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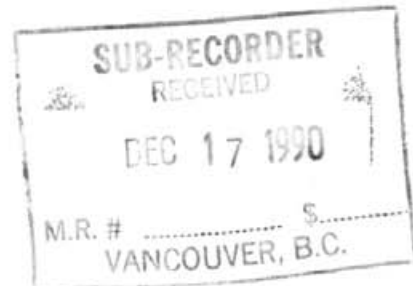
**ASSESSMENT REPORT**  
on the  
**1990 DIAMOND DRILLING PROGRAM**  
Chu 1-3 (9019, 9110, 9112)  
CC 1-3, CC 10-11 (1154, 1373, 1374, 1459, 1460)  
CH-1 (1461).

**KAMLOOPS MINING DIVISION**  
NTS 92P/8E

Lat 51°22'N Long 120°04'W

Owner and Operator:

Minnova Inc.  
3-311 Water Street.  
Vancouver, B.C.  
V6B 1B8



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

20,670

Dave Heberlein.  
November, 1990.

## TABLE OF CONTENTS

	<u>Page No.</u>
<b>1. INTRODUCTION</b>	
1.1 General.	1
1.2 Location and Access.	1
1.3 Topography and Climate.	1
1.4 Property History.	2
1.5 Work Done.	2
<b>2. CLAIMS</b>	3
<b>3. GEOLOGY</b>	3
3.1 Regional Geology.	3
<b>4. DIAMOND DRILLING</b>	5
4.1 Program Summary.	5
4.2 Results.	6
<b>5. SUMMARY AND CONCLUSIONS</b>	11
<b>6. REFERENCES</b>	12

### LIST OF APPENDICES

Appendix I	Diamond Drill Logs and Analytical Results.
Appendix II	Statement of Costs.
Appendix III	Statement of Qualifications.

### LIST OF FIGURES.

Figure 1.	Location Map.	1
Figure 2.	Claim Group Configuration.	3
Figure 3.	Drill Hole Location Map - CC-11 Grid.	5
Figure 4.	Drill Hole Location Map - Deposit Area.	8

## 1. INTRODUCTION

### 1.1 General:

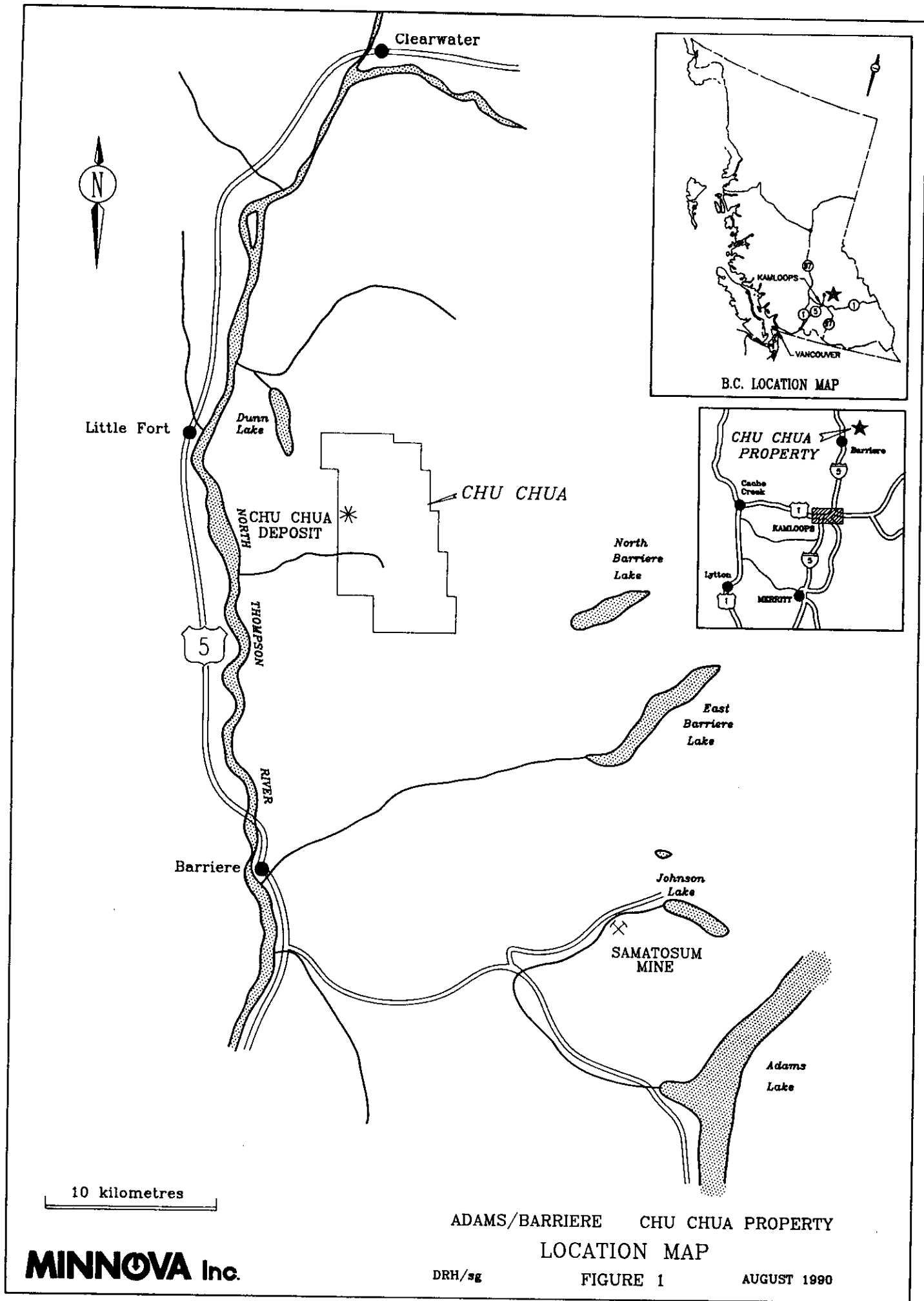
The Chu Chua property is part of a large land position held by Minnova Inc. in the Barriere area of south-central B.C. The claims cover rocks of the Mississippian to Permian Fennell Formation (Schiarizza and Preto, 1987) that host a significant pyritic massive sulphide deposit on the east flank of Chu Chua Mountain. Currently, the mineral inventory of the deposit stands at 2.7 million tonnes grading 1.67% Cu, 0.31% Zn, 7.4g/T Ag and 0.31g/T Au. In addition to the massive sulphide there is also an estimated 500,000 tonnes of massive talc and magnetite mineralization. At the time of writing, the deposit is considered to be sub-economic.

### 1.2 Location and Access (Fig. 1):

The Chu Chua property lies at the headwaters of Birk, Chu Chua and Cowell Creeks, approximately 24 kilometres northeast of Barriere, B.C.. Access from Barriere is via the paved Barriere Lakes Road, the North Barriere Lake and Birk Creek logging roads. A 4x4 dirt road from the end of the Birk Creek road provides access to the Chu Chua deposit. A network of logging roads provides good access to the southern property area.

### 1.3 Topography and Climate:

Physiographically, the claim area lies within the Adams Plateau; an area typified by rolling mountain country dissected by steeply incised valleys.



**MINNOVA Inc.**

ADAMS/BARRIERE CHU CHUA PROPERTY  
LOCATION MAP

DRH/sg

FIGURE 1

AUGUST 1990

Much of the southern and central claim area (south of Chu Chua Creek) has a relatively subdued topography (Fig. 2). Here, elevations range from 1250 to 1400m. North of Chu Chua Creek, relief is more pronounced with elevations ranging from 1500m at the western claim boundary to just over 2000m at the top of Green Mtn. Due to the elevation of the property, the work season is restricted to the period between late June and mid October. Throughout the rest of the year access is prevented by heavy accumulations of snow. Annual temperatures range from a minimum of -30 °C in winter to +30 °C in summer.

Vegetation cover varies from dense spruce, pine, and cedar stands at lower elevations to subalpine and alpine above 1800m. Much of the south and central portions of the property have been clear-cut logged.

#### 1.4 Property History:

A massive sulphide occurrence was discovered on the CC-1 claim in 1978 by Craigmont Mines Ltd. Between 1978 and 1984, Craigmont carried out linecutting, soil geochemistry, geological mapping, VLF-EM, magnetometer, and HLEM surveys over various parts of the property. Over 6000 meters of diamond drilling was completed on the deposit and a Dighem AEM survey was flown over the area in 1979. Minnova Inc. (then Corporation Falconbridge Copper) acquired the property in August, 1985. Exploration of the deposit area continued with diamond drilling, soil sampling, rock geochemistry and various geophysical surveys.

#### 1.5 Work Done.

The 1990 diamond drill program consisted of eight drill holes totalling 1731.9m. Three of these holes were drilled on the CC-1 claim close to the deposit (CC-1 Claim, Fig. 2). The remainder were

drilled on the CC-11 claim on a geophysical target (Fig. 2).

## 2.0 Claims.

Claim and grouping configurations are illustrated in Figure 2 and claim data is summarized in Table 1 below.

**TABLE 1. CHU CHUA CLAIM GROUPING**

CLAIM	REC #	UNITS	EXP. DATE
<b>GROUP A</b>			
CC-1	1154	16	03/02/2000
CC-2	1373	4	08/22/2000
CC-3	1374	3	08/22/2000
CC-10	1459	20	10/24/1995 <sup>#</sup>
CC-11	1460	20	10/24/1996
		<b>TOTAL UNITS 63</b>	
<b>GROUP B</b>			
CHU 1	9109	10	01/11/2000 <sup>*</sup>
CHU 2	9110	6	01/09/2000
CHU 3	9112	15	01/13/2000
CH-1	1461	20	10/24/1995 <sup>#</sup>
CC-1	1154	16	03/02/2000
CC-10	1459	20	10/24/1995
		<b>TOTAL UNITS 77</b>	

\* Assuming acceptance of this report.

# Unchanged

## 3. GEOLOGY

### 3.1 Regional Geology:

The Chu Chua property is underlain by rocks of the Mississippian to Permian Fennell Fm. (Schiarizza and Preto, 1987). Two litho-structural packages make up the Fennell Fm. These are called the upper and lower divisions. The lower division forms a north-south belt that extends from the Barriere River fault in the

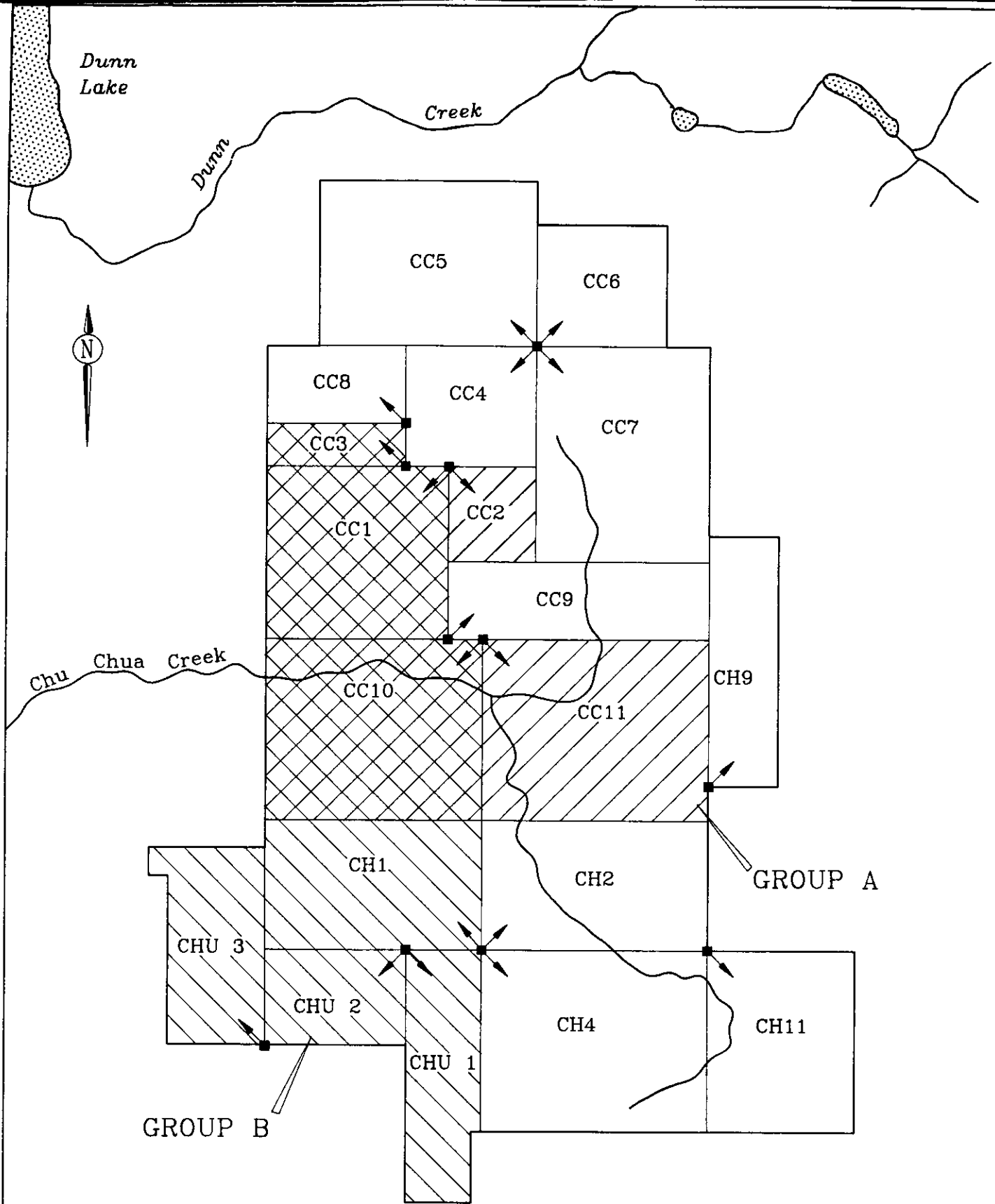


FIGURE 2  
 CHU CHUA OPTION  
 CLAIM GROUP CONFIGURATION

south to Clearwater in the north. It is composed of a complexly interbedded and thrust imbricated sequence of massive basalt, clastic metasediments (greywackes and argillites), ribbon cherts, quartz-feldspar phyric rhyolite and intraformational conglomerate.

