GEOLOGY AND GEOCHEMISTRY ASSESSMENT REPORT, 1985

on the

MAT 1-9 CLAIMS

091811

Whitehorse Mining District

N.T.S. 105 D/3

Latitude 60°12'

Longitude 135°11'

091811

Author: M.P. Webster

Date: April, 1986

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ -900- .

Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER ONE: INTRODUCTION

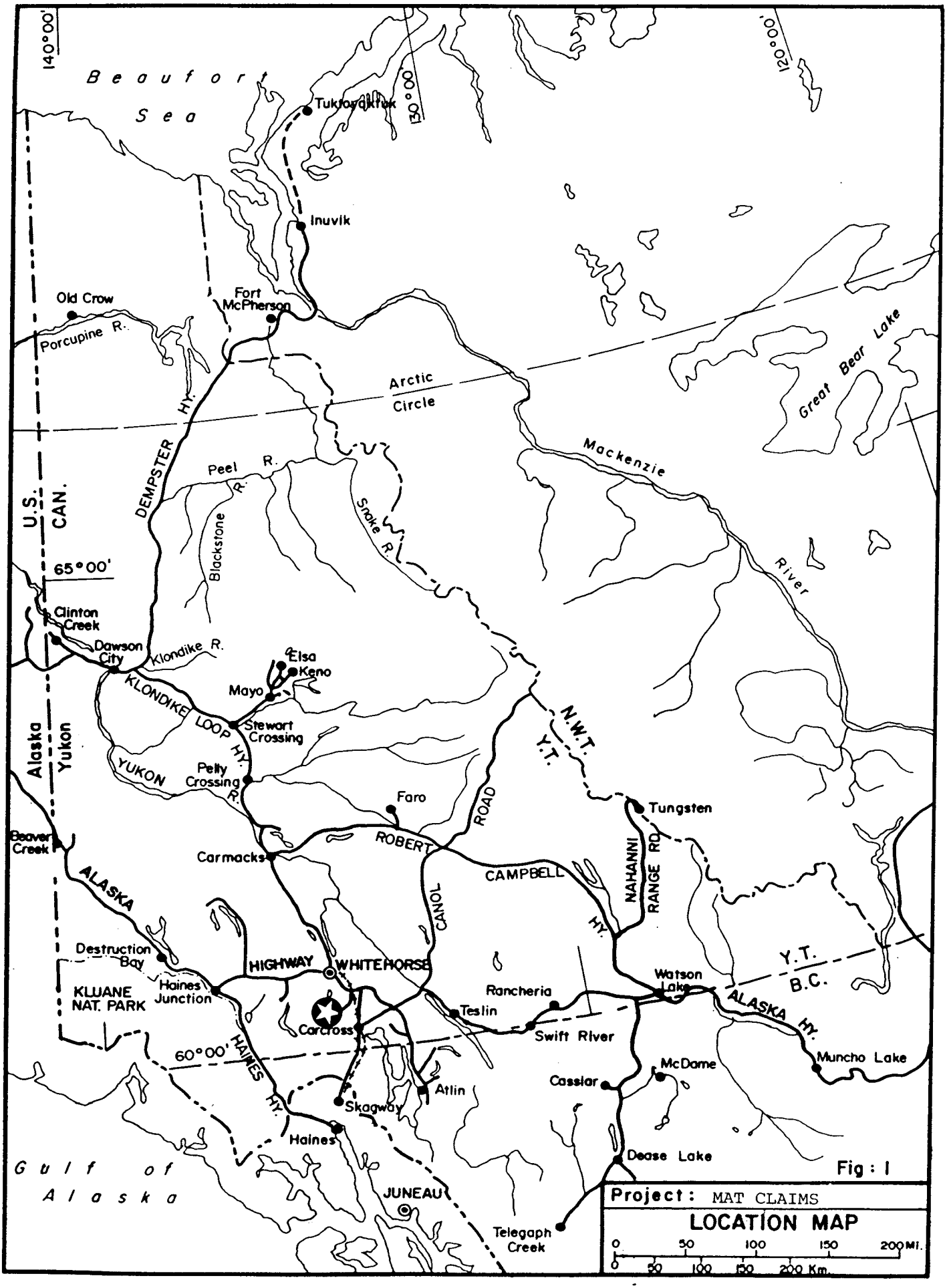
1-1: INTRODUCTORY STATEMENT

The MAT 1, MAT 2, MAT 3 fr., MAT 4 fr., MAT 5 fr., and MAT 6-9 claims are located on Becker Creek on N.T.S. 105 D/3 approximately 60 kilometres south of Whitehorse, Yukon (Figure 1). The claims cover geology favourable for precious metal vein deposits in the Wheaton River and were recorded in Whitehorse June 14, 1984.

Preliminary soil and silt sampling, geological mapping and prospecting was done June 6, 1985. Soil samples taken west of Becker Creek proved to be slightly anomalous in Ag-As-Mo. Silt samples taken east of Becker Creek (on the west side of Mt. Anderson) proved to be highly anomalous in base and precious metals. Geochemical values ranged from 190 to 240 ppm Zn, 260 to 490 ppm Pb, 1.0 to 3.0 ppm Ag and 10 to 1200 ppb Au in silt samples taken from this creek. Follow-up geological mapping, sampling and prospecting is recommended in both areas with priority give to the stream draining west from Mt. Anderson.

1-2: LOCATION AND ACCESS

The MAT 1, 2, 3 fr., 4 fr., 5 fr., 6-9 claims are located approximately 60 kilometres south of Whitehorse along Becker Creek in the



VANCAL 11928

Wheaton River area. The claims are within the Whitehorse Mining Division at latitude 60°12′ and longitude 135°11′ on N.T.S. 105 D/3 (Figure 1).

Access to the property is available by paved road along the Alaska Highway and Carcross Road to the Annie Lake Road turnoff approximately 45 kilometres south of Whitehorse. The Annie Lake Road provides year round access to the Mt. Skukum Mine and meets with the Becker Creek trail approximately 45 kilometres southwest from the highway exit. The Becker Creek trail will accommodate 4x4 vehicles directly to the claims and originally provided access to the Becker-Cochrane antimony deposit on Carbon Hill approximately 2 kilometres west of the property.

