ASSESSMENT REPORT

on the

1992 DIAMOND DRILLING PROGRAM

Clisbako 1 to 37 Claims

CARIBOO MINING DIVISION

NTS 93C/9E, 16E 93B/12W, 13W

Lat 52°43'N Long 124°03'W

Owner and Operator:

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

Dave Heberlein.
November, 1992.

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1. INTRODUCTION

1.1 General:

This report documents the results of an 11 hole, 1,357.9m diamond drilling program carried out on the Clisbako property between August 14th and September 10th, 1992. The program tested chargeability and resistivity anomalies identified by an IP survey carried out in late July and early August. Extensions to epithermal alteration zones identified in 1991 were also tested by the program.

1.2 Location and Access (Fig. 1):

The Property is located in central British Columbia about 105km west-southwest of Quesnel and approximately 40km southwest of the village of Nazko. It is centred at 52°43′ North and 124°03′ West.

Access to the claims is via the Michelle Creek and 4200 logging roads. The Michelle Creek or 3900 road as it is locally known, heads southwest from Nazko. At kilometre 27, the 4200 road branches off to the south and reaches the property boundary at kilometre 19. A spur road at kilometre 25 heads south to the grid area.

1.3 Physiography and Vegetation:

The claims form an irregular rectangular block covering an area of 10,925 hectares. East and northeast sides of the property are lowland areas typified by swampy meadows at the headwaters of the Clisbako River system. Central, south and western parts of the property are hilly with relief in the order of 250m and maximum elevations reaching 1675m at Mt. Dent near the west property

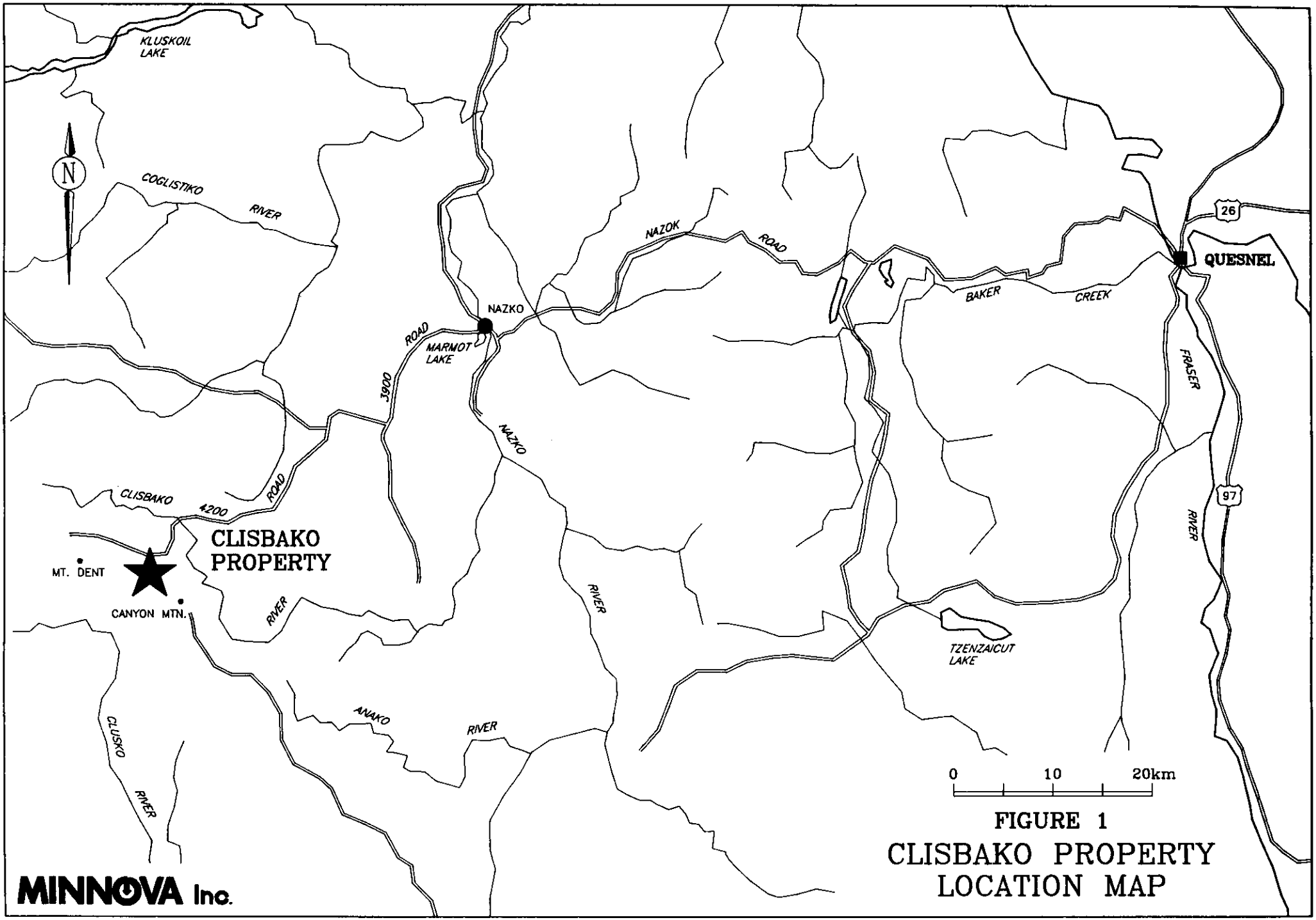


FIGURE 1

CLISBAKO PROPERTY
LOCATION MAP

MINNOVA Inc.

boundary. The hills form an east west divide between the Clisbako drainage to the north and the Clusko River drainage to the south.

Much of the claim area is forested, except where clear cut by recent logging. Lodgepole pine is the dominant species but black spruce and birch are abundant in low-lying and poorly drained areas. Grassy meadows occur along the major drainages in the east and north parts of the claim area. These are saturated for much of the year but dry out in late summer. Much of the central and southern parts of the property have been burned by forest fires in recent years. Three clear recent clear cuts and secondary logging roads provide access to the grid area.

Outcrop is sparse (<10%) and typically occurs in deeply incised creek channels, on hill tops and in road cuts. Much of the property is covered by a variable thickness stratified drift consisting mainly of fluvio-glacial sediments. A basal lodgement is present in places.

