## COMINCO LTD.

EXPLORATION NTS 82 L/4W

WESTERN DISTRICT
May 10, 1978

# ASSESSMENT REPORT

GEOLOGICAL; STREAM SILT, ROCK AND SOIL GEOCHEMICAL AND GROUND MAGNETIC

WORK ON THE

DOBBIN PROPERTY

(TAD CLAIMS 1-6)

TADPOLE LAKE AREA, VERNON M.D.

LATITUDE: 50001'N

LONGITUDE: 119046'W

WORK PERFORMED

JUNE 16 - SEPT. 24, 1977

REPORT BY:

M.J. OSATENKO

MIMERAL RESOURCES BRANCH
ASSESSMENT REPORT

6732
NO.

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#### SUMMARY

The Dobbin property is located 27 km northwest of Kelowna, B.C. It was staked in May, 1977 to cover two targets, one an alkaline porphyry copper and the other a porphyry Mo, both of which were located by previous workers (non-Cominco) in the late sixties.

Work in 1977 consisted of a compilation of previous assessment work, mapping and ground magnetics with minor stream silt, rock and soil geochemistry. Data from the porphyry Mo area shows six distinct Mo soil geochemical anomalies over a pyritic, quartz veined quartz porphyry stock. Most anomalous soil areas appear to represent poorly to untested targets.

Mapping and rock geochemistry in the vicinity of the Dobbin alkaline porphyry copper showing (at least  $150 \times 60 \text{ m}$ ) indicates that the copper mineralization (chalcopyrite) is associated with pyroxenitic rocks. Surface sampling confirms the typical drill indicated grade from previous work of 0.3% copper, however, average grades of 0.012 oz/ton platinum and 0.008 oz/ton palladium were not previouslay recognized (gold and silver average 0.001 oz/ton and 0.06 oz/ton respectively). The mineralized zone has not been fully tested to depth or along strike.

It is recommended to do mapping, Mo soil geochemistry, ground magnetics and I.P. on the porphyry Mo target. At the alkaline porphyry copper target further mapping; ground magnetics; rock geochemistry for copper, platinum and palladium and I.P. is required to better define areas of interest. Both areas warrant percussion drill testing.

#### INTRODUCTION

The Dobbin property was initially staked in May 1977 to cover two targets, one an alkaline porphyry copper and the other a porphyry Mo, both of which were located by previous workers. Additional staking was done during the summer to protect extensions of developed targets.

Mapping; stream silt, rock and soil geochemistry and ground magnetics were done by M.J. Osatenko assisted by B.G. Ames between June 16th and September 24th, 1977. Data collected are presented at scales of 1:2,000 and 1:10,000 with mapping control from 16 line km of surveyed grid, 1:15,800 airphotographs and a 1:10,000 blow-up of a 1:50,000 topographical map.

## LOCATION AND ACCESS

The property is situated 27 km northwest of Kelowna, B.C. along a good system of logging roads which are in part owned by Crown Zellerbach (plate 1). It takes about 45 minutes to drive from Kelowna to the property. The working season is from mid June to the end of September.

#### TOPOGRAPHY AND VEGETATION

The property varies in elevation from 1650 to 1850 m with gentle to moderately steep slopes. It is covered by a thick blanket of mature spruce and fir which has been extensively logged over the past six years. Water for drilling is available from Tadpole Lake, a small pond 1200 m to the southeast or from numerous streams which cross the main road to the east of Tadpole Lake.

#### PROPERTY AND OWNERSHIP

The Dobbin property (Vernon Mining Division) is 100% owned by Cominco and consists of the following claims (56 units):

CLAIM	RECORD NUMBER	NUMBER OF UNITS	DATE RECORDED
Tad I	316	16	May 13, 1977
Tad 2	317	3	May 13, 1977
Tad 3	318	10	May 13, 1977
Tad 4	319	20	May 13, 1977
Tad 5	340	3	June 16, 1977
Tad 6	377	4	Sept. 2, 1977

#### PREVIOUS WORK

The first known mention of copper mineralization in the Dobbin area appeared in the Annual Report of the Minister of Mines, B.C., 1929, p. 249. Some work was done in the area shortly after publication of the above account, however, work was limited and appears to have been confined to the area east or southeast of the principal Dobbin copper showing. In 1955, a grid was cut over the Northern end of the property but the nature of the work is not known.

