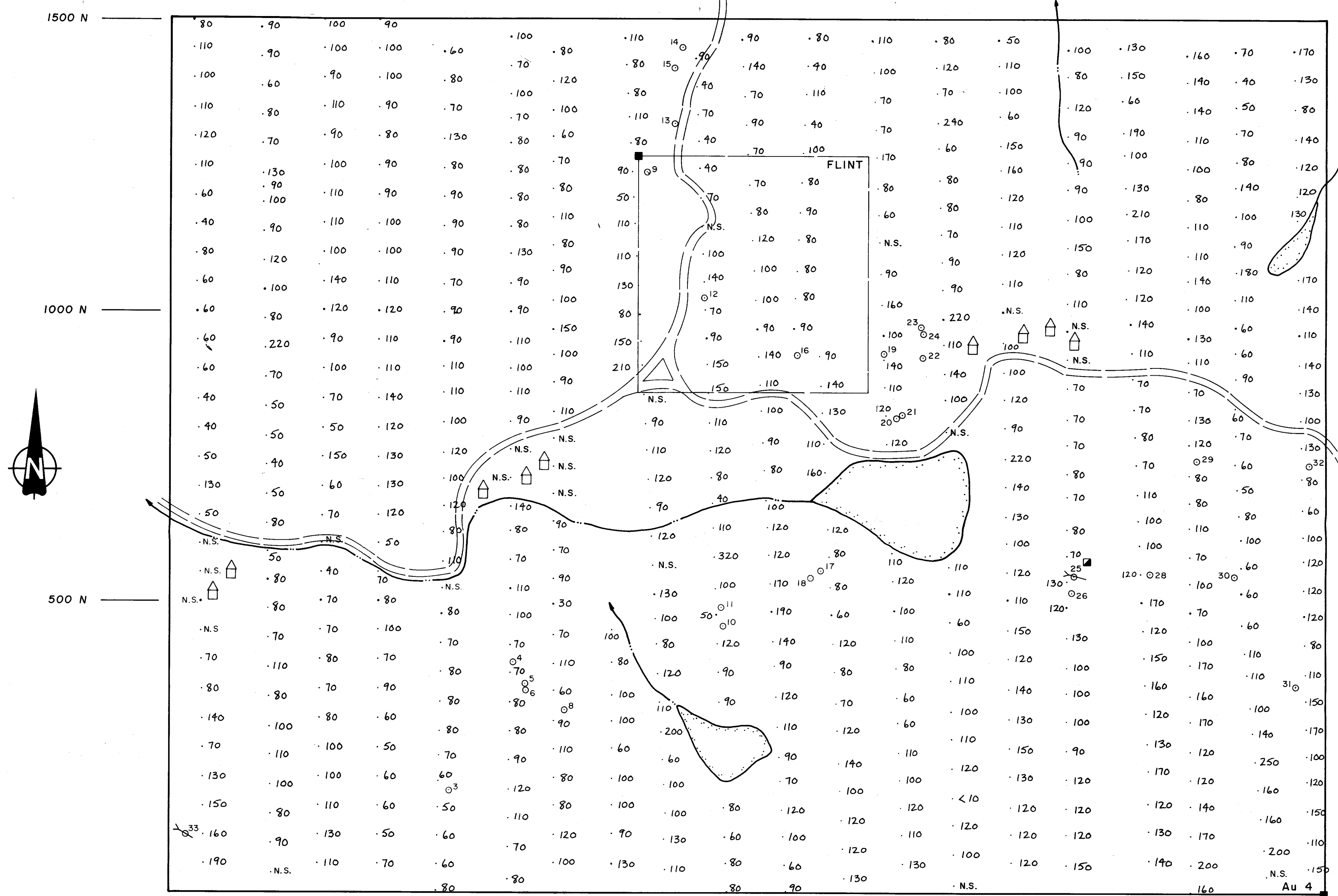
**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**14,154**  
metres  
W. G. T. CONSULTANTS LTD.