1.4 History:

Several major companies have carried out regional reconnaissance programs for uranium, oil and gas and epithermal Au-Ag in the region through the 1970's and early 1980's. There is no record or evidence of mineral exploration or mining activity in the claim area itself before 1990.

The closest mineral property to Clisbako is Rio Algom's OBOY prospect which is located about 4km northwest of the Clisbako 3 claim. Rio staked this property in the early 1980's and later carried out geological, geochemical and geophysical surveys and a 3000' diamond drilling program. Their target was a weak zone of quartz stockworking with anomalous Au values up to 300 ppb. The property is now inactive.

Attention was focused on the claim area when zones or argillic alteration were noted during a regional reconnaissance program by Eighty Eight Resources Ltd. in the summer of 1990. Later follow-up prospecting identified areas of glacial outwash deposits containing abundant epithermal quartz float. This material was traced up-ice to its sources and the main showings were discovered. After staking the area, Eighty Eight Resources Ltd. immediately carried out a preliminary soil sampling and geological mapping program to determine the extent of the epithermal alteration zones.

Minnova Inc. optioned the property in the spring of 1991 and proceeded to fly an airborne magnetic and EM survey using the Dighem system. A field program consisting of trenching, geological mapping and rock sampling over the alteration zones was completed that summer and followed by a 19 hole 3023.7m diamond drilling program later in the fall of 1991. Results of the drill program are documented in an assessment report by D.R. Heberlein (1992).

2.0 CLAIMS

The Clisbako property consists of 20 MGS mineral claims and 17 two post claims that cover an area of 10,925 hectares. A list of the claims and their expiry dates is shown below.

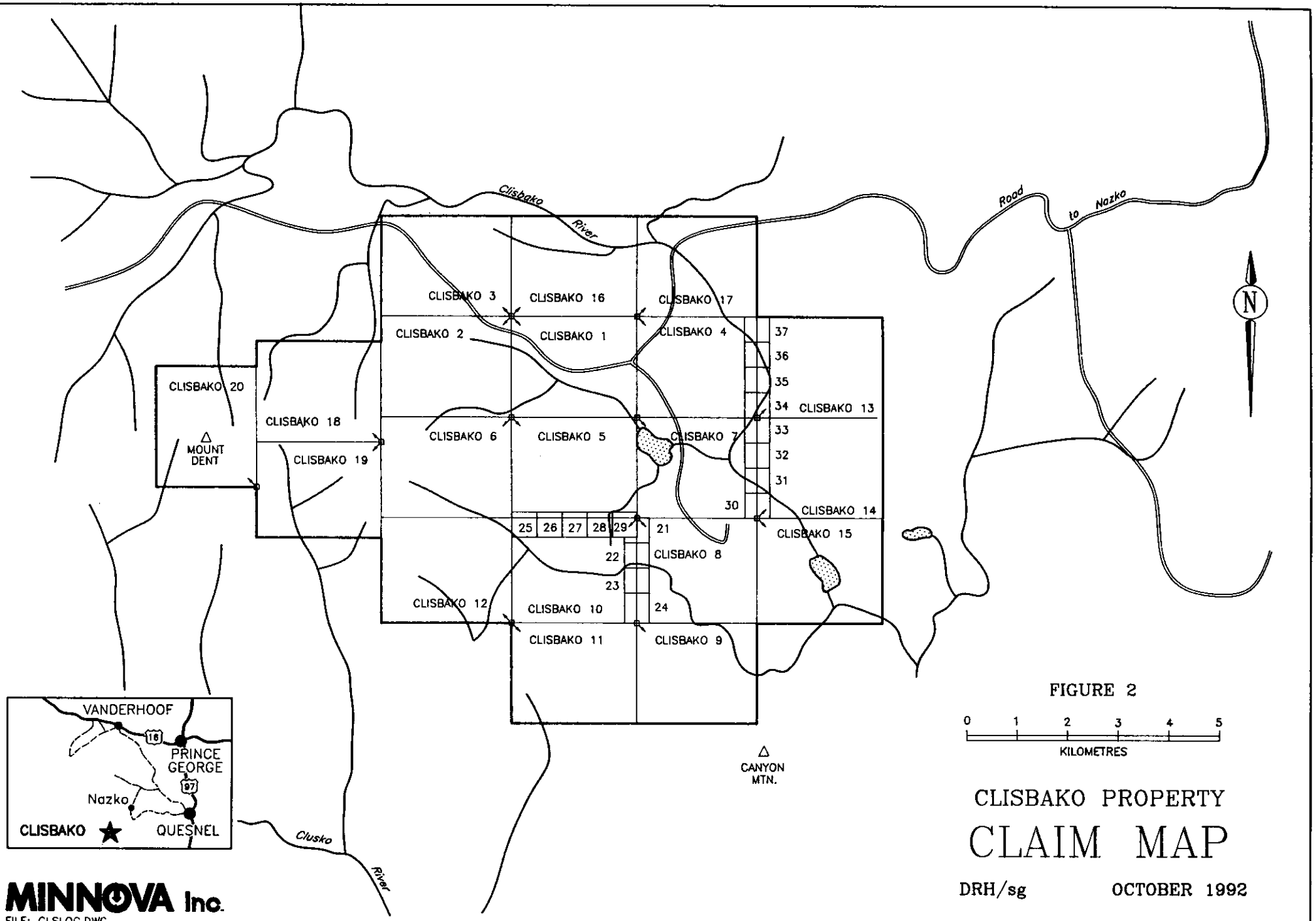


FIGURE 2

CLISBAKO PROPERTY

CLAIM MAP

DRH/sg OCTOBER 1992

MINNOVA Inc.