The upper division underlies most of the property area and hosts the Chu Chua deposit. It consists of pillowed to massive basalt flows, diabase sills, argillite and rare chert. These rocks can be traced from Barriere as far north as Wells Grey Park. They are responsible for the rugged cliff exposures on either side of the North Thompson River Valley between Little Fort and Clearwater.

Both divisions of the Fennell Fm. are intruded by the Cretaceous Baldy batholith, which forms a prominent easterly trending mountain range to the northeast of Barriere.

Deformation in the Fennell formation is not intense. Units have been rotated into a vertically dipping west facing homocline that is interpreted to be the western limb of a thrust-dismembered anticline (Schiarizza and Preto, 1987). There is little evidence for mesoscopic folding and penetrative fabrics are mostly absent. Late, north and east trending (Tertiary ?) normal faults cause local offsets of the Upper Fennell stratigraphy.

A west-dipping thrust fault is inferred to separate the upper and lower divisions of the Fennell Fm. This is based on conodont ages determined from chert beds in both divisions. The Lower Fennell sequence is also inferred to be thrust imbricated based on fossil data (Schiarizza and Preto, 1987).

Both Fennell Fm. divisions are regionally metamorphosed to lower greenschist facies. Close to the contact of the Baldy Batholith (within approximately 500m) the regional metamorphism is



overprinted by a contact thermal aureole. Locally this reaches hornblende hornfels grade. Despite the metamorphism, primary textures are well preserved in both volcanic and sedimentary units.

#### 4. DIAMOND DRILLING

##### 4.1 Program Summary

A diamond drilling program consisting of eight holes, totalling 1731.9m was carried out between August 1st and November 10th, 1990. Drilling was performed by Paragon Drilling Ltd. of Kamloops, B.C., using a skid-mounted Val Dor 3000 diamond drill and NQ rods. Drill core was logged by D. Heberlein, T. Clarke and A. French at Minnova's warehouse in Barriere. The core is also stored at that location.

Drill hole locations are shown in Figure 3 and 4 and summarized in Table 2 below:

TABLE 2. DIAMOND DRILL HOLE LOCATIONS

<u>HOLE</u>	<u>NORTHING</u>	<u>EASTING</u>	<u>ELEV.</u>	<u>AZIMUTH</u>	<u>DIP</u>	<u>DEPTH</u>
MCC-55	7300mN	11000mE	1538m	270°	-50°	203.6m
MCC-57	7198mN	11100mE	1532m	270°	-50°	181.7m
MCC-58	7000mN	11100mE	1546m	270°	-50°	48.1m*
MCC-59	7000mN	11160mE	1553m	270°	-50°	183.5m
CCF-60	10400mN	9900mE	n/a	090°	-50°	100.9m
CCF-61	10200mN	9975mE	n/a	090°	-60°	200.9m
CCF-62	9600mN	9518mE	1685m	090°	-50°	813.2m
<b>TOTAL</b>						<b>1731.9m</b>

\* **Hole abandoned.**

n/a Not Available at time of writing.

##### 4.2 Results.

Drill holes MCC-55 to MCC-59 were drilled on the CC-11 claim to test a strong, coincident EM and magnetic anomaly (Fig. 3). Results are as follows:

**MCC-55:** This hole was drilled to test a second, short strike length EM conductor (A2 -Fig. \*). It was collared in a sequence of interlayered pillow basalt flows and diabase sills. Both units were

found to contain traces of finely disseminated pyrrhotite. At 157.8m silicified and weakly sericitized wackes were encountered. From 173.3 to 203.6m the hole intersected a magnetic, plagioclase phyrlic diabase sill containing up to 30% magnetite. This unit differs from the sills encountered higher in the hole and in previous holes. It explains the magnetic anomaly between conductors A1 and A2 (Fig. 3).

**MCC-56:** This hole was drilled to test the altered sediment-sill sequence identified in holes MCC 52 to 55 for potentially mineralized horizons. Pillow basalts and diabase sills were present from the base of the casing (18.9m) to a depth of 70.0m. From 70.0 to 80.9m, a sequence of interbedded cherts and graphitic siltstones was present. The argillaceous intervals in the sequence were altered by a distinctive stockworking of sericitic veinlets that were found to contain traces of disseminated pyrite and pyrrhotite. A plagioclase phyrlic basalt flow (or diabase sill) and hyaloclastic sediment interval separate these sediments from a second, narrow cherty interval located between 88.9 and 92.6m. Bedded pyrite (1-3%) with traces of chalcopyrite characterize this unit. A narrow (15cm) section of semi-massive sulphide with approximately 3% chalcopyrite was noted between 90.28 and 90.42m. A fault terminates the mineralized chert at 91.5m.

A third sedimentary section was intersected between 169.3 and 171.1m. Well bedded quartz wackes, quartzites and cherts dominate this section. They are weakly sericitized in places and contain no significant mineralization.

**MCC-57:** This hole was drilled 100m to the south of MCC-56 to test the continuity of the banded sulphide horizon found in that hole. Again, the hole was collared in a pillow basalt-hyaloclastic sediment-diabase sill sequence (24.4 to 105.4m). Cherts and argillites were encountered from 105.4 to 109.8m and 118.7 to

128.8m. The well bedded pyrite was not noted in either of these intervals. Elevated pyrite contents (to 2%) were noted in intensely bleached cherts in the uppermost sediment section. Below 128.8m the hole diabase was present to the end of the hole (142.6m).

**MCC-58:** This hole was drilled 200m to the south of MCC-56 to test the continuity of the mineralized chert horizon. The hole was abandoned in bad ground at 48.16m. Diabase was the only lithology encountered.

**MCC-59:** This hole was drilled 60m to the east of MCC-58 to test the same bedded sulphide unit. A well bedded sequence of pillow basalts, pillow breccias and laminated interflow sediments was intersected between 15.4 and 131.9m. A massive cherty unit was encountered between 131.9 and 134.75m. As with other cherts intersected in this area, it was extensively veined by numerous sericitic stringers. Pyrite was present as disseminated crystal aggregates (to 1%) in the stringers. Chlorite was also abundant as a patchy alteration and in late cross-cutting stringers. Diabase, with brecciated sections was present to the end of the hole at 183.5m. The bedded sulphide horizon was identified in the hole.

Drill holes CCF-60 to CCF 62 were drilled in the deposit area (Fig. 4). Results are:

**CCF-60:** This was one of three holes drilled in the deposit area (Fig. 4). The target was the possible northern extension of a high grade copper intersection (8.52% Cu over 1.6m) obtained by Craigmont on line 103+00mN in the early 1980's. Pillow basalts were intersected from the base of the casing (at 5.18m) to a depth of 30.07m. This interval contained a narrow zone of inter-pillow chert and chert healed pillow breccia between 14.2 and 14.6m. The target horizon was intersected between 30.1 and 34.9m. No massive sulphides were present. Instead, however a distinctive sequence of

maroon and grey-green, banded cherts was present. No significant sulphide was noted.

Silicified tuffaceous sediments were also encountered from 34.9 to 47.0m. Up to 10% pyrite was present in this interval as disseminations. Traces of chalcopyrite were also noted. More siliceous sediments were found between 75.0 and 87.1m. Here intense iron carbonated spotting was noted in addition to the silicification. Disseminations, stringers and bands of pyrite (to 20%) were present over the lowermost 3m of this interval. Below this, the hole remained in pillow basalt to its end at 100.9m.

**CCF-61:** This hole was drilled into the footwall of the Chu Chua deposit to test a zone of intense silicification, brecciation encountered by an early Craigmont drillhole (CC-5). The hole collared in the hangingwall of the North Lens and penetrated the massive sulphide from 21.9 to 48.9m (assays are listed in Appendix I). In the footwall, the target zone was not intersected. The hole remained in interlayered pillow basalt flows and pillow breccias to its end at 200.9m.

**CCF-62:** This hole was drilled to the south of the Chu Chua Main Lens to test a deep massive sulphide target discovered by Craigmont in the early 1980's. Pillow basalt, pillow breccia, interflow sediment, and diabase sills were intersected from the base of the casing at 7.0m to a depth of 697.7m. From 697.7 to 724.4m a strongly albite and epidote altered pillow breccia was encountered. This unit is characterized by intense chloritization of the pillow cores and albite epidote alteration of the pillow rims. One to three centimetre veinlets of albite-epidote and maghemite pervade the upper part of the interval.

A narrow diabase sill cuts the altered pillow breccia between 704.0 to 706.5m. Below this, from 708.3 to 709.6m, the breccia is

intensely silicified and cut by numerous anastomosing stringers of pyrite (10 to 30%) and chalcopyrite (1 to 2%). This zone grades down into more chloritized pillow breccia containing disseminated and blebby pyrite (to 20%) and massive sulphide (pyrite) clasts up to 3cm in length. From 714.75 to 715.2m massive sulphide consisting of fine grained, brecciated pyrite (>70%) and chalcopyrite (<3%) was encountered. This intersection is rimmed by albite-epidote suggesting that it is a large breccia clast. Assays of 1.37% Cu and 4.1% Zn were returned from this interval (Appendix 1).

Less altered pillow basalt breccias continued to 732.7m. Here, a narrow bed (to 4cm) of laminated pyrite was encountered. A lower zone of semi-massive pyrite was also noted between 773.9 and 775.6m. This interval is typified by intense chloritization (as stringers) and patchy silicification of the pillow basalt. Sulphides occur as diffuse bands of fine-grained, semi-massive pyrite up to 15cm in thickness. From 775.6m to the end of the hole at 813.2m, alteration intensity and sulphide content gradually diminish to background levels.

## **5. SUMMARY AND CONCLUSIONS.**

The 1990 diamond drill program on the Chu Chua property set out to test a coincident EM and magnetic anomaly on the CC-11 claim. The EM anomaly was explained by a sequence of wackes, graphitic argillites and cherts that form a restricted sedimentary interval in the Upper Fennell stratigraphy. Significant alteration (sericitization and silicification) of the sediments and the presence of a bedded pyritic chert unit in MCC-56 indicate a favourable massive sulphide environment. Additional exploration is warranted to better define the relationship of the sediment package to the Chu Chua horizon. Evaluation of the strike and down dip potential of the mineralized chert horizon is also recommended.

The intention of the drilling in the deposit area was to test specific targets in the footwall and on the plane of the mineralization. Holes CCF-60 and CCF-61, did not identify any additional mineralization as was hoped. Drill hole CCF-61 did provide an additional, shallow intersection of the North Lens. This will help in refining the mineral inventory of the deposit.

CCF-62 did produce positive results. It demonstrated that the Chu Chua massive sulphide horizon persists down to the 1250m level. It also identified a zone of zinc rich massive sulphide; something that has not been seen to date at Chu Chua. Additional deep drilling in this area is recommended to determine the size and economic potential of the zinc mineralization.

#### **6. REFERENCES.**

Schiarizza, P., and Preto, V.A., 1987, Geology of the Adams Plateau-Clearwater-Vavenby Area: B.C. Ministry of Energy, Mines, and Petroleum Resources, Paper 1979-2, 88 pages.

