

ARIS SUMMARY SHEET

District Geologist, Nelson

Off Confidential: 91.11.08

ASSESSMENT REPORT 20841

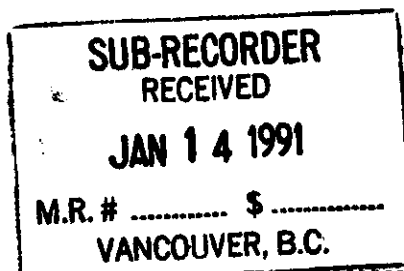
MINING DIVISION: Fort Steele

PROPERTY: Estella
LOCATION: LAT 49 47 00 LONG 115 37 00
UTM 11 5515240 599585
NTS 082G13E
CAMP: 001 Purcell Belt (Sullivan)
CLAIM(S): Lewis 22, TC 2
OPERATOR(S): Cominco Bakra Res.
AUTHOR(S): Schultze, H.C.
REPORT YEAR: 1990, 18 Pages
COMMODITIES
SEARCHED FOR: Lead, Zinc, Silver
KEYWORDS: Proterozoic, Fort Steele Formation, Aldridge Formation
Creston Formation, Clastics, Folds, Faults, Intrusives, Quartz veins
Sulphides
WORK
DONE: Drilling
DIAD 261.3 m 3 hole(s); NQ
MINFILE: 082GNW008, 082GNW046

LOG NO: OCT 03 1991	RD.	LOG NO: 21-01	RD.
ACTION: <i>[Handwritten signature]</i>		ACTION:	
FILE NO: <u>COMINCO LTD.</u>		FILE NO:	

EXPLORATION

WESTERN DISTRICT



DIAMOND DRILLING REPORT

ESTELLA PROPERTY
LEWIS 22 AND TC2 MINERAL CLAIMS
FORT STEELE MINING DIVISION, B.C.
N.T.S. 82G/13E

- ASSESSMENT REPORT -

GEOLOGICAL BRANCH
ASSESSMENT REPORT
20,841

LAT: 49° 46'N

LONG: 115°36'W

OPERATOR

COMINCO LTD.

KOOTENAY EXPLORATION
1051 INDUSTRIAL ROAD #2
CRANBROOK, B.C.
V1C 4K7

Work Performed During September and November, 1990

Report by: H. C. Schultze

Submitted: December, 1990

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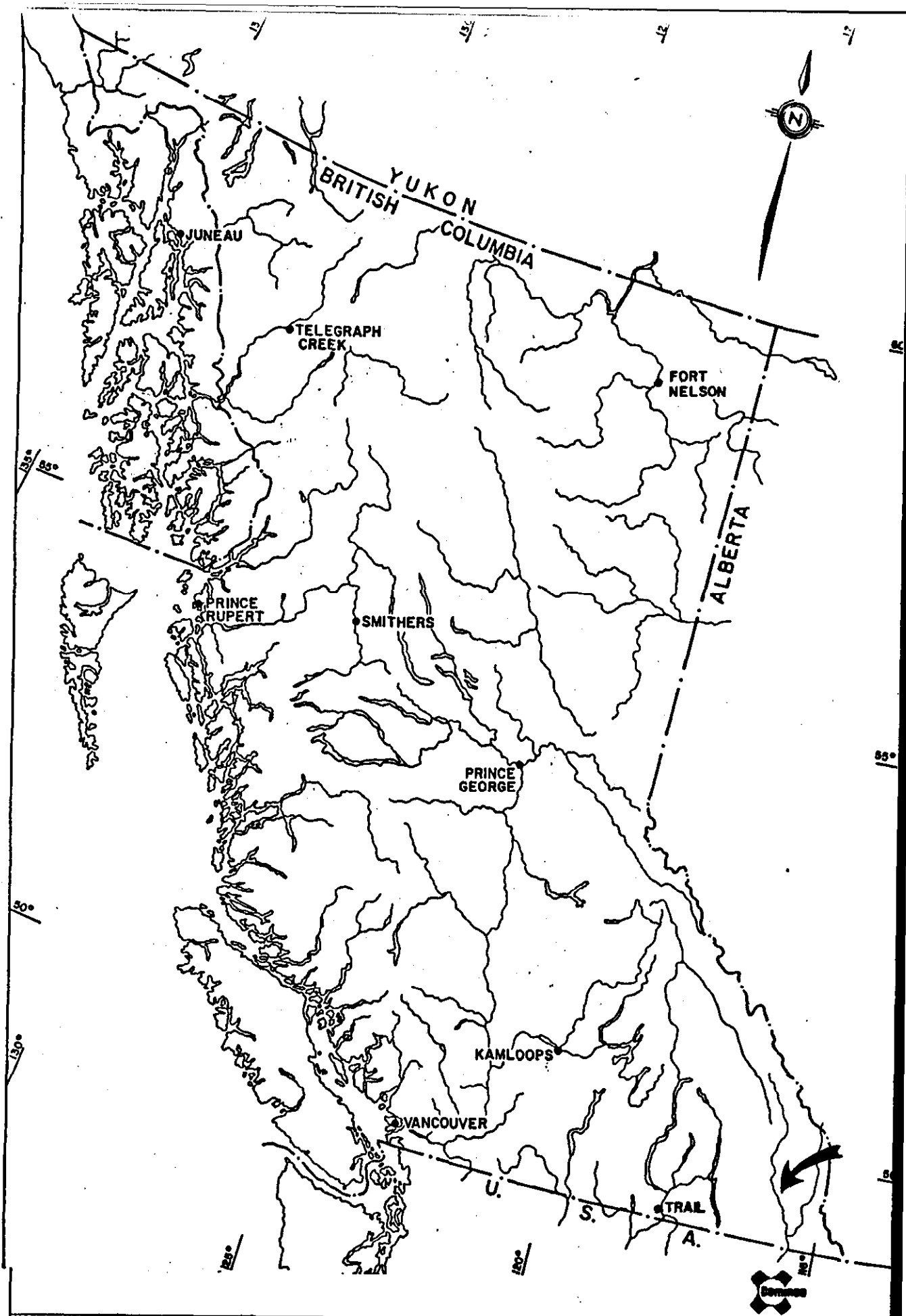
PROPERTY LOCATION MAP ✓

