

COMINCO LTD.

EXPLORATION
NTS 105-0-1,2

WESTERN DISTRICT



GEOLOGICAL AND GEOCHEMICAL

ASSESSMENT REPORT

ON THE

NIDD CLAIM GROUP

MACMILLAN PASS AREA,
YUKON TERRITORY



September 20, 1977

M.S. Travis

PERIOD OF WORK

June 3, 1977 to August 23, 1977

090231



This report has been examined by the Geological Evaluation Dept and is recommended to the Council to be considered as representation work in the amount of \$ 80,893.55

J A Morris
A/ Resident Geologist or
Resident Mining Engineer

Considered as representation work under
Section 53 (4) Yukon Quartz Mining Act.

B.R. BAXTER
Supervising Mining Recorder

[Signature]
Commissioner of Yukon Territory

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Summary

The NIDD claim group, consisting of 261 mineral claims, was staked in September 1976 and June 1977 in the MacMillan Pass area following major discoveries of lead-zinc-silver mineralization by Ogilvie Joint Ventures. During the summer of 1977 Cominco personnel carried out a geological mapping, prospecting and soil sampling program on the NIDD property.

The MacMillan Pass area is underlain by a sequence of sedimentary strata of Proterozoic to Mississippian age. Minor Ordovician volcanic units are interbedded with this sequence. The Paleozoic strata are intruded by numerous small quartz monzonite and granodiorite stocks of Tertiary age.

On the NIDD property, strata of the Ordovician-Silurian Road River Formation are the oldest rocks exposed. This formation consists of black carbonaceous shale, dark grey silty limestone and medium crystalline dolomitized limestone. Overlying the Road River stratigraphy are rhythmites, siltstone, shale and conglomerate of the Canol Formation. This unit consists of black siliceous, carbonaceous shale which contains some baritic sections. The Imperial Formation overlies the Canol Formation and consists of thick beds of rhythmites and sandstones.

All strata are folded on a large scale along east-west trending axes. Minor folding is intense with widely varying orientations. Faulting is a minor structural feature in this area and is difficult to observe.

No lead-zinc mineralization was observed on the NIDD property but in the MacMillan Pass area, significant mineralization has been found in the black shale of the Canol Formation.

In the geochemical sampling program, approximately 2000 soil samples were collected on a 200 by 100 meter regional grid or a 100 by 50 meter detailed grid. The samples were analyzed for lead, zinc, silver and barium and the results were statistically analyzed. A number of anomalies in each element were located on the property.

INTRODUCTIONA. Property Description

As of September 1, 1977 the NIDD group consisted of 261 mineral claims, the particulars of which are as follows:

<u>CLAIM</u>	<u>CLAIM NO.</u>	<u>DATE RECORDED</u>
NIDD 1	YA 7241	October 20, 1976
NIDD 2	YA 7242	"
NIDD 3	YA 7243	"
NIDD 4	YA 7244	"
NIDD 5	YA 7245	"
NIDD 6	YA 7246	"
NIDD 7	YA 7247	"
NIDD 8	YA 7248	"
NIDD 9	YA 7249	"
NIDD 10	YA 7250	"
NIDD 11	YA 7251	"
NIDD 12	YA 7252	"
NIDD 13	YA 7253	"
NIDD 14	YA 7254	"
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NIDD 17	YA 7257	"
NIDD 18	YA 7258	"
NIDD 19	YA 7259	"
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NIDD 25	YA 7265	"
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NIDD 27	YA 7267	"
NIDD 28	YA 7268	"
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NIDD 37	YA 7277	"
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NIDD 39	YA 7279	"
NIDD 40	YA 7280	"
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NIDD 51	YA 7285	"
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NIDD 65	YA 7292	"
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NIDD 71	YA 7295	"
NIDD 72	YA 7296	"
NIDD 73	YA 7297	"
NIDD 76	YA 7298	"
NIDD 77	YA 7299	"
NIDD 78	YA 7300	"
NIDD 79	YA 7301	"

3./20 September 1977.

<u>CLAIM</u>	<u>CLAIM NO.</u>	<u>DATE RECORDED</u>
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NIDD 82	YA 7303	"
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NIDD 104	YA 7320	"
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NIDD 118	YA 7330	"
NIDD 119	YA 7331	"
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NIDD 153	YA 7354	"
NIDD 154	YA 7355	"
NIDD 155	YA 7356	"
NIDD 156	YA 7357	"
NIDD 157	YA 7358	"
NIDD 158	YA 7359	"
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NIDD 171	YA 7366	"
NIDD 173	YA 7367	"
NIDD 174	YA 7368	"
NIDD 175	YA 7369	"
NIDD 176	YA 7370	"
NIDD 177	YA 7371	"
NIDD 178	YA 7372	"

<u>CLAIM</u>	<u>CLAIM NO.</u>	<u>DATE RECORDED</u>
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NIDD 183	YA 7375	"
NIDD 184	YA 7376	"
NIDD 185	YA 7377	"
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NIDD 202	YA 7392	"
NIDD 203	YA 7393	"
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NIDD 211	YA 7401	"
NIDD 212	YA 7402	"
NIDD 213	YA 7403	"
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NIDD 215	YA 7405	"
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NIDD 248	YA 7436	"
NIDD 249	YA 7437	"
NIDD 250	YA 7438	"
NIDD 251	YA 7439	"
NIDD 252	YA 7440	"

5./20 September 1977.

<u>CLAIM</u>	<u>CLAIM NO.</u>	<u>DATE RECORDED</u>
NIDD 253	YA 7441	"
NIDD 254	YA 7442	"
NIDD 255	YA 7443	"
NIDD 256	YA 7444	"
NIDD 257	YA 7445	"
NIDD 258	YA 7446	"
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NIDD 343	YA 15454	"
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NIDD 345	YA 15456	"
NIDD 346	YA 15457	"

B. History

Interest in the MacMillan Pass area has been sporadic for the past 25 years since the discovery of the TOM orebody. In 1975, interest was again renewed in this area with the discovery of the Jason deposit approximately 4 miles west of the TOM deposit. In September 1976, Cominco staked 230 NIDD claims over the ground to the west of the Jason group. From June 3, 1977 to August 23, 1977 Cominco personnel carried out a geological mapping program on scale of 1:10,000 over the whole property. In addition detailed prospecting was done over all areas of exposed rock and soil sampling was carried out over covered areas on a grid system.

An additional 31 NIDD claims were added on to the original NIDD group on June 8, 1977 and recorded July 11, 1977. This brings the total number of NIDD claims to 261 as of September 1, 1977. It is these claims to which assessment work is applied.

C. Location and Access

Physiographically, the NIDD group lies within the Hess Mountains of the Yukon Territory, approximately 110 miles northeast of the town of Ross River. The property is roughly 14 miles long in an east-west direction and the eastern end is located approximately 1.5 miles west of the MacMillan Pass airstrip (see Plate 2). It lies in the Mayo Mining District with coordinates of 63°13' north and 130°15' west to 130°43' west. The property is on NTS sheets 105-0-1 and 105-0-2.

Topographically, the area is one of high relief. The higher peaks reach over 2100 meters (6500 feet) A.S.L. and the valley bottoms between 1000 and 1300 meters (3300 to 4200 feet) A.S.L. The NIDD group is located between 1000 and 2000 meters A.S.L.

Access to the NIDD group is by fixed wing aircraft or the North Canal Road to the MacMillan Pass airstrip and then by helicopter to the property.

GEOLOGY

- Regional

The MacMillan Pass area is underlain by a sequence of sediments from Upper Proterozoic-Cambrian to Mississippian with minor interbedded volcanic rocks of Ordovician age. These rocks are intruded by numerous small quartz monzonite and granodiorite stocks of Cretaceous age.

The Upper Proterozoic-Cambrian rocks are predominantly dark grey to brown and minor silty green slate with some areas of interbanded laminated slate and phyllite. This interbanded unit also contains minor bands of laminated siltstone and platy brown quartzitic sandstone. Locally a thick member of orange weathering dolomitic shale is present. This unit grades into quartzite to the east of MacMillan Pass.

The Cambrian and Lower Ordovician section is exposed to the northeast and east of MacMillan Pass as dolomite and limestone of the Sekwi Formation and overlying black calcareous shales and black silty limestone (unnamed).

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The Upper Ordovician and Silurian stratigraphy consists of platy silvery grey to tan weathering black graptolitic calcareous shale of the Road River Formation (or correlative Whittaker Fm.). Locally within the Road River Formation there are thin horizons containing dark green basic volcanic flows and associated greywackes.

Overlying the Road River Formation is a sequence of rhythmites, turbidites and deep marine clastic sediments belonging to the Canol Formation. The strata probably range in age from Upper Devonian to Mississippian.

Included in this sequence of rocks is a chert pebble and chert granule conglomerate, which is the main geological marker horizon used for mapping stratigraphy. Also a black carbonaceous and siliceous shale, which contains baritic and pyritic sections is found in this unit and is host for some of the basemetal deposits of the area.

These Paleozoic sediments are intruded by Cretaceous stocks of medium grained biotite-hornblende quartz monzonite and granodiorite.