1-3: PHYSIOGRAPHY AND VEGETATION

The Wheaton River area lies along the western flank of the Yukon Plateau and east of the Coast Ranges. The terrain varies from rolling hills to elevated plains incised by wide, deep v-shaped valleys with hanging valleys remaining from the Pleistocene glaciation.

The MAT 1-9 claims are characteristic of the region in that the Becker Creek valley is bounded by steep, rugged slopes up to 590 metres (2,000′) high. Vegetation on the property is typical of the regional pattern in that the Becker Creek valley is densely wooded with conifer, birch and willow. The treeline is found at approximately 1,370 metres (4,500′) elevation and an alpine-type vegetation cover consisting of lichen, moss and grasses is found above this point.

1-4: HISTORY OF THE PROPERTY

The MAT 1, 2, 3 fr., 4 fr., 5 fr., 6-9 claims (Figure 2) were staked June 10, 1984 and recorded in Whitehorse June 14, 1984. No previous work has been done by Noranda Exploration Company, Ltd. in the area covered by the claims.

The claims were staked to cover geology favourable for precious metal vein deposits in the Wheaton camp, possible projected extensions of known vein deposits on both Carbon Hill and Mt. Anderson, and to secure ground immediately adjacent to the TAM group which was optioned by Sanfred Resources Ltd. to Noranda Exploration Co. Ltd. on September 1, 1984.

Upon acceptance of this report the claims will be in good standing until June 14, 1986.

1-5: WORK PROGRAM

A preliminary field program consisting of geological mapping, prospecting and sampling was undertaken June 6, 1985 on the MAT 1-9 claims. A total of 49 soil and 12 silt samples were taken.