MAP - ESTELLA CLAIMS AND DRILL HOLE LOCATIONS ✓

Page No.

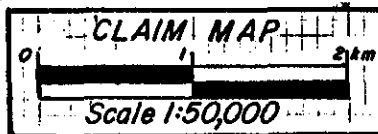
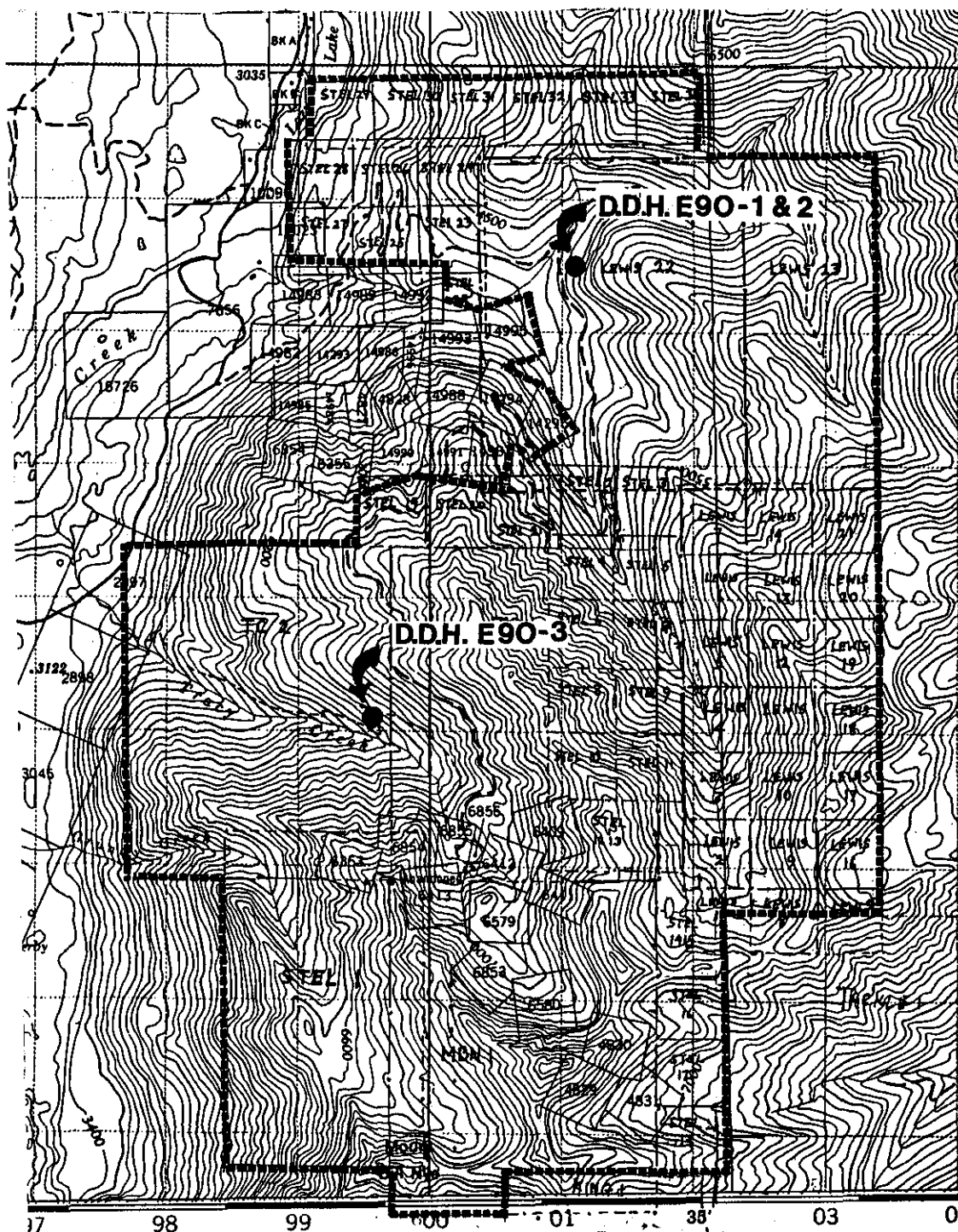
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Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