- Local Geology

The NIDD claims cover a sequence of rocks which belong to the Road River Formation, Canol Formation and Imperial Formation sediments. The oldest rocks exposed on the property are black, siliceous and frequently calcareous shales. This unit is thin to medium bedded, the thickness increasing in proportion to the silica content. Axial plane cleavage and numerous jointing directions are well developed in this shale. Minor fossil remnants were located in some of the beds but the fossils, probably plant material, were not identified due to poor preservation.

The strata overlying the shale are a carbonaceous, bituminous, silty dark grey limestone approximately 40 meters thick. This unit is well bedded to massive and frequently, beds up to 20cm thick contain abundant Tentaculites and crinoid fragments.

The upper half of this limestone bed and, rarely, the lowermost few meters is intensely recrystallized to a medium crystalline sandy dolomite. The dolomite weathers bright orange as opposed to a dark grey to black for the limestone. The dolomitic portion which may also contain amounts of ankerite is well veined with secondary quartz.

Overlying the dolomite is a sequence of rhythmites, sandstones, chert pebble conglomerates and micaceous silty shales. This unit is considered to be the Canol Formation strata. Its thickness varies from 150 meters to over 500 meters. This sequence of sediments starts with a predominance of pyritic quartzose sandstone and micaceous shale. These are interbedded with frequent beds of quartzose argillaceous siltstone up to 3 meters thick. These siltstones are well crossbedded. Overlying the sandstone and siltstone is a sequence of rhythmites, grey to orange-brown in colour. These rhythmites show cyclical bedding of quartz siltstone and grey shale in .5 to 1cm beds. The rhythmites are interbedded on a large scale with a resistant weathering chert pebble and chert granule conglomerate. The conglomerate frequently forms lenses within the rhythmite section. Locally individual conglomerate beds may reach 120 meters in thickness. The uppermost part of the preceding sequence of sediments are rhythmites which again are variable in thickness from 5 meters to 200 meters.

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Overlying the rhythmite section are distinctive silver weathering siliceous, carbonaceous, silty black shales of the Upper Canol Formation. This unit is thin to medium bedded with bed thickness increasing in proportion to silica content. The shales are rarely pyritic and frequently show an increase in nodular barite content. Rarely light grey massive barite lenses are found interbedded with the baritic shale. This unit is highly variable in thickness even on a local scale. Thickness ranges from 50 meters to over 250 meters on the property.

The youngest strata exposed on the NIDD property belong to the Imperial Formation. The rocks are mainly quartzose pyritic sandstone and siltstone with minor sections of crossbedded rhythmites. These units weather grey-brown in colour and except for the rhythmites are thickly bedded.

- Structural Geology

The structural complexity of the strata in the area is extreme. On the large scale, there are a series of anticlines and synclines with sinuous but roughly east-west trending axial traces. These folds vary in shape along strike, changing from open to isoclinal and from upright to overturned.

Associated with the large scale folds is a system of folds on the scale of a few meters. These folds are ubiquitous on the property and some may be accessory or parasitic to the major folds. Other small folds show no relationship to the major folds and provide evidence for an extremely complex structural history.

No obvious evidence for thrust faulting was found on the property although it is a common occurrence throughout this region.

Evidence for normal faulting was also slight. Offsets of strata are very difficult to find and only rarely were slickensides observed. The faulting seemed to have a general north-south strike and dips were indeterminable.

MINERALIZATION

Bedded pyrite was observed rarely in the lower part of the Canol Formation. Discrete euhedral cubes occur within the lower Canol Formation and lower Imperial Formation siltstones. Baritic sections of the Canol Formation rarely show positive reactions to tests for secondary zinc but no visible lead or zinc sulphides were observed. These baritic horizons and the underlying black shale are host rocks for the large lead-zinc-silver deposits in the MacMillan Pass area.

GEOCHEMISTRY

A soil geochemical survey was done over most of the overburden covered parts of the NIDD property. A baseline 21km long was cut on a bearing of 096° (west half) and 122° (east half). Eight cut crosslines were turned off at right angles at various distances along the baseline and all other crosslines were flagged and paced at 90° to the baseline. There were two grid spacings used on the property. The regional scale grid consists of crosslines every 200 meters with samples taken at 100 meter intervals on the cross lines. The detailed

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scale grid consists of cross lines every 100 meters and samples taken at 50 meter intervals on the cross lines. Approximately 2000 soil samples were collected on the geochemical grid. All samples were analyzed for lead, zinc, silver and most of the samples were analyzed for barium.

Lead

The background values for lead are calculated to be those values less than 65 ppm. Anomalous values are those values between 65 ppm and 125 ppm and very anomalous values are calculated to be greater than 125 ppm. Three anomalous areas were clearly outlined. In these three areas there are many small scattered zones of anomalous and very anomalous results. The highest value within the anomalous areas was 250 ppm lead.

Zinc

The background values for zinc are calculated to be those values less than 550 ppm. Anomalous values are those values between 550 ppm and 3500 ppm and very anomalous values are calculated to be greater than 3500. The largest zinc anomaly on the property is coincident with lead and silver anomalies.

Silver

The background values for silver are calculated to be those values less than 2.0 ppm. Anomalous values are those values 2.0 and 3.0 ppm, and very anomalous values are calculated to be greater than 3.0 ppm. The areas of anomalous silver values are generally coincident with anomalous lead values.

Barium

The background values for barium were calculated to be those values less than .80%. Anomalous values are those values between .80% and 1.0% and very anomalous values are calculated to be greater than 1.0%. There were 2 major anomalous barite areas outlined on the property.

CONCLUSIONS & RECOMMENDATIONS

The geological mapping indicates that stratigraphy which hosts lead-zinc-silver mineralization in the MacMillan Pass area is present on the NIDD property. No economically interesting mineralization was found on the property.

Some geochemical anomalies were located in overburden covered areas of the property.

It is recommended that more detailed geochemical work be done on the property.

Report by: M.S. Travis
M.S. Travis
Geologist

Endorsed by: D.W. Heddle
D.W. Heddle, P.Eng.
Assistant Manager
Western District

Approved for Release by: G. Harden
G. Harden
Manager Exploration
Western District

STATEMENT OF QUALIFICATIONS

I, Steven Travis with business address at 200 Granville Square, Vancouver 2, British Columbia, do hereby certify that I have supervised the field work and have assessed and interpreted the data resulting from this geological and geochemical survey on the NIDD mineral claims.

I also certify that:

1. I am a graduate of the University of British Columbia, B. Sc. Majors Geology,
2. I have been engaged in mineral exploration since graduation.

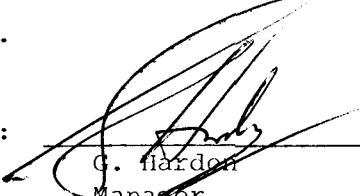
Respectfully submitted:

M.S. Travis
M. Steven Travis

Vancouver, B.C.

Steve Travis was responsible for supervising the geological and geochemical survey described herein. Mr. Travis received his B. Sc. degree in Majors Geology from the University of British Columbia in 1974. He has worked for Cominco Ltd. since graduation. I consider him a competent geologist.

Signed by:


G. Harden

Manager
Western District Exploration

EXHIBIT "A"

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

NIDD GROUP OF MINERAL CLAIMS

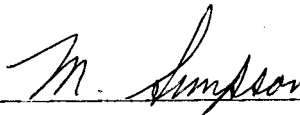
Situated at

63°13' North Latitude
130°15' West Longitude

N.T.S. 105 0-1,2

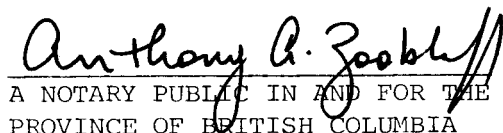
Salaries:	M.S. Travis	(128 days @ \$85.00)	\$10,880.00
	W. Sikombe	(80 Days @ \$58.00)	4,640.00
	M. Simpson	(95 days @ \$72.00)	6,840.00
	J. Ralph	(28 days @ \$58.00)	1,624.00
	T. Vader	(79 days @ \$42.00)	3,318.00
	W. Lefebvre	(79 days @ \$42.00)	3,318.00
	M. Kulich	(95 days @ \$40.00)	3,800.00
Transportation:	Helicopter		18,422.24
	Fixed Wing		3,010.47
Camp Costs:			13,933.83
Communications:			545.61
Line Cutting:			4,652.00
Analysis:			5,909.40
	TOTAL:		\$80,893.55