The personnel involved in the program are listed below:

Mary Webster	Party Chief
Shirley Abercrombie	Senior Assistant
Hugh Copland	Senior Assistant
Dennis Bull	Junior Assistant
Mary Cross	Junior Assistant

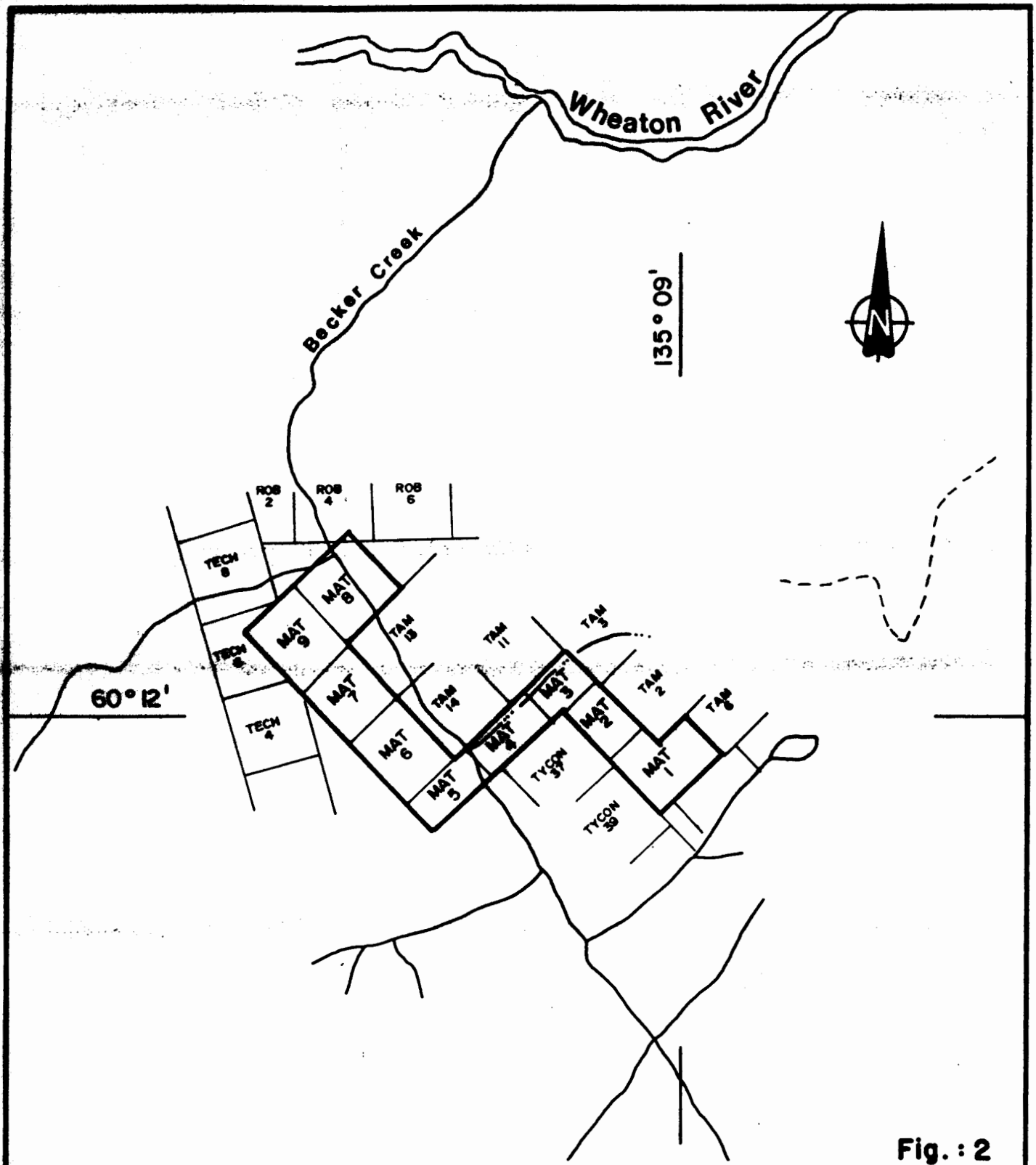


Fig. : 2

REVISED	Mt. Anderson
	MAT 1-9 Claims
	Claim Location Map
PROJ. No.	SURVEY BY: DATE:
N.T.S. 105D3	DRAWN BY: SCALE: 1 : 31 680
DWG. No.	NORANDA EXPLORATION
	OFFICE: Whitehorse