In 1967 Phelps Dodge carried out a reconnaissance stream silt geochemical survey in the area and obtained a strong Mo anomaly in stream silts just to the west of Tadpole Lake. They apparently did a little soil geochemistry but dropped the ground the following year. It was taken up in 1968 by Texas Gulf Sulfur who conducted an extensive Mo soil geochemical program (assessment report 1896). At least six interesting soil anomalies were defined but the extent of follow-up drilling is not known.

Work by I. Greg and G. Shell on the main Dobbin copper showing commenced in 1968 with three short holes being drilled (0.38% copper/13 m, 0.18% copper/8 m and 0.32% copper/34 m). The property was then optioned to Atlas Exploration in 1969 who performed soil geochemical (Cu, Mo and Ni), ground magnetic, geological and I.P. surveys (assessment report 2255). They drilled a number of holes with discouraging results.

In 1972 Geoquest Resources drilled a vertical hole to 120 m in the middle of the main showing which returned about 0.3% copper over the full extent of the hole. They continued work in 1974 under Rockel Mines and drilled three diamond drill holes in the vicinity of their hole in 1972 (see plate 3 for summary of drill results). Grades encountered were in the range 0.1 to 0.4% copper (up to 0.029 MoS<sub>2</sub>) with silver about 0.1 oz/ton over intersections of up to 60 m (assessment report 5568). The property was allowed to lapse in early 1977.

#### GEOLOGY

The geology of the Mo target near Tadpole Lake is shown in plate 2 while the main Dobbin copper showing geological data is given in plate 3 with some data that plots off of plate 3 shown on plate 2.

# Mo target area near Tadpole Lake

The Tadpole Lake Mo target is underlain by argillaceous sediments and intrusive rocks of quartz porphyry to granodiorite composition. Sediments (Unit 1), which consist of argillite, greywacke and impure quartzite with minor limestone, trend north-northwesterly and dip steeply to the west. They contain pyrite in amounts up to 4% as disseminations and along fractures. To the west and south of the Dobbin copper showing the sediments are not pyritic. Thin amphibolitic units were noted in a small outcrop 1000 m west of Tadpole Lake. Elsewhere off the property basic, volcanic rocks occur within the sedimentary sequence.

The intrusive rocks (Unit 6) are mainly medium grained, quartz porphyries consisting of quartz phenocrysts in a plagioclase, quartz, biotite matrix. Jointing and fractures are well developed and trend easterly, southeasterly and northerly (moderate to steep dips). Quartz veins (less than 1 to 3 cm in width), with less than 1 to 5% pyrite, follow these structural features and are most obvious in the area of Mo soil anomalies reported by T.G.S. (up to 10% of rock outcrop). Pyrite for the most part is highly oxidized to limonite. No MoS2 was seen except for a float boulder on the northern edge of Tadpole Lake (see MINERALIZATION part of the report page 4).

## Dobbin Copper Showing area

The rocks in the vicinity of the Dobbin copper showing are mainly undersaturated to weakly oversaturated ultrabasic to alkaline rocks with minor crosscutting granitic dykes. Mapping to date is incomplete but the stock is somewhat tooth-shaped being greater than 2 km in an E-W direction and perhaps up to 4 km N-S. On the basis of cross-cutting relationships the oldest rocks in the area are the sediments (Unit 1, previously discussed on this page) followed by gabbro (syenodiorite, diorite), pyroxenite, monzonite, diorite and finally by granodiorite.

The gabbroic unit (Unit 2) is mainly composed of gabbro and syenodiorite with minor diorite. It is generally medium grained, massive and contains highly variable amounts of K-feldspar (nil to 35%). Typically the gabbro consists of 50-60% plagioclase, 40% hornblende (augite?), less than 10% K-feldspar and 1% disseminated magnetite with the syenodiorite most commonly having 50% plagioclase, 30% hornblende (augite?) and 19% K-feldspar (rest magnetite). Dioritic rocks are similar to the gabbros but have less mafic minerals (30%). Minor pyrite, as disseminations and along fractures, is usually present in all three rock types of the gabbroic unit, often with albite and epidote.