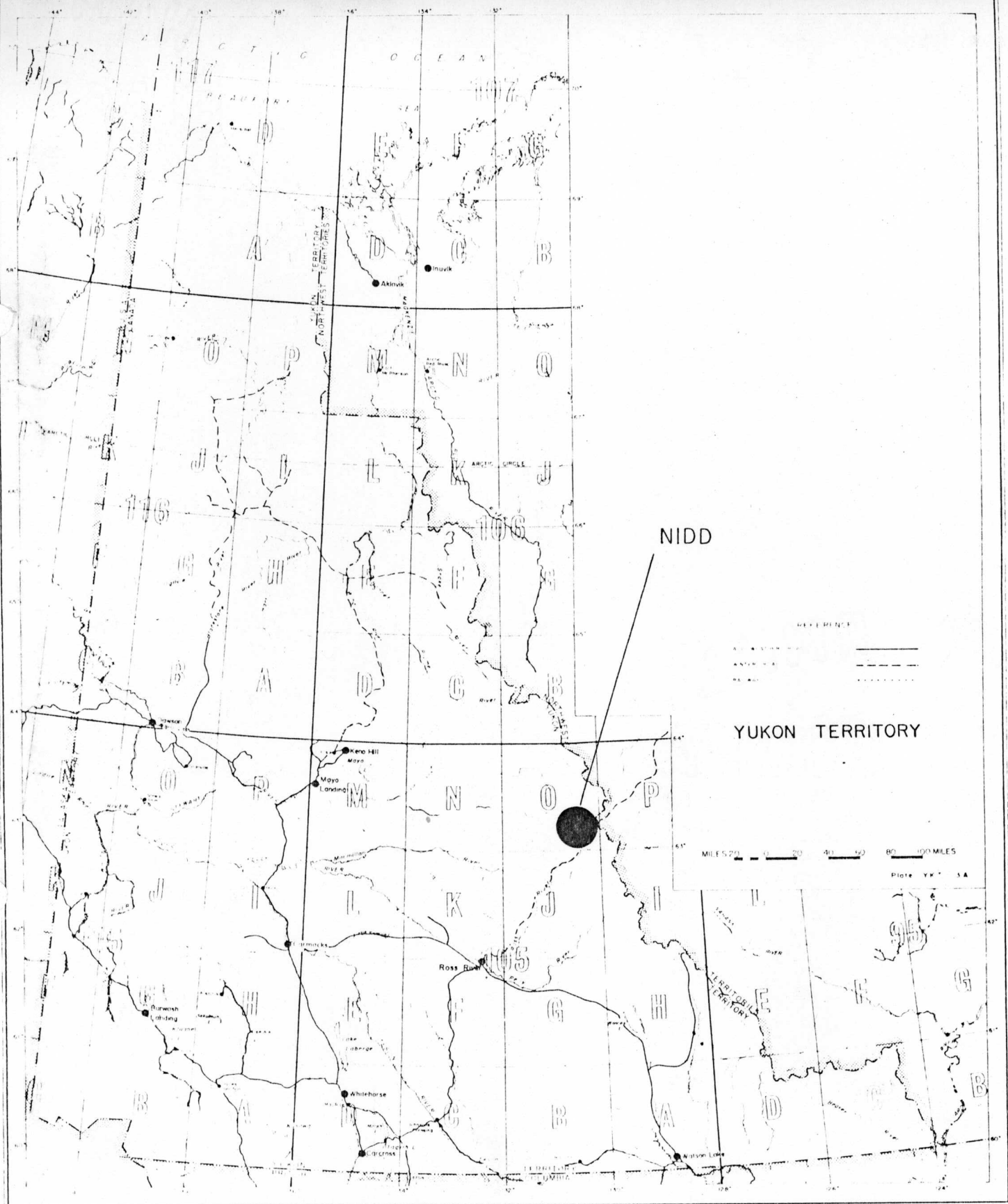
Signed:



Michael Simpson

THIS IS EXHIBIT "A" TO THE ~~STATUTORY DECLARATION~~ ^{✓ AFFIDAVIT} OF EXPENDITURES
RELATING TO THE GEOLOGICAL AND GEOCHEMICAL SURVEY DECLARED BEFORE
ME ON THE 24th DAY OF October, 1977, A.D.