0 500 1000 2000 meters

Scale 1:31,680 (1" = 1/2 mile)

VANCAL 11927

CHAPTER TWO: GEOLOGY

2-1: REGIONAL GEOLOGY

The geology and mineral potential of the area has been documented by D.D. Cairnes (1912, 1916), J.O. Wheeler (1961), and more recently by M.J. Smith (1979), M.B. Lambert (1974) and the Northern Cordillera Mineral Inventory (Archer, Cathro & Associates Ltd., 1981).

The oldest rocks in the region are the Precambrian metasediments of the Yukon Group (Table 1). The Yukon Group quartz-mica schists, feldspathic gneisses and crystalline limestone occur as a northwest trending belt intruded by granitic rocks of the Cretaceous Coast Intrusions. The Triassic Lewes River Group metavolcanic rocks and Jurassic Laberge Group metasediments unconformably overlie the Yukon Group and occupy the northeastern part of the Wheaton River area. The Lower Tertiary Skukum Group[1] is comprised of intermediate to felsic volcanic rocks which occur in the centre of the Wheaton River area and as part of the Bennett Lake complex 20 km to the south at the Yukon-B.C. border.

---

1. The Skukum Group volcanics have been described as the "Carmacks basalts" and "Wheaton River Volcanics" (Cairnes, 1912, p. 64 and 68), the "New Volcanics" and "Acid Volcanics" (Cockfield and Bell, 1926, p. 34), and recently as two groups subdivided into seven members of defined composition and texture (Pride, 1983, p. 94-104).