FILE: CLSLOC.DWG

TABLE 1. LIST OF CLAIMS

Claim	Record No.	Units	Record Date	Expiry* Date
Clisbako 1	206988	20	06-03-90	06-03-96
Clisbako 2	206989	20	06-08-90	06-08-96
Clisbako 3	206990	20	06-05-90	06-05-96
Clisbako 4	206991	20	06-03-90	06-03-96
Clisbako 5	206992	20	06-08-90	06-08-96
Clisbako 6	206993	20	06-08-90	06-08-96
Clisbako 7	206994	20	06-05-90	06-05-96
Clisbako 8	207022	20	06-23-90	06-23-96
Clisbako 9	207023	20	06-26-90	06-26-96
Clisbako 10	207024	20	06-27-90	06-27-96
Clisbako 11	207236	20	09-19-90	09-19-92
Clisbako 12	207250	20	09-20-90	09-20-92
Clisbako 13	207251	20	09-29-90	09-29-94
Clisbako 14	207252	20	09-29-90	09-29-94
Clisbako 15	207266	20	09-29-90	09-29-94
Clisbako 16	207416	20	04-18-91	04-18-96
Clisbako 17	207417	20	04-18-91	04-18-96
Clisbako 18	207418	20	04-23-91	04-23-95
Clisbako 19	207419	20	04-23-91	04-23-95
Clisbako 20	207420	20	04-22-91	04-22-95
Clisbako 21	310170	1	06-10-92	06-10-97
Clisbako 22	310171	1	06-10-92	06-10-97
Clisbako 23	310172	1	06-10-92	06-10-97
Clisbako 24	310173	1	06-10-92	06-10-97
Clisbako 25	310185	1	06-14-92	06-14-97
Clisbako 26	310186	1	06-14-92	06-14-97
Clisbako 27	310187	1	06-14-92	06-14-97
Clisbako 28	310188	1	06-14-92	06-14-97
Clisbako 29	310189	1	06-14-92	06-14-97
Clisbako 30	310190	1	06-15-92	09-15-97
Clisbako 31	310191	1	06-15-92	06-15-97
Clisbako 32	310192	1	06-15-92	06-15-97
Clisbako 33	310194	1	06-15-92	06-15-97
Clisbako 34	310195	1	06-15-92	06-15-97
Clisbako 35	310196	1	06-15-92	06-15-97
Clisbako 36	310197	1	06-15-92	06-15-97
Clisbako 37	310198	1	06-15-92	06-15-97
		417	Units	

* Assuming acceptance of this assessment report.

3. GEOLOGY

Two ages of volcanic rocks underlie the Clisbako property. Oldest rocks, informally named the Clisbako formation, consist of

a regionally extensive succession of felsic to intermediate flows and pyroclastic rocks. The age of these rocks is uncertain. Tipper (1968) assigns them a probable Paleocene to Eocene age and correlates them with the Ootsa Lake Gp. They underlie about 90% of the claim area and are well exposed along the hill tops between Mt. Dent and the Clisbako River.

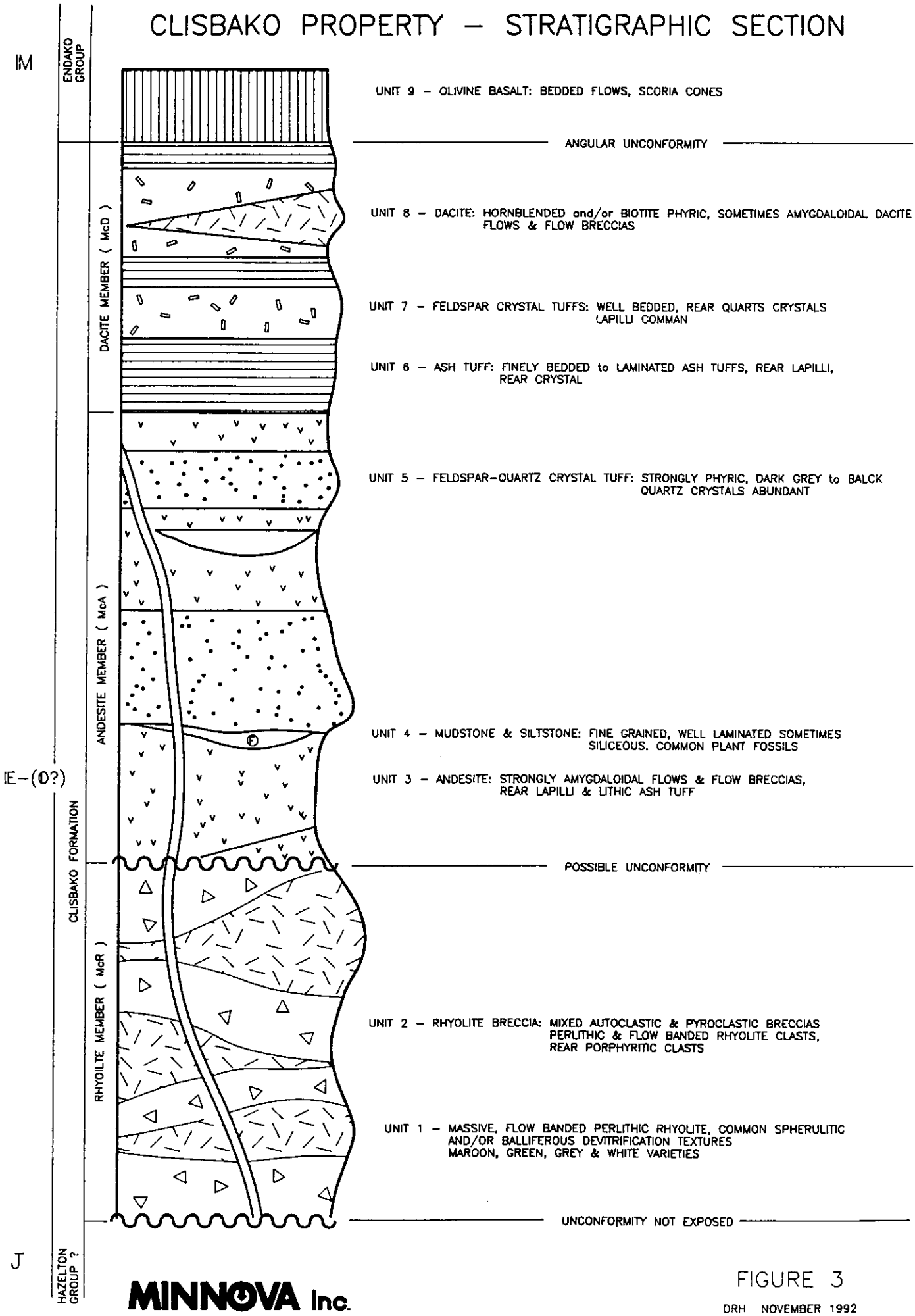
Unconformably overlying the Clisbako formation is a 30 to 50m thick sequence of olivine basalt flows and locally abundant pyroclastic rocks belonging to the Miocene Endako Group. These rocks outcrop at the south east corner of the property near Canyon Mountain and underlie much of the low lands in the Clisbako River drainage.