A NOTARY PUBLIC IN AND FOR THE
PROVINCE OF BRITISH COLUMBIA



NIDD

YUKON TERRITORY

MILES 20 40 60 80 100

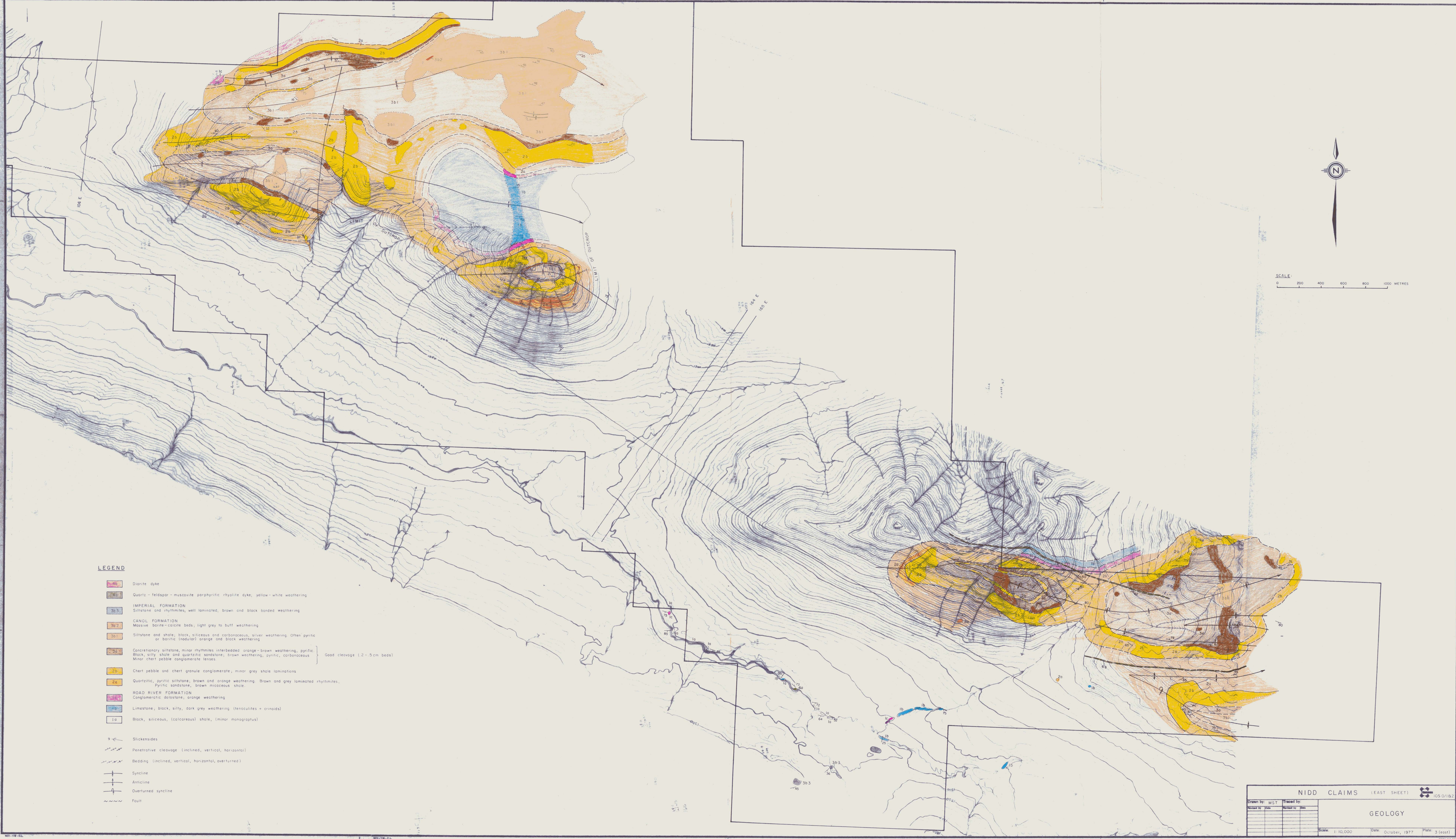
Plate YKT 5A

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

LOCATION MAP-NIDD GROUP

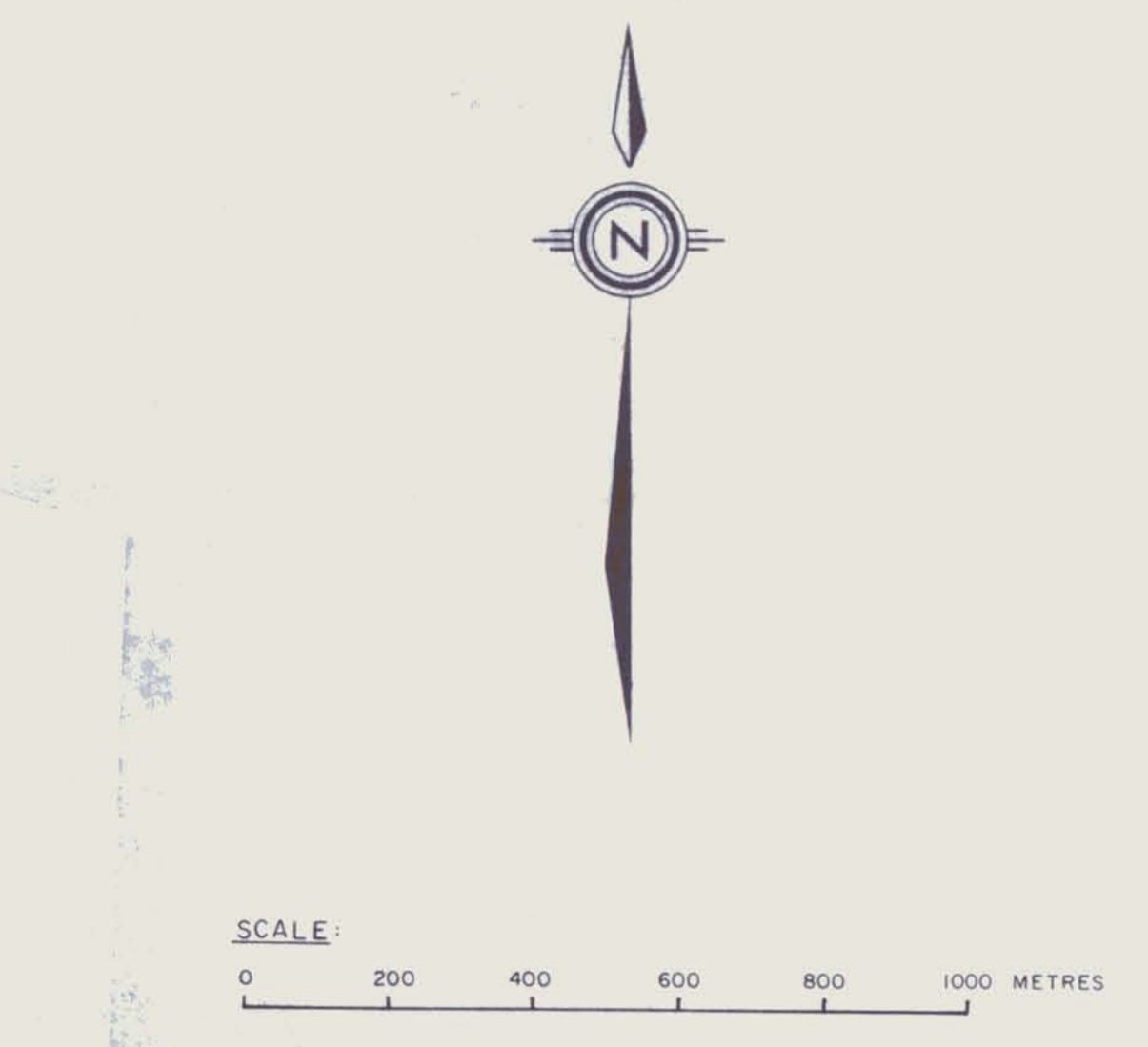
Scale: 1" = 80 miles Date: OCT. 1977 Plate: 1





LEGEND

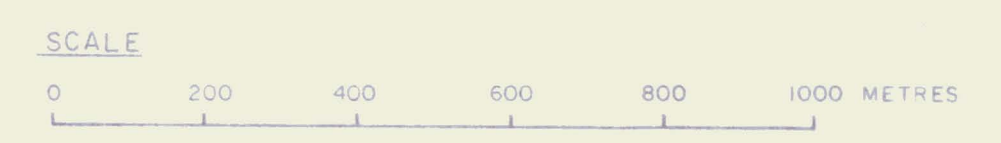
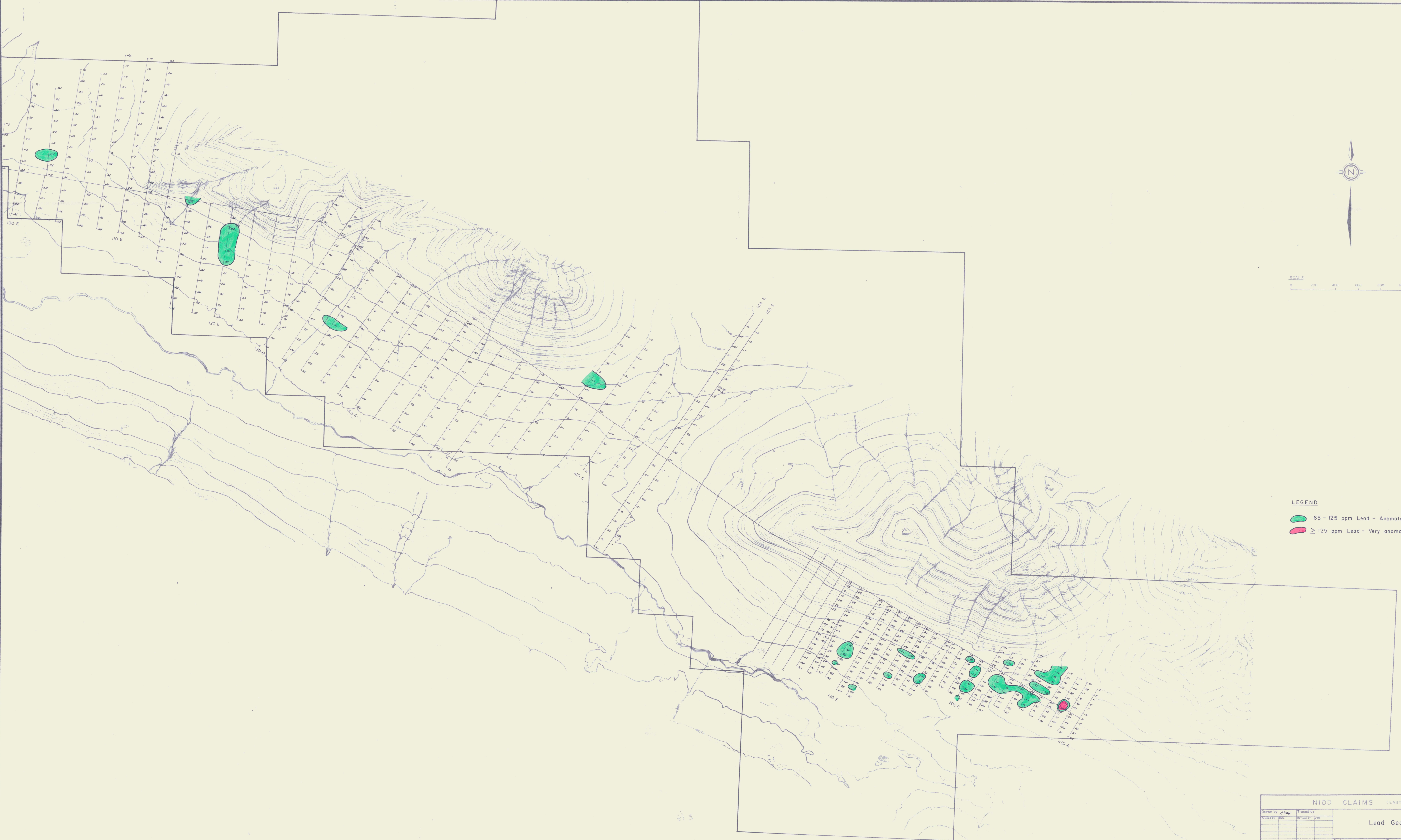
- Diorite dyke
- Quartz - feldspar - muscovite porphyritic rhyolite dyke; yellow-white weathering
- IMPERIAL FORMATION**
- Siltstone and rhythmites, well laminated, brown and black banded weathering
- CANOL FORMATION**
- Massive barite-calcite beds; light grey to buff weathering
- Siltstone and shale; black, siliceous and carbonaceous, silver weathering. Often pyritic or baritic (nodular) orange and black weathering
- Concretionary siltstone, minor rhythmites interbedded orange-brown weathering, pyritic. Black, silty shale and quartzitic sandstone; brown weathering, pyritic, carbonaceous. Minor chert pebble conglomerate lenses. Good cleavage (2-5cm beds)
- Chert pebble and chert granule conglomerate, minor grey shale laminations
- Quartzitic, pyritic siltstone; brown and orange weathering. Brown and grey laminated rhythmites. Pyritic sandstone, brown micaceous shale.
- ROAD RIVER FORMATION**
- Conglomeratic dolostone, orange weathering
- Limestone, black, silty, dark grey weathering (tenaculites + crinoids)
- Black, siliceous, (calcareous) shale, (minor monograptus)
- 1a
- Slickensides
- Penetrative cleavage (inclined, vertical, horizontal)
- Bedding (inclined, vertical, horizontal, overturned)
- Syncline
- Anticline
- Overturned syncline
- Fault