ESTELLA PROPERTY
LOCATION MAP
FT. STEELE M.D., B.C.



82G/13E

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

Estella Property **— Diamond Drilling 1990 —**

Scale: Date: Plate:

COMINCO LTD.EXPLORATIONWESTERN DISTRICT

DIAMOND DRILLING REPORT

LEWIS 22 AND TC2 MINERAL CLAIMS

FORT STEELE MINING DIVISION

H. C. Schultze

December, 1990

1.00 INTRODUCTION1.10 Location and Access

The property is located 28 km east of Kimberley, B. C. and 9 km east of Wasa, B.C. and is centred on N.T.S. map-sheet 82G/13E at latitude 49°46' and longitude 115°36'.

The property is accessed by Highway 93/95 to Wasa (773 m asl.), thence eastward 10 km along Lazy Lake secondary road, thence along the Lewis Creek road for 15 km to the Estella mine site in the Tracy Creek basin (1798 m asl.). A steep 5 km long 4-wheel drive road exists within the Tracy Creek drainage and lies between the Estella mine site and the Lazy Lake road.

1.20 Property Definition

The Estella property is a joint venture option involving Cominco Ltd., Bethlehem Resources Ltd. and Bakra Resources Ltd. in which the claims of each company, covering over 2680 hectares in this area, have been grouped together. Cominco is the operator. Diamond drilling was carried out on the Lewis 22 (Rec. 3673) and TC2 (Rec. 2937) mineral claims.

1.30 Topography and Vegetation

The vegetation varies from very thick to open (on talus) while topography is steep everywhere and varies from 920m to 2649m in elevation. In the vicinity of the minesite the slopes are steep and treacherous.

1.40 History

The Estella deposit was discovered in 1895 and explored intermittently until 1950. From 1951 to 1953 Estella Mines Ltd. produced 67,000 tons containing 1.5 oz/ton Ag, 3% Pb and 9% Zn. Subsequent acquisition was by Copper Soo Mines Ltd. who then amalgamated with Giant Mascot Mines Ltd., resulting control was 60% and 40% interest respectively. In 1966 and 1967 51,000 tons

was produced containing 1.9 oz/ton Ag, 4.2% Pb and 7.6% Zn. In 1970 Giant Mascot obtained 100% of the Estella property; in 1983 Giant Mascot became an asset of Campbell Resources Inc. In 1987 L. Mikulic staked claims surrounding the 14 remaining Estella crown granted claims and optioned the claims to Bakra Resources Ltd. who had Mag, EM, geochemical and geological work performed. In 1988 Bethlehem Resources Ltd. obtained control of the Estella crown granted claims from Campbell Resources. Cominco staked Stel and Lewis claims in 1988, 1989 and 1990. Cominco optioned ground controlled by Bethlehem and Bakra in 1989 and has since conducted geological studies, geochemical and geophysical surveys.