**APPENDIX I**  
**STATEMENT OF COSTS**



**STATEMENT OF COSTS**

**DIAMOND DRILLING**

Direct Drilling Costs (1731.9m @ \$66.75/m) (Paragon Drilling Ltd.).....	\$115,624
Water Truck: (Gallant Trucking):.....	\$8,978

**ANALYTICAL COSTS**

Min-En Labs, North Vancouver, B.C: (** Litho Samples @ \$***/sample) (** Assays @ \$**/sample).....	\$1,509
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**PERSONNEL**

D. Heberlein - Senior Project Geologist 25 days @ \$200/day.....	\$5,000
A. French - Project Geologist 25 days @ \$150/day.....	\$3,750
T. Clarke - Field Geologist 15 days @ \$135/day.....	\$2,025
S. Frazer - Core Splitter 15 days @ \$105/day.....	\$1,575

**LOGISTICS**

Vehicles:.....	\$1,870
Food and Accomodation:.....	\$2,700
Sample Shipment:.....	\$400

**MISCELLANEOUS COSTS**

Drafting and Computer Time:.....	\$100
Supplies:.....	\$175
Travel Expenses:.....	<u>\$1,500</u>

**TOTALS**

**\$145,206**

**APPENDIX II  
DIAMOND DRILL LOGS AND  
ANALYTICAL RESULTS**

HOLE NUMBER: MCC-55

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CC11 ZONE  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-11  
LOCATION: CC-11 GRID

PLOTTING COORDS GRID: CC-11  
NORTH: 7300.00N  
EAST: 11100.00E  
ELEV: 1523.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 203.60m  
START DEPTH: 0.00m  
FINAL DEPTH: 203.60m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: September 1, 1990  
DATE COMPLETED: September 4, 1990  
DATE LOGGED: September 5, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NO

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST A2 DEEPEM ANOMALY AXIS.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
29.90	-	0° 0'	ACID	-	-	-	-	-	-	-	-
84.70	-	0° 0'	ACID	-	-	-	-	-	-	-	-
139.60	-	0° 0'	ACID	-	-	-	-	-	-	-	-
160.00	-	0° 0'	ACID	-	-	-	-	-	-	-	-
203.60	-	0° 0'	ACID	-	-	-	-	-	-	-	-
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HOLE NUMBER: MCC-55

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 23.80	«CASING»					
23.80 TO 157.80	«PIL. BASL +DIABASE»	<p>Lt green-dark grey. Fine to coarse grained. Pale green pillow basalts intruded by numerous grey diabase dykes/sills.</p> <p>‡32.0-33.9‡ «Diabase» Dark grey. Med grained diabase with irregular but sharp contacts running subparallel to c.a.</p> <p>‡41.2-42.5‡ «Diabase» Green-grey. Med to coarse grained. Mottled black on dark green pyroxene phyrlic diabase. Phenocrysts uniform in size, approximately 1-2mm size.</p> <p>‡52.7-58.0‡ «Diabase» Grey/green. Med grained. Mottled black &amp; green diabase.</p> <p>‡74.4-81.0‡ «Diabase» Grey-green. Med grained. Mottled black &amp; green diabase</p> <p>‡90.0-91.5‡ «Diabase» Green. Med grained speckled diabase; are grain size is 1-2mm. Upper and lower contacts are difficult to determine as they seem to be gradational (grain size &amp; colour) into pillow basalts.</p> <p>‡96.0-102.0‡ «Bleached Pillow Basalt» V. pale grey. Fine grained. Bleached and veined pillow basalt. Abundant hyaloclastic bx. 5cm vein at 97.7m oriented at 05 to c.a.</p> <p>‡117.0-118.0‡ «Pyroxene Diabase» Dark green. Coarse grained. Pyroxene phyrlic diabase; phenocrysts up to 5mm size now corroded &amp; chloritized. Upper contact marked by calcite/fe-carbonate vein @ 35 to c.a.</p> <p>‡125.4-126.2‡ «Bleached» V. pale green, bleached, «Qtz-flooded» bslt. Lower contact marked by qtz vein @ 05 to c.a.</p>	<p>05</p> <p>35</p> <p>05</p>	<p>Green schist metamorphism, particularly evident in the diabase where alteration of primary minerals to chlorite/epidote is noted. Randomly oriented «qtz-carb str.» &amp; veins.</p> <p>‡Mod to Strong Carb alt‡ Qtz-carb veining. Qtz + calcite, dolomite, Fe-dolomite, &amp; siderite.</p> <p>«Qtz flooded» Epidote rimmed qtz flooding.</p>	<p>«Tr Po» as 3-5mm blebs and disseminated along fractures and pillow selvages.</p>	<p>Pale green pillow selvages common &amp; easily visible. Occasional triple junctions in pillowed bsalts. Good core recovery (~90%).</p>

HOLE NUMBER: MCC-55

DRILL HOLE RECORD

LOGGED BY: T. CLARKE

PAGE: 2

HOLE NUMBER: MCC-55

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		129.2-129.9} «Qtz-Dol Veining» Qtz-dolomite veining in diabase-looking rock; may actually be med grained pillow bslt. Veins 4-5cm wide, oriented @ 50 to c.a.	50	«Qtz-dol» veining.		
157.80 TO 168.50	«WACKE»	Med - dark grey. Fine grained. A sequence of finely laminated to brecciated wackes. Upper contact marked by 30cm bleached, siliceous, and sericitized zone with the contact @ 60 to c.a. BEDDING @ 163.3M BEDDING @ 168.0M	60 60 45	Qtz flooding/veining + sericitization in upper 30cm. Patchy lt sericitization (both pervasive and along fractures).	«Py tr» as 1-2mm cubes - looks diagenetic.	
168.50 TO 173.30	«SILICEOUS SEDIMENTS»	Lt grey. Fine grained. Lt grey siliceous sediments. Essentially massive and devoid of any primary textures except for rare sericitic bands. BEDDING @ 170.8M	45	Silicification(or silica remobilization in chert?). Lt sericitization. «Sil + Ser»		
173.30 TO 184.80	«DIABASE»	Dark green, med to coarse grained diabase. Original pyroxene phenocrysts up to 10mm size are now highly corroded and chloritized.		Green schist metamorphism has largely altered primary minerals to chlorite & epidote. Randomly oriented calcite stringers.		Mag anomaly? Broken core at upper contact.
184.80 TO 191.40	«BRECCIA»	Dark green-black. Fine to coarse grained. This looks like a depositional breccia (possibly auto-breccia?) which has later been faulted. Faulted sections are marked by healed fault breccia/gouge and Qtz-carb veins; some vein contact @ 50 to c.a. The autobreccia(?) consists of dark grey-black, 0.1-3.0cm clasts in a lighter green chloritic matrix; breccia is mostly clast supported. Upper contact marked by vein breccia @ 05 to c.a.	50 05	«Qtz-carb str.»	Py tr in veins.	
191.40 TO 197.80	«FELDSPAR PHYRIC»	Lt to med grey. Fine to med grained. Lt to med grey feldspar phyric diabase; a fairly uniform unit.				
197.80 TO 203.60	«BRECCIATED »	Black. Fine grained. Brecciated black rock, fairly fine grained. Most of interval is weakly magnetic; some sections are highly magnetic. A light brown mineral speckled throughout magnetic sections.			«Mt 10-30%, Py tr» Disseminated mt & py plus fracture coating py.	

HOLE NUMBER: MCC-55

DRILL HOLE RECORD

LOGGED BY: T. CLARKE

PAGE: 3

HOLE NUMBER: MCC-55

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		END OF HOLE.				

HOLE NUMBER: MCC-55

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc	
	0.00	0.00	0.00							

HOLE NUMBER: MCC-55

ASSAY SHEET

PAGE: 5

HOLE NUMBER: MCC-55

GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Ba %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb
BCD30034	160.00	163.00	3.00																					
BCD30035	200.00	201.00	1.00																					



HOLE NUMBER: MCC-56

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CC11 ZONE  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-11  
LOCATION: CHU CHUA

PLOTTING COORDS GRID: CC-11  
NORTH: 7098.00M  
EAST: 11042.00E  
ELEV: 1538.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 181.66m  
START DEPTH: 0.00m  
FINAL DEPTH: 181.66m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: September 5, 1990  
DATE COMPLETED: September 7, 1990  
DATE LOGGED: September 8, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE (24.38)  
CORE STORAGE: BARRIERE.

PURPOSE: To test EM conductor A1 on line 7100N.

Hole intersected 15cm of semi massive sulphide

DIRECTIONAL DATA: with significant chalcopryrite mineralization.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
24.30	-	-50° 0'	ACID	OK		-	-	-	-	-	
66.40	-	-50° 0'	ACID	OK		-	-	-	-	-	
153.00	-	-49° 0'	ACID	OK		-	-	-	-	-	
181.66	-	-50° 0'	ACID	OK		-	-	-	-	-	
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HOLE NUMBER: MCC-56

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 18.90	«CASING»					
18.90 TO 60.60	«PIL. BASL + HYALO BX.»	Dark Green. Fine grained. A well preserved sequence of pillow basalts and hyaloclastic sediments. For the most part the flows are massive, becoming pillowed close to the brecciated flow tops. Pillow rims are typically amygdaloidal. Vesicles are chlorite filled. †32.9-34.05† «Hyalo Bx» Hyalo Bx. Pale green, interflow sediments consisting of pillow debris in a matrix of curvi-linear glass shards and rounded mafic granules. Pillow clasts are angular to sub-rounded and range up to 10mm in length. †37.3-39.1† «Hyalo Bx.» Hyalo Bx Pillow fragments are more common. †50.4-51.9† «Pillow Bx.» Pillow Bx. Rounded pillow fragments form a clast supported breccia. Clasts contain numerous pillow rims. They are poorly sorted and range in size from 10 to 80mm. †57.3-60.35† «Fault»		Slight bleaching noted in places.		
60.60 TO 67.50	«PF PHYRIC DIABASE»	V. Dark Green. Medium Grained. Strongly porphyritic rock typified by 25-30% 1-3mm plagioclase phenocrysts in a medium grained melanocratic groundmass. Some of the feldspars exhibit ophitic intergrowths with the ferromagnesian minerals.  †65.9-66.4† «Chilled Margin» A dark grey fine grained to aphanitic margin to the porph. diabase. Rock has a siliceous aspect, almost hornfelsic in texture.		Patchy epidote throughout.		
67.50 TO 68.50	«BRECCIA»	Med. Grey. A highly unusual banded of "bedded" breccia. The rock is characterized by rectangular parallel aligned rectangular shaped clasts of cherty material in a fine grained siliceous matrix. The clasts seem to have been cherty beds that have been pulled apart. Towards contacts of the interval the fragments become chaotically rotated into a true breccia. BANDING @ 68.0m	35	Bleaching.	«Py tr.-1%, Po tr.» as disseminated crystal aggregates up to 8mm across.	Possibly a disrupted cherty sediment.

HOLE NUMBER: MCC-56

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN.

PAGE: 2

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
68.50 TO 70.00	«PF PHYRIC DIABASE»	Dark Grey. Med. Grained. A finer grained version of the above diabase interval.				
70.00 TO 80.88	«CHT+ARG»	Black to Yellow Grey. Fine Grained. Interbedded cherts and graphitic argillites. Cherts make up 60 % of the interval. They occur as massive beds up to 80 cm in thickness. These are interbedded with finely laminated graphitic argillites and grey siltstones. Laminations are on a 2 to 10mm scale. {70.7-71.7} «Mas. Chert» {71.7-76.4} «Graphitic Arg.» Well laminated on a 2 to 5mm scale. LAMINATION @ 72.7m {76.4-80.88} «Chert» Poorly banded to massive chert with sericitic numerous sericitic veinlets. These cut the banding at a shallow angle.	87	Cherts lower in the interval are cut by sericitic stringers containing patches of chlorite. Later Qz and Chl str. cut the Ser veins. «Qz-Chl str.»	«Py tr, Po tr»  «Py tr» as subhedral diagenetic ? crystals up to 12mm across.	
80.88 TO 85.60	«PF PHYRIC BASALT»	Dark green. Med. grained feldspar phyric basalt flow that grades down hole into laminated tuffaceous sediment.		Within 50cm of the lower contact the basalt is bleached and cut by numerous Qz-Carb stringers. These are concentrated in the tuffaceous sediments. Chlorite str. are abundant close to the contact.	«Py tr.» as finely disseminated crystals.	
85.60 TO 88.90	«HYALO TUFF»	Med. Green. Medium to coarse grained. A banded or bedded tuffaceous sediment unit containing numerous basalt and diabase clasts. BANDING @ 87.4m	35	Qz-Carb stringers with bleached envelopes cut earlier chlorite str. Larger Qz veins, i.e. at 87.3m contain bands of chloritic material parallel to the vein contact. Bright green mica (fuchsite?) is present on fracture surfaces.		
88.90 TO 91.60	«PYRITIC SEDS»	Pale Yellow-Grey. Fine grained. A well laminated sediment comprised of fine grained cherty beds up to 30mm in thickness. The rock has a yellow to grey colour due to varying sericite contents. Near the base of the unit coarser clastics are noted. These are fine grained quartz sands. Pyritic beds and laminae occur at irregular intervals throughout this unit. Finely disseminated pyrite is also present. BEDDING @ 90.7m {90.28-90.42} «SMSX» An interval of concentrated sulphide bands and stringers. Pyrite bands reach	75	Pervasive sericite. This may be an original component of the rock as it seems to be restricted to some beds. «Int. Ser»	«Py 1-3%, Cp tr» Sulphides occur as bands, laminae and fine disseminations.	AN EXHALITE?? Samples: BCD 30036 88.9-90.4 Trace analysis. BCD 30037 90.4-91.9 Assay BCD 30038 91.9-91.6 Trace analysis.
					«Py 35%, Cp 1%»	

HOLE NUMBER: MCC-56

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		20mm in width. These contain rounded (possibly framboidal) Pyrite grains. Chalcopyrite occurs as cross cutting stringers				
91.60 TO 92.60	«FAULT»	A highly sheared and fractured zone composed of chloritic material - possibly after diabase.				
92.60 TO 143.80	«DIABASE»	Dark Green. Medium Grained. A monotonous section of massive, homogeneous diabase. †118.6-118.9† «Qz-Carb Vein» †119.6-120.4† «Qz-Carb Str. Zone» †128.1-129.2† «Sil. Zone» Pale Grey. Broken silicified zone. †132.7-135.4† «Fault Bx.» Angular frags in a partly healed fault breccia. Clasts partly rotated. Average size - 25mm. Calcite and dol form a partial matrix. Vuggy cavities noted.	12	Sparce Qz-Carb veinlets. Epidote str. noted at 104.5m  Chlorite selvages.  Calcite and Dol. form a cement to the breccia. †132.7-135.4† «Cal-Dol Cement»	«Py tr» in Qz str.	
143.80 TO 169.30	«DIABASE»	Dark Green. A disrupted interval of diabase. The unit is cut by several late faults, some with well developed gouges.		Abundant «Qz-Carb str.» with irregular shapes and orientations. Near to the faults chlorite is more abundant.		
169.30 TO 171.10	«CHT+QTZT»	Grey. Fine to medium grained. A siliceous sedimentary interval composed of two units; an upper massive grey chert and a lower laminated quartz arenite of quartzite. LAMINATION @ 170.8m †169.3-170.4† «Mas. Chert» †170.4-171.1† «Quartzite» A laminated sili-clastic sediment showing evidence of loading. This indicates tops up hole ??	60	«Sericite str.», sheets and late Qz str «Qz-Dol str.»	«Py tr.»	