NICKLING RESOURCES INC.

**Au 4 CLAIM**  
BRIDESVILLE, ROCK CREEK AREA  
GREENWOOD M. D., B. C.

**GEOCHEMISTRY**  
ZINC - ppm



- LEGEND**
- CLAIM BOUNDARY
  - LEGAL CORNER POST
  - CREEK
  - LAKE
  - ROAD
  - BUILDING
  - SHAFT
  - ADIT
  - SOIL SAMPLE
  - SOIL SAMPLE - 500 N, 1000 N, 1500 N

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**14,154**  
Metres

L 18 | L 16 | L 1 | L 3 | L 27 | L 4 | L 6 | L 8 | L 17 | L 21 | L 14

W. G. T. CONSULTANTS LTD.

NICKLING RESOURCES INC.

**Au 4 CLAIM**

BRIDESVILLE, ROCK CREEK AREA

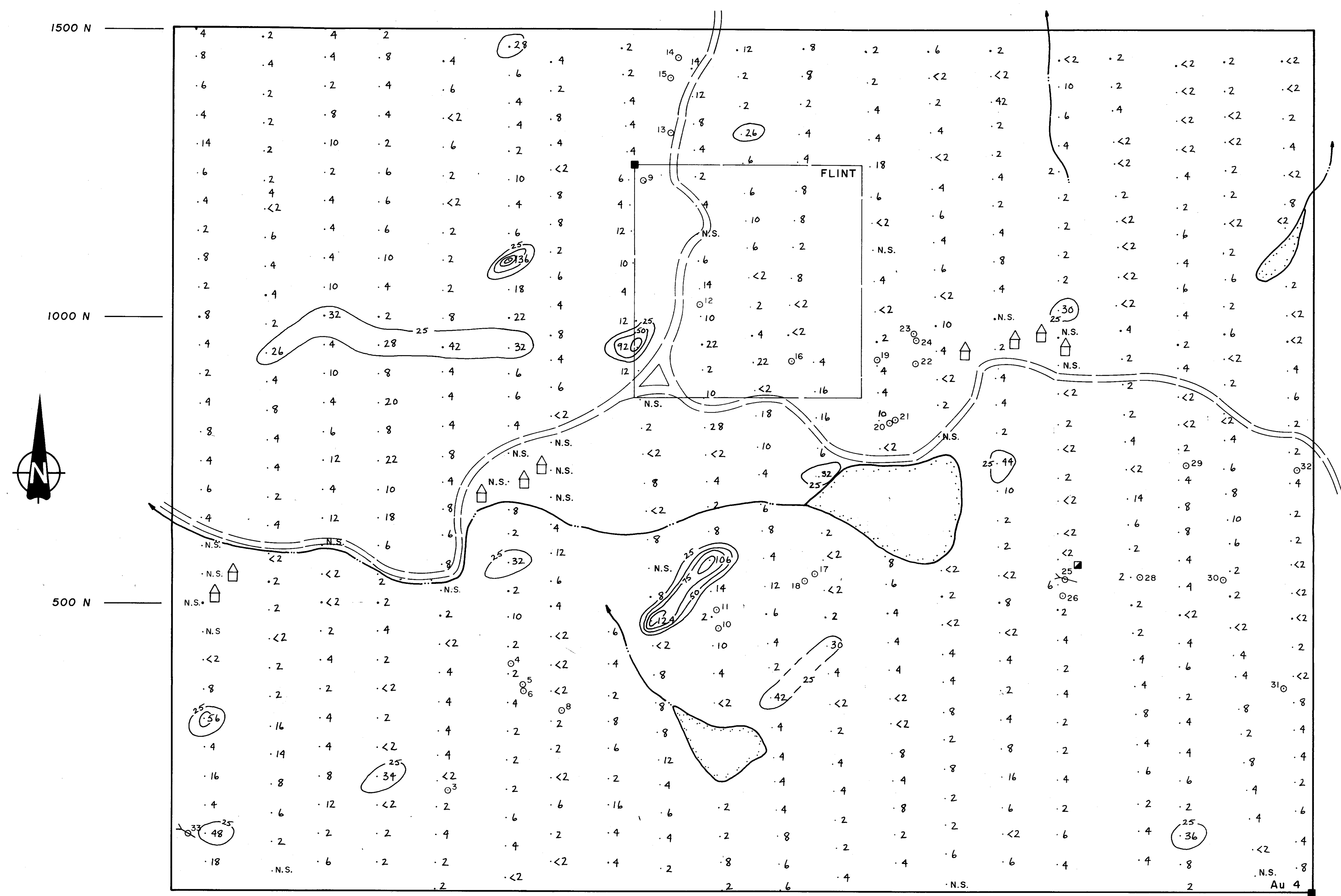
GREENWOOD M. D., B. C.