Finance statements for the periods of production at Estella have not been studied, however considering acquisition and capital costs and the small tonnages produced, it is unlikely that any profits were realized.

2.00 DETAILED TECHNICAL DATA AND INTERPRETATION

2.10 DRILLING

2.11 Purpose and Scope of Drilling

Three holes were drilled on two EM anomalies at locations shown on the property map. Hole names are E90-1, E90-2 and E90-3. Hole E90-1 entered gabbro, interpreted to be a dike, and was stopped because the target was assumed to be stratabound. An alternative drill site was selected and E90-2 cored a graphitic argillite that is interpreted as the EM conductor. Hole E90-3 cored argillite and subwacke cut by numerous pyritic quartz and calcite veinlets, interpreted as the weak EM conductor at this location.

2.111 Core Storage

Core from the drilling being reported on is stored at Cominco's exploration core storage area at the Sullivan Mine in Kimberley.

2.12 RESULTS

Results of drilling the three holes are given below. Detailed drill logs and analyses appear in Appendix A.

2.121 DDH E90-1

Drill hole E90-1 was collared at an elevation of 1360m at UTM coordinates 601 030E/551 8715N on September 26, 1990 and abandoned September 30 at 28.96m due to technical difficulties resulting from extremely fractured ground. The hole was drilled at -70° azimuth towards 270° azimuth. From the base of overburden at 5.48 to 28.96 m, a dark green hornblende rich gabbro was

cored. Within the gabbro are numerous thin to 20 cm thick quartz veins which are typically barren, however some contain traces of malachite and azurite and <1 to 2% chalcopryrite. Core is extremely broken and fractured while traces of malachite are localized along some of the fractured surfaces. A pervasive foliation preserved in fragments of core is consistent at 35° to core axis.

2.122 DDH E90-2

Drill hole E90-2 was collared at an elevation of 1360m 50m north of DDH E90-1 on October 1 in another attempt to drill test the stratigraphy here. It was drilled at -70° towards 270° azimuth to a total depth of 181.4m.

From the base of overburden at 14.02 m, drilling cored a soft, thin to medium bedded, carbonaceous, dark grey to black argillite unit with variably calcareous and siliceous zones to a depth of 169.30 m. Within this unit is a light grey ankeritic wacke unit @ 27.13 to 31.3 m. Felsic intrusives exists @ 31.50 - 32.72 m and 44.70 - 58.43 m. Bedding is intensely folded in the argillite unit with bedding to core axis angles ranging from 90° to 0° over the entire interval; numerous zones are highly fractured and some zones are intensely sheared.

From 68m to 169.30m the argillite unit becomes increasingly graphitic; from graphite localized along sheared bedding planes at 68m to wholly graphitic, highly conductive beds at depth.

The graphitic argillite unit is underlain at 169.30m by a thin bedded, thin laminated cream to yellow to green variably siliceous dolomite unit, cored to the end of the hole at 181.40m. Bedding to core axis angles in this unit are consistent at 70°.

Quartz veinlets present within the last 20m of core in places contain weak disseminations of galena and pyrite.

The hole was completed October 23, 1990; the extended duration resulting from extremely broken and sheared ground conditions within the argillite unit hampering drilling.

2.123 DDH E90-3

Drill hole E90-3 was collared at an elevation of 1610m at UTM coordinates 599 450E/551 5330N on October 25 and drilled vertically to a depth of 50.90m. The hole was completed October 27.

From the base of overburden at 12.8 m to 50.9m is a sequence of thin bedded, medium to dark grey argillite and subwacke units. Bedding to core angles are relatively consistent at 80° to 90°. Quartz and calcite veinlets <3 m wide are ubiquitous throughout

the hole and commonly contain disseminated or aggregates of subhedral to euhedral pyrite. Where these veinlets are weathered limonite is abundant. From 29m and below limonite decreases in abundance and Fe-sulfides in quartz-calcite filled fractures increases.

3.00 DISCUSSION

3.10 DDH E90-1

Drill hole E90-1 cored a mafic intrusion having mineralogies and textures characteristic of Moyie intrusions elsewhere on the property and in the region. This particular intrusion is a dike. The presence of copper bearing minerals is interesting, however their occurrence in the dike is primarily restricted to thin veins and in insufficient abundance to warrant follow-up.