NIDD CLAIMS (EAST SHEET) 105.0/1b2

GEOLOGY

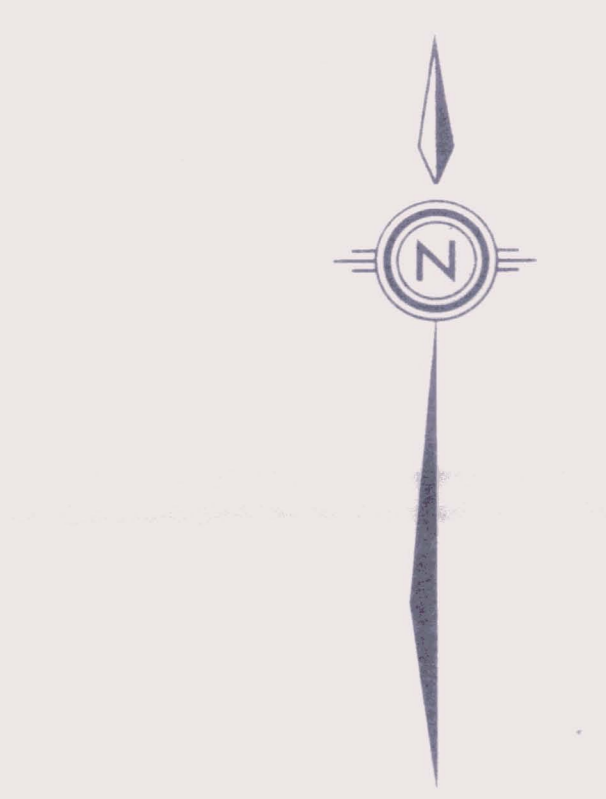
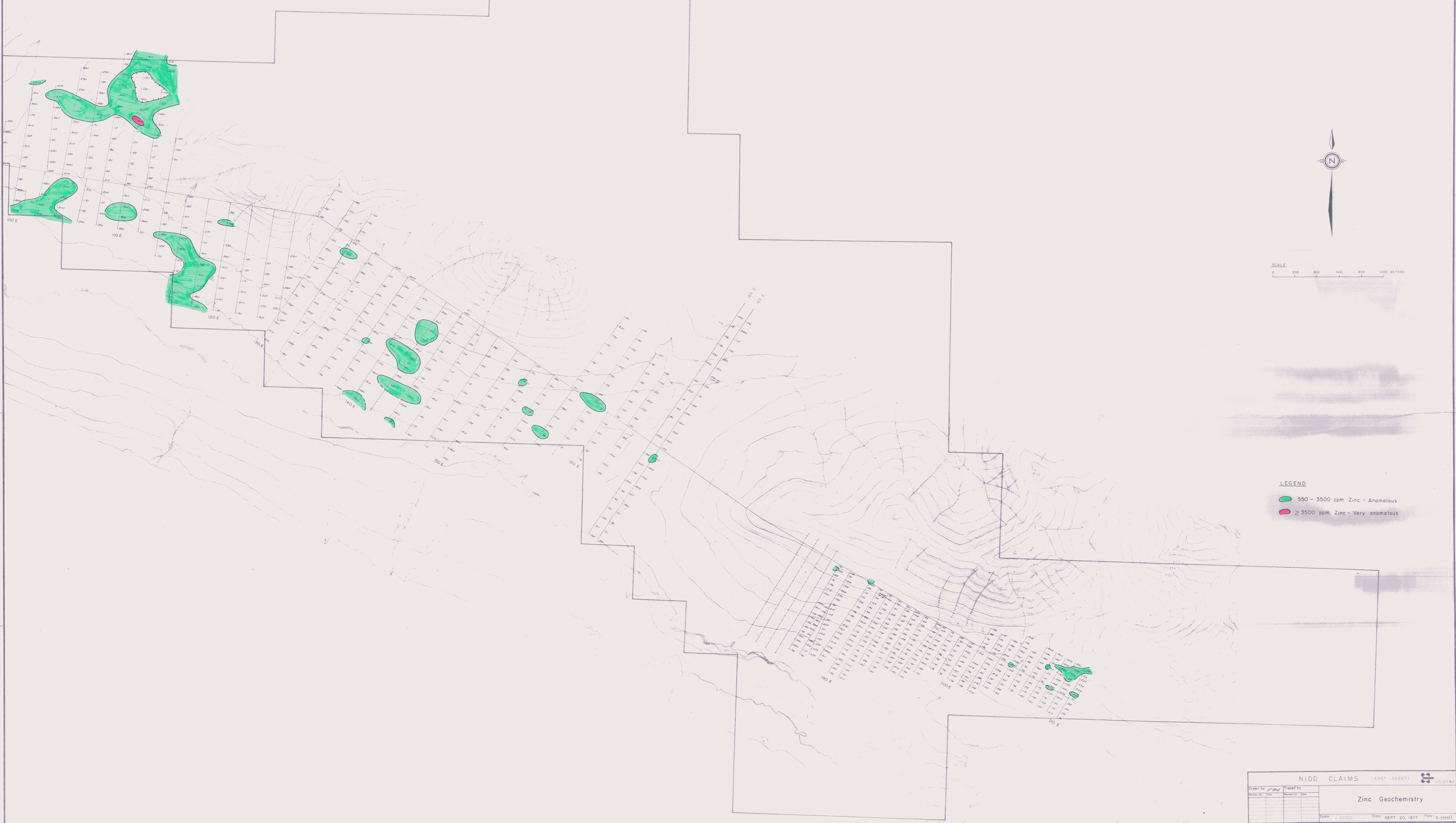
Scale: 1:10,000 Date: October, 1977 Plate: 3 (east)



LEGEND

- █ 65 - 125 ppm Lead - Anomalous
- █ ≥ 125 ppm Lead - Very anomalous

NIDD CLAIMS (EAST SHEET)		105 O/182
Drawn by: <i>[Signature]</i>	Traced by:	
Revised by: []	Revised by: []	
Lead Geochemistry		
Scale: 1:10,000	Date: SEPT 20, 1977	Plate: 4 (east)

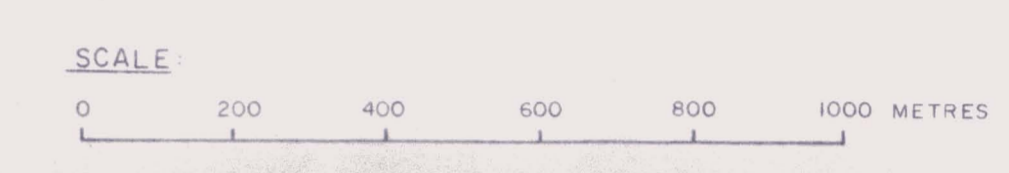
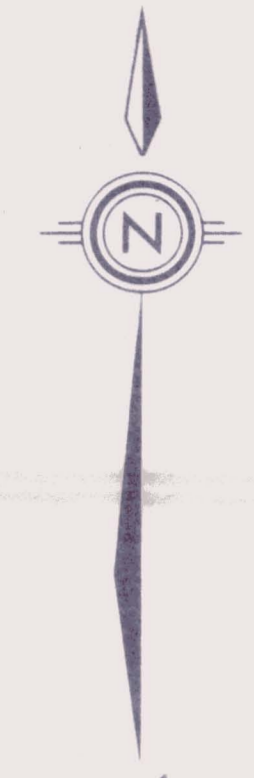
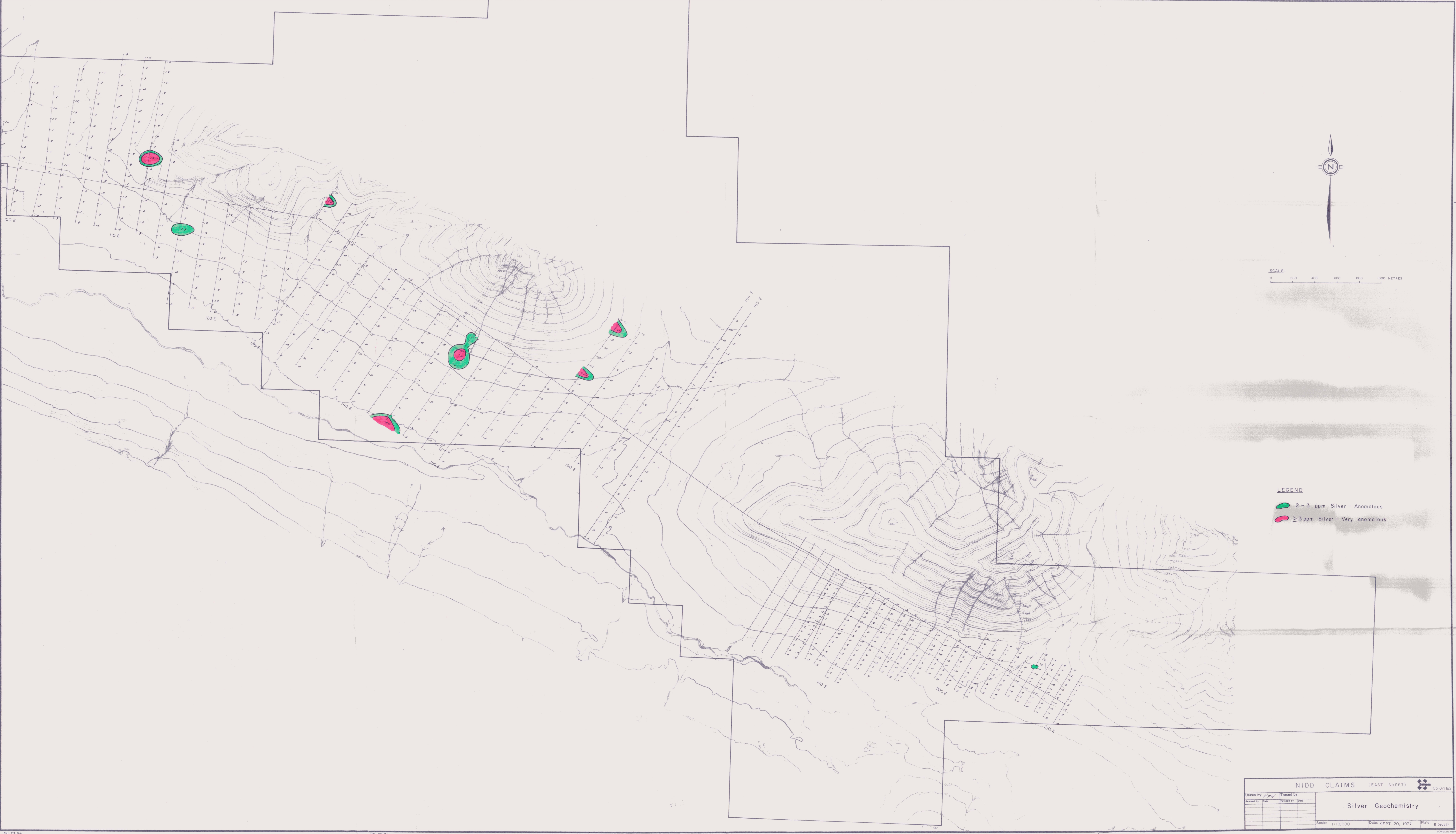