HOLE NUMBER: MCC-56

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN.

PAGE: 4

HOLE NUMBER: MCC-56

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
171.10 TO 181.66	«DIABASE»	Dark Green. Same as the above diabase unit. †172.6-175.2† «Bleached» 179.8-180.2 Silicified Yellow-Grey. †181.1-181.66† «Fault Gouge» END OF HOLE.		Bleached locally over narrow intervals These zones are weakly silicified. Pervasive silicification and sericitiza tion. No veins present. †179.8-180.2† «Strong Sil.»	«Py tr.»	

HOLE NUMBER: MCC-56

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS											COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc						
BCD30037	90.28	90.42	0.14	1.020	.01	.01	.01	9.0	1.02	0.01	0.01	9	0.01		

HOLE NUMBER: MCC-56

ASSAY SHEET

PAGE: 6

HOLE NUMBER: MCC-56

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb
BCD30036	88.90	90.28	1.38														1.1	10	285	699	23	1	28	1
BCD30038	90.42	91.60	1.18														0.8	13	208	246	24	2	21	4

HOLE NUMBER: MCC-57

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CC11 ZONE  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-11  
LOCATION: CC-11 GRID

PLOTTING COORDS GRID: CC-11  
NORTH: 7198.00N  
EAST: 11100.00E  
ELEV: 1537.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 142.64m  
START DEPTH: 0.00m  
FINAL DEPTH: 142.64m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: September 7, 1990  
DATE COMPLETED: September 9, 1990  
DATE LOGGED: September 10, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST MINERALIZED HORIZON LOCATED BY MCC-56.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
81.60	-	-50° 0'	ACID	ok		-	-	-	-	-	
107.50	-	-50° 0'	ACID	OK		-	-	-	-	-	
142.64	-	-49° 0'	ACID	OK		-	-	-	-	-	
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HOLE NUMBER: MCC-57

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 24.38	«CASING»					
24.38 TO 105.40	«PIL. BSLT + BX»	<p>Dark green. Medium green massive to pillowed flows. Served repeating flow sequences are present. Flow bases are typically medium grained &amp; homogeneous. This grades up into paler, finer grained basalt &amp; eventually into a narrow pillowed interval. Pillow breccia and/or hyaloclastic sediment separates flows. Coarser porphyritic flows also noted. These superficially resemble diabase, but still exhibit the pillowed top. Individual flow units average 4.5m in thickness.</p> <p>‡53.1-54.85‡ «Pil Bx» Med to dark green. Coarse grained. A fragment supported pillow breccia. Rounded clasts up to 50mm across float in pale green, fine grained matrix. Clasts range from equant to elongate. Pillow rims can be identified.</p> <p>‡62.6-67.4‡ «Pil Bx»</p> <p>‡71.0-73.45‡ «Pil Bx»</p> <p>‡76.5-77.6‡ «Pil Bx»</p> <p>‡86.8-90.2‡ «Pil Bx»</p> <p>‡92.9-93.5‡ «Hyaloclastic Sed»</p> <p>‡101.5-105.4‡ «Bleached» Med brown. Fine grained massive basalt.</p>		<p>«Weak qtz-dol str.»</p> <p>Exhibits a pale brown alteration. Towards lower contact it is bleached to a coffee colour. Rock is distinctly harder than the normal basalt.</p>	<p>«Py tr» as fine str.</p> <p>«Py tr»</p>	<p>Litho across alt. contact.</p>
105.40 TO 109.80	«CHERT + ARG»	<p>Pale grey. Fine grained. A well bedded sequence of cherts and argillites. Beds are on a 3-5cm scale. Cherty beds are massive and unlaminated. A strong penetrative cleavage is developed in the argillaceous units.</p> <p style="text-align: right;">BEDDING @ 106.4m CLEAVAGE @ 106.9m</p> <p>Cleavage implies a folded sequence. Bedding steeper than cleavage =&gt; overturned.</p>	60 12	Intense bleaching and sericitization of the seds. Cherty beds show unaltered remnants which are dark grey to black.	«Py 2%» as diss. crystals up to 5mm.	Chert beds could be silicified wackes => turbidite.

HOLE NUMBER: MCC-57

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 2

HOLE NUMBER: MCC-57

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
109.80 TO 118.70	«DOLOMITIZED DIABASE»	Pale grey. Med grained. A massive, grey, mottled textured rock with little in the way of structure. This unit appears to consist almost entirely of medium grained carbonate. It does not stain blue however, on a scratched surface it fizzes with acid => dolomite. (Fe deficient). The protolith of this unit is difficult to determine. The mottled appearance and its stratigraphic position suggest that it is or was a diabase.		Dolomite replacement of a diabase protolith. Rare qtz str. «Int. Dol»	Traces of py in qtz str. also a possible sphalerite @ 116.7m.	
118.70 TO 128.80	«CHERT + ARG»	Grey to black. Fine grained. Interbedded or layered sequence of black argillite and pyritic chert. This interval has been highly broken by a fault zone, so that its original width has been distorted. FAULT CONTACT @ 128.8m Much of this interval is now a fault breccia. ‡119.9-120.0‡ «Gouge» ‡121.6-122.2‡ «Graphitic Gouge» Black to grey.	25	Bleaching is the only recognizable alteration.	«Py tr-1%» Occurring as diss crystal aggregates and perhaps bands in some chert frags.  «Py 3%»	
128.80 TO 142.64	«DIABASE»	Green. Med to fine grained. Typical medium grained diabase. This unit is highly faulted over the 5m of the interval. Lower down it is moderately fractured and veined by qtz and fe-carb. ‡128.8-129.3‡ «Fault» Bright green. Crushed zone partial gouge. ‡140.2-141.5‡ «Qtz-Dol Vein» White. A massive qtz-dol vein. UPPER CONTACT @ 140.2m LOWER CONTACT @ 141.5m  END OF HOLE.	19 20	Bleaching and chloritization near the fault. Development of fuchsite also at upper contact of unit.  «Stong fuchsite» alteration close to fault contact.	«Py tr-1%» as disseminations.  «Py tr»	

HOLE NUMBER: MCC-57

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 3

HOLE NUMBER: MCC-57

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc	
	0.00	0.00	0.00							

HOLE NUMBER: MCC-57

ASSAY SHEET

PAGE: 4

HOLE NUMBER: MCC-57

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb	
BCD30039	105.40	107.80	2.40	7.95	0.245	3.22	3.77	2.6	1.67	0.06	0.01	0.01	74.03	0.42	0.36	94.33	0.4	41	190	72	27	1	54	10	54
BCD30040	107.80	109.70	1.90	6.89	0.18	2.56	2.33	1.84	1.59	0.08	0.59	0.01	78.34	0.38	0.09	94.87	1.2	23	134	162	37	1	23	5	23
BCD30041	109.70	111.10	1.40	12.65	0.125	6.86	7.57	1.21	5.08	0.15	1.87	0.04	52.04	1.14	0.12	88.85	0.8	1	411	13	10	1	44	5	44
BCD30042	111.10	116.20	5.10	14.56	0.125	5.61	4.61	3.31	1.56	0.12	2.76	0.03	58.44	0.57	0.25	91.94	0.8	1	193	10	32	1	44	10	44
BCD30043	116.20	118.70	2.50	12.23	0.15	7.94	5.08	2.84	2.19	0.13	1.59	0.01	57.19	0.47	0.5	90.31	1.2	124	266	18	75	1	58	45	58

HOLE NUMBER: MCC-57

GEOCHEM. SHEET

PAGE: 5

HOLE NUMBER: MCC-58

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: CC11 ZONE  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-11  
LOCATION: CC-11 GRID

PLOTTING COORDS GRID: CC-11  
NORTH: 7000.00N  
EAST: 11100.00E  
ELEV: 1546.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 48.16m  
START DEPTH: 0.00m  
FINAL DEPTH: 48.16m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: September 9, 1990  
DATE COMPLETED: September 10, 1990  
DATE LOGGED: September 11, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: PULLED FROM HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST THE MINERALIZED HORIZON INTERSECTED IN MCC-57. HOLE WAS ABANDONED DUE TO BAD CAVING &

DIRECTIONAL DATA: APPARENT OFF SET OF STRATIGRAPHY. COLLAR MOVED 60m EAST.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
25.90	-	-50° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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HOLE NUMBER: MCC-58

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

HOLE NUMBER: MCC-58

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 21.34	«CASING»					
21.34 TO 48.16	«DIABASE»	<p>Green(s). Med grained. A variably altered section of diabase. The rock is strongly fractured and in places veined by qtz-carb stringers.</p> <p>{23.1-27.6} V. dark grey. Extremely dark colored silicified diabase. Color reflects high chlorite content as seen on fracture surfaces.</p> <p>{27.6-29.8} Light green. Completely epidotized diabase. An unusual alteration. It seems to be associated with a silicified zone (see next int.) as an envelope.</p> <p>{29.8-30.6} «Silicified/Fault» Pale grey. Fine grained. A completely silicified zone, perhaps a vein, cutting the core at This interval is banded suggesting bedding, however the symmetry of the alt suggests a structural zone.</p> <p>{30.6-34.0}</p> <p>{43.0-43.35} «Bleached»</p> <p>END OF HOLE.</p>	20	<p>«Strong Sil»</p> <p>«Epidotized»</p> <p>«Silicified Zone»</p> <p>«Mod. Epidote» «Dol Patches» Ser + Chl-Wacke»</p>	<p>«Po tr»</p> <p>«Py tr, Po tr»</p> <p>«Py 2%» on fractures &amp; as disseminated crystals.</p> <p>«Py tr»</p>	

HOLE NUMBER: MCC-58

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 2

HOLE NUMBER: MCC-58

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						SG g/cc	COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t			
	0.00	0.00	0.00								

HOLE NUMBER: MCC-58

GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb
	0.00	0.00	0.00																					



HOLE NUMBER: MCC-59

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CC11 ZONE  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-11  
LOCATION: CC-11 GRID

PLOTTING COORDS GRID: CC-11  
NORTH: 7000.00N  
EAST: 11160.00E  
ELEV: 1553.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 183.50m  
START DEPTH: 0.00m  
FINAL DEPTH: 183.50m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: September 10, 1990  
DATE COMPLETED: September 12, 1990  
DATE LOGGED: September 11, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST THE MINERALIZED HORIZON INTERSECTED IN MCC-56 @ 7000N.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
25.30	-	-50° 0'	ACID	OK		-	-	-	-	-	
90.80	-	-49° 0'	ACID	OK		-	-	-	-	-	
127.10	-	-50° 0'	ACID	OK		-	-	-	-	-	
160.90	-	-49° 0'	ACID	OK		-	-	-	-	-	
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HOLE NUMBER: MCC-59

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 1

HOLE NUMBER: MCC-59

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.40	«CASING»					
15.40 TO 123.20	«PIL. BSLT, PIL. BX AUTO BX»	<p>Med green-grey. Fine to med grained. A typical section of pillowed flows. This interval consists of well marked flows separated by narrow pillow breccias. The top 40m is quite highly brecciated-not tectonically. It could be an autobrecciated flow. Within this zone there are some pyroxene-phyric sections, that may be flow cores or feeder dykes.</p> <p>‡15.4-39.2‡ «Autobreccia» Med grey/green. An incipiently brecciated unit. The rock has been broken up into angular clasts up to 35mm in length. Many are insitu =&gt; not a true brecciation. This also suggest that it is not a tectonic feature. Flow Breccia. FLOW CONTACT @ 30.0m</p> <p>‡65.6-66.3‡ «Pil. Bx»</p> <p>‡74.4-77.7‡ «Pil. Bx/Hyalo Tuff» Well developed interflow breccia with rounded clasts up to 64mm. Pillow rims clearly visible.</p> <p>‡82.2-82.8‡ «Pil. Bx»</p> <p>‡87.7-90.9‡ «Pil. Bx, Hyalo Tuff»</p> <p>‡97.8-98.9‡ «Pil. Bx» FLOW BASE @ 98.9m</p> <p>‡114.0-114.8‡ «Pil. Bx»</p> <p>‡122.6-123.2‡ «Ser Inter-flow Seds» Yellow/grey. Fine grained. A well laminated sed interval between flows. The seds are weakly sericitic and bleached. LAMINATION @ 122.7m Narrow qtz str cut interval near base. These reach 20mm in width.</p>	35           50   50	<p>Little or non. Some bleaching noted lower in the interval.</p> <p>Weak bleaching.</p> <p>«Weak Ser &amp; Bleaching» «Qtz Veining»</p>	<p>Traces of pyrite.</p> <p>Py trace-disseminated.</p>	<p>Possibly a hydrobreccia.</p> <p>Tops down hole.</p>

