BC Geological Survey
Assessment Report
07182

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MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 7182

COMINCO LTD.

SULLIVAN MINE KIMBERLEY, B.C.

X.L. - STONEY GROUPS ASSESSMENT REPORT

The following report describes the results of deepening by drilling, diamond drill hole 6799 from a 749 metre depth to a 1525 metre depth, in the Kimberley area on the X.L. and Stoney Crown-granted mineral claims in the Fort Steele Mining Division.

The N.T.S. location is 82 G/12

Latitude 49° 43' North

Longtitude 116° 00' West

Cominco Ltd., owner of the claims was the operator of the exploration program.

P. Klewchuk is author of this report.

Data of Submission: February, 1979

Endorsed for Release by:

J.M. HAMILTON, P. ENG.
Chief Geologist, Kimberley

INTRODUCTION

i) Specific Location

D.D.H. 6799 is located in the 4000 Scram in Sullivan Mine, Kimberley. Access to the site is through mine workings and requires the approval of the Mine Superintendent. The site itself is likely to remain accessible for a number of years, however, mining may destroy the collar within a year or two. An index map showing also the location of the mine office is attached, Figure 1.

ii) Property Definition

The property being investigated forms part of the Sullivan Mine claim group, owned by Cominco Ltd. Cominco Ltd. has operated the mine for about 71 years. The Sullivan orebody is one of the largest base metal deposits in British Columbia and it has contributed a major proportion of the mineral wealth generated in the province.

iii) The lower portion of one hole is being reported on in this report. The first stage of drilling, to 749 metres, was reported on previously in a submission by geologist P.W. Ransom dated September, 1978. D.D.H. 6799 was drilled from 749 metres to 1525 metres using special NBQ wire-line tools 7.6 cm. in diameter. Core recovered was 3.65 cm. in diameter.

iv) D.D.H. 6799 was collared on the X.L. Crown-granted mineral claim and crossed onto the Stoney Crown-granted mineral claim at a depth of 874.5 metres. The point at which D.D.H. 6799 crossed the claim boundary was determined by comparing survey calculations of the collar of the hole, the surveys of the claims on surface, and down-hole surveys done at 30 to 50 m. intervals with a Sperry Sun Single Shot down hole survey device.

DETAILED TECHNICAL DATA AND INTERPRETATION

I) Purpose

The purpose of D.D.H. 6799 was to test at depth ground directly below the Sullivan orebody adjacent to the zone of tourmalinite alteration in the footwall of the orebody.

ii) Results

No mineralization of economic value was encountered in D.D.H. 6799 from a depth of 749 metres to a depth of 1525 metres. Descriptive logs accompany this report.

iii) Interpretation

749-845.5m Medium, thin and occasionally thick bedded siliceous sediments, mainly wacke with minor subwacke and quartzitic wacke. Some alteration effects of an overlying intrusive gabbro are evident in the upper part of the zone. Short sections of core were lost during drilling.

845.5-848m Brecciated wacke with quartz-calcite-pyrrhotite veining.

848-913m Thin, medium and thick bedded wacke with minor quartzitic wacke, subwacke and argillite. Porphyroblastic development of biotite and feldspar occurs locally. Metamorphic effects of the underlying intrusive gabbro are increasingly evident as the contact at 913m is approached.

913-1064m Moyie instrusive; gabbro

1064-1230.5m Siliceous sediments, predominantly medium, thin and thick bedded wacke, with minor quartzitic wacke, subwacke and

argillite. Alteration effects of overlying and underlying gabbros are evident nearer the contacts. Porphyroblastic development of biotite, commonly with minor phrrhotite, is present-locally.

1230.5-1250m Moyie instrusive; gabbro

1250-1255m Altered siliceous sediments. Medium and thin bedded wacke and subwacke.

1255-1416m Moyie instrusive; gabbro.

1416-1525m Siliceous sediments, predominantly medium, thin and thick bedded wacke with minor quartzitic wacke, subwacke, and argillite. Alteration effects caused by the overlying gabbro are strongly evident near the contact.

The lower part of D.D.H. 6799 from 749 metres to 1525 metres penetrated a normal sequence of Aldridge sediments and Moyie intrusive gabbros.

iv) Conclusions

No economic mineralization occurs in the area of Sullivan Mine footwall sediments penetrated by D.D.H. 6799 from 749 metres to 1525 metres.

The rocks encountered in the coring are typical sediments of the Aldridge Formation that have been intruded and altered by Moyie intrusives.

AUTHOR'S QUALIFICATIONS

As author of this report, I, Peter Klewchuk certify that:

I am employed by Cominco Ltd. as a geologist active in minerals exploration.

I am a graduate of the University of British Columbia with a degree of Bachelor of Science in geology.

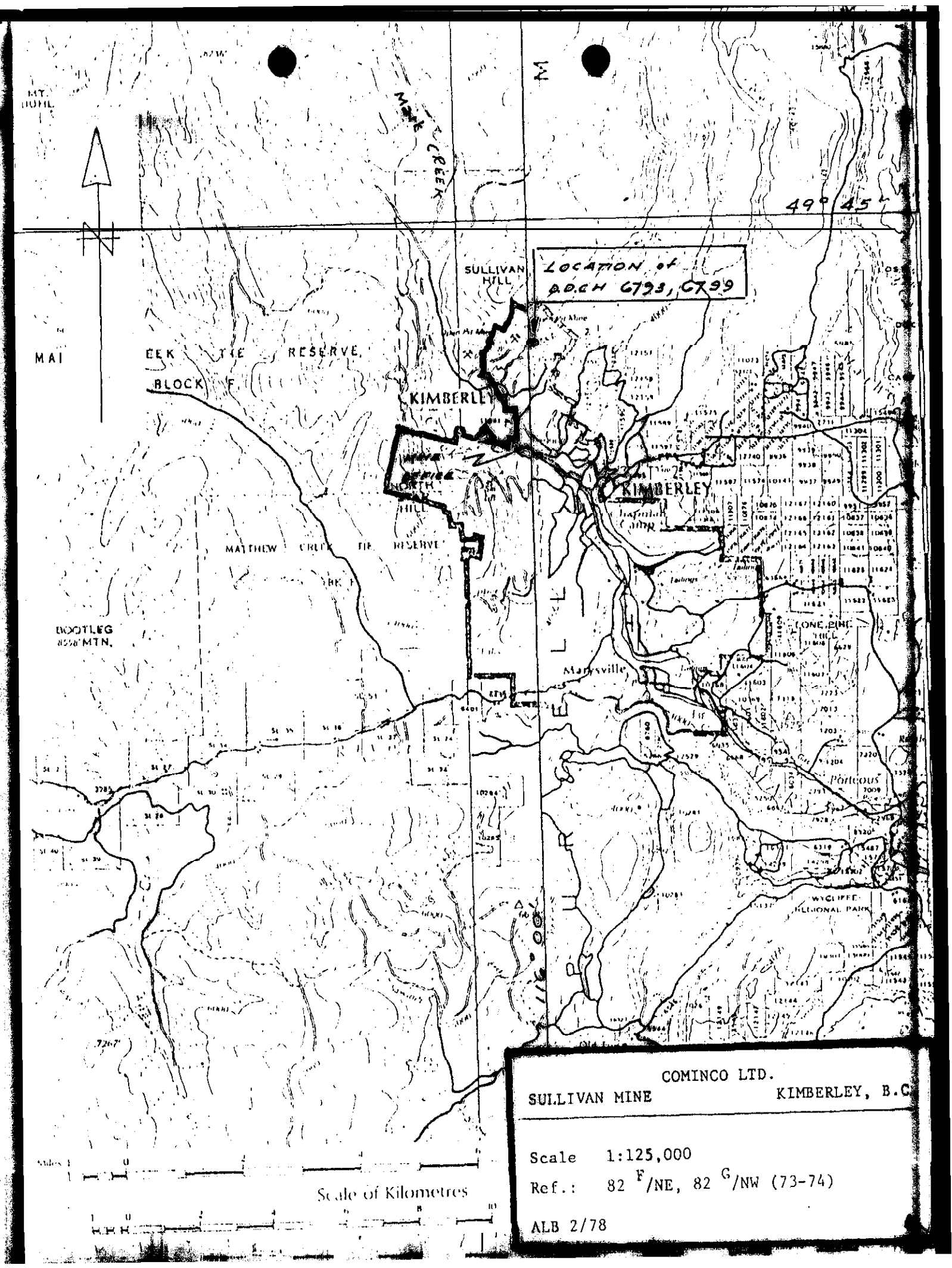
I am a graduate of the University of Calgary with a degree of Master of Science in geology.