LEGEND

- 550 - 3500 ppm Zinc - Anomalous
- ≥ 3500 ppm Zinc - Very anomalous

Drawn by	Traced by
Checked by	Reviewed by

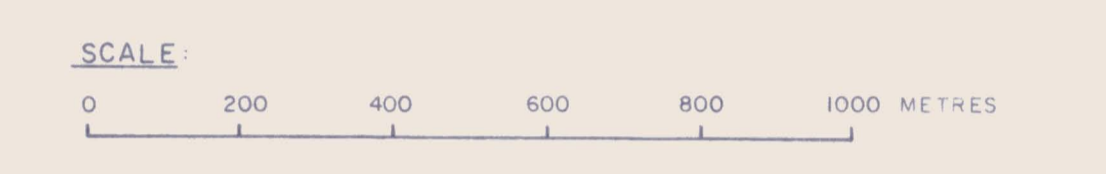
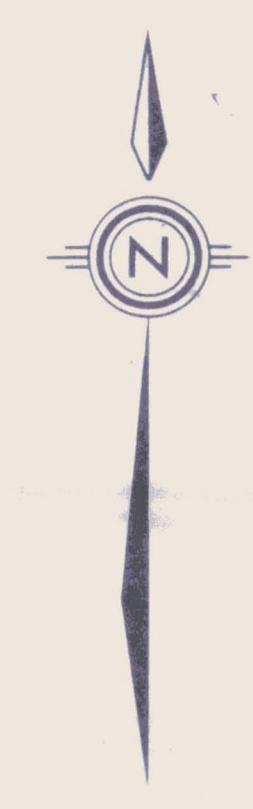
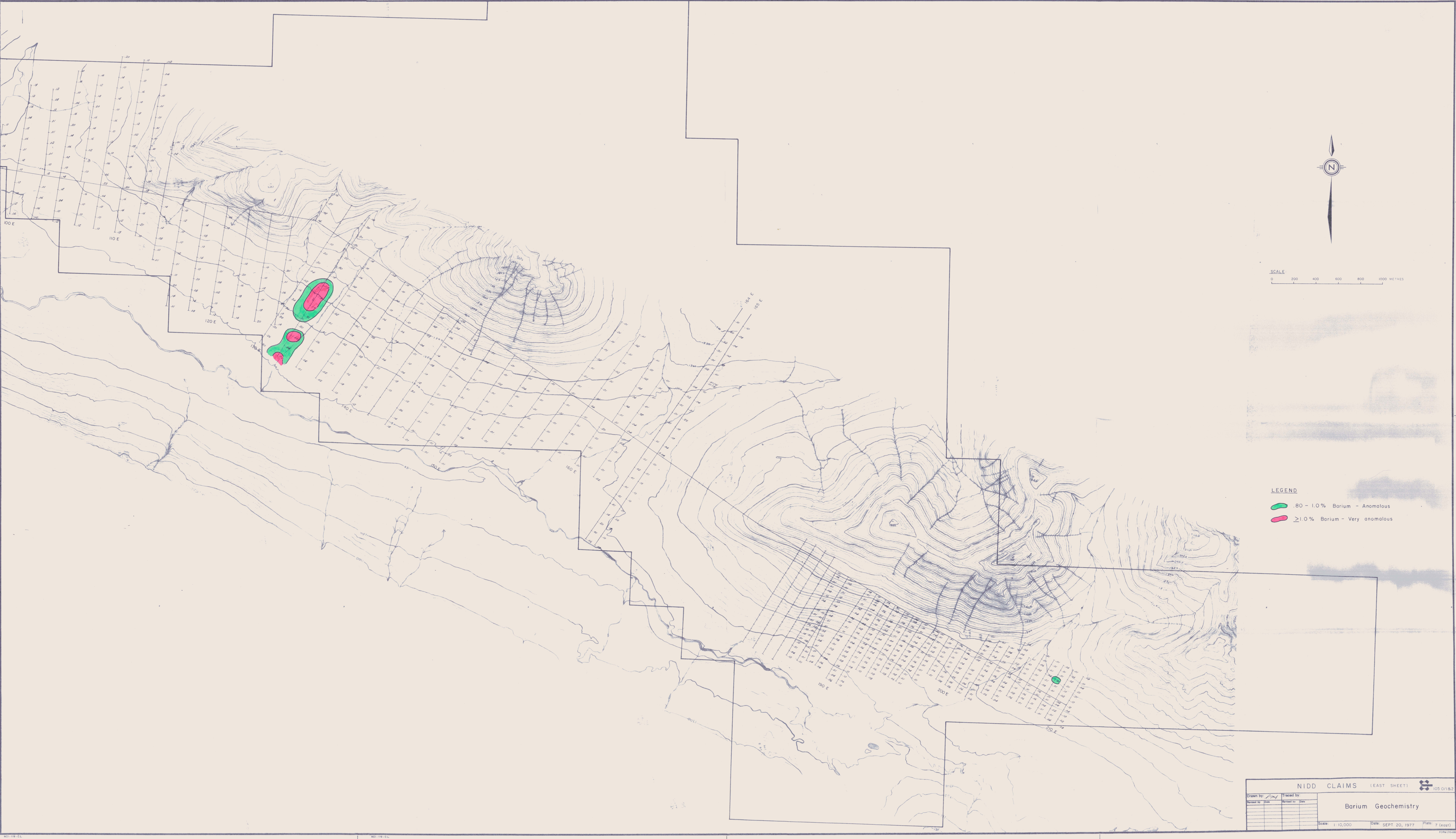
Zinc Geochemistry



LEGEND

- 2 - 3 ppm Silver - Anomalous
- ≥ 3 ppm Silver - Very anomalous

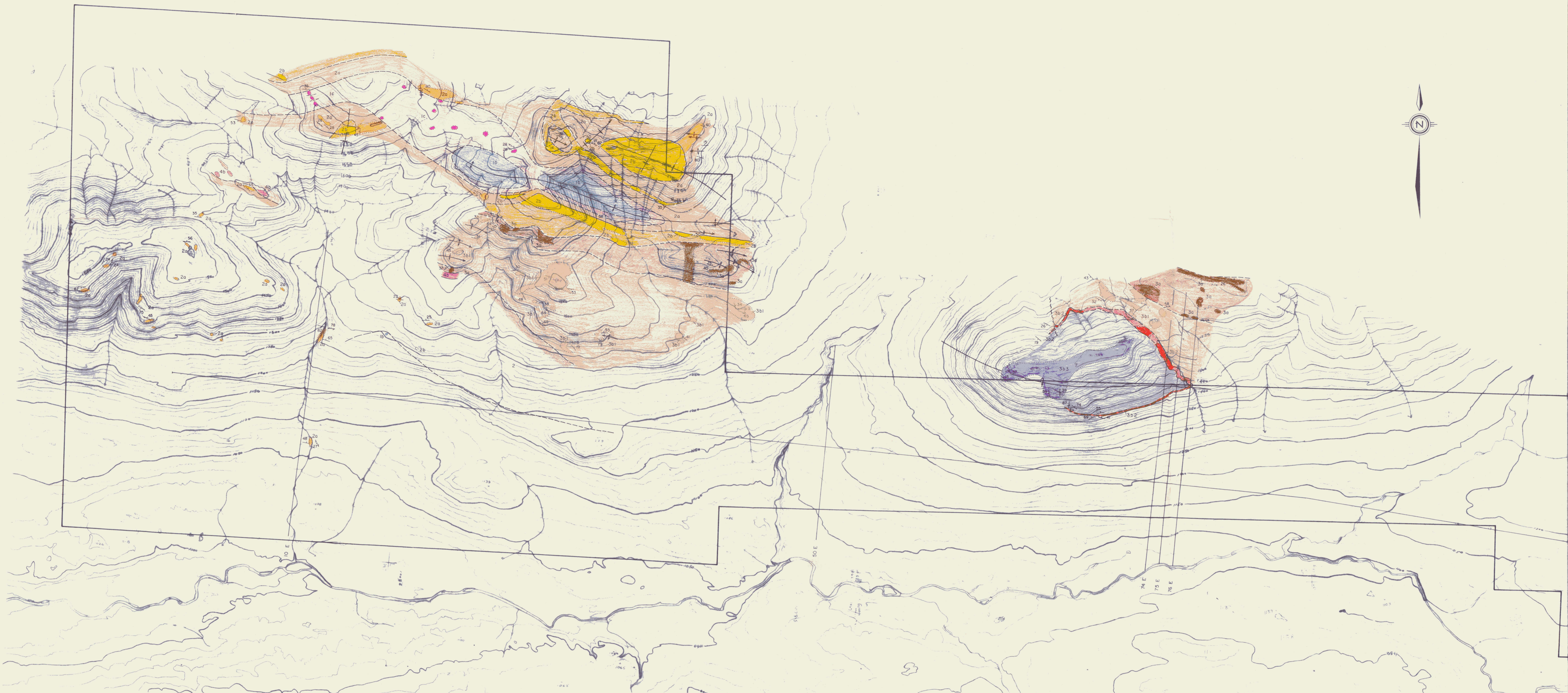
NIDD CLAIMS (EAST SHEET)		105 O/182
Drawn by: <i>[Signature]</i>	Traced by:	
Checked by: <i>[Signature]</i>	Checked by: <i>[Signature]</i>	
Silver Geochemistry		
Scale: 1:10,000	Date: SEPT 20, 1977	Plate: 6 (east)