3.20 DDH E90-2

With the exception of a thin wacke member and thin felsic dikes, hole E90-2 cored a thick sequence of carbonaceous to graphitic argillites and a lower siliceous dolomite unit. These units correlate with units stratigraphically low in the Proterozoic Aldridge Formation in the Hughes Range.

The rocks are highly sheared and fractured and contain only minor amounts of Pb-Zn mineralization in association with veining.

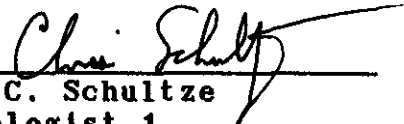
3.30 DDH E90-3

Drill hole E90-3 cored sediments characteristic of the Aldridge Fm. here having a network of pyrite bearing quartz and calcite filled fractures.

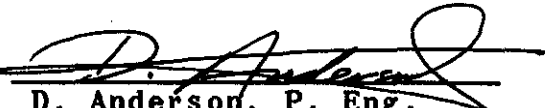
4.00 CONCLUSIONS

No mineralization of economic significance was obtained in drill holes E90-1, E90-2 nor E90-3.

Report by:


H. C. Schultze
Geologist 1

Endorsed by:


D. Anderson, P. Eng.
Senior Geologist

Approved by:


W. J. Wolfe, P. Eng.
Manager Exploration
Western Canada

HCS/el

Distribution: Mining Recorder (2 copies)
Western District, Exploration
Kootenay Exploration
Bakra Resources
Bethlehem Resources

EXHIBIT "A"STATEMENT OF EXPENDITURES

DIAMOND DRILLING - LEWIS 22 AND TC2 CLAIMS

DIAMOND DRILL HOLES E90-1, E90-2, E90-3

FORT STEELE MINING DIVISION

Mobilization/Demobilization out of Edmonton Night and Day Drilling, Box 137, Edmonton, AB T5J 3S2	\$2500
Roadwork, drill pads, standby	\$10000
Drilling (3 holes)	\$11250
Muds and additives	\$1500
Salaries: H. C. Schultze - 20 days @ \$200/day - planning, report writing, supervision	\$4000

TOTAL: \$29250

IN THE MATTER OF
THE B.C. MINERAL ACT
IN THE MATTER OF A DIAMOND DRILLING PROGRAM
CARRIED OUT ON THE LEWIS 22 AND TC2 MINERAL CLAIMS
in the Fort Steele Mining Division of
the Province of British Columbia
More Particularly N.T.S. 82G/13E

A F F I D A V I T

I, H. C. Schultze, of the City of Cranbrook, in the Province of British Columbia, make Oath and say:

1. That I am employed as a Geologist by Cominco Ltd. and as such, have personal knowledge of the facts to which I hereinafter depose:
2. That annexed hereto and marked Exhibit "A" to this my Affidavit is a true copy of expenditures incurred on a diamond drilling program conducted on the Lewis 22 and TC2 claims during September and October of 1990.



H. C. Schultze
Geologist 1

STATEMENT OF QUALIFICATIONS

I, H. C. Schultze, of the City of Cranbrook, British Columbia, do hereby certify:

1. That I am a graduate of the University of Calgary 1988 with a B.Sc. degree, Geology Major:
2. That I am employed by Cominco Ltd. as an exploration geologist:
3. That I have been actively involved in mineral exploration for the past six years.



H. C. Schultze
Geologist 1
Cominco Ltd.

APPENDIX A
DRILL HOLE LOGS AND ANALYSES

Scale

Colour Plot
& Dip

Drill Hole Record



Property	ESTELLA	District	WESTERN	Hole No.	E90-1
Commenced	SEPTEMBER 26, 1990	Location	NORTH GRID LEWIS CREEK	Tests at	NONE
Completed	SEPTEMBER 30, 1990	Core Size	NQ	Hor. Comp.	
Co-ordinates	1760N/1650E	Corr. Dip	-70°	Vert. Comp.	
Objective	To test a 100 mho-plus UTEM conductor	True Brg.	270°	Logged by	HCS
		% Recov.	90%	Date	OCTOBER 1990