Stratigraphy:

A schematic stratigraphic column for the Clisbako property is shown in Figure 3.

The Clisbako Formation is subdivided into three lithologically distinct members: the Rhyolite Member, the Andesite Member and the Dacite Member. The Rhyolite Member (Mcr) is the oldest stratigraphic unit. It outcrops mainly in the Mt. Dent area, but also as a north-south trending strip in the east central part of the property. Aphanitic to glassy rhyolite flows (Unit 1) are the dominant lithology, however feldspar phyric flows are also present but aerially insignificant. Most of the rhyolites are strongly flow banded and exhibit spectacular devitrification textures such as spherulites and ball textures. Perlites (after primary obsidian) are widespread. Individual flows vary from a few metres to several tens of metres in thickness. They commonly have autobrecciated tops and bases and grade laterally into unsorted, clast supported breccia deposits. Hematitic rhyolite breccias sometimes containing a variety of rhyolite clast types (Unit 2) separate the flows.

CLISBAKO PROPERTY – STRATIGRAPHIC SECTION



MINNOVA Inc.

FIGURE 3

DRH NOVEMBER 1992

Incipient welding textures are present in these rocks suggesting that they are of pyroclastic origin.

Overlying the Rhyolite Member, possibly unconformably, is the Andesite Member (Mca). This package is bimodal, consisting of interbedded andesite flows (Unit 3) and thick, well bedded rhyolitic feldspar-quartz crystal tuffs (Unit 5). Andesites are exposed mostly in creek channels in the east-central claim area, south and west of the lake. They are characteristically strongly amygdaloidal and weather dark grey to olive green. Amygdules are filled by quartz, calcite and chlorite. Interflow sediments (Unit 4) composed of laminated siltstones and mudstones occur near the top of the andesite intervals. In at least one locality, they contain abundant broad leaf plant fossils.

Feldspar-quartz crystal tuff (Unit 5) separates the andesite flow sequences. Tuffs units are moderately well bedded on a 10 to 200 cm scale. They contain up to 25% grey to black quartz crystals (to 10mm) and 20% subhedral to euhedral alkali feldspar crystals in a felsic ash matrix. They are exposed over a wide area in the east central part of the property and south of the claims.

Overlying the Andesite Member is the Dacite Member (Mcd). It consists mostly of inter-bedded feldspar crystal tuff (Unit 6) and fine laminated ash tuff (Unit 7). A lack of quartz crystals is the main distinguishing feature between this unit and Unit 5. Rare massive to vesicular biotite and hornblende phyric dacite flows (Unit 8) are interspersed throughout the sequence. Steeply dipping bedded rocks of the Dacite member outcrop on the prominent hill 1km southwest of the lake.

Endako Group olivine basalts (Meb) unconformably overlie the Clisbako Formation. The contact is well exposed in a ravine on the north slope of Canyon Mtn at the south east corner of the claims. In this area a well preserved eruptive centre is exposed. Bedded

scoria and agglutinate deposits mark the remnant of a cinder cone. Two basalt flows are fed by this centre. Abundant olivine in the form of dunite nodules (up to 15 cm in diameter) and large euhedral phenocrysts (to 10mm) characterize this unit.

Flat lying basalt flows also underlie the Clisbako river drainage in the northeast claim area. Although not exposed, their distribution is accurately defined by aeromagnetic data.

Structure:

North to north-northeast striking faults are the most prominent structures on the property. They dip moderately to steeply east and west (40 to 80°) and are responsible for extensive block faulting of the Clisbako Formation. Measured offsets range from a few metres to about 200 metres. Epithermal alteration is hosted by several of these faults.

Faulting has caused considerable rotation of the volcanic sequence, resulting in highly variable dips. For example, on the west part of the grid, units of the Dacite member dip steeply to vertically while at the North Zone bedding is nearly flat lying.

A shallow graben is defined by the north trending faults in the grid area. Epithermal style alteration at the North, Central, South, Gore and West Lake zones occur along these structures. The easternmost fault, the East Boundary Fault, hosts epithermal alteration intermittently over a length of 2km. The South, Trail and Central Zones occur along this structure.

Other structures include northwest and northeast trending linears which form conspicuous drainage patterns in the northeast claim area. They have no measurable offset and significance is not understood.

Epithermal Alteration:

Several occurrences of epithermal-style alteration are known in the east part of the property. They are all similar in style.

The zones are characterized by wide haloes of pervasive argillic alteration occurring in the hanging wall of the graben faults. Extensive stockworks of quartz, pyrite (± marcasite) veinlets occur throughout the argillic zones. Overall sulphide content averages about 0.5%.

Stockworks grade into areas of pervasive silicification close to the faults. These commonly contain irregular shaped bodies of hydrothermal breccia and banded veins.

Argillic alteration occurs up to 100m into the hanging wall of the source structures. Where several parallel structures occur close together, such as at the North Zone, the argillic zones coalesce into a single wide expanse. Silicification is more restricted, occurring as 1 to 25m wide zones along fault planes. Narrow subparallel silicified zones also occur in the footwall of the host structures.

Footwall alteration is less strong than hanging wall alteration. Argillic alteration is typical, however at some locations weak propylitization consisting mostly of chlorite and calcite veinlets is developed.

Alteration is well developed in a variety of host rocks. At the North, West Lake and Central zones alteration occurs in Unit 1 rhyolite and Unit 5 crystal tuff. At the South Zone strongest alteration is hosted by amygdaloidal andesite of Unit 3.

Geochemistry:

The alteration zones have a typical epithermal geochemical signature. Anomalous to highly anomalous values for Hg, As, Sb, Ba, Ag and Au are widespread. In the silicified zones Hg values reach levels of several thousands of ppb and As in the thousands of ppm. Anomalous Au values (in low hundreds ppb) and silver (to 77 ppm) occur in the silicified zones. Highest gold values occur in banded quartz veins and pyritic banded chalcedony veins. Values exceeding 1.0 g/t Au are rare and ore grades have not been seen to date.

4. DIAMOND DRILLING

4.1 Program Summary:

Eleven holes, totalling 1,357.9m were drilled on the Clisbako property between August 14th and September 10th, 1992. Drilling was performed by Frontier Drilling Ltd. of Langely, B.C., using a skid-mounted Longyear Super 38 diamond drill and NQ rods. Drill core was logged by P. Thiersch and G. Duso at Minnova's core storage facility on the property (Fig. 4).