**GEOCHEMISTRY**

SILVER - ppb

SCALE: 1:5,000	DATE: SEPT. 85.	N.T.S. '82 E/3 E	FIGURE: 4c	DRAFTED BY: B. D. S.
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- LEGEND**
- CLAIM BOUNDARY
  - LEGAL CORNER POST
  - CREEK
  - LAKE
  - ROAD
  - BUILDING
  - SHAFT
  - ADIT
  - SOIL SAMPLE
  - SOIL SAMPLE - 500 N, 1000 N, 1500 N
  - ROCK SAMPLE
  - NO SAMPLE
- CONTOUR INTERVAL 25 ppb

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

250 0 250  
Meters

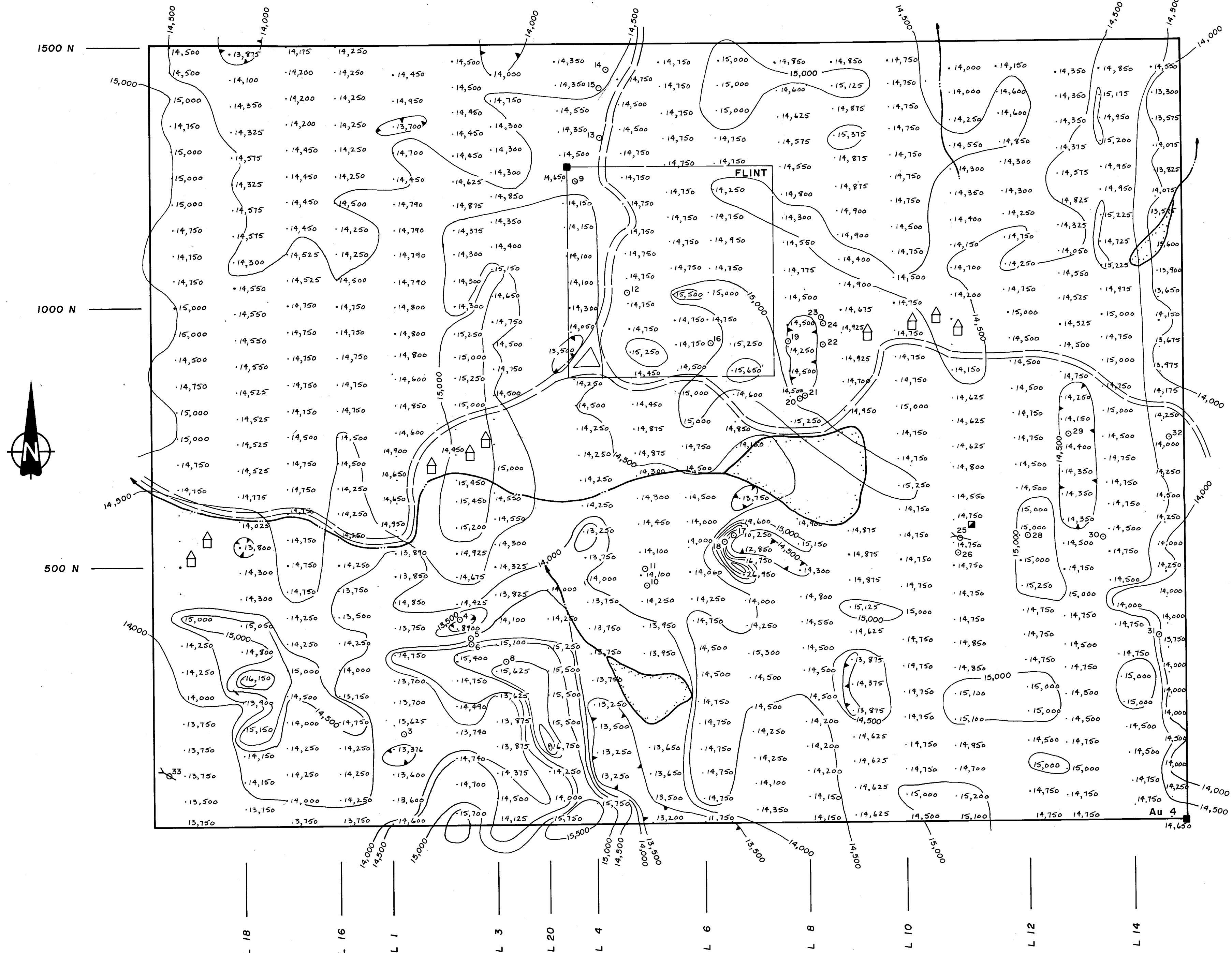
**14,154**  
WATER CONSULTANTS LTD.  
NICKLING RESOURCES INC.