From	To	Description
------	----	-------------

0 - 5.48	Overburden
----------	------------

5.48 - 28.96	Gabbro. Fine to medium crystalline, subhedral, dark green hornblende (45%) and calcite (36%) and euhedral biotite (5%), pyrite (2-3%), ilmenite (1-2%), and dolomite (8-10%) forming an anisotropic, felted groundmass parallel to foliation (35° to c/a). Quartz veins varying in width from <1 cm to 20 cm are common and parallel the strain fabric. Malachite and azurite bearing limonitic/pyritic fracture zones exist at 14.33 - 15.0 m and 16.16 - 17.06 m. Chalcopyrite (1-2%) bearing pyrite-quartz veins exist at 17.68 - 17.71 m and 17.98 - 18.10 m.
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** END OF HOLE AT 28.96 M **

Claim	Lewis 22
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T Brg.	270°
--------	------

Collar Dip	-70°
------------	------

Elev.	1360m
-------	-------

Length	28.96m
--------	--------

Hole No.	E90-1
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Sheet	1 of 1
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Property	Estella	District	Western	Hole No.	E90-2
Commenced	October 1, 1990	Location	North Grid - Lewis Ck.	Tests at	---
Completed	October 23, 1990	Core Size	NQ	Corr. Dip	-70°
Co-ordinates	1810 N/1640 E			True Brq.	270
Objective	To test a 100 mho - plus UTEM conductor			% Recov.	85%
					Date October 1990

Feet	Meters	Description
From	To	
0	14.02	Overburden
14.02	14.50	Broken, rubbly core comprising soft, carbonaceous, dark grey argillite. White coarse crystalline vein quartz fragments with <1% Py present in this interval.
14.50	14.55	3 cm wide quartz (80%), Fe-calcite (18%), and pyrite veinlet lies @ 35° to c/a. Adjacent dark-grey argillites are heavily fractured and healed with quartz and Fe-calcite.
14.55	14.85	Light orange weathering, fine grained, greenish/grey wacke(?); fine quartz grains set within an Fe rich carbonate matrix, subhedral pyrite (<1%) up to 2 mm is disseminated throughout. Strong foliation developed @ 20° to c/a.
14.85	23.90	Dark grey, carbonaceous argillite with variably siliceous zones. Faint, wispy, white, very thin, calcareous laminae accentuate bedding. Core is quite rubbly. Bedding to c/a @ 18.25 m is 62°. Small sheared zones parallel to bedding exist and contain 2 - 3% pyrite. Quartz veining on the millimetre scale to that described above is common. Pyritization is intimately associated with the veining and often forms very thin selvages.
23.90	25.50	Fault. Limonitic gossanous zones plus quartz, calcite and intensely sheared and brecciated dark grey, carbonaceous argillite. Shearing to c/a @ 25.6 m is 15°.
25.50	27.13	Rubbly broken core. Dark grey argillite with white, calcareous, wispy laminae.
27.13	31.30	Light greenish/grey wacke(?) very similar to that encountered @ 14.55 m. Pyrite-limonite present as disseminations and also in 1 to 3 mm wide bands parallel to foliation. Foliation to c/a is 28°.
31.30	31.50	Shear zone. Intensely sheared, strained fabric with massive pyrite veining (4 cm wide) along with pyrite and quartz and calcite bands 1 to 3 mm thick.

Claim	Lewis 22
T Brq.	270°
Collar Dip	-70°
Elev.	2360m
Length	181.40 m
Hole No.	E90-2
Sheet	1 of 4

211-0437

Property	District	Hole No.	E90-2
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brq.	Logged by
Objective		% Recov.	Date

Footage		Description
From	To	
31.50	32.72	Felsic intrusive. Alkaline feldspar phenocrysts up to 1 cm suspended within a fine grained chloritic, very calcareous matrix. Pyrite and limonite occur disseminated within and as fracture fill and forms up to 5% of the rock volume.
32.72	34.05	Highly fractured and brecciated carbonaceous argillite. Fractures healed by quartz and calcite in roughly equal proportions. FeS ₂ content is lower than the altered intervals above being on the order of 2 to 3%.
34.05	44.55	Medium bedded dark grey to black carbonaceous argillite with interbedded thin to medium bedded argillaceous, dark grey limestone. Faint, white, wispy calcareous laminae are common. Units locally exhibit an intense strain fabric. Small Fe-calcite/calcite and quartz veinlets are common. Py (1-2%) is typically confined to these vein filled fractures. Bedding to c/a @ 42.2 m is 80°; veinlets typically lie subparallel to c/a while larger veins (1-2 cm) lie subparallel to bedding. A very thin (< 1 mm) red garnet and calcite bearing fracture exists @ 43.3 m.
44.55	44.70	Fault. Lies @ 70° to c/a. Zone comprises approximately 35% quartz, 30% brecciated, carbonaceous argillite plus stylolitic carbon bearing seams, 30% calcite, 3% sericite and 2% pyrite and limonite.
44.70	58.43	Light grey/green, fine grained felsic, chloritic intrusive (resembles an altered sediment); comprises approximately 50% fine grained quartz plus feldspar, 25% chlorite, 15% calcite, 5 - 8% pyrite, 2 - 3% sphene and 1 - 2% ilmenite(?). Texturally the unit is similar to an altered wacke, however, distinct crosscutting relationships exist with varying internal compositions and fabrics. Subhedral to euhedral pyrite commonly forms aggregate and is focused into bands paralleling the foliation throughout the interval. Internally brecciated intervals exist, notably @ 45.93 - 46.43 and 48.41 m. Crosscutting quartz and calcite and FeCO ₃ and pyrite veins and veinlets are ubiquitous.