Rocks of the ultrabasic suite (Unit 3) are the main host of the coppermagnetite mineralization and are widespread over the property. They are medium to coarse grained, massive, often porphyritic and comprise hornblende pyroxenites and pyroxene hornblendites which contain highly variable amounts of biotite. Dykes of these rocks clearly cross-cut the gabbroic rocks of Unit 2.

Monzonite (Unit 4) outcrops over a large area, principally in the northern part of the stock, and in the Whiterocks Mountain area. They are medium to very coarse grained, porphyritic (K-feldspar phenocrysts up to 8 cm in length), trachytoidal and contain about 70% K-feldspar, 20% plagioclase, 2% quartz and 8% hornblende and biotite (less than 1% magnetite). Pyrite content is usually less than 1% but locally, near the contacts with pyritic argillites, it rises to 5%. Unit 5 rock are fine grained diorite dykes that cut the monzonitic rocks of Unit 4. All rock units are apparently cut by granitic rocks (mainly granodiorite) of Unit 6.

# **MINERALIZATION**

MoS<sub>2</sub>-pyrite mineralization occurs in quartz veined, granitic boulders near the northern edge of Tadpole Lake (estimated grade 0.05% MoS<sub>2</sub>).

The main Dobbin copper showing drill intersections by other companies are discussed in the PREVIOUS WORK part of the report (page 2) and shown in plate 3. Surface chip samples confirm the 0.2 to 0.4% copper grades over an area at least 150 x 60 m with gold and silver values typically low i.e. 40 ppb (0.001 oz/ton) and 2.0 ppm (0.06 oz/ton) respectively. Platinum and palladium values from six rock chip samples returned 390 ppb (0.012 oz/ton) and 265 ppb (0.008 oz/ton) respectively. These were done by Bondar Clegg in Vancouver and confirmed by Chemex. In addition to the main showing area copper mineralization occurs 1120 m to the northeast (300 to 1400 ppm copper, chalcopyrite - magnetite in pyroxenite no Pt or Pd) and 1050 m to the southeast (up to 2250 ppm copper, 450 ppb Pt and 900 ppb Pd).

STREAM SILT, ROCK AND SOIL GEOCHEMISTRY (See plate 2 for silt results)

Three soil lines (L<sub>1</sub> to L<sub>3</sub>, plate 2) were surveyed over the main Mo soil anomaly located by T.G.S. at Tadpole Lake. Values ranged from 1 to 30 ppm and confirm the previously indicated anomaly (see APPENDIX "D" for sampling procedures and analytical methods). This anomaly is 1500 x 350 m with at least five additional areas of Mo soil anomaly, all of which may be significant. Nine outcrops near or adjacent to these soil anomalies were analysed for Mo with the quartz porphyries running from less than 2 to 40 ppm. Values greater than 4 ppm Mo in granitic rocks are considered anomalous based on previous rock geochemical surveys

(by MJO) around the Brenda and Endako deposits. The values observed near the soil anomalies are anomalous and similar to those from the peripheral regions of the two studied deposits.

The four copper soil anomalies around the Dobbin showing area are from work by Atlas Exploration. Most anomalies are near copper mineralization (plate 2).

Plate 3 shows all the rock geochemical data for copper, platinum and palladium not previously discussed in the MINERALIZATION part of this report.

#### GEOPHYSICS

#### **Ground Magnetics**

Two areas were surveyed, one around Tadpole Lake and the other around the Dobbin copper showing. Readings were made with a MP 2 magnetometer (measures total field and is reproducible to  $\pm 3\%$  at one standard deviation) on lines 50 to 200 m apart on 50 m stations. The baseline was read first with subsequent readings tied into the baseline to ensure comparable results over the grid.

In the Tadpole Lake area two lines (plate 2) were read (38 readings) to define possible alteration zones in the quartz porphyry unit i.e. weak magnetic lows. The survey shows a 400 m wide zone, over the main Mo soil anomaly, of slightly low magnetic values. This trend becomes obscure at the east end of line 1.

The magnetic survey in the Dobbin showing area (plate 4) comprised 236 readings. Five strongly anomalous areas (greater than 5,000 gammas) were located over the gabbroic and pyroxenitic units, two of which are over copper mineralization (main Dobbin showing and 1120 m to the northeast). The other three are poorly exposed and untested.