HOLE NUMBER: MCC-59

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 2

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
123.20 TO 131.90	«PF PHYRIC	Dark green. Med grained. A distinctive micropor-		Several types of alteration are present	Py & Po present in trace amounts.	
TO 131.40	DIABASE»	phyry characterized by white, 1-2mm plagioclase laths in a medium grained melanocratic ground mass. The interval is fairly homogeneous in texture.  ‡123.2-123.7‡ Pink.  ‡123.7-126.6‡  ‡130.67-131.4‡ This interval exhibits a strong banding - possibly a contact feature. BANDING @ 131.4m CONTACT @ 131.9m	40 18	Leucoxene (or a pink look-alike) is abundant near the upper & lower contact. Lower parts of the section are also weakly silicified.  «Leucoxene» Pink leucoxene appears to be replacing plagioclase laths. Some Fe carb may also be present.  «Weak Sil» Weak pervasive silicification.  «Leucoxene + Chl» Interval is heavily spotted with pink leucoxene.	«Py + Po 1%» in stringers.	
131.90 TO 134.75	«CHERT OR SIL DIABASE»	Grey. Fine grained. Highly siliceous interval resembling massive + silicified grey chert. As with cherts in other holes this interval is cut by numerous qtz and sericite stringers. Remnant bedding noted in places. BEDDING @ 134.15m	20	Extensive remobilization of qtz obscures original banding. «Silicified» «Sericite Str» Chlorite abundant.	«Py 1%» in stringers.	
134.75 TO 141.70	«DIABASE BX»	Med green/grey. Med grained. A slightly bleached diabase showing a strong fracture and vein set parallel to the CA. This has caused the core to breakup. VEINING @ 137.1m	05	«Qtz-Chl Veining»	Py trace. «Po tr-1%» in stringers.	
141.70 TO 160.00	«DIABASE BX»	Yellow/green. Med grained. An extremely brecciated and altered section of diabase. Much of the unit is pervaded by white qtz veins. The host is brecciated into angular fragments. These are epidotized and in places rimmed by fuchsite. Grey dolomite forms much of the matrix to the more brecciated sections.  ‡141.7-142.9‡  ‡142.9-155.2‡ «Breccia» Diabase breccia consist-		Mod to Intense «Epidotization» «Pervasive Sil»     «Qtz Vein»  «Epidotized Clasts»	«Py + Po-1%»	Broken core.

HOLE NUMBER: MCC-59

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		ing of epidotized and carbonatized clasts in a qtz dol matrix. ‡155.2-160.0‡ «Breccia»		«Int. Silicification» «Dol-Qtz Matrix»  «Pervasive Sil» «Chl-Fuch Patches»		
160.00 TO 183.50	«DIABASE»	Grey to green. Med grained. Contact with breccia is gradational over 30cm at top of interval. This unit is relatively unaltered. Slight bleaching & narrow intervals of silicified breccia are present Alt decreases to end of hole.  ‡160.0-161.9‡ «Bleached» ‡161.9-162.1‡ «Breccia» ‡162.5-162.8‡ «Breccia» CONTACT @ 162.8m ‡164.85-165.0‡ «Breccia» CONTACT @ 165.0m ‡166.4-169.7‡ Completely dolomitized.  END OF HOLE.	50 30	«Weak Sil»  «Strong Sil» «Mod Carb and Epid» «Strong Sil» «Mod Carb» «Mod Sil»  «Int Dol» Dolomitized - complete replacement.	«Py tr-1%»  «Py tr»	

HOLE NUMBER: MCC-59

DRILL HOLE RECORD

LOGGED BY: D. HEBERLEIN

PAGE: 4

HOLE NUMBER: MCC-59

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc	
	0.00	0.00	0.00							

HOLE NUMBER: MCC-59

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Ba %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb	
BCD30044	130.67	131.40	0.73	8.23	0.195	1.61	3.5	1.25	1.67	0.05	1.59	0.01	77.16	0.49	0.18	95.93	0.6	32	203	70	22	1	65	5	65
BCD30045	131.90	134.70	2.80	13.05	0.02	11.43	10.27	0.06	6.24	0.17	3.07	0.01	44.38	1.46	0.16	90.33	1.2	1	48	67	10	1	61	5	61
BCD30046	141.70	145.35	3.65	3.61	0.06	15.8	5.41	1.04	5.77	0.14	0.02	0.01	49.72	0.41	0.76	82.74	1.6	45	68	15	16	2	59	5	59
BCD30047	145.35	148.00	2.65	4.9	0.04	23.25	7.79	0.93	8.08	0.19	1.12	0.01	24.24	0.56	0.65	71.76	2	1	49	8	15	1	76	5	76
BCD30048	148.00	150.40	2.40	5.99	0.035	21.83	7.49	0.68	6.88	0.18	1.9	0.05	28.69	0.77	0.75	75.25	2	1	38	19	13	1	76	10	76
BCD30049	150.40	152.20	1.80	5.51	0.045	23.56	7.57	1.11	7.81	0.19	1.31	0.02	24.62	0.81	0.81	73.36	1.9	1	56	11	21	1	79	5	79
BCD30050	166.45	168.65	2.20	13.34	0.135	9.84	9.55	1.94	4.33	0.17	4.09	0.01	40.73	1.54	0.63	86.32	1.1	1	239	24	18	1	50	5	50
BCD30051	171.70	173.20	1.50	13.94	0.04	8.26	10.07	0.43	5.5	0.17	4.05	0.01	46.05	1.55	0.08	90.16	0.8	1	76	59	14	1	55	5	55

HOLE NUMBER: MCC-59

GEOCHEM. SHEET

PAGE: 6

HOLE NUMBER: CCF-60

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:            METRIC UNITS: X

PROJECT NAME: CHU CHUA  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-1  
LOCATION: CHU CHUA

PLOTTING COORDS GRID: CC  
NORTH: 10400.00N  
EAST: 9900.00E  
ELEV: 1819.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 100.90m  
START DEPTH: 0.00m  
FINAL DEPTH: 100.90m

COLLAR GRID AZIMUTH: 90° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: September 14, 1990  
DATE COMPLETED: September 16, 1990  
DATE LOGGED: September 17, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST FOR SULPHIDES ON L104N.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
11.60	-	-50° 0'	ACID	OK		-	-	-	-	-	
29.90	-	-50° 0'	ACID	OK		-	-	-	-	-	
78.60	-	-48° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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HOLE NUMBER: CCF-60

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 5.18	«CASING»					
5.18 TO 30.07	«PILL BSLT»	<p>Med-dark green. Fine to med grained. A typical sequence of flows with pillowed/pillow brecciated tops. Flows are fine grained near lower and upper margins but become medium grained in centre; flow thickness appears to be 3-6m.</p> <p>‡14.2-14.6‡ «Chert» Lt.-med grey. Fine grained. A short interval of interflow or interpillow chert; upper contact is irregular, with basalt breccia fragments floating in chert; lower contact is irregular. CONTACT @ 14.2m BEDDING @ 14.3m</p> <p>‡28.0-28.7‡ «Pillow Bx + Tuff» Lt-dark green. Dark green pillow fragments &amp; hyaloclastic bx with light green epidotized matrix, overlain by a 20cm intoerval of olive green tuff. BEDDING @ 28.1m</p>	50 50	Light local chloritization; some epidotization of brecciated flow tops; local silicification.		Core highly broken down to app. 10m; recovery 50-60%. Below 10m core is largely intact with recovery 90-95%.
30.07 TO 34.90	«MAROON SEDS & BSLT»	<p>Maroon. Fine to coarse grained. Maroon coloured sediments &amp; breccias; upper contact is gradational with patchy maroon colouring appearing at 30.07m &amp; becoming more pervasive downhole. Some sediments are colour banded. From 30.07-30.9m is predominately grey, siliceous bslt(?) with patchy maroon colouring.</p> <p>‡30.9-32.9‡ «Breccia» Maroon. Fine to coarse grained. Maroon coloured breccia. Breccia clasts are 0.1-3.0cm size, med to dark maroon colour, and range from clast to matrix supported; matrix supported; matrix is lighter maroon/pink colour. Appears to be more like a hydrobreccia than a fault or depositional breccia; many clasts are fractured and fragmented but have not been moved to any degree.</p> <p>‡32.9-34.9‡ «Banded Sediments» Maroon. Fine grained. Colour banded maroon sediments; banding on a scale of 0.2-1.0cm. BEDDING @ 34.4m</p>	45	«Jasperization» Maroon silicification. Patchy random qtz-carb veins/stringers.		

HOLE NUMBER: CCF-60

DRILL HOLE RECORD

LOGGED BY: T. CLARKE

PAGE: 2



FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
34.90 TO 47.00	«TUFF + SILICIFIED TUFF»	<p>Lt.-med green. Fine grained. Almost completely silicified tuff, mottled lt to med green colour. Most primary textures destroyed, but some lamination are still visible. Upper contact with the maroon colour changes to green over 20cm; lower contact marked by thin (5cm) depositional breccia.</p> <p>↓34.9-36.0↓ «Tuff + Fragmental Tuff» Green. Fine grained. Olive green tuff down to 35.3m; finely laminated, with some black layers. BEDDING @ 35.1m Fragmental tuff 35.6-36.0m, consisting of .1-3.0cm black fragments in dark green matrix.</p> <p>↓36.0-47.0↓ «Silicified Tuff» Green. Fine grained. Silicified tuff, mottled lt. - med green original textures obliterated, although vaguely defined colour banding of the silicification is 30-45 to c.a., and may reflect bedding. LOWER CONTACT @ 47.0m</p>	40	<p>Pervasive silicification (intense) and stringer sericitization below 36m.</p> <p>Thin cross-cutting bands and fronts of pink colouration. Patch silicification some pink coloured, 35.3-35.6m.</p> <p>«Silicified» Lt. Stringer sericitization.</p>	<p>Stringers and disseminated patches of py, locally up to 15%.</p> <p>«Py 1-3%» Mostly disseminated in the fragmental tuff. &lt;1mm pink sulphide(?) traces, not py, also in the fragmental tuff.</p> <p>«Py tr-10%, cp tr» Sulphides occur as fine grained aggregates forming blebs and fracture fillings.</p>	
47.00 TO 75.00	«DIABASE»	Grey/green. Fine to med. grained. Primarily fine to med grained diabase with possible rare pillowed flow tops; pillowed flow tops(?) or epidotized contacts(?) seen at 49.4 and 51.4m. Diabase is med. grey, & mostly feldspar phyric; fairly homogeneous.		Lt random qtz-carb veins/stringers. Local chloritization, especially in coarser grained intervals.		
75.00 TO 87.10	«SILICEOUS SEDIMENTS»	<p>Grey. Fine grained. Grey siliceous sediments, ranging from massive and completely silicified to laminated with patchy silicification. Laminations (bedding) are tightly folded, but are generally subparallel to c.a.</p> <p>↓77.7-79.8↓ «Diabase» Green. Fine grained. Med. green, fine grained diabase. Both Upper &amp; lower contacts broken up and difficult to determine.</p> <p>↓79.8-87.1↓ Siliceous sediments, lt grey colour.</p>		<p>«Fe-dol + Ser» Spotted fe-dolomitization + yellow stringer sericitization.</p> <p>«Sil + Fe-dol» Varying silicification and spotted Fe-dolomitization. Some qtz-dol veining, up to 5cm width.</p>	<p>«Py 2-20%, cp tr» Disseminated, stringers, and bands.</p>	Very similar lithology to the "siliceous sediments" and "siliceous wackes" seen in MCC-52 to MCC-59.

HOLE NUMBER: CCF-60

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
87.10 TO 100.90	«PILL BSLT + PILL BX»	Green to black. Fine grained. Pillow bslt + pillow breccia. Contact with overlying seds is transitional over 20cm.  {87.1-88.1} Tan. Fine grained.  {99.6-100.2} Tan. Fine grained.  END OF HOLE.		Lt qtz-carb stringers.  «Fe-Carb» Pervasive fe-carbonate alteration, decreasing in intensity downhole; tan colour.  «Fe-Carb» 0.8m interval of tan coloured, pervasive fe-carb alteration.	«Po tr» Occurs primarily along contacts in breccia intervals.	