TABLE 1: TABLE OF FORMATIONS

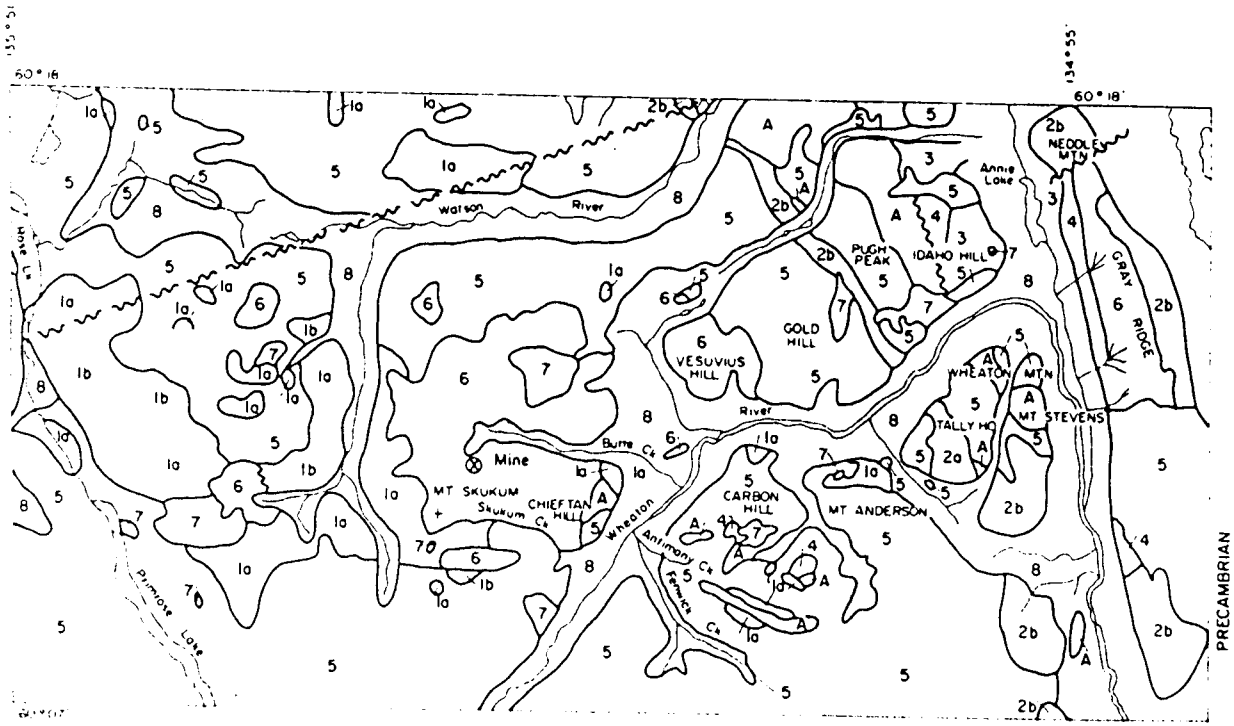
ERA	PERIOD or EPOCH	FORMATION	LITHOLOGY
Cenozoic	Recent and Pleistoce		Glacial debris, loess, volcanic ash Basalt; minor pyroclastic rocks
		----------UNCONFORMITY----------	
	Tertiary		Granite Porphyry, Rhyolite
		----------INTRUSIVE INTO LOWER SKUKUM GP.-----	
		Skukum Group	Andesite, basalt, rhyolite, trachyte breccia, tuffs, flows. Granitic breccia, minor greywacke, sandstone and siltstone.
Mesozoic	Cretaceous	Coast Intrusions	Hbld-bio-oligoclase granodiorite diorite, granite, pegmatitic syenite
		----------INTRUSIVE CONTACT ----------	
		Hutshi Group	Basalt, andesite, porphyritic andesite, qtz latite & rhyolite flows, breccias and tuffs; minor greywacke, argillite; conglomerate locally at base
	Upper Jurassic	Tantalus Fm	Arkose, siltstone, congl. argillite, coal
	Lower Jurassic	Laberge Group	Conglomerate, greywacke, arkose quartzite, siltstone, argillite, hornfels
		----------UNCONFORMITY----------	
	Upper Triassic	Lewes River Group	Volcanic greywacke, siltstone, argillite, limestone breccia, conglomerate; volcanic breccia, agglomerate, tuff; andesite porphyritic andesite & basalt
Paleozoic	Pennsylvanian(?) & Permian	Taku Group	Limestone, breccia, chert; greenstone and (?) pyroclastic rocks
Precambrian		Yukon Group	Quartz-mica, qtz-chlorite and mica schists; quartzite, feldspathic hbld gneiss, amphibolite, epidote-amphibolite crystalline limestone; feldspathic gneiss, lit-par-lit gneiss; gneissic porphyritic granodiorite & quartz diorite

The Bennett Lake complex consists of a rhyolite to dacite ash flow, breccia and tuff volcanic package in part circumscribed by a high level rhyolite ring dyke with related intrusions. Lambert describes this complex as "two nested calderas, an eroded structural dome and a thick succession of pyroclastic and epiclastic rocks related to eruption, subsidence and filling of the cauldrons" (Lambert, 1974, p. 9).

Lambert suggested that the Skukum region may represent a second caldera complex with grossly similar geology and structural characteristics.

The Skukum complex occupies approximately 140 km^2 and is elliptical in plan. It is partially fault bounded and in places intruded by felsic dykes and stocks. A major north trending fault divides the Skukum ellipse into two parts which are made up of probably genetically related interlayered sedimentary-volcanic units. On the west side, andesitic flows, pyroclastic flows and sedimentary units up to 500 metres thick are found. The eastern block consists of altered pyroclastic, brecciated, flow banded and spherulitic felsic lava flows up to 800 metres thick. Cogenetic high level rhyolite to dacite intrusions punctuate the perimeter of the complex. These rhyolites are thought to represent late ring fracture intrusions associated with a caldera event (Pride, nee Smith, 1981).