I am a member of the Geological Association of Canada.

I have been continuously engaged in mining and exploration geology for the past five (5) years.

Peter Klewchuk

PETER KLEWCHUK
Geologist



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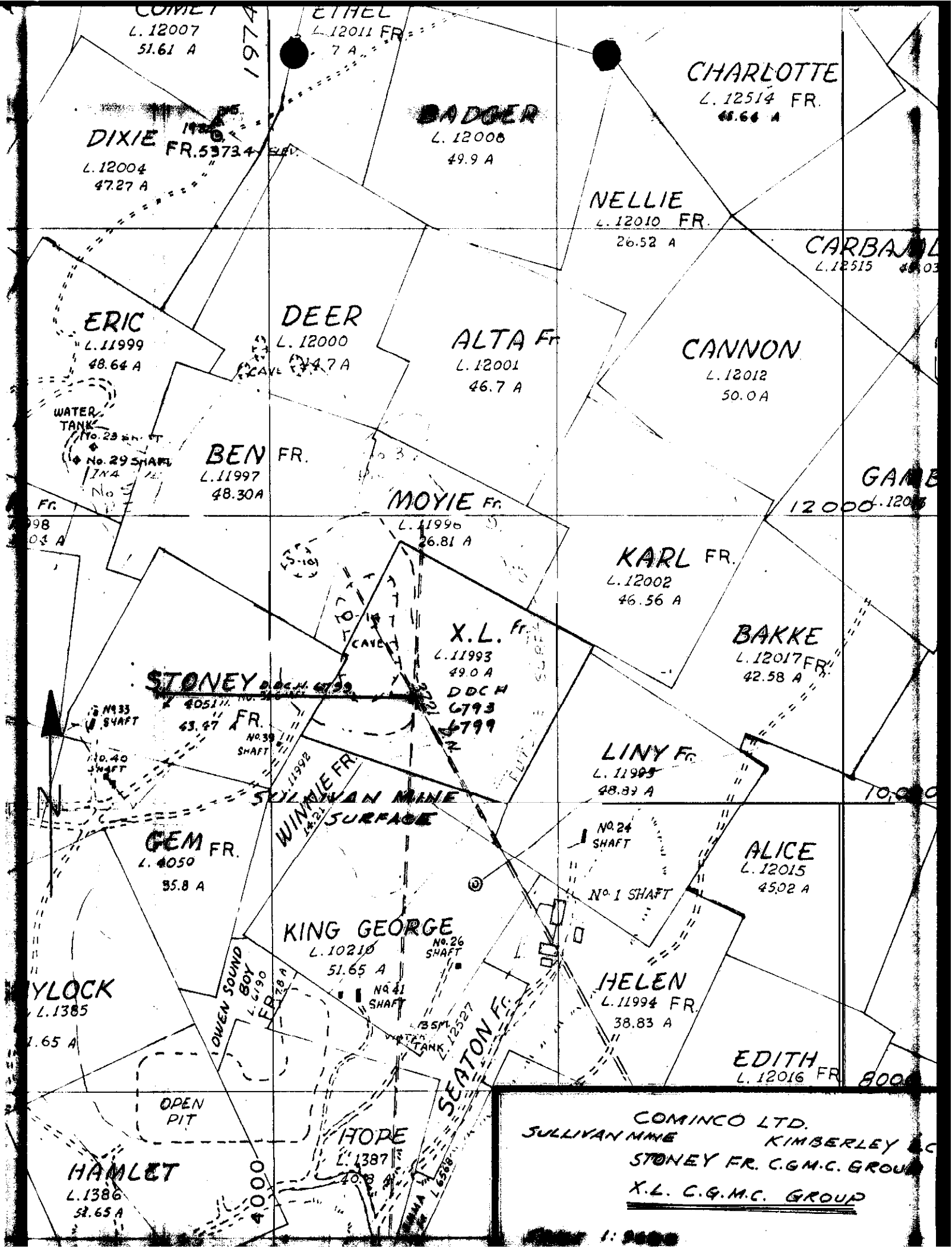
SULLIVAN MINE KIMBERLEY, B.C.

Scale 1:125,000

Ref.: 82 F/NE, 82 G/NW (73-74)

ALB 2/78


COMET
L. 12007
51.61 A
ETHEL
L. 12011 FR.
7 A
CHARLOTTE
L. 12514 FR.
DIXIE
FR. 53734
L. 12004
47.27 A
BADGER
L. 12008
49.9 A
NELLIE
L. 12010 FR.
26.52 A
CARBAL
L. 12515
ERIC
L. 11999
48.64 A
DEER
L. 12000
ALTA Fr
L. 12001
46.7 A
CANNON
L. 12012
50.0 A
WATER TANK
No. 29 SHAFT
BEN FR.
L. 11997
48.30A
MOYIE Fr.
L. 11996
26.81 A
12000
KARL FR.
L. 12002
46.56 A
X.L. Fr
L. 11993
49.0 A
DDCH
6793
6799
BAKKE
L. 12017 FR.
42.58 A
STONEY
4051
43.47 FR.
No. 39 SHAFT
No. 40 SHAFT
No. 33 SHAFT
LINY Fr.
L. 11995
48.87 A
SULLIVAN MINE
SURFACE
WINNIE FR.
GEM FR.
L. 4050
35.8 A
No. 24 SHAFT
No. 1 SHAFT
ALICE
L. 12015
45.02 A
KING GEORGE
L. 10210
51.65 A
No. 26 SHAFT
No. 41 SHAFT
OWEN SOUND BOY
L. 6190
FR. 78 A
HELEN
L. 11994 FR.
38.83 A
L. 12527
SEATON Fr.
EDITH
L. 12016 FR.
OPEN PIT
HOPE
L. 1387
HAMLET
L. 1386
53.65 A
4000
COMINCO LTD.
SULLIVAN MINE
KIMBERLEY
STONEY FR. C.G.M.C. GROUP
X.L. C.G.M.C. GROUP

Diamond Drill Geological Log FOR D.D.H. 6799

Comaco

See also sheet referring to top part of hole 0-2456'

LAT. 10747.31 DEP. 5042.93 ELEV. 4002.02
DIP -68.6° (Collar) AZIM. 271° 28' LENGTH 5003'
HORIZ.COMP. 1100' VERT COMP. 4872.89'
DATE COLLARED: March 23, 1978 DATE COMPLETED: Jan.27/79
CORE STORAGE: Open Pit Core Lab Racks
DRILLED ON CLAIM(S): X-L & Stoney
OBJECTIVE: Skirt zone of tourmalinite; deep test for sulphide mineralization below Sullivan Orebody
PLANNED LENGTH: 5000'
TERMINATION COMMENTS: Hole completed to 5003'. No ore intersected.