HOLE NUMBER: CCF-60

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc	
	0.00	0.00	0.00							

HOLE NUMBER: CCF-60

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb
BCD30052	27.07	30.07	3.00	13.87	0.015	8.26	10.64	0.01	6.51	0.26	2.7	0.55	50.27	1.78	0.06	94.99	3.7	1	131	45	897	1	840	10
BCD30053	30.07	32.90	2.83	8.16	0.105	2.04	3.39	0.41	1.03	0.1	0.24	0.01	80.23	0.5	0.02	96.23	1.1	24	151	3	154	2	118	5
BCD30054	32.90	34.90	2.00	9.15	0.22	1.1	3.52	1.64	1.06	0.06	0.25	0.46	78.93	0.58	0.09	97.08	0.8	29	905	2	69	1	62	5
BCD30055	34.90	37.90	3.00	10.29	0.25	1.01	9.11	0.01	5.26	0.14	0.15	0.01	67.25	1.03	1.62	96.13	0.8	1	366	67	39	1	69	10
BCD30056	37.90	40.90	3.00	7.39	0.155	0.44	3.27	0.01	3.11	0.03	0.01	0.11	82.11	0.44	0.18	97.25	0.5	1	227	14	35	1	33	5
BCD30057	40.90	43.90	3.00	9.2	0.205	0.43	4.33	0.92	3.5	0.04	0.01	0.2	77.28	0.54	0.48	97.12	0.4	1	182	15	29	1	33	5
BCD30058	43.90	47.00	3.10	8.72	0.265	0.33	3.8	0.68	3.31	0.05	0.01	0.13	78.75	0.54	0.22	96.79	0.5	1	275	70	22	1	30	5
BCD30059	75.00	77.70	2.70	7.26	0.285	0.65	2.91	0.01	3.07	0.03	0.01	0.01	82.19	0.4	0.07	96.86	0.4	22	224	16	24	1	20	5
BCD30060	79.80	82.80	3.00	7.19	0.165	1.83	3.82	0.39	4.95	0.06	0.01	0.2	75.79	0.43	0.34	95.15	0.7	1	136	46	18	1	36	5
BCD30061	82.80	84.90	2.10	7.31	0.115	4.08	8.02	0.01	6.01	0.08	0.01	0.06	66.46	0.46	3.01	95.62	6.2	30	111	1323	166	4	234	80
BCD30062	84.90	87.10	2.20	7.84	0.105	2.56	10.37	0.01	5.38	0.1	0.01	0.05	65.6	0.64	3.92	96.6	2.6	13	95	2202	63	1	397	50
BCD30063	87.10	88.60	1.50	14.28	0.135	8.06	10.19	0.01	6.68	0.21	1.68	0.14	45.69	1.64	0.21	88.92	1.2	1	111	59	22	1	85	10

HOLE NUMBER: CCF-60

GEOCHEM. SHEET

PAGE: 6

HOLE NUMBER: CCF-61

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CHU CHUA  
PROJECT NUMBER: 616  
CLAIM NUMBER: CC-1  
LOCATION: CHU CHUA

PLOTTING COORDS GRID: CC  
NORTH: 10200.00N  
EAST: 9975.00E  
ELEV: 0.00

ALTERNATE COORDS GRID:  
NORTH: 0+ 0  
EAST: 0+ 0  
ELEV: 0.00

COLLAR DIP: -60° 0' 0"  
LENGTH OF THE HOLE: 200.90m  
START DEPTH: 0.00m  
FINAL DEPTH: 200.90m

COLLAR GRID AZIMUTH: 90° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: September 16, 1990  
DATE COMPLETED: September 20, 1990  
DATE LOGGED: September 22, 1990

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: TO TEST DOWN DIP EXTENSION OF PYRITIC BRECCIA INTERSECTED IN CC-5.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
8.80	-	-60° 0'	ACID	OK		-	-	-	-	-	
66.80	-	-59° 0'	ACID	OK		-	-	-	-	-	
121.60	-	-59° 0'	ACID	OK		-	-	-	-	-	
176.50	-	-57° 0'	ACID	OK		-	-	-	-	-	
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HOLE NUMBER: CCF-61

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 5.20	«CASING»					
5.20 TO 21.90	«BASALT + TUFF»	Med green. Fine grained. Medium green basalt and tuff; some laminations subparallel to c.a. Some faulting below 15m. ↓15.3-15.7↓ «Fault» ↓21.0-21.9↓ «Fault»		Rust on fractures. Lt. chloritization. Some silicification near lower contact.	Tr py.	Highly broken core.
21.90 TO 48.90	«MSSX»	Dull yellow. Fine to med grained. Massive sulphides, predominantly pyrite with varying amounts of chalcopyrite, covellite & bornite. Sulphides occur primarily as granular & massive, and show no real banded textures. Covellite & bornite traces occur on fracture surfaces. Chalcopyrite occurs as wisps and blebs.		«Py 90-100%, cp tr-5%»		
48.90 TO 200.90	«BSLT + PILLOW BX»	Green - grey. Fine to med grained. Basalt flows with pillowed flow tops; occasional pillow breccia sections. ↓48.9-55.0↓ «Brecciated» Grey. Fine grained. Possible disrupted laminations of a wacke? Stockworking decreases in intensity downhole. ↓57.8-58.2↓ «Pillow Bx» ↓76.2-77.7↓ «Pillow Bx» ↓86.2-88.1↓ «Pillow Bx» ↓120.0-122.2↓ «Siliceous Bx» Lt. grey. ↓196.8-197.5↓ «Pillow Bx» END OF HOLE.		Lt to moderate chloritization.  Patchy silicification + stringers sericitization.  Silicification and bleaching.	«Py Stwk» Pyrite stockwork, 2-20%.  «Po tr» «Tr Po, Cp»	

HOLE NUMBER: CCF-61

DRILL HOLE RECORD

LOGGED BY: T. CLARKE

PAGE: 2

HOLE NUMBER: CCF-61

ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS											COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t	SG g/cc						
BCD30064	21.90	23.40	1.50	0.618	0.01	0.20	0.38	0.08	0.618	0.01	0.2	2.7	0.38	4.69	
BCD30065	23.40	24.90	1.50	2.540	0.02	0.16	0.80	6.0	2.54	0.02	0.16	6	0.8	4.6	
BCD30066	24.90	26.40	1.50	3.52	0.02	0.82	0.81	8.0	3.52	0.02	0.82	8	0.81	4.53	
BCD30067	26.40	27.90	1.50	2.91	0.02	0.38	0.77	6.1	2.91	0.02	0.38	6.1	0.77	4.73	
BCD30068	27.90	29.40	1.50	2.64	0.02	0.49	0.63	6.3	2.64	0.02	0.49	6.3	0.63	4.74	
BCD30069	29.40	30.90	1.50	0.753	0.01	0.08	0.46	4.2	0.753	0.01	0.08	4.2	0.46	4.73	
BCD30070	30.90	32.40	1.50	0.321	0.01	0.07	0.44	4.1	0.321	0.01	0.07	4.1	0.44	4.77	
BCD30071	32.40	33.90	1.50	1.670	0.01	0.08	0.47	6.3	1.67	0.01	0.08	6.3	0.47	4.54	
BCD30072	33.90	35.40	1.50	1.82	0.02	0.03	0.46	6.0	1.82	0.02	0.3	6	0.46	3.9	
BCD30073	35.40	36.90	1.50	1.50	0.01	0.05	0.40	7.2	1.5	0.01	0.05	7.2	0.4	4.59	
BCD30074	36.90	38.40	1.50	2.59	0.01	0.03	0.20	4.2	2.59	0.01	0.03	4.2	0.2	4.8	
BCD30075	38.40	39.90	1.50	0.468	0.01	0.05	0.16	3.9	0.468	0.01	0.05	3.9	0.16	4.78	
BCD30076	39.90	41.40	1.50	2.220	0.01	0.02	0.06	4.0	2.22	0.01	0.02	4	0.06	4.6	
BCD30077	41.40	42.90	1.50	1.96	0.01	0.05	0.19	4.1	1.96	0.01	0.05	4.1	0.19	4.73	
BCD30078	42.90	44.40	1.50	0.730	0.01	0.12	0.21	4.0	0.73	0.01	0.12	4	0.21	4.8	
BCD30079	44.40	45.90	1.50	1.70	0.01	0.05	0.18	4.3	1.7	0.01	0.05	4.3	0.18	4.58	
BCD30080	45.90	47.40	1.50	0.718	0.01	0.20	0.20	4.1	0.718	0.01	0.2	4.1	0.2	4.69	
BCD30081	47.40	48.90	1.50	1.830	0.01	0.09	0.36	6.2	1.83	0.01	0.09	6.2	0.36	4.85	

HOLE NUMBER: CCF-61

ASSAY SHEET

PAGE: 3

HOLE NUMBER: CCF-61

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb	
BCD30082	48.90	50.40	1.50	5.73	0.15	1.81	6.91	0.01	3.75	0.04	0.01	0.01	75.55	0.29	1.45	95.69	0.9	1	249	317	17	1	108	10	108
BCD30083	50.40	51.90	1.50	6.99	0.44	1.52	6.63	0.01	2.87	0.06	0.01	0.01	75.45	0.41	3.22	97.59	1.2	33	292	463	31	2	70	5	70
BCD30084	51.90	53.40	1.50	13.4	0.535	4.04	10.77	0.01	7.16	0.22	0.04	0.01	53.22	1.47	0.94	91.83	0.5	1	726	68	8	1	238	10	238
BCD30085	53.40	54.90	1.50	9.71	0.82	5.1	7.17	0.01	4.62	0.16	0.11	0.03	64.47	0.95	0.96	94.1	1.1	1	443	115	27	1	281	5	281
BCD30086	54.90	56.40	1.50	15.48	0.995	6.07	11.73	0.01	5.41	0.2	3.14	0.01	47.45	1.88	0.83	93.19	1.5	1	1850	56	23	1	107	5	107
BCD30087	56.40	57.90	1.50	14.53	0.63	9.05	10.52	0.01	5.71	0.19	3.25	0.06	47.63	1.78	0.42	93.78	2.8	1	1459	43	19	1	69	5	69
BCD30088	82.00	83.50	1.50	15.4	0.195	7.46	11.93	0.01	5.56	0.22	2.84	0.11	47.93	1.9	0.63	94.2	2.9	1	659	145	29	1	108	15	108
BCD30089	181.00	182.50	1.50	16.15	0.01	7.53	11.01	0.01	6.19	0.19	3.44	0.24	48.13	1.65	0.28	94.84	2.8	1	35	97	11	1	56	5	56

HOLE NUMBER: CCF-61

GEOCHEM. SHEET

PAGE: 4



HOLE NUMBER: CCF-62

MINNOVA INC.  
DRILL HOLE RECORD

IMPERIAL UNITS:

METRIC UNITS: X

PROJECT NAME: CHU CHUA  
PROJECT NUMBER: 616  
CLAIM NUMBER:  
LOCATION: CHU CHUA MOUNTAIN

PLOTTING COORDS GRID:  
NORTH: 9600.00N  
EAST: 9518.00E  
ELEV: 1685.00

ALTERNATE COORDS GRID: CC-1  
NORTH: 96+ 0N  
EAST: 95+18E  
ELEV: 1685.00

COLLAR DIP: -50° 0' 0"  
LENGTH OF THE HOLE: 813.20m  
START DEPTH: 0.00m  
FINAL DEPTH: 813.20m

COLLAR GRID AZIMUTH: 90° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: October 12, 1990  
DATE COMPLETED: November 1, 1990  
DATE LOGGED: 0, 0

COLLAR SURVEY: NO  
MULTISHOT SURVEY: NO  
RQD LOG: NO

PULSE EM SURVEY: NO  
PLUGGED: NO  
HOLE SIZE: NQ

CONTRACTOR: PARAGON DRILLING LTD.  
CASING: LEFT IN HOLE  
CORE STORAGE: BARRIERE

PURPOSE: DRILLING TO TEST PRESENCE OF MASSIVE SULPHIDE AT DEPTH, WITHIN POSSIBLE DOWN FAULTED BLOCK.