- LEGEND
- █ 0.80 - 1.0% Barium - Anomalous
 - █ ≥ 1.0% Barium - Very anomalous

NIDD CLAIMS (EAST SHEET) 105 0/182

Drawn by: <i>[Signature]</i>	Traced by:
Checked by: <i>[Signature]</i>	Checked by: <i>[Signature]</i>
Barium Geochemistry	
Scale: 1:10,000	Date: SEPT 20, 1977
Plate: 7 (east)	

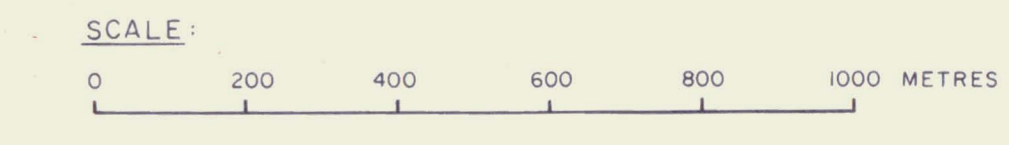
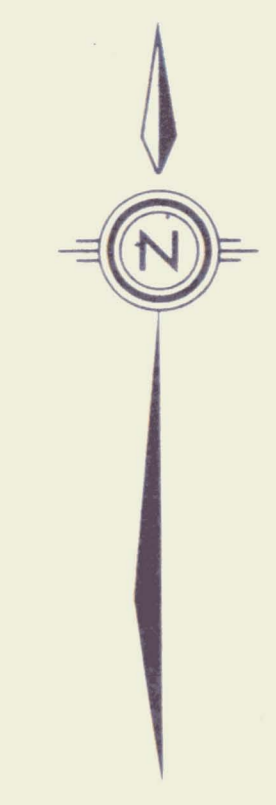


LEGEND

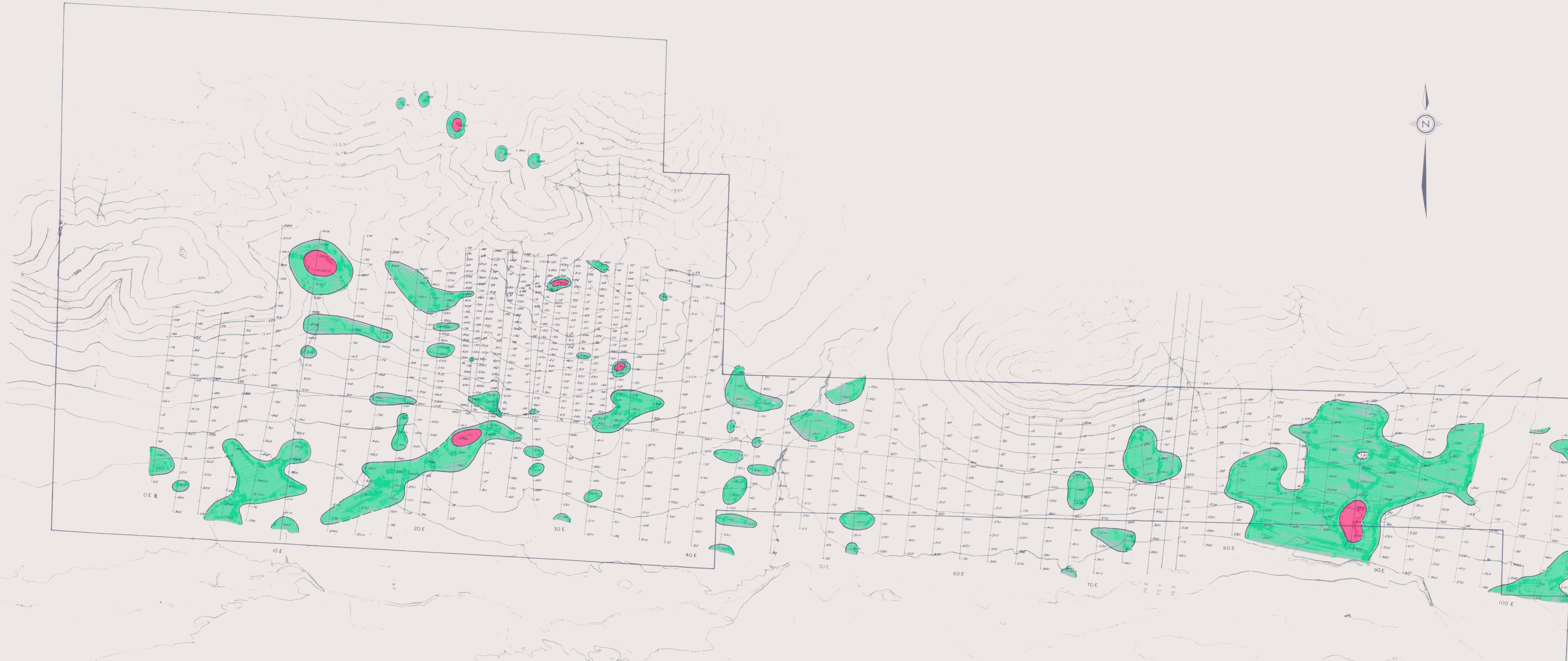
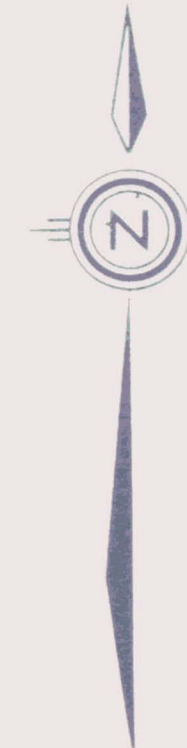
- 4b Diorite dyke
- 4a Quartz - feldspar - muscovite porphyritic rhyolite dyke; yellow - white weathering
- IMPERIAL FORMATION**
- 3b.3 Siltstone and rhythmites; well laminated, brown and black banded weathering
- CANOL FORMATION**
- 3b.2 Massive barite-calcite beds; light grey to buff weathering
- 3b.1 Siltstone and shale; black, siliceous and carbonaceous, silver weathering. Often pyritic or baritic (nodular) orange and black weathering
- 3b Concretionary siltstone, minor rhythmites interbedded orange - brown weathering, pyritic Black, silty shale and quartzitic sandstone; brown weathering, pyritic, carbonaceous Minor chert pebble conglomerate lenses
- 2b Chert pebble and chert granule conglomerate, minor grey shale laminations
- 2a Quartzitic, pyritic siltstone; brown and orange weathering. Brown and grey laminated rhythmites, Pyritic sandstone, brown micaceous shale
- ROAD RIVER FORMATION**
- 1c Conglomeratic dolostone, orange weathering
- 1b Limestone, black, silty, dark grey weathering (fenaculites + crinoids)
- 1a Black, siliceous, (calcareous) shale, (minor monograptus)

- Slickensides
- Penetrative cleavage (inclined, vertical, horizontal)
- Bedding (inclined, vertical, horizontal, overturned)
- Syncline
- Anticline
- Overturned syncline
- Fault



Good cleavage (1.2 - 5cm beds)




NIDD CLAIMS (WEST SHEET)		105 071 & 2
<small>Drawn by: MST</small>	<small>Traced by:</small>	
<small>Revised by: Date</small>	<small>Revised by: Date</small>	
<small> </small>	<small> </small>	
GEOLOGY		
<small>Scale: 1:10,000</small>	<small>Date: October, 1977</small>	<small>Plate: 3 (west)</small>