DRILLED BY: Tonto to 2456', Heath & Sherwood 2456' to 5003'.
TYPE DRILL: Tonto; Longyear 44; H&S: BBS3 See General Comments
CORE SIZE(S): 0-2164 HQ; 2164-2456 NQ; 2456-5003 NBQ
PERFORMANCE COMMENTS:

See other sheet for Tonto performance.

H&S: Performance was steady although slow at times in fractured sediments. Coring in gabbro was significantly better than in sediments. Decreased productivity in sediments is attributed to NBQ drilling. Difficulties encountered were dealt with in a responsible, professional manner.

CASING REMAINING IN HOLE (LENGTH & SIZE): PW-10' HW-213'
HWL rods 2171' plus N steel wedge/H core barrel 2171'- to 2191'
TYPE OF CAP & METHOD OF SEALING:

OTHER MATERIAL REMAINING IN HOLE: About 255' of N rods left in old hole at 2444' depth; wedged around these with N steel wedge at 2181'.

SURVEY INSTRUMENT USED: Sperry Sun Single Shot

ADDITIONAL DOWN HOLE TESTS: See attached list of surveys (2 pages).

GENERAL COMMENTS:

Tonto's longyear 44 was converted to electric power. H&S used a BBS-3 machine and used diesel power with a scrubber scrubbed fumes were exhausted directly to a mine exhaust circuit. A separate electric motor powered a hydraulic-driven wire-line winch.

Rod string used by H&S was NBQ: outside diam. NQ, core BQ. Rods were thick walled aluminum with steel couplings. O-type tapered box threads. The lower 1300' or so of rods were steel to maintain the rod string in tension during drilling. A weight indicator was used to regulate bit pressure. Rods were each 12' long; a 48' pull was used.

Minor problems & slow productivity by Heath & Sherwood in sediments are attributed to inexperience in drilling Aldridge formation rocks and the NBQ equipment. In sediments, runs were comparatively short with core blocking in the tube.

Baroid mud was used for the lower half of the hole, mud products were mainly quickgel, quickerol and Esso Kut-wel 45.

LOG LEGEND

BED THICKNESS CLASSIFICATION

BEDS	Very Thick Bedded
	100 cm
	Thick Bedded
	30 cm
	Medium Bedded
	10 cm
	Thin Bedded
	3 cm
	Very Thin Bedded
	1 cm
LAMINAE	Laminated
	0.3 cm
	Thinly Laminated

LITHOLOGY ABBREVIATIONS

OQ - Orthoquartzite
QA - Quartz Arenite
QW - Quartz Wacke
QCW - Quartzitic Wacke
W - Wacke
SW - Sub Wacke
AG - Argillite

6799

Diamond Drill Geological Log

Commco

Objective:

Sampled:

Logged By: P. Klewchuk Date: Jan. 1979

Composites:

40 Scale

Color Plot & Dips | Ore Classes

0

Block:	Sect.:	Place:	App. Bear:	App.: Dip:	Length:

From	To	Discard: Reason:
0	2456	Drilled by Tonto Drilling Ltd.
2456	5003	Drilled by Heath and Sherwood Drilling Ltd. Drilling started October 18, 1978, terminated January 27, 1979
2456	2485.5	NBQ size core. Siliceous moderately altered sediments. Med. and thin bedded. Wacke with subwacke bed tops ½ - 1½ cm wide. Subwacke bed topsare light grey-green coloured, bleached. Wacke portion of beds are darker gray. Biotite spotting occurs through most of the interval; minor Po is locally present in association with biotite spotting and as very small veinlets. Core angle: 2458'-60°, 2477'-60°, 2482'-67°.
2485.5	2500	No core retrieved: Mislatched tube with 9' of core in barrel. Rods dropped (1600' of rods 900' in hole) when lowering rods with core tube latched. Caused by hoisting cable breaking.
2500	2517	N standard core, drilled with standard core barrel. 50% core recovery. First piece of N core is breccia with Qtz, calcite, chlorite and slickensides. This may represent a fault but its magnitude cannot be judged due to the large amount of lost core adjacent to this zone. Most of N core is quite broken. Appears to be med. & thin bedded wacke, moderately altered.
2517	2564	NBQ core. Moderately altered siliceous sediments. Med. & thick bedded. Dull gray & light brown coloration caused by alteration. Core is quite hard - siliceous - possibly due also to alteration. Calcite occurs along a narrow

Core Size: NBQ & N STANDARD

Hole No.: 6799

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Diamond Drill Geological Log

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40 Scale

Color Plot & Dips | Ore Classes

Objective:

Sampled:

Logged By: Date:

Composites:

Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:

From	To	Discard: Reason:
		(1 cm) band at 2551'. Elsewhere calcite is present very infrequently along very thin veinlets.
		Some core loss experienced: 2535'-2541' 55% core loss.
		2541'-2543' 50% core loss.
		2543'-2548' 90% core loss.
		Core angle: 2520'-70°; 2525'-54°; 2533'-60°; 2552'-60°; 2563'-60°.
2564	2647	Thin bedded wacke and sub wacke. Occasional medium thick beds. Bleaching alteration is prominant in the zone; much of the core is a light gray color. Locally individual beds are mottled due to alteration. At 2583' a 20 cm zone is calcareous. Small (to 1.5 cm diam.) concretion - like pods of Po are developed in the calcite-rich zone. Po occurs elsewhere in the zone as very small irregular veinlets. Core is moderately broken locally; 2644'-2647' is quite broken. Core angle: 2580'-60°; 2586'-62°; 2602'-65°; 2623'-70°; 2640'-60°;
2647	2648	Core ground.
2648	2774	Wacke. Minor subwacke, possibly minor QCW or QW. Medium and thin bedded. Moderately altered; light bleaching and ? silicification is present. Locally texture is mottled. Biotite spotting is present but not intense. Calcite is present (eg. at 2674') as minor irregular veinlets, but only very locally. Core angle: 2664'-50°; 2686'-63°; 2708'-58°; 2737'-60°; 2772'-80°.
2774	2781	Zone of brecciation. Qtz-calcite-pyrrhotite veining is common. Rock is well annealed. Minor ZnS noted at 2779.5'. Lithology is predominantly wacke, minor Quartz wacke. Alteration is present throughout; biotite + Po

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Objective:

Sampled:

Logged By: Date:

Composites:

Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:

40 Scale

Color Plot & Dips | Ore Classes

From	To	Discard: Reason:
		spotting occurs at 2780.5'. Core here parallels the trend of the Qtz vein-brecciation may be entirely due to the presence of the vein.
2781	2800	Wacke thin and medium bedded. Slight to moderate alteration is evident. Development of biotite and ? feldspar porphyroblasts is common. The felsic 'spots' may be quartz & feldspar. Core angle: 2781'-57°; 2799'-64°.
2800	2813	Wacke Thick and medium bedded. Subwacke or argillite tops are commonly 1-1½ cm wide. Alteration effects are not notable due to more homogeneous nature of the rock as a function of thicker bedding.
		Minor calcite veining (to 5 mm wide) occurs at 2811 within a 3 cm wide brecciated zone. Calcite is otherwise locally present along very minor thin fractures. Core angle: 2805'-72°.
2813	2852	Wacke, minor quartzitic wacke or quartz wacke. Thin and medium bedded. Biotite spotting and feldspar (+ quartz ?) spotting are common. This alteration effect concentrates aggregates of biotite in parts of some beds while concentrating the feldspar porphyroblasts separately from biotite.
		Minor Po is present locally as small irregular blebs. Slight disruption of some bedding planes occurs from 2818' to 2823'. Very weak ZnS mineralization is present at 2838' as small irregular lenses associated with minor po.
		Core angle: 2815'-63°; 2830'-67°; 2847'-67°
2852	2870	Wacke and quartz wacke, thick and medium bedded. Subwacke bed tops are narrow, 1-2 cm thick. Most of this zone is quite siliceous - possibly silicified through

Core Size: NBQ

Hole No.: 6799

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Diamond Drill Geological Log

Cominco

Objective:		Sampled:				40 Scale	
Logged By:	Date:	Composites:				Color Plot & Dips	Ore Classes
Block:	Sect.:	Place:	App. Bear:	.: Dip.:	Length:		
From 0	iscord:	Reason:					

alteration. Color is dark blue-gray. Core angle: 2865'-65°.