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
8.50	-	-50° 0'	ACID		WEAK ETCH	-	-	-	-	-	-
47.20	-	-50° 0'	ACID	OK		-	-	-	-	-	-
87.80	-	-50° 0'	ACID		BAD ETCH	-	-	-	-	-	-
142.60	-	-50° 0'	ACID	OK		-	-	-	-	-	-
188.00	-	-49° 0'	ACID		DOUBLE ETCH	-	-	-	-	-	-
221.90	-	-49° 0'	ACID	OK		-	-	-	-	-	-
248.00	-	-48° 0'	ACID	OK		-	-	-	-	-	-
268.80	-	-49° 0'	ACID	OK		-	-	-	-	-	-
310.00	-	-48° 0'	ACID	OK		-	-	-	-	-	-
359.00	-	-48° 0'	ACID	OK		-	-	-	-	-	-
417.00	-	-49° 0'	ACID	OK		-	-	-	-	-	-
503.30	-	-49° 0'	ACID	OK		-	-	-	-	-	-
560.00	-	-49° 0'	ACID	OK		-	-	-	-	-	-
669.90	-	-50° 0'	ACID	OK		-	-	-	-	-	-
760.60	-	-48° 0'	ACID	OK		-	-	-	-	-	-
45.10	88° 0'	-49° 0'	TRO-PARI	OK		-	-	-	-	-	-
45.11	0° 0'	0° 0'	TRO-PARI	OK		-	-	-	-	-	-
197.50	92°30'	-48° 0'	TRO-PARI	OK		-	-	-	-	-	-
349.89	88° 0'	-49° 0'	TRO-PARI	OK		-	-	-	-	-	-
502.28	88° 0'	-50° 0'	TRO-PARI	OK		-	-	-	-	-	-
654.67	99° 0'	-50° 0'	TRO-PARI	OK		-	-	-	-	-	-
807.10	99°30'	-49° 0'	TRO-PARI	OK		-	-	-	-	-	-
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 7.00	«CASING»					
7.00 TO 692.00	«BASALT»	<p>Pale green. Fine to aphanitic grained.</p> <p>Pale green, fine grained to aphanitic massive and pillowed basaltic flows. Pillow selvages are occasionally visible with characteristic triple junctions and intervening hyaloclastic breccia. Basalts are locally variolitic. Later stage qtz calcite veins &amp; veinlets occupying 1-3% by volume often cross the core at an angle to c.a. of (30-35d</p> <p>Occasional quartz feldspar veins sub parallel to c.a. occur eg. 47.0m and 47.2m, the latter containing vuggy quartz. Notable changes in texture and structure downhole are as follows:</p> <p>44.9-45.2m: broken core, possible fracture.</p> <p>85.0-85.2m: fault, low angle to c.a.</p> <p>↓96.9-98.2↓ «Healed Flt Bx»</p> <p>↓108.9-109.3↓ «Healed Flt Bx»</p> <p>120.4-121.3m: Well developed small pillows, with long axis sub-parallel to c.a. approx 10cm.</p> <p>124.0m: Blocky broken core.</p> <p>124.5m: Mesh-like network of fine calcite vnlets &lt;0.5mm in width, possibly infilling shattered basalt?</p> <p>127.0m: Feldspar phenocrysts (micro crysts?) with in core of pillow. Variolitic?</p> <p>↓128.0-128.5↓ «Healed Flt Bx» with mesh network quartz calcite veinlets.</p> <p>↓139.6-141.0m↓ «Healed Flt Bx»</p> <p>150.7-151.3m: Healed to partly broken fault bx.</p> <p>152.4m: Well developed small oval pillows.</p> <p>166.0m: Quartz veining in partly healed fault bx.</p> <p>↓185.3-188.8↓ «Hy-clastic Bx» well developed interval hyaloclastic (intraformational) basaltic breccia.</p> <p>↓201.3-202.1↓ «Healed Flt Bx»</p> <p>226.6-227.1m: Fault sub-parallel to c.a. infilled with qtz calcite vein, 10-15mm width.</p> <p>↓242.8-243.4↓ «Flt Bx/Gou» includes quartz calcite fragments and some iron staining. Angle to c.a. difficult to determine but appears to be low.</p> <p>↓246.7-248.2↓ «Flt Bx/Gou Zone» including partly iron stained clayey basaltic gouge.</p>	<p>33</p> <p>25</p> <p>«Qz-Cal str.»</p>	<p>Greenish yellow quartz epidote alteration occurs as streaks &amp; patches within the basalts and at the margins of the pillow selvages. Moderate chloritic alteration throughout. Ground water circulation has resulted in some manganese &amp; iron staining in fractures.</p> <p>Quartz pyrite stringer in hyaloclastic breccia.</p> <p>Fine grained pyrite grains and small stringers in qtz-calcite vein.</p>	<p>Secondary pyrite occurs as grains and small blebs (&lt;2mm), occasionally smeared in minor shears and fractures.</p> <p>Basalt blocky and broken near fault zones.</p> <p>Significant fault fracture zone appears to trend at low angle (20-25degs) to c.a.</p>	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		<p>‡251.0-252.8‡ «Flt Bx/Gou Zone» lens broken than the above faulted interval.  252.8m: Quartz vein in basalt, sub-parallel to c.a.  259.3-273.2m: Generally blocky broken core.</p> <p>‡273.2-273.7‡ «Flt Gouge»  ‡278.4-280.3‡ «Flt Zone + Limonite» Faulted, partly bleached basalt, stained orange brown by iron rich ground water.  280.3-281.6m: Faulted, gouged pale green basalt.  289.9-290.3m: Bleached whitish yellow and pale green basalt.  296.6-305.6m: Generally blocky and broken core with minor intervals of gouge.  319.0-320.3m: Blocky broken core.  468.4-468.9m: Blocky broken core.  487.0-487.5m: Blocky broken core.  ‡497.5-503.3‡ «Porph Bslt» Fine - coarse grained pyroxene phyrlic basalt.  505.9-506.5m: Blocky broken basalt, minor gouge and qtz vein.  ‡533.0-538.9‡ «Flt Zone» Blocky broken core with intense faulting in gouge zone 537.0-537.8m.  549.3-551.0m: Blocky core.  568.3-568.8m: 3 parallel quartz veins at angle to c.a.</p>	20	<p>Basalt silicified by quartz flooding.</p> <p>Broken core surfaces show iron and manganese staining.</p> <p>‡289.9-290.3m‡ «Silic Basalt»</p> <p>305.5m: Dark blotchy (chloritic) alteration of basalt.</p> <p>385m4m: Silicified basalt - 'glassy'.</p> <p>Moderate chloritic alteration.</p>		Core breaks along variable angles to c.a.
		<p>572.9m: Albite-epidote veining along pillow margin. Well developed pale green, very fine grained pillow basalt to 615.0m.  ‡615.0-654.7‡ «Massive Basalt» Pale to dark green, massive medium to coarse grained basalts (diabase!). Minor intervals of broken blocky core at: 586.6-587.1m - blocky core.  588.1-588.4m - broken, brecciated.  ‡625.3-627.0‡ «Blocky Basalt»  628.8-629.5m: Blocky core.  636.8-644.0m: Broken, brecciated including 40cm partly healed gouge/breccia.  647.0-648.3m: Broken, partly brecciated.  654.7-692.0m: Massive medium to coarse grained &amp; aphanitic to fine glassy pillowed basalts.</p>	25			

HOLE NUMBER: CCF-62

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
692.00 TO 697.70	«PILLOW BASALT»	Pale green. Gradational contact with the overlying massive and pillowed basalts. Interval comprises pale green, aphanitic to fine grained, pillowed basalt with well defined triple junctions and pillow selvages. Hyaloclastic breccia at 694.2m has possible silicified sediment as matrix. Occasional quartz vein filled shears at low angle to c.a. (5-10degs)	07	Albite-epidote alteration at pillow margins. Moderate to intense chloritic alteration. No consist foliation plane. «Mod to int chl»	<1/2% py. blebs sparsely disseminated within 'glassy' basalts. Single chalcopyrite bleb associated with pyrite in hyaloclastic breccia.	
697.70 TO 704.00	«ALBITE EPIDOTE/BSLT BX»	Pale to dark green. Fine grained. Minor fault at upper contact is marked by blocky broken core. Interval comprises partly faulted, pale to darker green, fine grained pillow basalt, with locally well developed inter-pillow breccia. The lower contact is marked by a grain size change from a fine to a fine to medium basalt/diabase.		Intense albite-epidote-haematite alteration of inter-pillow breccia matrix, to give an olive green & reddish brown colouration. Albite/epidote-hematite zones occur up to a width of 20cm. The wider zones show streaking/banding of the haematite within the quartz-epidote «Mod chl, Ab-Ep-He veins»	<1% pyrite as grains, blebs and thin, short stringers within the zones of breccia alteration and within planes of fracturing/faulting.	Blocky broken core occurs between: 697.698.5m, 699.6-700.4m, 701.1-701.7m.
704.00 TO 706.50	«DIABASE»	Pale greyish green to darker green. Fine to med grained. Pale greyish to darker green fine to med grained diabase. Contact with the above unit marked by quartz-epidote, alteration stringer. The lower 1/2 metre of the interval is micro-feldspar porphyritic. The lower contact is faulted to a clayey gouge.		«Mod to int chl» alteration.- Occasional patches of olive green «Qz-Ep patches». Trace leucoxene.	<1/2% pyrite as occasional blebs.	Diabase intrusive? Irregular contact zone, no trend visible.
706.50 TO 707.40	«FLT GOU/BX»	Pale green. Fine grained. Partly healed mafic fault breccia/gouge zone with white quartz and calcite occupying 20% by volume as veins, veinlets and patches. Orientation approximately at	55	Chloritic alteration.	Secondary blebby pyrite concentrated in partly healed blocky section; 10% pyrite over 10cm: - 706.9-707.0m.	
707.40 TO 708.30	«MAF/CHT»	Pale green to grey. Fine grained. Transitional interval from mafic/intermediate intrusive to chert. Colour change is very gradually passing from green to grey. Transition zone has numerous anastomosing hairline fractures.		«Weak to mod chl» alteration.	Pyrite occurs as very fine grained dusty disseminations mostly in the lower half of the interval. Occasional thin bands (<1mm) and patches are present. Overall 3-4% pyrite.	Possibly chilled margin?
708.30 TO 709.60	«PYRITIC CHT BX»	Grey. Crypto-xalline to coarse pebble clasts. Gradational contact with the overlying transitional zone. The interval is dominated by a grey chert breccia with subrounded to sub-angular, granule to pebble size clasts with a generally fine grained pyrite matrix. The upper half metre does not display the well developed breccia texture but in-			Sulphide content is summarised for the following 2 intervals: 708.3-708.8 «10% py, 2% cp» 708.8-709.6 «25-30% py, 1-2% cp» Pyrite is generally dusty to very fine grained but coarser euhedral grains and blebs do occur. Chalcopyrite occurs as	Matrix to chert/breccia also comprises pitch black argillite?