#### CONCLUSIONS

#### Tadpole Lake Mo area

- 1. Mo soil anomalies reported by T.G.S. were confirmed and are apparently related to  $MoS_2$  mineralization in a pyritic, quartz veined quartz porphyry stock.
- 2. At least 6 anomalous soil areas were located by previous workers (many not entirely defined), the largest being about  $1500 \times 350$  m.
- These Mo soil anomalies appear to be untested.

#### Dobbin Copper Showing area

1. Copper and platinum + palladium mineralization occurs in pyroxenitic rocks over an area at least  $150 \times 60$  m at the Dobbin showing. Grades are typically 0.3% copper with 0.012 oz/ton platinum and 0.008 oz/ton palladium. Gold and silver values average 0.001 oz/ton and 0.06 oz/ton respectively.

- 2. The main showing mineralized zone has not been defined to depth or along strike but in view of the low copper grades encountered additional drilling is not warranted.
- 3. Compilations of all previous work and our own has defined a number of areas for further ground surveys.

Report by:

M.J. Osatenko

Project Geologist

Endorsed by:

F.L. Wynne

Senior Geologist

Approved for release by:

G. Harden Manager

Western District

MJO/pcd

# APPENDIX "A"

# STATEMENT OF EXPENDITURES FOR GEOLOGICAL; STREAM SILT, ROCK AND SOIL GEOCHEMICAL AND GROUND MAGNETIC WORK ON THE TAD MINERAL CLAIMS

# GEOLOGY

<u>acoroa1</u>	
Salaries	
M.J. Osatenko June 16th - June 28th, 1977 (13 days at \$155/day)	\$2,015.
Reporting and drafting (5 days at \$155/day)	775.
B.G. Ames June 16th - June 28th, 1977 (13 days at \$70/day)	910.
September 22nd - September 24th, 1977 (3 days at \$70/day)	210.
Domicile	
Accommodation (29 man days June 16th - September 24th, 1977 at \$30/day)	870.
TRANSPORTATION	
Truck for 16 days (June 16th - September 24th, 1977)	400.
MAGNETOMETER	
½ month rental period	124.
ASSAYS	
30 soil and stream silt samples for Mo at \$1.60/	48.
9 rock samples for molybdenum at \$2.50/sample	22.
22 rock samples for copper at \$2.25/sample	50.
20 rock samples for platinum and palladium at \$10/sample	200.
	5,624.

M. Ontenko

#### APPENDIX "B"

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A GEOLOGICAL; STREAM SILT, ROCK AND SOIL GEOCHEMICAL

AND GROUND MAGNETIC PROGRAM

CARRIED OUT ON THE TAD 1-6 MINERAL CLAIMS

Located in the Vernon Mining Division

of the Province of British Columbia

More Particularly N.T.S. 82 L/4W

# AFFIDAVIT

- I, MYRON J. OSATENKO OF THE CITY OF VANCOUVER IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:
- THAT I AM EMPLOYED AS A PROJECT GEOLOGIST BY COMINCO LTD. AND AS SUCH HAVE A PERSONAL KNOWLEDGE OF THE FACTS TO WHICH I HEREINAFTER DEPOSE;
- 2. THAT ANNEXED HERETO AND MARKED AS "EXHIBIT A" TO THIS MY AFFIDAVIT IS A TRUE COPY OF EXPENDITURES OF A GEOLOGICAL; STREAM SILT, ROCK AND SOIL GEOCHEMICAL AND GROUND MAGNETIC PROGRAM CARRIED OUT ON THE TAD 1-6 MINERAL CLAIMS;
- 3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN THE SIXTEENTH DAY OF JUNE 1977 AND THE 24th DAY OF SEPTEMBER 1977 FOR THE PURPOSE OF MINERAL EXPLORATION ON THE ABOVE NOTED CLAIMS.