Drill core was routinely split in 2 metre sections (or less if lithology dictated) and half of the core was shipped to Minen Labs in North Vancouver for geochemical analysis. Gold was determined by fire assay with an AA finish and Ag, As, Ba, Cu, Pb, Zn and Sb by ICP. Mercury was determined by AA using the cold vapour technique.

Drill hole locations are shown in Figure 4 and summarized in the table below. All coordinates are in UTM grid units. Drill logs and analytical results are presented in Appendix 1.

TABLE 2. DIAMOND DRILL HOLE LOCATIONS

HOLE	UTM EAST	UTM NORTH	ELEV.	AZM.	DIP	LENGTH
CL-92-20	429650	5841550	1293m	090°	-45°	132.6m
CL-92-21	429050	5841375	1320m	090°	-45°	76.8m
CL-92-22	429200	5841385	1314m	270°	-45°	156.7m
CL-92-23	428600	5841590	1335m	270°	-45°	185.0m
CL-92-24	428637	5841500	1345m	270°	-55°	168.6m
CL-92-25	429850	5841035	1345m	090°	-45°	101.2m
CL-92-26	429250	5841385	1310m	270°	-55°	76.2m
CL-92-27	429000	5841375	1320m	090°	-45°	121.0m
CL-92-28	429755	5839328	1292m	090°	-45°	154.5m
CL-92-29	429765	5839220	1290m	090°	-55°	78.3m
CL-92-30	429755	5839328	1292m	120°	-55°	107.0m
				TOTAL		1,357.9m

4.2 Results:

Results of the drilling program are summarized below.

4.2.1 Tufa Zone:

Drill hole **CL-92-20** was drilled to test a strong chargeability anomaly identified beneath the Tufa Zone. It penetrated a complex sequence of Unit 1 perlite, rhyolite and rhyolite breccia. Alteration is weak throughout the hole, with pervasive argillization prominent in the lower half. Strongest clay alteration occurs between 92.6 and 99.0m, in a gougy fault zone. Zones of strong silicification occur between 66.2 and 72.6m and 105.6 to 132.6m.

The strong chargeability anomaly was not explained by this hole. Disseminated pyrite (3%) was intersected over a 50cm width between 96.2 and 98.3m; an insufficient quantity to produce the strong IP response.

4.2.2 West Lake Zone:

Four holes (CL-92-21, CL-92-22, Cl-92-26 and CL-92-27) were drilled into the West Lake Zone. They were designed to test a coincident resistivity and chargeability anomaly and the dip extension of a mineralized epithermal vein exposed in two trenches.

Hole **Cl-92-21** collared in and followed a fault zone to a depth of 76.8m where the hole was abandoned. Core recovery averaged 50% throughout the hole. Recovered material consists mainly of clay-rich fault gouge containing pebble sized clasts of rhyolite and vein material. Pyrite as disseminated subhedral grains occurs throughout the hole in amounts up to 2%.

Hole **CL-92-22** was drilled to test the same target as CL-92-21. To avoid the fault the hole was collared 150m to the east of CL-92-21 and drilled in the opposite direction (270°).

A strongly argillized sequence of Unit 4 feldspar-quartz crystal tuff was encountered to a depth of 52.7m. Patchy silicification and moderate to strong argillic alteration with abundant quartz-pyrite stringers was noted throughout the interval. Intense silicification with zones of black-matrix breccia, jigsaw breccia and narrow quartz veins occurs between 52.7 and a fault zone at 108.9m. This alteration occurs at a major contact between Unit 4 and Unit 1. Strongly anomalous values for As (152-2492 ppm) and weak to moderately anomalous Hg values (up to 385 ppb) occur throughout the hole. Gold values are weakly anomalous (up to 23 ppb) in the most silicified intervals, and Ag is sporadically elevated through the entire hole.

Hole **CL-92-26** was drilled 50m east of CL-92-22, to test the alteration zone about 50m down dip. Unfortunately, as in hole CL-92-21, the hole followed a fault and was abandoned at 76.2m. Core recovered was mostly feldspar-quartz crystal tuff (15.2 to 62.2)

with moderate argillic and patchy silica alteration. Below the fault at 62.2m the hole remained in rhyolite breccia to the end of the hole.

Encouraging results were produced by hole **CL-92-27** which was drilled beneath CL-92-21. Strong alteration consisting of intense argillization, quartz stockworking and intermittent strong silicification was encountered between 58.8 and 75.6m. Zones of pyritic hydrothermal breccia occur from 62.2 to 63.9 and 70.7 to 75.6. Very high Hg values (1165 to 18,375 ppb) occur between 46.0 and 57.0m. Gold and Ag grades are very low with sporadic peaks up to 13.7 ppm Ag and 135 ppb Au.

4.2.3 West Pit Zone:

Two holes (**CL-92-23** and **CL-92-24**) were drilled to test an area of high chargeability and resistivity values in the West Pit area. Trenching on this target failed to reach bedrock, however quartz breccia float and bright yellow clay was abundant in the subcrop.

Hole **CL-92-23** penetrated 30.8m of overburden. From 30.8m to 75m, a strongly argillized zone containing a well developed stockwork of quartz and pyrite was intersected. Narrow intervals of strong silicification are present in this interval (34.1 to 34.6m, 48.1 to 48.6m and 56.1 to 56.8m). From 75.0 to 89.7, a complex zone of stockworking and brecciation was encountered. Several narrow bodies of hydrothermal breccia are present in this zone. Alteration and mineralization are hosted by amygdaloidal andesite. A fault truncates the mineralization at 108.8m and juxtaposes Unit 1 rhyolite, which continues to the end of the hole.

No significant metal values were encountered in this hole.

CL-92-24 was drilled into the West Pit IP anomaly, 100m to the southeast of CL-92-23. Unit 4 crystal tuff with moderate to

strong silicification was intersected from 9.1 to 100.4m. Most of the alteration occurs above 32.5m and is closely associated with several small faults. A clay-rich fault zone (100.8 to 107.7m) separates the crystal tuffs from perlitic, flow banded rhyolite. This unit continues to the bottom of the hole at 168.6m. Alteration below the fault is weak and no significant mineralization was observed in the rhyolite. No significant metal values were detected in the hole.