HOLE NUMBER: CCF-62

DRILL HOLE RECORD

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PAGE: 4

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		stead a weak compositional layering defined by colour change and pyrite banding.(80-90degs.)	85		medium-coarse grained size, blebby aggregations, but at 708.6m an irregular, stringy band (4-10mm width) occurs with fine grained pyrite.	
709.60 TO 714.75	«MAF BX MAF/CHT»	<p>Grey light to dark green &amp; olive. Fine to coarse grained. A mixed, quite complex interval comprising: intimately mixed grey chert and green mafic; light and dark green, pyritic mafic breccia and possible mafic intrusive.</p> <p>709.6-710.4m: Transitional zone of greenish grey chert and mafic component.</p> <p>710.4-711.2m: Zone containing distinct patches of chert and greyish green fine to medium grained mafic.</p> <p>711.2-711.5m: Pyritic mafic, possibly minor fault bounded. Melanocratic compared to surrounding green chloritic basalts.</p> <p>711.5-713.6m: Patchy chert and greyish green fine to medium grained mafic.</p> <p>‡713.6-714.75‡ Distinct «Breccia» with light and dark angular mafic clasts, up to 25cm width. Breccia is mostly clast supported but there is 25% silicified pale yellow matrix.</p>		<p>Trace pale greenish yellow sericitization. Moderate chloritic alteration.</p> <p>«Weak Ser, Mod chl»</p> <p>«Mod Sil» of breccia matrix.</p>	<p>Variable distribution of sulphides as detailed below:</p> <p>5-7% fine grained pyrite in patches and streaky bands.</p> <p>7% fine grained pyrite in wispy streaks and patches.</p> <p>15-20% fine to blebby disseminated pyrite.</p> <p>5-7% pyrite as wisps in chert, patches &amp; rounded brecciated (clasts?) nodules. Irregular blebby, patchy (clasts?) of fine brassy pyrite within breccia matrix, up to 5x20mm. Irregular patches and blebs chalcopryrite up to 3x7mm.</p> <p>‡713.6-714.7‡ «5% py, 2% cp»</p>	<p>Mafic chert breccia.</p> <p>Pyritic mafic intrusive?</p> <p>Mafic chert breccia.</p> <p>Py mafic breccia.</p>
714.75 TO 715.20	«MSSX»	Dark Brown. Very fine grained. Unusual upper and lower contacts to a 45cm interval of massive sulphide. The contacts are characterized by siliceous pale yellow green material, similar to the above breccia matrix. Contacts are irregular but never the less conformable. No apparent structural trend. Brecciated at lower contact.		<p>Siliceous yellow green matrix material may be the product of Albite-epidote alteration.</p> <p>«Ab-Ep rims to Sx»</p>	<p>‡714.75-715.2‡ «70% py, 3% cp»</p> <p>Very fine grained brassy yellow pyrite. Fine grained wisps and stringy patches of chalcopryrite. Siliceous irregular blebs and patches occupy approximately 27% by volume.</p>	Massive sulphide intersection may be a boulder within a breccia sequence. NB. The sequence of lithologies from 708.8-715.2m may be part of the same brecciated package.
715.20 TO 724.40	«MAF BX»	<p>Pale and dark green. Coarse grained. Pale green and dark green mafic (basalt) clasts of angular shape and variable size (granule to cobble) from a generally clasts supported breccia. Pale yellow greenish (albite-epidote?) forms an anastomosing matrix between the broken mafic fragments.</p> <p>1-2% late stage quartz calcite veins.(30-40degs)</p> <p>No overall fabric or foliation developed. Core breaks at irregular angles to c.a. Occasional shears/fractures developed sub-parallel to c.a. eg. 716.9m. The lower contact is marked by a 1-4mm</p>	35	<p>Moderate chloritic alteration of all mafic clasts. Approximately 20% of interval is silicified.</p> <p>«Mod Chl»</p>	<p>Trace pyrite. Very occasional grains &amp; blebs, with the exception that the lower contact is marked by a thin, 1-4mm band of fine grained pyrite.</p>	Tectonic breccia? Pillow breccia?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		band of pyrite at angle to c.a. This could possibly represent bedding.	74			
724.40 TO 732.70	«PILLOW BSLTS»	Pale to dark green. Fine to medium grained. Pale to dark green, fine to fine/medium grained pillow basalts with well developed hyaloclastic breccia. Pillow silvages, however, are not readily apparent. 1-2% late stage quartz-calcite veins occur at low angle to c.a.	12	Albite epidote alteration of hyaloclastic breccia matrix. Moderate chloritic alteration throughout, with local Qtz-chlorite veins and stringers. «Ab-Ep alt of bx matrix»	Trace pyrite. Very occasional grains or blebs. Pyrite increases within lower 0.4m of interval, within hyaloclastic breccia.	Pillow basalts & hyaloclastic breccia.
732.70 TO 734.80	«MSSX/BSLT»	Green and brassy yellow. Fine grained. Brassy yellow, ropey, massive sulphide bands (mssx) (beds?) & patches in pale to dark green chloritic basalt. The upper contact is conformable, with the mssx cut off by a younger flow? The lower contact is faulted with some core loss. The irregular ropey bands occur at low angles, varying to sub-parallel to c.a. Pale yellow/green (cherty?) silicified (beds?) occur in close association with the mssx.	60 20	Pervasive chloritic alteration. Locally intense black chlorite stringers. 80% of interval silicified due to cherty bands and quartz epidote alteration. «Int chl, Bands of Ab-Ep»	The overall % sulphides is difficult to estimate due to the irregular distribution. Approximately: †732.7-734.6† «30-40% py, 1% cp» Fine grained massive pyrite has true widths up to 4cm. Chalcopyrite distribution ranges from trace to 3-4%. Cp is confined to the extremities of the massive pyrite, more often associated with pale yellow silicified zones and on shear surfaces.	
734.80 TO 736.90	«QTZ-EPI BSLT»	Yellow green to dark green. Fine grained. Almost chaotic mixture of chloritic basalt, quartz epidote alteration and creamy grey silicification (chert?) Numerous grey quartz veins (1-3mm width) locally invade the host rock at high angle to the c.a. (60-70degs) Possibly filling planes of foliation along which minor slip (5-10mm) has taken place. This trend is perpendicular to the orientation of the pale yellow green quartz-epidote alteration which is sub-parallel to c.a. The lower contact appears gradational.	65	60% Albite-epidote alteration intense throughout 60% of the interval. Moderate to intense chloritic 'green and black' alteration. «Int. Ep-Ab, int Chl»	Trace pyrite.	Altered stockwork zone?
736.90 TO 773.30	«PILLOW BSLT/BX»	Pale to dark green and grey. Fine to fine/medium grained. Sequence of pale to dark green and grey, fine to fine/medium grained pillow basalts with 30% pale yellow green quartz epidote as matrix filling to locally brecciated intervals. Minor mafic intrusives may be present but contacts are difficult to identify. †742.5-743.2† «Fault Zone» Intermittent brecciation. 3-4% late stage white quartz calcite veins. †745.7-746.7† «Blocky/Gouge» Blocky, broken core,		Moderate chloritic alteration throughout. Locally intense quartz epidote alteration which decreases in concentration downhole. «Mod Chl»	Occasional blebby pyrite on fracture/shear surfaces.  Occasional pyrite porphyroblast.	Debateable whether quartz epidote matrix is just infilling voids around brecciated basalt or whether it is partly intrusive causing brecciated?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		with minor gouge 746.3-746.5m. ‡751.4-752.6‡ «Diabase Dyke?» ‡757.0-758.1‡ «Mafic Breccia» Distinct, matrix to clast supported breccia with pale and dark green, granule to pebble size, angular clasts of basalt. Tectonic? Matrix is yellow/green quartz epidote and green fine chloritic mafic (volcaniclastic?)		Partly silicified breccia matrix. ‡757.0-758.1‡ «Sil bx matrix»		
773.30 TO 773.90	«FLT BX/ GOU»	Green. Intensely faulted zone of basalt, shattered to friable breccia and sandy gouge. 3-4% white quartz veins as remnant blocks and fragments within the fault zone.	55	Chloritic alteration.	No sulphides associated with quartz veins.	Late deformation event.
773.90 TO 775.60	«PY SIL ALT	Greenish grey. Very fine to fine grained. Green-		Weak pale yellow/green sericite after	30% very fine disseminated pyrite.	
TO 774.60	MAF»	ish grey, pyritic, very fine grained, silicified, altered, mafic (flow or volcaniclastic?). Texture locally appears conglomeratic/brecciated, with faint granule to small pebble size clasts of pyrite and mafic, elongate and parallel to weak foliation at (65-85degs) Late stage white quartz calcite veins occupy 30% of the lower 20cm, 775.4-775.6m. The lower contact appears gradational but it is possible core less from a minor fault zone could have taken place?	75	chlorite? Patchy silicification both primary (chert) & secondary (veining). Chlorite has a minor presence, locally intense as black stringers. «Int chl, patchy sil»	Minor arsenopyrite? ‡773.9-775.6‡ «30% py, <1/2% cp» Chalcopyrite occurs as small discreet blebs (<1-2mm) associated with thin (1-2mm) quartz veins. Remobilization?	
775.60 TO 813.20	«PILLOW BSLT/BX»	Pale to dark green and grey. Fine to fine/medium grained. Variable shades of pale to dark green and grey, fine to fine/medium grained pillow basalts. Pillow selvages are not readily apparent but are marked by bands of quartz epidote alteration. The variable textures and colours throughout the sequence suggest some mafic to intermediate intrusives may be present but contacts are difficult to distinguish. Occasional intervals of mafic breccia are also present. ‡782.7-784.5‡ «Diabase» Intrusive? ‡784.5-785.7‡ «Mafic Breccia» Angular, pebble to cobble size clasts in a siliceous creamy white to yellow/green matrix (interpillow breccia?). ‡799.6-800.1‡ «Mafic Breccia» Interpillow breccia? ‡804.8-805.5‡ «Bleached» due to intrusive? The core is quite competent but blocky intervals		Chloritic alteration varies from moderate to intense and may in part be responsible for the blotchy, pale green grey mottled texture seen at 802.5m. Silicification locally intense. Creamy white, silicification possibly chert? Pale yellow/green silicified stringers & breccia matrix due to quartz-epidote alteration.	<0.2% pyrite occurring as blebs within pillow margins; grains and blebs associated with fractures and shears & occasional porphyroblasts associated with a chill margin? at 804.6m. ‡781.8-782.2‡ «1/2% py» in quartz epidote (?) stringer running sub-parallel to c.a.	

HOLE NUMBER: CCF-62

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 26-November-1990

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		do occur within the lower 25m of the hole. Weak foliation is developed at an angle to c.a. of Some shearing has also taken place, at a low angle to c.a. of	65 25			
		END OF HOLE.				

HOLE NUMBER: CCF-62

DRILL HOLE RECORD

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PAGE: 8



HOLE NUMBER: CCF-62

## ASSAY SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	ASSAYS						SG g/cc	COMMENTS
				Cu %	Pb %	Zn %	Au g/t	Ag g/t			
BCD24932	708.30	708.80	0.50	0.302	0.01	0.01	0.02	10.0			
BCD24933	708.90	709.60	0.70	0.790	0.01	0.02	0.05	10.3			
BCD24940	714.75	715.20	0.45	1.370	0.03	4.19	0.94	12.4			
BCD24944	732.70	733.20	0.50	0.249	0.01	0.03	0.20	2.8			
BCD24946	733.95	734.80	0.85	0.413	0.01	0.04	0.31	4.60			
BCD24949	773.90	774.70	0.80	0.176	0.01	0.04	0.16	3.90			
BCD24950	774.70	775.60	0.90	0.169	0.01	0.03	0.16	3.70			

HOLE NUMBER: CCF-62

ASSAY SHEET

PAGE: 9

HOLE NUMBER: CCF-62

## GEOCHEM. SHEET

DATE: 26-November-1990

Sample	From (m)	To (m)	Length (m)	Al2O3 %	Bat %	CaO %	Fe2O3 %	K2O %	MgO %	MnO2 %	Na2O %	P2O5 %	SiO2 %	TiO2 %	S %	TOT %	Ag ppm	As ppm	Ba ppm	Cu ppm	Pb ppm	Sb ppm	Zn ppm	Au ppb
BCD24926	120.50	121.10	0.60														4.4	1	16	88	2	1	61	1
BCD24927	139.60	141.00	1.40														4.4	1	16	70	10	1	60	2
BCD24928	694.30	697.30	3.00	14.06	0.045	12.63	10.34	0.38	5.82	0.21	2.92	0.08	47.16	1.61	0.28	95.52	4.1	1	36	79	3	1	57	5
BCD24929	700.40	703.90	3.50	12.61	0.1	12.8	10.12	0.15	4.83	0.23	1.6	0.1	52.04	1.12	0.14	95.84	2.7	1	118	146	26	1	54	5
BCD24930	706.50	707.40	0.90														2.2	37	248	301	43	3	127	41
BCD24931	707.40	708.30	0.90														1.9	1	193	105	31	1	302	5
BCD24932	708.30	708.80	0.50																					
BCD24933	708.80	709.60	0.80																					
BCD24934	709.60	710.40	0.80														2.2	19	201	1157	126	2	3057	56
BCD24935	710.40	711.20	0.80														1.4	1	174	270	31	1	1190	24
BCD24936	711.20	711.55	0.35														2.1	1	50	2319	5	1	352	39
BCD24937	711.55	712.50	0.95														1.4	1	184	236	37	1	1190	20
BCD24938	712.50	713.60	1.10														2.9	1	216	950	21	1	1134	16
BCD24939	713.60	714.75	1.15														4.5	1	467	1118	11	1	417	2
BCD24941	715.20	718.20	3.00	13.99	0.195	13.12	11.07	0.29	5.55	0.2	2.3	0.08	47.69	1.54	0.07	96.1	4.2	1	216	215	10	1	80	5
BCD24942	729.20	732.20	3.00	13.87	0.12	11.64	10.65	0.14	6.27	0.21	2.77	0.08	46.75	1.63	0.2	94.33	4.7	1	278	65	3	1	67	5
BCD24943	732.20	732.70	0.50														5.2	1	414	398	2	1	107	1
BCD24944	732.70	733.20	0.50																					
BCD24945	733.20	733.95	0.75														3.4	1	16	2534	34	1	133	501
BCD24946	733.95	734.80	0.85																					
BCD24947	734.80	736.90	2.10	11.38	0.075	9.2	7.81	0.36	4.66	0.21	2.01	0.06	57.43	1.18	0.19	94.56	3.2	1	135	106	17	1	137	5
BCD24948	770.30	773.30	3.00	13.47	0.025	10.66	10.2	0.28	6.36	0.19	2.58	0.09	45.03	1.58	0.13	90.59	1.9	1	60	53	4	1	111	5
BCD24949	773.90	774.70	0.80																					
BCD24950	774.70	775.60	0.90																					
BCD24951	775.60	778.60	3.00	13.7	0.015	11.1	10.47	0.02	6.21	0.19	3.39	0.04	46.63	1.62	0.04	93.43	4.1	1	56	70	3	1	67	5
BCD24953	781.80	782.20	0.40														4.7	1	75	125	6	1	66	22
BCD24952	810.10	813.20	3.10	14.08	0.015	13.1	10.75	0.08	6.41	0.18	2.96	0.08	46.91	1.65	0.15	96.36	4.6	1	66	130	4	1	57	5

HOLE NUMBER: CCF-62

GEOCHEM. SHEET

PAGE: 10

**APPENDIX III**  
**STATEMENT OF QUALIFICATIONS**

## STATEMENT OF QUALIFICATIONS

I, David Heberlein of 821 Pinemont Avenue, Port Coquitlam, B.C. certify that:

1. I graduated from the University of Southampton, England with a B.Sc (Honours) Degree in Geology in 1980.
2. I graduated from the University of British Columbia with an M.Sc Degree in Geology in 1985.
3. I have practised my profession continuously since my graduation.
4. I am a Fellow of the Geological Association of Canada (F5050).
5. I am currently employed by Minnova Inc. as a Senior Project Geologist.
6. Work described in this report was carried out under my direct supervision.

Date: 12-12-1990

Signature: 



GEOLOGICAL BRANCH  
ASSESSMENT REPORT  
20,570

<b>MINNOVA Inc.</b>		
CHU CHUA PROPERTY		
CC-11 GRID		
DRILL HOLE LOCATION MAP		
N.T.S. 92P/BE	SCALE: 1:2500	FIG. No.
DATE: DECEMBER 1990	REVISED:	<b>3</b>
DRAWN BY: JB/sq	FILE: CHUGEO90.DWG	

CC-10  
CC-11