Vein occurrences are spatially related to the ring structure in both the Bennett Lake and Skukum volcanic complexes. This mineralization is thought to be linked to hydrothermal and structural events of late stage caldera development.



SCALE

0 5 10 15 km

Legend

CENOZOIC

Quaternary

8 Alluvium, glacial deposits, volcanic ash, loess

Tertiary or Earlier

7 Rhyolite

6 SKUKUM GROUP
Andesite, basalt, rhyolite and trachyte breccia tuffs & flows, granitic conglomerate, minor greywacke

MESOZOIC

Cretaceous

5 COAST INTRUSIONS
Granodiorite, quartz diorite

Jurassic (?) and Cretaceous

4 TANTALUS FORMATION
Arkose, siltstone, conglomerate, argillite, coal

Jurassic

3 LABERGE GROUP
Greywacke, arkose, quartzite, conglomerate, siltstone, argillite, hornfels

Triassic

2 LEWES RIVER GROUP
A) Limestone, limestone breccia
B) Metamorphosed rocks

PRECAMBRIAN and LATER

1 YUKON GROUP
A) Quartz-mica, quartz chlorite and mica schists, micaceous quartzite, gneiss, amphibolite
B) Crystalline limestone

A Volcanic rocks of uncertain age

Fig. : 3

REVISED	WHEATON RIVER Property
	REGIONAL GEOLOGY (Modified from SMITH, 1981)
PROJ No	SURVEY BY DATE MAY 85
NTS 105 D	DRAWN BY AI SCALE
DWG No	NORANDA EXPLORATION OFFICE Whitehorse

2-2: PROPERTY GEOLOGY

The property is largely underlain by Cretaceous Coast Intrusion granodiorite to quartz monzonite. The MAT 4-9 claims are heavily forested with very little bedrock exposed above the vegetation cover. Granitic rocks which occasionally crop out range in size from granular sands and cobbles to boulders >1.0 metres in diameter and are believed to be float material from the dominant host rock granodiorite which may contain dioritic phases and small amounts of disseminated pyrite.

The claims east of Becker Creek are also largely underlain by Cretaceous granodiorite, however, narrow rhyolite dykes, basaltic dykes and minor quartz stringers have been mapped on the west side of Mt. Anderson. Very few sulphides were found in the cliff faces exposed in the creek draining west from Mt. Anderson. The dominant rock type mapped on the remaining claims is granodiorite which is largely present as talus on the ridge west of Mt. Anderson.

Rock Descriptions

Coast Intrusions:

Medium to coarse grained, grey to pinkish, equigranular granodiorite. Biotite (up to 10%) generally dominates over hornblende. Euhedral to subhedral quartz grains; K-feldspar and mafic minerals are subhedral. Intense alteration of K-feldspar to grey clay masses and leaching of mafics near rhyolite-granodiorite contact. Disseminated, trace to 5%, pyrite blebs or euhedral grains <3 mm in diameter are common.

Late Intrusions

Porphyritic Mafic Dykes:

Dark green to black, very fine grained basalt. Siliceous and calcareous alteration, minor pyrite. 1-5 mm diam. subhedral quartz phenocrysts.

Quartz Veins:

Range in width from a few millimetres to 0.25 m in width. Clear grey to white, massive to vuggy, laminar textures. Carbonate, sericite alteration intensity is minor. Pyrite usually <10% and disseminated. Minor leaching at vein contacts.

CHAPTER THREE: GEOCHEMISTRY

A reconnaissance prospecting, geological mapping, soil and silt sampling program was conducted on the MAT 1-9 claims June 6, 1984. Geochemical results are listed at the back of this report in Appendix 1 and sample locations are plotted on Figure 4.