At 2869' D.D.H. 6799 crosses the claim boundary from the X.L. Claim to the Stoney Claim.

2870 2883 Wacke thin & med. bedded. Dark blue-gray in color. Moderate to strong alteration is evident. Biotite porphyroblasts (1-2 cm diam.) are present in numerous zones. Minor po occurs in association with the metamorphic biotite. Much of the rock is hardened, presumably through addition of silica. A few small irregular veinlets of po occur near 2870'. Core angle: 2875'-72°.

2883 2951 Wacke and quartz wacke. Alteration masks lithology, but the beds appear to have been mainly wackes and quartz wackes. Mainly thick bedded, with a few med. thick beds & very few thin beds. Moderate to strong alteration is evident by bleached grayish colored zones & general hard nature (silicification ?) of the beds. At 2889' a 20 cm width of core is calcareous - this appears to be a concretionary feature. Locally small zones display evidence of deformation; small fractures often have associated with them minor brecciation.

Core angle: 2893'-68°; 2905'-68°; 2917'-67°; 2939'-72°.

2951 2995.5 Strongly altered sediments. Original lithology probably wacke or quartz wacke. The interval is mainly thick and medium bedded. A grayish color predominates, a bleaching effect of alteration. Narrow zones display minor brecciation, usually with irregular veinlets of pyrrhotite. Pyrite and chlorite are evident in a few small veins & at 2983.5' a small narrow (3 mm) veinlets contains pyrite & sphalerite.

Core angle: 2958'-72°; 2975'-66°; 2991'-70°.

Core Size: NBQ

Hole No. 6799 Page 35

Diamond Drill Geological Log

Cominco

Objective:		Sampled:					40 Scale
Logged By:	Date:	Composites:					Color Plot & Dips / Ore Classes
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:		

From	To	Discard:	Reason:
2995.5	3490	Gabbro.	2995.5'-3009' Relatively fine grained. Sediment -gabbro contact at 2995.5' is at 53° to c.a. The contact is quite sharp with a foliation which may represent flow. Amphibole, feldspar & quartz are the main mineralogic constituents. 3005'-3007' core is intensely shattered.
			3009'-3022' Grain size coarsens from fine-med. grained to coarse grained. Green amphiboles are typically elongate, to 5 mm long near 3022'. Quartz and feldspar are grayish in colour and the gabbro here is green-gray in colour.
			3022'-3149' Coarse-grained. Good igneous texture. No recognized fabric except for local foliation associated with minor fractures. Green amphiboles are up to 1.5 cm long. Biotite is common. Po is a minor constituent. Py is present along some fracture surfaces. Calcareous along some short zones near 3149'. Core from 3086'-3092' is broken-shattered by drilling.
			3149'-3162.5' Mixed zone of coarse-grained gabbro (65%) and coarse grained milky white calcite and grey quartz veins (35%). Vein contacts with gabbro are irregular.
			3162.5'-3166 Med. grained biotite-rich gabbro (70%) and coarse-grained quartz-calcite veins (30%) Contacts are all quite irregular. Med. grained biotite-rich gabbro here is not calcareous.
			3166'-3200' Mixed zone of coarse-grained veins of calcite-quartz (50%) and med. to coarse grained, locally calcareous, gabbro. Contacts are generally quite irregular, with

Core Size

Hole No. 6799

Diamond Drill Geological Log

Cominco

Objective:			Sampled:		
Logged By:	Date:		Composites:		
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:

From | To | Discard: | Reason:

40 Scale

Color Plot & Dips | Ore Classes

minor brecciation of the gabbro at some contacts. Concentrations of biotite occur locally in the calcite quartz veins.

3200'-3243' Med. grained gabbro. Avg.grain size is 1-2 mm. Little variation in the igneous texture is present; grain size is slightly finer closer to 3243'. Small felsic and calcareous veinlets are rare; Pyrrhotite and minor chalcopyrite are present in quartz-calcite veins at 3224' and 3226'.

3243'-3465' Medium and fine-grained gabbro. Little variation in texture occurs across this entire interval. Locally short zones are finer grained or more med. grained. Small quartz veins & calcite veins are scattered through the gabbro here. At 3393' one calcite vein is 1-3 cm wide. At 3449' a 9 cm wide calcite quartz vein contains breccia fragments of the adjacent gabbro.

3465'-3490' Medium and fine-grained gabbro with 2 zones of calcite-quartz veining and minor brecciation. 3465'-3467' and 3480'-3482' are zones of brecciation with quartz-calcite veins. A moderate foliation at 70° to c.a. is developed in the 3480'-3482' zone. There may be included sediments in the 3480'-3482' zone. Gabbro here is mainly med. grained, becoming fine grained from 3478' to 3480' and right at the gabbro-sediment contact from 3489' to 3490'. The lower gabbro contact is fairly distinct at 50° to c.a.

Core Size

Hole No. 6799 Page 37

Diamond Drill Geological Log

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Objective:		Sampled:				
Logged By:	Date:	Composites:				
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:	

40 Scale

Color Plot & Dips | Ore Classes

0

From	To	Discard: Reason:
3490	3536.5	Altered sediments. Fine-grained, siliceous, they appear to have been mainly wacke and quartzitic or quartz wacke. Bed thickness varies; medium thickness is common but thick & thin beds are also present.
		A small shear at 45° (± 20°-radiating) to c.a. occurs at 3490.5'. Otherwise core is only moderately broken, although numerous fractures near-parallel to c.a. do exist. Color is a dull brown-gray with local zones of bleaching. Core angle: 3508'-55°; 3514'-70°; 3524'-71°; 3492'-3499'; 5' core loss. 3511'-3512'; 1' core loss; this core was re-drilled; lost out of core tube. Calcite occurs along narrow fractures.
3536.5	3540	Zone of discontinuous, weakly calcareous laminations. Vague to fairly distinct laminations, dark brown to gray to white in color comprise the entire zone. Bleaching is present along a calcite vein at 3539'. Laminations occur at 71° to c.a. This zone compares favourably in character to a calcareous zone in D.D.H. 5498 at 897'.
3540	3616	Wacke and possibly quartzitic and quartz wacke. Predominantly thick and med. bedded with a few thin beds. Alteration masks lithologies - sediments have been hardened. Grain size is fine or very fine grained. Alteration has also discolored the rock to bleached pale yellow - green - purple colors. Narrow bed tops (usually < 1 cm. thick) are a pale yellowish-gray color.
		A few narrow zones are weakly calcareous & thin fractures occasionally contain calcite. Some biotite spotting is present near 3585'. Minor pyrite occurs along small fractures scattered through the interval, e.g. at 3599'. Po and chlorite occur in small irregular veinlets near 3603'. Core angle 3544'-72°; 3560'-69°; 3577'-64°; 3592'-66°; 3605'-64°.