4.2.4 Beaver Pond Zone:

The Beaver Pond Zone was tested by hole **CL-92-25**. It lies at the south end of the West Lake Zone IP anomaly and is reflected at surface by three narrow breccia vein outcrops in the north bank of the North Zone creek channel.

Hole CL-92-25 collared in intensely argillized amygdaloidal andesite after 46.3m of casing. A well developed quartz-pyrite stockwork zone was penetrated from 46.3 to 56.3m. In this interval pyrite contents reach about 5%. Silicified fault breccia/ hydrothermal breccia occurs from 56.3 to 57.0m. The breccia lies in the hangingwall of a 2.8m (57.0 to 59.8m) wide quartz vein that occupies a major fault plane. Banded, bladed and breccia textures are present in this vein. Silicification and brecciation continue intermittently below the vein to a second fault at 61.5m. Below this the hole remains in rhyolite breccia to its end at 101.2m.

Alteration in the rhyolite consists mostly of pervasive argillization which decreases in intensity down hole. A narrow zone of silicification occurs between 71.3 and 71.6m where a small quartz vein occurs. No anomalous metal concentrations occur in this hole.

4.2.5 South Zone:

Three holes (CL-92-28, CL-92-29 and CL-92-30) were drilled at the South Zone. They were designed to test the west-dipping epithermal alteration zone, discovered in 1991 both along strike and down dip from the surface showings.

CL-92-28 collared in a well developed stockwork of quartz-pyrite stringers hosted by amygdaloidal andesite. At 57.0m a clay-rich fault plane separates the stockwork from silicified, black matrix hydrothermal breccia (58.0 to 69.3m). The breccia occupies a major fault contact between Unit 3 andesite in the hanging wall and Unit 1 and 2 rhyolite in the footwall. Rhyolites continue to the bottom of the hole at 154.5m.

Narrow, highly silicified zones cut the otherwise weakly altered rhyolite in several places (e.g., 71.2 to 72.0m and 75.6 to 81.0m).

Mercury and Arsenic are highly anomalous (up to 2720 ppb Hg and 610 ppm As) in the silicified breccia and in the overlying stockwork. Highest Au concentrations (294 ppb) occur in the black matrix breccia. Silver is most concentrated (10.5 ppm) at the upper contact of the breccia.

Hole **CL-92-29** was drilled 125m south of CL-92-29. It was drilled to test the South Zone structure 70m down dip from the surface exposure. Again it collared in strongly stockworked Unit 3 andesite which extends to 40.5m. From 40.5m to 44.2m the silicified black matrix breccia was intersected. The altered section is narrower and less well developed than it is in CL-92-28. Below the breccia, Unit 2 rhyolite breccia was present to the end of the hole at 154.5m.

Very high Hg values (to 7,500 ppb) occur in the silicified breccia from 40.5 to 45.2m. Anomalous As concentrations between 307 and 835 ppm extend over a wider interval (40.5 to 48.8m) which straddles the breccia zone. The highest gold value of 164 ppb occurs in the stockwork zone near the upper contact of the breccia. Silver values are generally elevated (+1.0 ppm) but do not occur over coherent widths.

Hole **CL-92-30** was drilled from the same collar as CL-92-28 to test the epithermal alteration 70m down dip from the surface exposures, mid way between holes CL-92-28 and CL-92-29. A well developed silicified breccia zone with an overlying stockwork hosted by argillized andesite was intersected between 58.3 and 70.2m. The breccia interval (62.4 to 70.2m) contains a 50cm wide cross cutting banded and bladed vein at the footwall contact. Below the vein stockworking and silicification persist to 76.6m where there is a sharp contact with rhyolite. The hole remains in rhyolite to the end at 107.0m. Alteration intensity gradually diminishes down hole.

Elevated values for Au (to 228 ppb), Hg (to 2160 ppb), and As (to 764 ppm) occur near to upper contact of the breccia zone.

5. SUMMARY AND CONCLUSIONS.

The drill program was designed to test IP anomalies identified by a gradient array IP survey carried out early in the 1992 field season. It also set out to complete the testing of the west dipping epithermal breccia body discovered at the South Zone in 1991.

Results of the program are disappointing. Despite intersecting extensive widths of strong epithermal alteration in each target area, no significant precious metal values were detected. Nevertheless, strongly anomalous indicator elements such as Hg, As (and Sb) show that the system as a whole has a classic epithermal signature. It may yet have potential at depth. A near surface, open pit target has all but been eliminated by the 1991 and 1992 drilling programs in the grid area.

6. REFERENCES.

Dawson, J.M., 1990; Geological and Geochemical Report on the Clisbako Property. Assessment Report.

Heberlein, D.R., 1992; Diamond Drilling Assessment Report on the Clisbako Property, Cariboo Mining Division.

Tipper, H.W., 1968; Geology, Anahim Lake. GSC Geology Map 1202A.

APPENDIX I
STATEMENT OF COSTS

STATEMENT OF COSTS

DRILLING (August 14 to September 25, 1992):

Contract Payment (Frontier Drilling Ltd.)
1,419.6m @ $49.70/m.....$70,549.85

Reclamation (Grass Seed):..... $356.87

PERSONNEL:

Peter Thiersch (Project Geologist):
25 days @ $ 180 /day..... $4,500.00

Greg Duso (Assistant):
25 days @ $115/day..... $2,875.00

Nancy Kastelein (Cook):
25 days @ $125/day..... $3,125.00

ANALYTICAL COSTS:

Geochemical Analyses of Drill Core
for Ag, As, Ba, Cu, Pb, Sb, Zn, Au and Hg:
172 samples @ $15.50 /sample..... $2,666.00

LOGISTICS:

Meals and Accomodation:
80 mandays @ $25/day..... $2,000.00

Vehicle Rental:
25 days @ $ 50/day..... $1,000.00

Travel Expenses:..... $380.00

Field Expenses:
(Core Racks, Camp Equpment etc.)..... $2,484.50

SUPERVISION:

Dave Heberlein (Senior Project Geologist):
5 days @ $250 /day..... $1,250.00

REPORT PREPARATION:

Dave Heberlein
2 days @ $250/day..... $500.00

TOTAL **$91,687.22**

APPENDIX II
DIAMOND DRILL LOGS AND ANALYTICAL RESULTS

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: TUFA ZONE

PLOTTING COORDS GRID: UTM
NORTH: 41550.00N
EAST: 29650.00E
ELEV: 1293.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1293.00