3-1: SILT SAMPLING PROGRAM

A total of 12 silt samples were taken during this program from narrow streams draining east from Carbon Hill and from the stream draining west from Mt. Anderson on MAT 3 fr. and MAT 4 fr. Samples (S69466, 37726-28) taken from the east draining streams ranged from 0.2 to 1.0 ppm Ag, up to 120 ppm Zn and 26 ppm As. Samples taken from the large stream draining west from Mt. Anderson are highly anomalous in Pb, Zn, Ag and Au. The results are listed below as sampled from the headwaters of MAT 3 fr. downstream to Becker Creek.

SAMPLE	Zn	Pb	Ag	Au (ppb)
S69367	240	400	3.0	1200
S69366	230	490	1.6	670
S69365	210	400	2.6	120
S69363	220	380	1.6	200
S69362	210	440	2.0	170
S69369	200	320	1.0	10
S69370	200	320	1.0	10
S69371	190	260	1.0	230

Other geochemical results from the above listed samples range from 34 to 42 ppm Cu, 12 to 24 ppm As and 1 to 14 ppm Mo.

3-2: SOIL SAMPLING PROGRAM

A total of 49 soil samples were taken on the MAT 1-9 claims. Two lines 1,700 metres and 750 metres in length were sampled at 50 metre intervals on the west and east sides of the claim block respectively.

The soil sample results from Line 1 taken west of Becker Creek indicate a slight silver enhancement which ranges from 0.2 to 1.0 ppm Ag from station 1+00W to 6+00W (P69292-300, P69451). Samples P69295 and P69300 have coincident zinc anomalies of 130 ppm Zn and 170 ppm Zn respectively. A coincident weak As-Mo anomaly is noted from station 0+00S to station 4+50S (P69290-98) whereas the molybdenum enhancement is continuous to 8+50S (P69455). The values are slightly higher than background detection limits and range from 1-8 ppm As and 1-10 ppm Mo. No values greater than 10 ppb Au were detected in any soil samples taken during this program.

Line 2 taken east of Becker Creek did not indicate significant anomalies in the elements analyzed during this program.

CHAPTER FOUR: CONCLUSIONS AND RECOMMENDATIONS

The 1985 sampling program indicated weakly anomalous and coincident Ag-As-Mo enhancement with sporadic zinc highs in soil samples taken along Line 1 west of Becker Creek. Soil samples taken along the east ridge of Mt. Anderson failed to detect significant anomalies in the elements analyzed (Cu, Pb, Zn, As, Mo, Au) during this program.

Silt samples taken west of Becker Creek detected values in four samples which ranged from 70-120 ppm Zn and 0.2-1.0 ppm Ag. Significant multi-element anomalies were detected in the stream draining west from Mt. Anderson. These values ranged from 190 to 240 ppm Zn, 260 to 490 ppm Pb, 1.0 to 3.0 ppm Ag and 10 to 1200 ppb Au.

The following recommendations are listed in order of priority:

1. Detailed geological mapping, sampling and prospecting upstream from those samples taken in the major creek draining west from Mt. Anderson.
2. Detailed soil sampling in closed vicinity to the multi-element anomalies detected in soil samples taken along Line 1.

Respectfully submitted,

Mary P. Webster

Mary P. Webster
Field Geologist

STATEMENT OF QUALIFICATIONS

I, Mary P. Webster, of the City of Whitehorse, Yukon Territory do hereby certify that:

1. I have been employed as a Geologist by Noranda Exploration Company, Limited (No Personal Liability) since May 1984.

2. I am a graduate of McMaster University, Hamilton, Ontario with a B.Sc. in Geology.

3. I am a member of the Prospector's and Developers Association and the B.C. and Yukon Chamber of Mines.

4. I supervised and carried out part of the work described in this report.

Mary P. Webster
Field Geologist
Noranda Exploration Co. Ltd.
(No Personal Liability)