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Cominco

40 Scale

Objective:

Sampled:

Logged By: Date:

Composites:

Color Plot & Dips | Ore Classes

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Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:

From	To	Discard: Reason:
3616	3675	Wacke and possibly quartzitic and quartz wacke. Medium and thin beds, about equal numbers. Alteration has bleached and hardened the rock. Bed tops (subwacke to argillite) are commonly narrow (< 1.5 cm) and light colored: gray-yellow-pale brown. Most of the rock is altered to a very pale brown color (overprinted on normal dark blue-gray color). Locally bleaching occurs along poorly - defined fractures. Biotite spotting, usually whith Po, is present at a few places. Core is quite broken for about 50% of the interval; numerous fractures sub-parallel to core axis are present. Pyrite &/or chlorite in minor amounts are common on fracture surfaces. Core angle: 3623'-62°; 3634'-68°; 3650'-65°; 3674'-65°.
3675	3686	Wacke mostly med. bedded with a few thick and thin beds. Very fine grained and fine grained; alteration has apparently hardened the rock. Bleaching is present throughout the interval; most noteable at subwacke bed tops & along minor fractures. Very minor biotite spotting is present locally, usually with Po. Core angle: 3678'-57°.
3686	3700	Wacke thin & medium bedded. Quite strongly bleached. Pyrite & chlorite occur on fracture surfaces . Core angle: 3697'-52°.
3700	3752	Altered wacke. Predominantly med. bedded but with numerous thin beds and a few thick beds. Grain size is typically fine or very fine grained. Alteration appears to have hardened the rock such that essentially all of the unit is of a uniform hardness (cf. quartzitic wacke). A pale brown discoloration is present throughout the interval as a consequence of alteration.

Core Size

Hole No. 6799

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7507-

Diamond Drill Geological Log

Cominco

Objective:		Sampled:				40 Scale
Logged By:	Date:	Composites:				Color Plot & Dips / Ore Classes &
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:	

From	To	Discard: Reason:
		Biotite spotting occurs locally, minor Py & chlorite are common along fractures. At 3741.5' a 20 cm zone is weakly calcareous. This zone is irregularly laminated.
		At 3751' a 0.6-1.0 cm wide quartz vein occurs at 20° to c.a. More intense bleaching is associated with the qtz vein. Core angle: 3710'-70°; 3731'-70°; 3750'-64°. Core loss: 3743'-3745': 1.5' core loss.
3752	3763	Wacke, altered. Medium and thin bedded. Subwacke bed tops are 1-4 cm thick and pale gray coloured. Minor biotite spotting is quite common. Core angle : 3759'-69°.
3763	3788	Wacke, Med. bedded, a few thin beds. Light gray subwacke bed tops are few mm to 1 cm thick Alteration is evident by bleaching, biotite spotting and very slight brown coloration. Py and chlorite are evident along fracture surfaces Core angle: 3772'-68°; 3786'-71°.
3788	3877	Wacke with subwacke bed tops. Thin and med. bedded. Alteration is present; light to moderate bleaching throughout, biotite spotting, commonly with minor Po, is quite common, and Py and chlorite are present along numerous fractures. An eye shaped, laminated clast 1.5 x 1 cm in size, is present at 3814'. Composition is wacke. Core is moderately fractured from 3785' to 3798', near 3803', near 3807'. Minor brecciation is present at 3789', 3802', 3815', 3834', 3838'-3839'. Irregular small veinlets of Po and/or Py and chlorite are usually associated with this minor brecciation. A few narrow (3-4 mm) calcite veins occur at 3859'. Core angle: 3798'-69°; 3812'-71°; 3826'-72°; 3850'-72°; 3862'-68°; 3875'-70°
3877	3931	Wacke, minor quartz wacke. Medium bedded, a few thick and thin beds. Lighter gray bed tops are wacke to subwacke composition, usually 5 mm to 1 cm thick.

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Cominco

40 Scale

Objective:

Sampled:

Logged By: Date:

Composites:

Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:

Color Plot & Dips | Ore Classes &

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From	To	Discard: Reason:
		Moderate alteration is evident; the rock appears hardened. Silicification?, chlorite and pyrite are common along small fractures and biotite porphyroblasts are developed locally. Generally alteration appears less intense than in previous interval.
		3880'-3881'; 1' of "crackle breccia". Rock is not broken up but is laced with closely spaced fractures. A few narrow pyrite veins are present. Short zones of similar brecciation are present from 3881' to 3883'.
		A few narrow fracture surfaces contain calcite. Core angle: 3888'-67°; 3896'-73°; 3910'-74°; 3924'-75°; 3929'-73°; 3606'-3609' only ½' core recovered (mislatched core tube).
3931	3969	Wacke, subwacke & argillite. Thin & med. bedded, a few very thin beds. Typically gray or dark milky gray subwacke or argillite bed tops ave. 1-3 cm thick with sharp bedding plane contacts. Minor brecciation occurs very locally Narrow irregular Po & Py veinlets are common in the fractures. Alteration effects are minor; locally recrystallization resulted in weakly mottled texture and a few fractures contain chlorite or calcite. Core angle: 3937'-72°; 3952'-75°; 3965'-74°.
3969	4022	Wacke and quartzitic wacke and/or quartz wacke. Predominantly med. bedded, some thin beds and a few very thin beds. Lighter gray subwacke and argillite bed tops are narrow (usually less than 1 cm thick) and distinct. At 3990' 10 cm of core contains 10-15% Po, as discontinuous laminae. Those laminae are parallel to adjacent beds (75° to c.a.). Minor Po is present also as rounded porphyroblastic concentrations with biotite and ? pink garnets. These 'spots' are 2-8 mm in diam. and are most common from 3995' to 4022'. Pyrite and/or chlorite is common along fracture surfaces. Core angle: 3978'-75°; 3990'-75°; 4002'-75°; 4020'-78°.

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Cominco

Objective:		Sampled:				
Logged By:	Date:	Composites:				
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:	

40 Scale

Color Plot & Dips | Ore Classes &

From	To	Discard:	Reason:
4022	4037	Altered sediments. Wacke with minor quartz wacke and subwacke. Beds appear to be mainly thick and medium in size with a few thin beds. Bedding planes are generally indistinct. 4023'-4029' is quite massive, chloritic pyrrhotitic and biotitic with (?) hornblende. Weak banding and siliceous nature indicates this zone is sediment. 4022'-4023' is quite siliceous with poorly defined grey quartz veins intruding and weakly brecciating the seds. Weak laminations, probably a function of alteration, are present near 4035'. Core angle: 72°-4034'.	
4037	4101	Gabbro; texture and color vary.	
		4037'-4044 Dark gray-black colored, fine-grained, minor Po is common. contact at 4037' is fairly sharp at 70° to c.a.	
		4044'-4092' Medium grained, locally fine grained. Color varies from gray-green to darker gray. Feldspar & quartz comprise est. 40% of the rock. Minor Po is present locally. Minor shearing at 4051' Py and calcite are present. Minor shearing is also evident at 4092' where hornblende crystals associated with the shearing are coarse grained.	
		4092'-4101' Fine-grained, dark gray-green color. Po is more common then in central zone; disseminated and fine-grained.	
4101	4119	Altered sediments. Med. & thin bedded wacke and subwacke. Most of the interval is quite siliceous. Bedding planes are mostly sharp; some are disrupted. Core from 4103' to 4114' is quite broken. Contact at 4101' is at 68° to c.a. Core angle: 4103'-65°; 4107'-65°	

Core Size

Hole No. 6799

Page

Diamond Drill Geological Log

Cominco

Objective:

Sampled:

Logged By: Date:

Composites:

Block: Sect.: Place: App. Bear: App. Dip: Length:

From	To	Discard: Reason:
4119	4645	Gabbro contact at 4119' is at 75° to c.a.
		4119'-4129' Fine to med. grained, dark green color. Feldspar < 10% by volume. Hornblende > quartz.
		4129'-4188' Coarse grained; green hornblende predominates with abundant white feldspar and gray quartz. Mica (biotite or phlogopite) is present locally, < 5%.
		4188'-4190' Foliated zone. 3 biotite-rich bands are present at 4188' 1-3 cm wide at 80° to c.a. The biotite rich bands are separated by narrow bands of quartz and feldspar. The rest of the zone is fine-med. grained, predominantly of horblende and biotite.
		4190'-4246' Coarse to very coarse grained. Hornblende and feldspar are the major minerals to 4220', then Hblde predominates to 4226'.
		4226'-4232' Biotite is the predominant mafic - biotite and feldspar comprise most of the rock. 4232 to 4246 is richer in hornblende with biotite common locally.
		4242'-4246' texture is disrupted by numerous small qtz-calcite veinlets.
		4246'-4248' White qtz-calcite vein with minor chlorite. Contacts are very irregular.
		4248'-4279' Coarse-grained. Hblde & biotite are common mafics, although locally biotite occurs in much lesser amounts. Texture is a fairly uniform coarse igneous texture.
		4279'-4315' Medium to coarse-grained. Hornblende-biotite - Feldspar-quartz composition. Zone from 4291 to 4295 is coarse grained

Core Size

Hole No. 6799

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40 Scale

Color Plot & Dips | Ore Classes & Al

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Objective:		Sampled:				
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Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:	

From	To	Discard:	Reason:

with biotite the predominant mafic. Small irregular quartz veins are present near 4291' (to 3 cm wide).

4315' 4" vein of massive gray quartz.

4315'-4356' Medium grained, locally coarse-grained. Dark green color. Feldspar content is low 10-15%. A few thin calcite veins are present near 4316' and 4321'.

4356'-4382' Similar med. grained, dark green gabbro with low feldspar content but with numerous, commonly irregular qtz. - feldspar veins.

4382'-4425' Med. grained, dark gray-green color. Similar to 4315'-4356' interval. Locally minor enrichment of feldspar is present but commonly feldspar is <10% of the gabbro. A few calcite veins occur.

4425'-4466' Med. grained, dark olive green color. Somewhat coarser-grained near 4462'. Texture is quite homogeneous except for small irregular veins of quartz and feldspar. Narrow shears; 4441'-60°; and 4456'-50°.

4466'-4567' Med. grained, gray-green to dark gray color. Homogeneous, igneous granular texture throughout. 4479-4480 calcareous zone. Gabbro is lighter green color and calcareous, may be a concretionary effect. Small veins of white calcite are present, narrow shear zone (0.5 cm wide) at 4483' at 40° to c.a. at 4508' at 50° to

Core Size

Hole No. 6799

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Color Plot & Dips | Ore Classes & A

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Diamond Drill Geological Log

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Composites:

Block: Sect.: Place: App. Bear: App. Dip.: Length:

From To Discard: Reason:

0 Scale

Color Plot & Dips | Ore Classes & A

c.a. with minor Po and Cpy.

4562' 1 cm wide Qtz vein at 90° to c.a., margins are foliated.

4563' 5 mm wide shear zone at 70° to c.a.

4567'-4568' Quartz vein, brecciated, pale green color, with included irregular patches of med. grained biotite.

4568'-4576' Med. grained, granular gabbro. Green-brown in color. Contains est. 25% biotite.

4576'-4645 Med. grained to fine grained. Predominantly fine grained below 4633'. Color is generally gray-green with minor local variations. 4634-4645' is brown-gray color resulting from abundant biotite.

Irregular gray quartz veins with minor associated brecciation occur near 4578' and 4579'. Narrow calcite and/or quartz veins are common below 4590'. Core is moderately broken from 4602' to 4632' but is good from 4632 to 4645 (contact with sediments).

4645 4655 Altered sediments

Silicified and bleached, pale gray to dark green brown color. Bleaching is most intense along very narrow fractures. Bed thicknesses are not apparent; lithology masked by silicification (probably wacke or quartzitic wacke). 4652.5' to 4654' is dark greenish, chloritic and appears to be chloritic wacke but may be gabbroic. Core angle:4649'-75°

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Cominco

Objective:			Sampled:		
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Color Plot & Dips | Ore Classes & Av

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From	To	Discard:	Reason:
4655	4742	Altered wacke and quartzitic wacke. Thin and med. bedded. Silicification is present throughout, and locally is quite intense (no tourmalinite recognized). Bed tops (subwacke) are commonly narrow (1-3 cm. wide) and light brown-gray color. Bases of beds are typical medium to dark blue-gray color. Moderate bleaching is present, most prominently developed along narrow closed fractures. 4704 to 4707' is quite intensely bleached with gray and light brown discoloration. Small porphyroblasts of biotite (sometimes with Po) are present locally, concentrated along zones in beds parallel to bedding planes; Po also occurs in very minor amounts in small veinlets. Core angle: 4662' - 80°; 4675'82°; 4692'-84°; 4710'-77°; 4716-78°; 4732'-78°; 4740-81°	
4742	4748	6' core ground; no recovery	
4748	4799	Wacke and quartzitic wacke. Medium and thin bedded. Siliceous alteration is present through most of the interval, but generally less intense than 4655'-4742' interval. Bed tops are subwacke to wacke in composition, 2-3 cm. thick. Minor Po and Py occur along thin veinlets; A small bleb of CPY is present at 4749' with Po. Core angle: 4746'-84°; 4762-82°; 4775-83°; 4791-81°	
4799	4839	Wacke, minor Quartzitic wacke and subwacke. Med. and thin bedded, locally very thin bedded and laminated. Color is med. bluish gray and only very minor alteration is evident. Locally Po occurs as narrow veinlets. Core angle: 4804'-84°; 4817-85°; 4833-80°	

Core Size

Hole No. 4799

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Diamond Drill Geological Log

Cominco

Objective:		Sampled:					40 Scale
Logged By:	Date:	Composites:					Color Plot & Dips / Ore Classes & Avg
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:		

From	To	Discard: Reason:
4839	4886.5	Wacke, minor subwacke and quartzitic wacke. Thin and med. bedded. Subwacke to argillite bed tops are light gray in color and generally 1-2 cm thick. 2 med. thick beds near 4860' are quartzitic wacke. Silicification is present near 4839-4840'. Small sections of core are broken throughout the interval. Core angle: 4845'-75°; 4860-76°; 4885'-50°.
4886.5	4890	N Standard core (Cored standard to recover jaw of foot clamp dropped down hole) 2' core recovered. Wacke and quartzitic wacke. Med. bedded. Portions of this interval are very hard, fine grained, quartzitic and are probably quartz arenite.
4890	4936	Wacke, minor quartzitic wacke, subwacke and quartz arenite. Predominantly med. bedded with a few thin and thick beds. Evidence of alteration is present locally throughout most of the interval: pale gray to pink and brown coloration is associated with silicification. 4919'-4920' $CaCO_3$ is present, probably a concretionary feature. A few thin zones e.g. at 4933' are very hard, fine-grained, siliceous. These may be quartz arenites or strongly silicified wackes. Tourmaline does not appear to be present. At 4909' small pinkish garnets are scattered through the core for ~15 cm. Core Angle: 4905'-73°; 4915-80°; 4931'-72°
4936	4940	Only 3" core recovered Quartz arenite or silicified wacke.
4940	4943	Appears to be a single quartzitic wacke bed. Bed top is not present; Core ground.