COLLAR DIP: -45° 0' 0"
LENGTH OF THE HOLE: 132.60m
START DEPTH: 0.00m
FINAL DEPTH: 132.60m

COLLAR GRID AZIMUTH: 90° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: August 14, 1992
DATE COMPLETED: August 17, 1992
DATE LOGGED: August 20, 1992

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

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

CONTRACTOR: FRONTIER DRILLING
CASING: 10' LEFT IN HOLE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP "PIPE" ANOMALY UNDER TUFA ZONE

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 0.00 TO 10.40	«CASING»					
10.40 TO 17.40	«OVERBURDEN -BASALT»					
17.40 TO 26.60	«OXIDE ZONE -FB FS RHYO »	F.B. FS Phyric rhyolite.(Classic FB latite)	40	highly fractured, gougy,«ST ARG»		
26.60 TO 40.10	«TUFF BRECCIA»	green, coarse grained, heterolithic depositional breccia.1-10 cm frags of perlitic rhyolitic,welded tuff and crystal ash tuff in a tuffaceous, locally bedded matrix. Matrix supported. ┤36-38├ «Fault zone»	65	Strongly fractured locally gougy«ST ARG » mottled green (chlorite) to black (he matite) alteration of frags and matrix.		
40.10 TO 44.50	«PERLITE»	Green, fine grained, classic perlitic rhyolite, locally intense, gives breccia like texture, upper contact is gougy- might be a fault.		«ST ARG»		
44.50 TO 45.20	«FAULT»	Grey coarse grained , 80% clay gouge zone.	65	«INT ARG»	Trace of sulphides.	
45.20 TO 66.20	«SPHEROIDAL RHYOLITE»	Green/maroon, fine grained, incredibly balliferous rhyolite, amazing density and size range from classic 1-3cm hematitic red balls to smaller <1cm trout spots. Many coalesce to form bands or cigar shapes. Perlitic texture is common between larger balls. Smaller spots often coalesce to become semi massive over 5-15cm larger balls commonly rimmed by white rind, in matrix, part of perlitic alterat ion which does not affect balls. Many smaller spot s are stretched and hollow- filled by py and chl and bright orange red mineral. These are the first true "lithophaysae" observed, look like amygdales but hematitic ball alteration surrounds the core. I'm now convinced that the balls are classic spheroidal alkali feldspar alteration accompanying devitrification. There chemistry is enriched in si lica and sodium relative to groundmass.	50	«PATCHY ARG» «MOD PROP» Pyrite doesn't exceed 1 or 2% but may b e responsible for I.P. chargeability allthough offset by 25m, this is the only sulphidic zone in the hole! Lower contact is gradational. ┤55.8-57.0├ «lithophaysae» <5mm, stretched, filled by calcite.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
66.20 TO 72.60	«PERLITE»	Dark green, fine grained, classic perlitic net tex tured rhyolite, rare balls.		«ST SIL»		
72.60 TO 77.20	«PERLITE»	Pale green, fine grained, intense perlitic				
77.20 TO 87.80	«HEMATITE BRECCIA»	Green and red coarse grained depositional breccia of f.b. rhyolite and perlite frags, variably chlor itized in a red to black hematitic matrix.		«ST CHL»frags «ST HEM» matrix, weak calcite stringers «PATCHY ST ARG»		This is where I.P. anomaly should be!
87.80 TO 88.20	«FAULT»	70% CLAY GOUGE				
88.20 TO 96.20	«PERLITE»	Classic perlite with local breccia like textures. rare balls.		highly fractured «MOD-INT ARG»		
96.20 TO 99.00	«FAULT» «GOUGE»	Major fault zone 60% clay gouge. [97.8-98.3] 90% clay gouge w\ minor py		«INT ARG» «EXT ARG»	3% disseminated py	this is probably I.P. anomaly.
99.00 TO 105.30	«PERLITE»	Pale grey, fine grained, finely banded, f.b. rhyolite overprinted by perlitic textures.Flow banding most apparant in upper 2m. Bands <1cm at lower contact "islands" of glassy unperlitized rhyolite remain. These are more silicious, less ar gillic like underlying rhyolite unit.	25	«MOD ARG»		
105.30 TO 132.60	«FLOW BAND RHYOLITE»	Dark grey, fine grained glassy unaltered flow banded rhyolite. Upper perlite represents alter- ation (hydration) halo around fault. Darker the rock the more silicious upper contact w\ perlite is "patchy". Rhyolite is flow banded and has variable feldspar microcrystals. [111.9-112.2] «FAULT» [118.5-120.9] «FRACTURE ZONE» fractured and [122.0-125.6] «FRACTURE ZONE» bleached zone with [128.4-132.6] «FRACTURE ZONE» some white clay. [124.4-132.6] «CALCITE VN» 3cm barren fracture fill.	45 20	«ST SIL» «PATCHY MOD ARG» minor calcite stringers. «MOD ARG» flow bands are hematite hairlines with weak chloritic halos.	trace of sulphides.	Contains bleached fracture zones.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
132.60 TO 132.70	«E.O.H.»					

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %		COMMENTS

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992	PLOTTING COORDS GRID: UTM	ALTERNATE COORDS GRID:	COLLAR DIP: -45° 0' 0"
PROJECT NUMBER: 667	NORTH: 41375.00N	NORTH: 0+ 0	LENGTH OF THE HOLE: 76.80m
CLAIM NUMBER:	EAST: 29050.00E	EAST: 0+ 0	START DEPTH: 0.00m
LOCATION: WEST LAKE ZONE	ELEV: 1320.00	ELEV: 1320.00	FINAL DEPTH: 76.80m
	COLLAR GRID AZIMUTH: 90° 0' 0"	COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"	

DATE STARTED: August 18, 1992	COLLAR SURVEY: NO	PULSE EM SURVEY: NO	CONTRACTOR: FRONTIER DRILLING
DATE COMPLETED: August 19, 1992	MULTISHOT SURVEY: NO	PLUGGED: NO	CASING: 10' LEFT IN HOLE
DATE LOGGED: August 26, 1992	RQD LOG: YES	HOLE SIZE: NQ	CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY AND VEINS FOUND IN TRENCH ALONG STRIKE TO SOUTH