APPENDIX 1

GEOCHEMICAL RESULTS

NORANDA EXPLORATION COMPANY, LIMITED
MAT Claims Geochemical Results

	SAMPLE NO.	Cu ppm	Zn ppm	Pb ppm	Ag ppm	As ppm	Mo ppm
SOILS:							
Line 1							
0+00S	69290	22	76	18	.2	6	2
0+61S	69291	20	72	12	.4	6	2
1+00S	69292	42	64	20	1.0	1	4
1+50S	69293	72	76	14	.8	4	2
2+00S	69294	14	68	16	.2	6	1
2+50S	69295	82	130	48	.6	8	2
3+00S	69296	46	72	10	.6	4	2
4+00S	69297	72	78	14	.8	4	4
4+50S	69298	24	72	10	.2	6	4
5+12S	69299	16	74	14	.2	1	4
5+50S	69300	30	170	34	.6	1	10
6+00S	69451	14	76	22	.4	1	2
6+50S	69452	12	72	14	.2	1	2
7+00S	69453	14	92	22	.2	1	2
7+50S	69454	16	76	12	.2	1	4
8+00S	69455	10	64	14	.2	1	2
8+50S	69456	10	66	12	.2	1	1
9+00S	69457	12	56	12	.2	1	1
9+50S	69458	8	50	10	.2	2	1
10+00S	69459	16	54	10	.2	1	1
10+50S	69460	12	46	10	.2	1	1
11+00S	69461	18	58	14	.2	2	1
11+50S	69462	10	60	8	.2	1	1
12+00S	69463	22	70	18	.4	6	1
12+50S	69464	22	62	12	.2	1	1
13+00S	69465	16	70	14	.4	4	1
14+00S	69467	14	68	12	.2	2	1
14+50S	69468	12	46	12	.2	1	1
15+00S	69469	18	60	8	.2	1	1
15+50S	69470	14	54	12	.2	1	1
16+00S	69471	24	74	20	.2	4	1
16+50S	69472	34	76	22	.2	1	1
17+00S	69473	32	78	20	.2	6	1
Line 2							
0+00N	69751	18	88	24	.2	1	1
0+50N	69752	18	92	24	.2	1	1
1+00N	69753	16	84	20	.2	1	1
1+50N	69754	18	90	20	.2	1	1
2+00N	69755	16	84	20	.2	4	1
2+50N	69756	24	82	10	.2	1	1
3+00N	69757	32	62	12	.2	4	1
3+50N	69758	30	64	12	.2	1	1
4+00N	69759	30	60	10	.2	1	1
4+50N	69760	28	62	8	.2	1	1
5+00N	69761	44	72	14	.2	1	1
5+50N	69762	44	70	14	.2	1	1
6+00N	69763	40	70	12	.2	1	1
6+50N	69764	38	60	12	.2	1	1
7+00N	69765	38	58	12	.2	8	1
7+50N	69766	40	62	12	.2	4	1

To Wheaton River

Mt. Anderson

5500

5000

4500

4000

3500

S37726

P69290

91

S37727

92

93

94

95

96

NS

97

98

99

P69300

S37728

P69451

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

P69473

Becker

Creek

Tree Cover

1
Float talus, boulders

Noranda MAT 1-9 Claims

62

2

1

Narrow Qv, quartz stringers

S69367

S69366

S69365

S69363

S69362

S69369

S69370

S69371

P67965

64

63

62

61

60

59

58

57

56

55

54

53

52

P67951

1
Talus, skree, float, boulders

60° 12'

135° 09'

N

091811

Fig. : 4

Legend

QUATERNARY

3 Alluvium

2 Mafic dyke : Andesite/basalt, med. to dark green, porphyritic local silicification, minor py, possibly coeval with quartz veins, age uncertain.

CRETACEOUS

1 Coast Intrusions : Diorite, hornblende - biotite granodiorite.

● Silt (S)

▲ Soil (P)

0 50 100 200 400 metres

REVISED	Mt. Anderson (MAT 1-9 Claims)
	091811
	Geology & Sample Location Map
PROJ. No.	
N.T.S. 105 D 3	SURVEY BY: MW DATE: APR 86
DWG. No.	DRAWN BY: AI SCALE: 1:5000
	NORANDA EXPLORATION
	OFFICE Whitehorse

VANCAL 1503