Core Size

Hole No. 6799

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Diamond Drill Geological Log

Cominco

Objective:			Sampled:			40 Scale
Logged By:	Date:		Composites:			Color Plot & Dips / Ore Classes &
Block:	Sect.:	Place:	App. Bear:	App.: Dip.:	Length:	

From	To	Discard:	Reason:
4943	4961	Quartzitic wacke. Medium and thick bedded. Color is dull brown-gray, may be caused by alteration. A number of short zones are calcareous; a few of the calcareous zones are laminated. Generally the calcareous zones (2 cm - 10 cm wide) are light gray in color. Core Angle: 4955'-77°	
4961	4990'	Wacke, minor subwacke and quartzitic wacke or silicified wacke. Med. and thin bedded with a few very thin beds. Narrow (2 - 3 cm. wide) light gray calcareous zones are present within the lower half of the interval. Calcite occurs also along fracture surfaces and as tiny veinlets. Locally coarse grained Py occurs with calcite in fractures. Core Angle: 4968'-76°; 4987-78°	
4990	4992	Single Quartz wacke or quartzitic wacke bed.	
4992	5003	Wacke Med. bedded with numerous calcareous zones. The calcareous zones comprise about 25% of the interval. Cross bedding is present in 3 zones near 4999' and 5000'. All the cross bedded zones are calcareous. Core Angle: 4998' - 78°	

P. Klewchak

Core Size

Hole No. 6799

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2507-

Diamond Drill Geological Log

Cominco

Objective:

Sampled:

Logged By: Date:

Composites:

40 Scale

Color Plot & Dips | Ore Classes & Ave

Block: | Sect.: | Place: | App. Bear. | App. Dip. | Length:

From | To | Discard: | Reason:

D.D.H. 6799 Sperry Sun Single Shot Surveys, 2456' - 5003' (Drilled by Heath & Sherwood)

Depth	Azimuth	Dip	
2535'	272.5°	-78.4°	90° compass unit
2697'	261°	-78.3°	20° compass unit
2888'	267°	-78.4°	20° compass unit
3081'	267°	-78.7°	20° compass unit
3256'	267°	-78.9°	20° compass unit
3400'	264°	-79.4°	20° compass unit
3775'	289°	-78.3°	20° compass unit
4075'	263°	-77.6°	20° compass unit
4608'	259°	-77.1°	20° compass unit
4999'	275°	-80.6°	20° compass unit

Core Size

Hole No. 6799

Page

Diamond Drill Geological Log

Cominco

Objective:

Sampled:

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App. Bear.:

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From

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Discard:

Reason:

40 Scale

Color Plot & Dips

Ore Classes & Aver

LIST OF SURVEYS, SPERRY SUN SINGLE SHOT

DEPTH	AZIMUTH	DIP
COLLAR	271° 23'.	-68.6°
90'	280° (?)	-69.5°
212'	273°	-71.3°
332'	272.5°	-72.5°
441'	273°	-72.4°
572'	272°	-72.5°
700'	270°	-72.8°
802'	269°	-73.5°
902'	266°	-74.5°
946'	265°	-74.8°
995'	263.5°	-75.6°
1060'	265°	-76.0°
1120'	264°	-76.2°
1180'	264.5°	-76.3°
1265'	264°	-77.0°
1387'	259.5°	-77.0°
1502'	265.5°	-76.8°
1603'	266°	-78.3°
1702'	267°	-79.3°
1805'	265.5°	-79.7°
1891'	272°	-80.4°

DEPTH	AZIMUTH	DIP
1999'	271°	-80.6°
2100'	270°	-81.0°
2220'	276°	-81.4°
2323'	282°	-82.5°
2373'	271°	-82.6°

REDRILL: "NEW" HOLE BELOW N WEDGE ON H ROD STRING:

2222'		-79.5°
2257'	-	-79.3°
2326'	-	-79.6°
2424'	-	-78°
2454'	272°	-78.4°

Core Size

Hole No.

6799 & 6799 REDRILL

Page

2567-

COMINCO LTD.

SULLIVAN MINE

KIMBERLEY, B.C.

COST SUMMARY
DDCH 6799

NOTE:

This underground deep core hole was stopped in July 1978 at a depth of 2,456 feet. A Statement of Exploration Costs to that date was submitted and approved September 25, 1978 on Notice to Group No. 2031. Drilling resumed in October 1978 and was completed in January 1979. Expenditures far this period are as follows:

			Dollars	
FOOTAGE				
2456 - 2645'	Invoice	7037	$ 4,317	
2465 - 3183'	Invoice	7065	12,993	
3183 - 3664'	Invoice	7088	12,959	
3666 - 4114'	Invoice	7095	13,256	
4114 - 4612'	Invoice	7140	16,189	
4612 - 5015'	Invoice	7147	13,529	
				$ 73,243
MOBILIZATION/DEMOB	Invoice	7037 7174		21,585
HOURLY CHARGES				
Invoice 7037			301	
Invoice 7065			2,720	
Invoice 7088			620	
Invoice 7095			261	
Invoice 7147			346	
				4,248
MATERIALS				
Invoice 7088			1,968	
Invoice 7140			1,856	
				3,844
CORE BOXES 100				430
Cominco Geological Supervision (3-1/2 mos. x $2,000)				7,000
Cominco charges for Engineering expertise, site preparation, and maintenance during the drill programme.				16,642
TOTAL COST				126,992
COST/FOOT				49.86

This hole crossed the X.L. Fr. (L 11993)/Stoney Fr. (L 4051) claim boundary at the 2869 foot mark. Expenditures have been apportioned to each group on a cost per foot basis.

X.L. Group	2456'	to	2869'	=	413'	@	$49.86	=	$ 20,592 — DHC 13
Stoney Fr.	2869'	to	5003'	=	2,134'	@	$49.86	=	$106,400 — AR 7184
			TOTAL	=	[illegible]'				$126,992

416-364-7301

suite 908, 40 univ[illegible] avenue,
toronto, ontario, M5J 1T1

November 7th, 1[illegible]

to Cominco Limited,
Trail,
British Columbia,
V1R 4L8

Invoice No. 70[illegible]
D.O. 267
Project No. 78-[illegible]78

In account with

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms net cash 15 days after date of invoice

hole no.

to cover diamond drilling for the period Oct 15 - 31

from	to	footage completed	rate	
Underground diamond drilling at Sullivan Mine, Kimberley, B.C. Your rof: S-16281L				
Mobilization				
-. To mine portal 50% of lump sum ($14,800.00)				✓ 7,4[illegible]
-. From mine portal to drill site.				
Oct. 15th		32 man hrs.		
Oct. 16th		32 ✓		
Oct. 17th		40 ✓		
Oct. 18th		15 ✓		
		119 man hrs.	25.80	✓ 3,[illegible]
Drilling				
2456	2500	44	21.35	✓ 9[illegible]9
2500	2645	145	23.30	✓ 3,3[illegible]8
Delays				
Oct. 27 (Night)	Blasting	2 rig hrs. ✓		
Oct. 28 (Day)	Blasting	1 ✓		
		3 rig hrs.	60.80	✓ 1[illegible]2
Tropari Test				
Oct. 28 (Day)		1 rig hr. ✓	67.00	✓ [illegible]7
Extra Travel Time				
Oct. 26 (Day)	Scoop tram blocking drift	2 man hrs. ✓	25.80	✓ [illegible]1
				$15,0[illegible]

Copy back to purchasing Trail
with approval Nov 22/78

e. & o. e.

suite 908, 40 university ave

toronto, ontario, M5J 1T1

November 21, 197

to Cominco Limited,
Trail, B.C.
V1R 4E8

COPY

Invoice #7065
D.O. 267
Project No. 78-

in association with

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms: net cash/10 days after date of invoice

hole no.