Claim	
T Brq.	
Collar Dip	
Elev.	
Length	
Hole No.	E90-2
Sheet	2 of 4

211-0437

Drill Hole Record



Property Estella District Western Hole No. E90-3
 Commenced October 25, 1990 Location Tracy Creek Tests at None Hor. Comp. ---
 Completed October 27, 1990 Core Size NQ Corr. Dip Vertical Vert. Comp. 50.90 m
 Co-ordinates True Brg. " Logged by HCS
 Objective To test a shallow Ch. 2 UTEM conductor % Recov. 98% Date October, 1990

From	To	Description
0	12.8	Overburden
12.8	27.35	Thin bedded, medium to dark grey argillite and subwacke; intermittent thin, parallel to wispy laminated light grey bands present. Ankerite porphyroblasts up to 2 mm in width are not uncommon within the argillaceous units. The core within this interval is extremely broken up and weathered. Quartz and calcite veinlets (<3 mm wide) subparallel to bedding or at high angles to bedding are ubiquitous and commonly contain disseminated or aggregates of subhedral to euhedral pyrite. Where these veinlets have been weathered limonite is prevalent. At 23.17 in the bedding to core axis is 85 degrees. Similar high angles are consistent throughout the hole.
27.35	27.58	Felsite dike. Light grey/green; highly siliceous; sub parallel to bedding; comprises approximately 50% fine crystalline quartz, 33% plagioclase, 10% yellowish sericite, 5% mariposite, and 2% pyrite. The unit has a strong anisotropic fabric and sharp chilled contact margins with the adjacent argillaceous beds.
27.58	28.83	Interbedded argillite and subwacke as above. Quartz and calcite veinlets with pyrite common.
28.83	29.0	Felsite dike. Same as dike above only mariposite not evident.
29.0	50.90	This interval comprises thin bedded argillite and subwacke units as described above. Limonitic zones decrease in frequency down the hole while pyrite present in quartz and calcite filled fractures correspondingly increases. These pyrite filled fractures are weakly to moderately conductive over the width of the core. Ankerite(?) porphyroblasts are ubiquitous throughout. Features with notable characteristics are as follows:
37.72		Slumped bed comprising a 2 cm thick interval of thin laminated, light to dark grey subwacke.

Claim	TC 1
T Brg.	
Collar Dip	-90°
Elev.	1610m
Length	50.90 m
Hole No.	E90-3
Sheet	2

Drill Hole Record



Property Estella District Western Hole No. E90-3
 Commenced October 25, 1990 Location Tracy Creek Tests at None Hor. Comp. ---
 Completed October 27, 1990 Core Size NQ Corr. Dip Vertical Vert. Comp. 50.90 m
 Co-ordinates True Brg. " Logged by HCS
 Objective To test a shallow Ch. 2 UTEM conductor % Recov. 98% Date October, 1990

From	To	Description
38.72		Bedding to core axis angle is 87 degrees.
42.70	43.20	Light grey wacke unit with 1 to 2% disseminated subhedral to euhedral pyrite.
49.4	49.8	5 cm thick medium grey argillaceous limestone bed.
50.90		Bedding to core axis angle is 80 degrees.

** END OF HOLE AT 50.90 M **

Claim	TC 1
T Brg.	
Collar Dip	-90°
Elev.	
Length	50.90 m
Hole No.	E90-3
Sheet	2 of 2