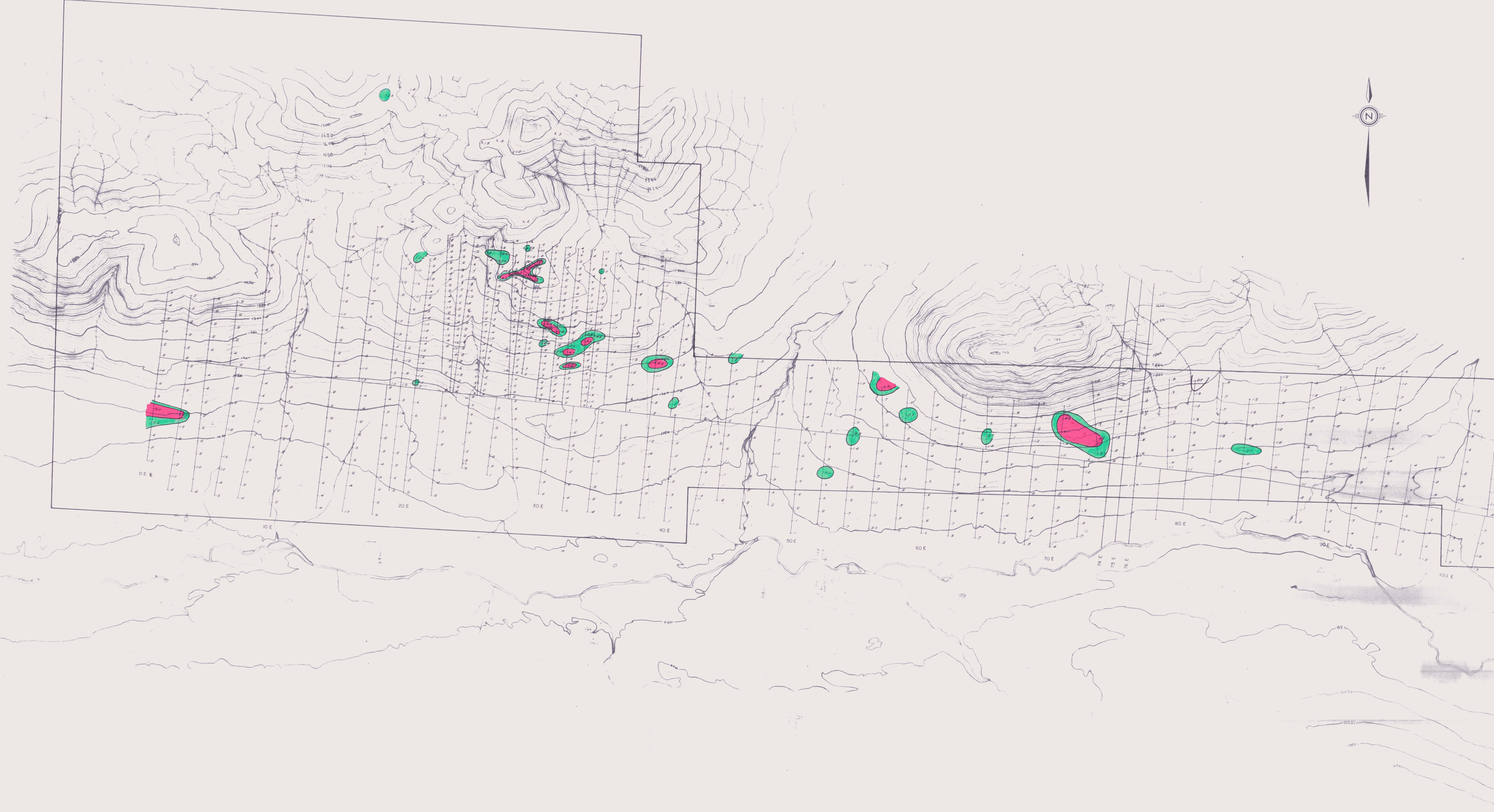


LEGEND

-  550 - 3500 ppm Zinc - Anomalous
-  ≥ 3500 ppm Zinc - Very anomalous

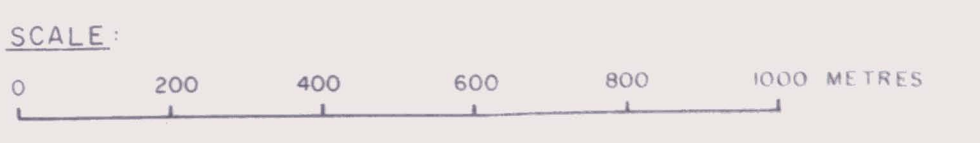


NIDD CLAIMS (WEST SHEET)		
Drawn by: <i>EM</i>	Traced by:	
Revised by:	Revised to:	
Zinc Geochemistry		
Scale: 1:10,000	Date: SEPT. 20, 1977	Page: 5 (west)

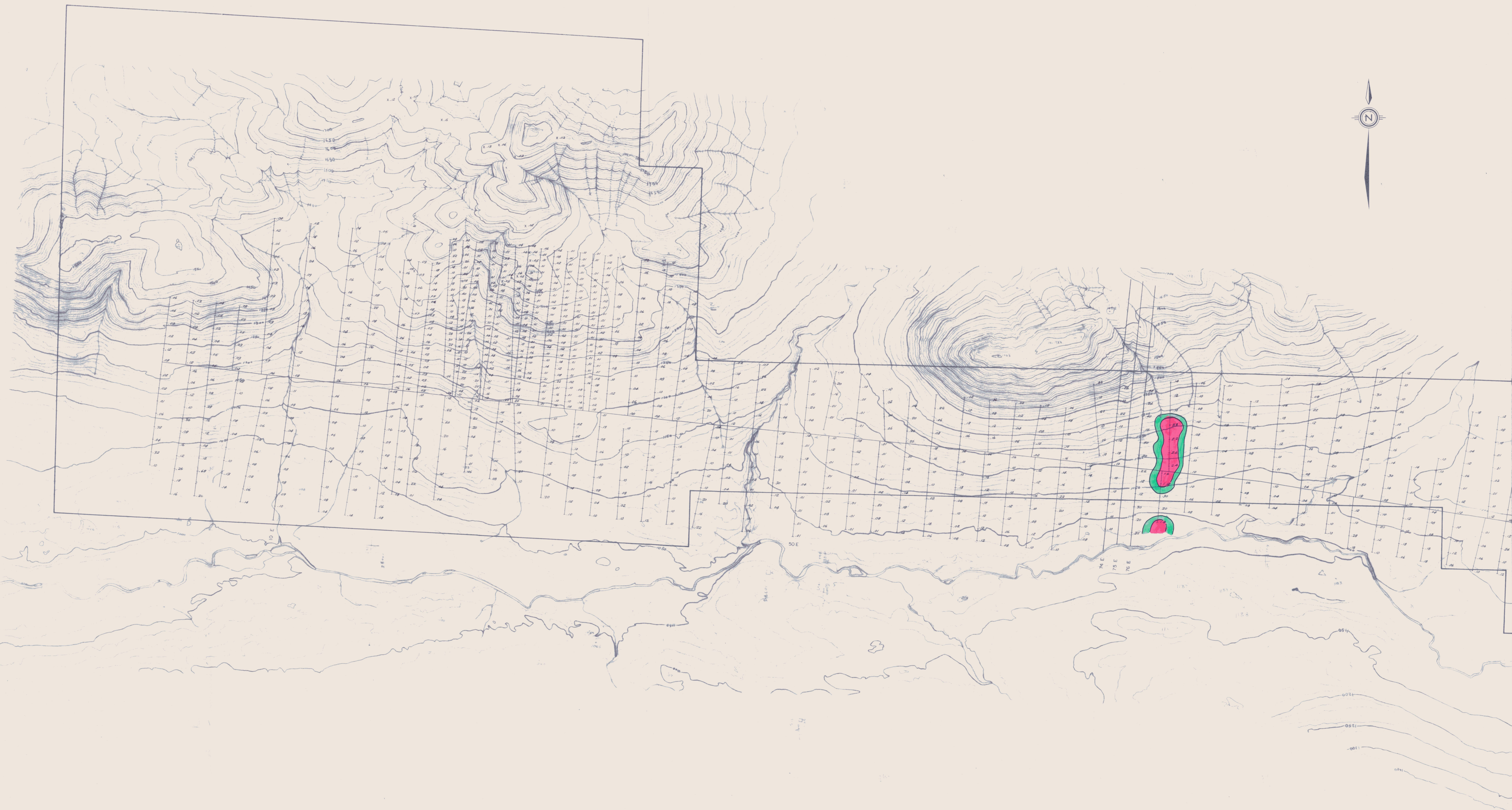


LEGEND



- 2 - 3 ppm Silver - Anomalous
- \geq 3 ppm Silver - Very anomalous

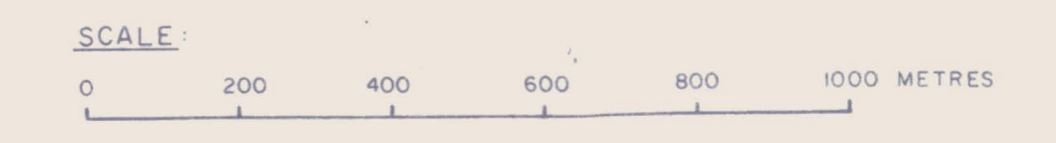


NIDD CLAIMS (WEST SHEET)				105 0/1R2
Drawn by: <i>P. Smith</i>	Traced by:			
Revised by:	Date:	Revised by:	Date:	
Silver Geochemistry				
Scale: 1:10,000		Date: SEPT. 20, 1977	Plate: 6 (west)	



LEGEND

-  80-1.0% Barium - Anomalous
-  ≥1.0% Barium - Very anomalous



NIDD CLAIMS (WEST SHEET) 105 02/182

Drawn by: <i>[Signature]</i>		Traced by:	
Checked by	Date	Checked by	Date

Barium Geochemistry

Scale: 1:10,000 Date: SEPT. 20, 1977 Plate: 7 (west)