**Au 4 CLAIM**  
BRIDESVILLE, ROCK CREEK AREA  
GREENWOOD M. D., B. C.

**GEOCHEMISTRY**  
GOLD - ppb

SCALE: 1:5,000	DATE: SEPT. 85.	N.T.S. 82 E/3 E	FIGURE: 4d	DRAFTED BY: B. D.S.
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L 18 | L 16 | L 14 | L 12 | L 10 | L 8 | L 6 | L 4 | L 2



**LEGEND**

- CLAIM BOUNDARY
- LEGAL CORNER POST
- CREEK
- LAKE
- ROAD
- BUILDING
- SHAFT
- ADIT
- SOIL SAMPLE
- SOIL SAMPLE - 500 N, 1000 N, 1500 N
- ROCK SAMPLE
- SURVEY STATION (VALUE IN GAMMAS)

**GEOLOGICAL BRANCH ASSESSMENT REPORT**

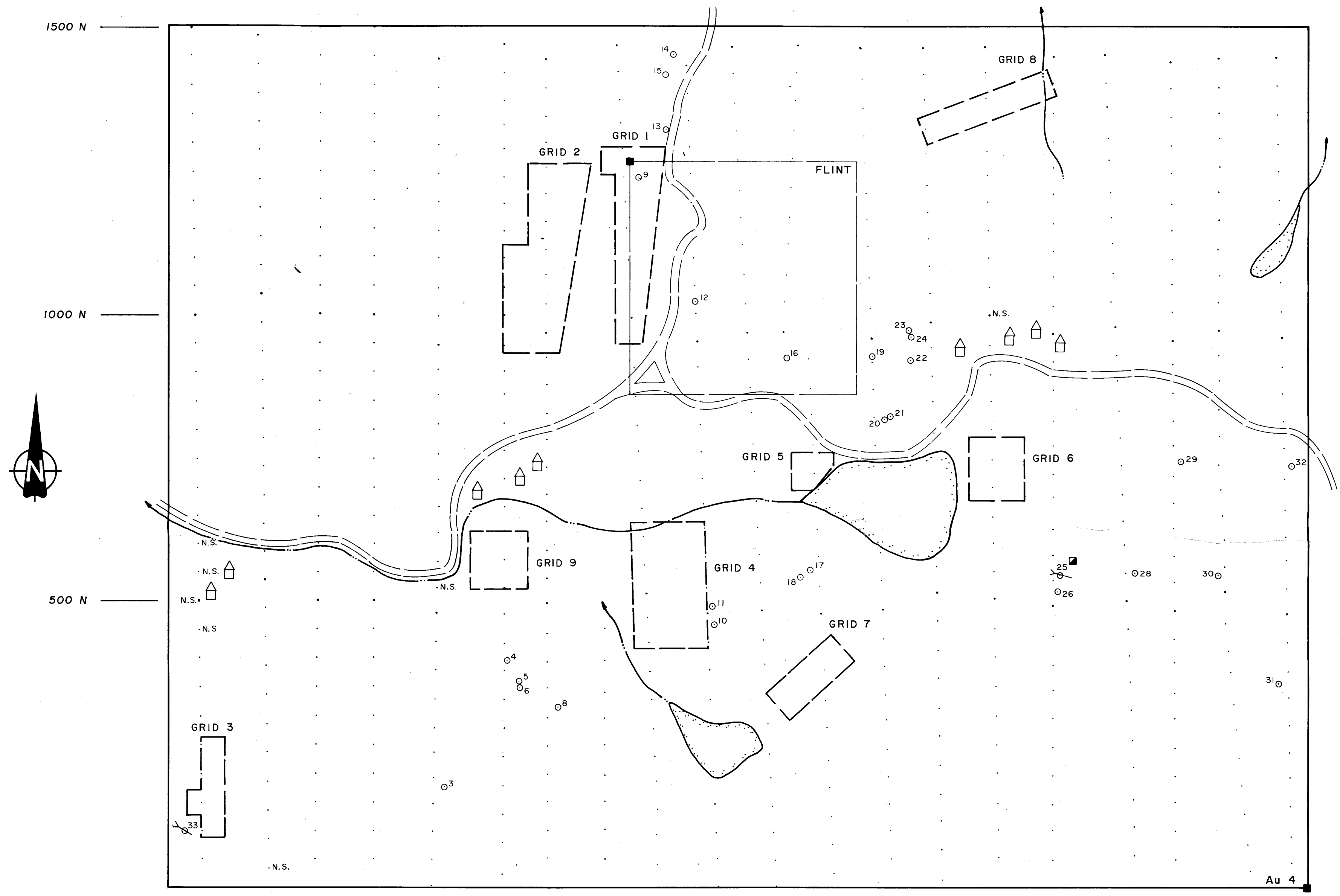
**14,154**  
Metres  
W. G. I. CONSULTANTS LTD.

NICKLING RESOURCES INC.

**Au 4 CLAIM**  
BRIDESVILLE, ROCK CREEK AREA  
GREENWOOD M. D., B. C.

**MAGNETOMETER SURVEY**

SCALE: 1:5,000	DATE: SEPT. 85.	N.T.S. 82 E/3 E	FIGURE: 5	DRAFTED BY: B. D. S.
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- LEGEND**
- CLAIM BOUNDARY
  - LEGAL CORNER POST
  - CREEK
  - LAKE
  - ROAD
  - BUILDING
  - SHAFT
  - ADIT
  - SOIL SAMPLE
  - SOIL SAMPLE - 500 N, 1000 N, 1500 N
  - ROCK SAMPLE
  - NO SAMPLE

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

250 ~~14,154~~ 250  
Metre  
W. G. T. CONSULTANTS LTD.

NICKLING RESOURCES INC.

**Au 4 CLAIM**  
BRIDESVILLE, ROCK CREEK AREA  
GREENWOOD M.D., B. C.

**GRID LOCATION MAP**

L 18    L 16    L 14    L 13    L 20    L 4    L 6    L 8    L 10    L 12    L 14