to cover diamond drilling for the period Nov 1 - 15

from	to	footage completed	rate		
Underground diamond drilling at Sullivan Mine, Kimberley, B.C.					
Your Ref. S-16281L					
2'645	3000	355	23.30	8,271.50	
3000	3183	183	25.80	4,721.40	12,992

Tropari Tests

Nov. 3 (day)	(2717')	1-1/2 rig hrs.		
Nov. 8 (day)	(2900')	1-1/2 rig hrs.		
Nov.13 (day)	(3000')	1 rig hr.		
		4 rig hrs. @	67.00	268

Delays

~~Nov. 3~~	~~(grave)~~	~~No power~~	~~4 rig hrs~~		~~out~~
~~4~~	~~(day)~~	~~" "~~	~~8 " "~~		~~out~~
8	(day)	Blasting	1 " "		
8	(aft.)	No ventilation	3 " "		
	(grave)	" "	2-1/2 rig hrs.		
10	(day)	Blasting	1 rig hrs.		
13	(grave	sheave wheel breakdown	1 " "		
14	(day)	" "	8 " "		
	(aft.)	" "	8 " "		
	(grave)	" "	8 " "		
15	(day)	" "	8 " "		
			~~50 1/2~~ 40½ rig hrs. @	60.80	2 462 ~~3,070~~

Materials
Drilling mud - to be charged later

$16,331
608
15,72

Nov 3 & 4 10 Rig hours to be removed
$ 608.00

COPY

ne 416-364-7301

suite 908, 40 university a[illegible],
toronto, ontario,
M5J 1T1

telex 06-2[illegible]62

December 6th, 197[illegible]

to Cominco Ltd.,
Trail B.C.,
V1R 4L8

Invoice No. 708[illegible]
D.O. 267
Project No. 78-[illegible]

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms: net cash 15 days after date of invoice

hole no.

to cover diamond drilling for the period

from	to	footage completed	rate		
Underground diamond drilling at Sullivan Mine, Kimberley, B.C.					
Your Ref: S-16281L					
November 15th-30th, 1978					
3183	3500	317	25.80	8,178.60	
3500	3666	166	28.80	4,780.80	12,959.[illegible]0
Tro-Pari Tests					
Nov. 21 (day) (3256', 3400') 2 rig hrs. 67.00					134.[illegible]0
Delays					
Nov. 20 day	No power	3 rig hrs.			
Nov. 23 day	Ventilation problems	3			
Nov. 30 day	Scoop trams in drift	~~5 1/2~~			
aft.	Scoop trams in drift	1			4[illegible]4
		~~12 1/2~~ 8 rig hrs.	60.80		~~7[illegible]~~
Materials					
Drilling Mud - Thiessen invoice		#4285		205.80	
		#4369		589.47	
Trac Fluids		#6696		980.00	
				1,775.27	
Plus 12%				213.03	1,98[illegible]
					15,841.70
~~Deduct Cominco Invoice # 139~~					~~-34[illegible]~~
					15,49[illegible]
~~Less 15% Holdback~~					~~2,3[illegible]~~
					~~$13,16[illegible]~~
					$ 15,568.[illegible]

Copy only

Pay

Thank you

e.&o.e.

Memorandum
For Use Within The Company Only

Cominco

To Purchasing (Maureen Lessier) Date Dec. 21, 1978
(Use Title if Possible)

From Geol. Technician (JWC) File No.
(Use Title if Possible)

Subject INVOICE ADJUSTMENTS Reference

The following adjustments should be made to the attached invoice and then it is okay for payment. These have been discussed with D. Lapinskie, Branch Superintendent in Calgary.

1. Delays: Nov. 30 Scooptram in drift reads 5-1/2 rig hrs
   Should read 1 rig. hour.
2. Remove "Deduct Cominco Invoice K139 $348.16".
3. Remove "Less 15% Holdback $2324.03".
   Pay $15,568.10.

JWCartwright:bk
Sullivan Mine
Dec. 21, 1978
cc: File

Invoice 7088
Nov 15-30
To Travel Dec 21/78

Signed

Telephone 416-364-7301

Telex 06-22627

suite 908, 40 university avenue,

toronto, ontario,
M5J 1T1

December 27th, 1978

Cominco Limited,
Trail B.C.
V1R 4L8

Invoice No. 7095
D.O. 267
Project No. 78-078

COPY

in account with

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms: net cash 15 days after date of invoice

hole no.	to cover diamond drilling for the period					
	from	to	footage completed	rate		
	Underground diamond drilling at Sullivan Mines, Kimberley, B.C.					
	Your Ref: S-16201-L					
	December 1st-15th, 1978					
	3666	4000	334	28.80	9,619.20	
	4000	4114	114	31.90	3,636.60	13,255.80
	Pre-Pari Tests					
	Dec. 5th (day) (3775')		1 rig hr.			
	Dec. 15th (day) (4100')		2			
			3 rig hrs.	67.00		201.00
	Delays					
Dec. 14	(Aft.) No power		1 rig hr.	60.80		60.80
	Materials					
	Drilling mud - Thiessen Invoice #4285					
	Quick Gel		40 only 50 lb. bags			
	Thiessen Invoice #4369					
	Quick Gel		50 only 50 lb. bags			
	Quik Trol		160 kg.			
	Frac Fluids Invoice #6696					
	Poly-Drill		490 lbs.			
	(above mud charged on our invoice #7088)					
						$13,517.60

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E. & O. E.

suite 908, 40 university m

toronto, ontario, Feb. 2, 1979
M5J 1T1

to Cominco Limited,
Trail, B.C.
V1R 4L8

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Invoice #7147
D.'O. 267
Project No. 78-07

9.00

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms net [illegible] days after date of invoice

hole no.

to cover diamond drilling for the period

from	to	footage completed	rate	
Underground Diamond Drilling at Sullivan Mine, Kimberley, B.C.				
Your Ref. S-16281-L				
January 16th - 31st, 1979				
4612	5003	391	34.60	13,52[illegible]60
Tro-Pari Tests				
Jan. 16th (day) ✓(4605')		1 rig hr.		
27th (aft.) ✓(5000')		1 rig hr.		
		2 rig hrs. @	67.00	1,3[illegible]00
Delays				
Jan. 22 (aft) Blasting		1 rig hr.		
23 (aft) "		1 rig hr.		
25 (day) No electricity		1/2 rig hr.		
27 (day) No water		1. rig hr.		
		3-1/2 rig hrs. @	60.80	21[illegible]
Demobilization				
- From drill site to mine portal				
Jan. 28		72 man hrs.		
29		72 " "		
		144 man hrs.	25.80	3,71[illegible]20
- From mine portal to H. & S. warehouse				
		50% of lump sum (14,800.00)		7,4[illegible]
				$24,9[illegible]

to balance forward
4/2/79

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suite 908, 40 university avenue,
toronto, ontario,
M5J 1T1

January 22nd, 1979

to Cominco Limited,
Trail, B.C.
V1R 4L8

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Invoice No. 7140
D.O. 267'
Project No. 78-078

in account with

heath & sherwood drilling

DIVISION OF
CHALLENGER INTERNATIONAL SERVICES LTD.

terms net cash 15 days from date of invoice

hole no.

To cover diamond drilling for the period

from	to	footage completed	rate		
Underground diamond drilling at Sullivan Mines, Kimberley, B.C.					
Your Ref: S-16281-L					
January 1st-15th, 1979					
4114	4500	386	31.90	12,313.40	
4500	4612	112	34.60	3,875.20	16,188.60
Materials					
Drilling mud - Thiessen Invoice #4449					
Quick Gel		80 only (50 lb. bags)			
Quick Trol		150 kg.		1,657.43	
Plus 12%				198.89	1,856.32
					$18,044.92

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