MYRON J. OSATENKO

# APPENDIX "C"

#### COMINCO LTD.

#### EXPLORATION

WESTERN DISTRICT

# STATEMENT OF QUALIFICATIONS

- I, MYRON J. OSATENKO, OF THE CITY OF VANCOUVER, BRITISH COLUMBIA, HEREBY CERTIFY:
- THAT I AM A GEOLOGIST, RESIDING AT 6437 116th STREET DELTA, BRITISH COLUMBIA WITH A BUSINESS ADDRESS AT 700-409 GRANVILLE STREET, VANCOUVER, BRITISH COLUMBIA.
- 2. THAT I GRADUATED WITH B.SC. AND M.SC. DEGREES IN GEOLOGY FROM THE UNIVERSITY OF BRITISH COLUMBIA IN 1965 AND 1967 RESPECTIVELY.
- THAT I HAVE PRACTISED GEOLOGY WITH COMINCO LTD, FROM 1967 TO PRESENT.

DATED THIS 30th day of April 1978 at Vancouver, British Columbia.

SIGNED

Myron J. Osatenko, M. Sc.

# APPENDIX "D"

# GEOCHEMICAL RESULTS

Sample Number	Mo (ppm)	Type of Sample
0-77-1618	10	Stream silt
0-77-1648	20	Stream silt
0-77-1628	8	Stream silt
0-77-163\$	<b>.</b> 2	Stream silt
0-77-40S	₹2	Stream silt
Line 1, 00	1	soil
Line 1, 50E	5	soil
Line 1, 100E	6	soil
Line 1, 150E	8	soil
Line 1, 200E	13	soil
Line 1, 250E	20	soil
Line 1, 300E	15	soil
Line 1, 350E	20	soil
Line 1, 400E	30	soîl
Line 2, 00	10	soil
Line 2, 50E	10	soil
Line 2, 100E	12	soil
Line 2, 150E	12	soil
Line 2, 250E	12	soil
Line 2, 300E	14	soil
Line 2, 350E	10	soil
Line 2, 400E	6	soil
Line 2, 450E	7	soil
Line 2, 500E	6	soil
Line 3, 00	11	soil
Line 3, 50E	10	soil
Line 3, 100E	25	soil
Line 3, 150E	30	soil
Line 3, 200E	20	soil
Line 3, 250E	15	soil
0-77-146	8	rock
0-77-149	40	rock

# Appendix "D" continued:

Sample Number	Mo	(ppm)	<u>T</u> ;	ype of Sample
0-77 <b>-</b> 150	4			rock
0-77-152	6			rock
0-77-154		<u> </u>		rock
0-77-158	<b>4</b> 2			rock
0-77-157	6			rock
0-77-158	2			rock
0-77-159	10			rock
	Cu_(ppm)	Pt (ppb)	Pd (ppb)	
0-77-163	3750	50	45	rock
0-77-164	363	175	125	rock
0-77-165	3130	1000	470	rock
0-77-168	2800	175	110	rock
0-77-169	3500	150	100	rock
0-77-170	3700	290	200	rock
0-77-172	4220	702	650	rock
0-77-183	1370	75	60	rock
0-77-191	2510			rock
0-77-232	212			rock
0-77-259	248	50	15	rock
0-77-290	2020	50	25	rock
0-77-268	2250	450	900	rock
A-77-102	14	50	10	rock
A-77-118	183	<b>&lt;</b> 50	25	rock
A-77-121	310	50	30	rock
A-77-123	347	50	20	rock
A-77-126	340	50	40	rock
0 <b>-</b> 77-280	1400	100	30	rock
0-77-282	380	50	25	rock
0-77-283	167	50	15	rock
0-77-440	565	50	<b>∠</b> 10	rock

# N.B.

- 1. All soil samples collected from B soil horizon (about 25 cm below surface). Both soil and stream silt samples were screened and the -80 mesh fraction sent for analysis.
- 2. Molybdenum analyses done by pyrosulfate fusion followed by thiocyanate colorimetric procedure.
- 3. Copper analyses by aqua regia digestion and atomic absorption.
- 4. Platinum and palladium results by fire assay followed by atomic absorption (Bondar Clegg and Clemex of Vancouver).
- 5. Molybdenum and copper analyses done by Cominco Laboratory in Vancouver.

## Threshold Values

Molybdenum	rocks soil stream silts	4 ppm 5 ppm 5 ppm	
Copper	rocks from Do	bbin area	100 ppm
Platinum	rocks from Do	bbin area	100 ppb
Palladium	rocks from Do	bbin area	100 ppb