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 25.90	«CASING»					
25.90 TO 28.00	«FAULT»	Oxide yellow iron stained fault gouge containing rounded sand to pebble sized heterolithic clasts. Some clasts silicified with veinlets visible, other clasts are grey chalcedony.	30	Strongly weathered and «MOD ARG» alt.	none	50% RECOVERY
28.00 TO 31.80	«SILICIFIED FAULT»	Oxide yellow, same fault but dominated by angular clasts of grey and/or pyritic chalcedony and white-yellow quartz. Partly resilicified but highly fractured and very porous.	10	«MOD SIL»	«1% PYRITE»	50% RECOVERY
31.80 TO 44.80	«GOUGE»	Pyritic quartz clasts, sand to pebble sized, in gouge matrix. Rare vein or breccia frag to 10cm		«INT ARG»	«1-2% PYRITE»	60% RECOVERY
44.80 TO 76.80	«FAULT»	Most fault gouge washed away leaving clasts of hydrothermal quartz vein and breccia, and strongly argillized feldspar crystal tuff. ⌊52.7-58.2⌋ «TRICONE» No recovery. ⌊76.7⌋ Pink orange mineral stain - orp? hem?		«ST ARG»		20% RECOVERY
76.80 TO 76.80	EOH					

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38084	26.00	32.60	6.60	2.6	152	324	14	2.02	11	18	11	197	1620	0.22	
38085	32.60	35.70	3.10	5	170	154	39	4.11	8	20	8	148	5070	5.19	
38086	35.70	40.20	4.50	3.8	484	179	25	2.66	5	24	6	136	1200	2.86	
38087	40.20	43.20	3.00	2.7	59	1088	13	2.17	2	8	35	28	715	2.37	
38088	43.20	52.70	9.50	11.9	151	429	14	0.84	5	13	12	104	505	0.66	
38089	58.20	67.70	9.50	7.8	264	1256	14	0.97	6	44	18	109	1230	0.08	
38090	67.70	76.80	9.10	2.4	125	202	6	0.59	7	19	12	58	300	0.03	

From (m)	To (m)	Length (L)	Sum Of Length S>= 0.00cm	RQD S/LX100	Number Of Fracturs	Fracturs Per Metres	Number Of Veins	Veins Per Metres	Angle	Comments
0.00	0.00	0.00	0.00	0	0	0	0	0	0	

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: CL-92-22 IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: WEST LAKE ZONE

PLOTTING COORDS GRID: UTM
NORTH: 41385.00N
EAST: 29200.00E
ELEV: 1314.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1314.00

COLLAR DIP: -45° 0' 0"
LENGTH OF THE HOLE: 157.60m
START DEPTH: 0.00m
FINAL DEPTH: 157.60m

COLLAR GRID AZIMUTH: 270° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: August 17, 1992
DATE COMPLETED: August 19, 1992
DATE LOGGED: August 23, 1992

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

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

CONTRACTOR: FRONTIER DRILLING
CASING: 10' LEFT IN HOLE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY AND VEINS FOUND IN TRENCHING BEST ASSAY IN TRENCH 7g Au, 85g Ag

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
154.50	-	-46° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 27.40	«CASING»	Overburden.				
27.40 TO 33.50	«OXIDE ZONE -FXT»	Orange, strongly oxidized feldspar crystal tuff or ash flow. Looks tuffaceous but wavy banding in fg ash? layers suggest flowage. Textural variability suggests ash flow origin. beds @	35	«PATCHY SIL, ST FE OX» Strongly oxidized, variable patchy silicification along some 2-3cm beds.	«TRACE PYRITE» preserved in silicified patches, otherwise oxidized.	
33.50 TO 43.50	«QUARTZ STOCKWORK-FXT»	Orange and grey, weak to moderate grey-black quartz stockwork. Black sulphidic veinlets to 2cm generally <1cm. Host rock is feldspar crystal rich ash flow tuff with irregular bedding or flow laminations and rare lapilli frags <1cm, 5%, feldspars 1-6mm, 30%. [33.5 - 34.2] «Black Sulphidic Quartz Vein» 2cm wide	10	«MOD-ST ARG, PATCHY ST SIL»	«1-5% PY» in grey to black quartz veins and stringers «TRACE BLACK (SILVER?) SULPHIDE» along vein selvages. «5% pyrite»	Quartz stringers at low angle to core axis indicate drilling down dip.
43.50 TO 46.90	«FAULT ZONE -LAPILLI TUFF?»	Grey-green, cg heterolithic breccia of <1cm-10cm angular frags of feldspar crystal tuff, aphanitic clay altered frags and grey quartz vein material. Looks like a lapilli tuff but gougey zones indicate a tectonic origin of overprint.		«ST-INT ARG, PATCHY SIL» Weak black quartz stockwork throughout interval.	«3% PYRITE» in broken stringers.	
46.90 TO 49.20	«FELDSPAR CRYSTAL-ASH TUFF»	Pale grey, mg tuffaceous interbed of feldspar crystal ash tuff. Weak fabric at 90 to CA may be bedding or weak welding. fabric @	90	«MOD-ST ARG» Weak quartz-pyrite stringers. Increasing silicification to bottom of interval, accompanied by pervasive iron staining, feldspars clay altered.	«1-2% PYRITE» in quartz stringers. ***RUBY SILVER*** noted at 47.7m	Host rock is continous feldspar crystal tuff down to fault at 99.7m.
49.20 TO 52.00	«LITHIC LAPILLI TUFF»	Pale grey, cg, silicified heterolithic lapilli tuff of subrounded to angular frags of welded feldspar crystal tuff, ash tuff and rare perlitic rhyolite. 90% of frags <2cm, 10% up to 10cm, in a lithic crystal rich matrix. bedding contact stringers	35 20	«ST SIL» is pervasive but some frags remain strongly argillized. Weak to moderate stockworking increases down section	«1-3% PYRITE» mainly restricted to quartz stringers. Patches of matrix are grey and silicified but don't carry significant sulphide.	Upper contact is gradational, but fractured and shows iron oxide halo above and below contact.
52.00 TO 57.00	«BLACK QUARTZ BRECCIA»	Black and white, cg monolithic hydrothermal breccia of feldspar crystal ash tuff. Frags angular <1cm to 20cm, at least three phases of brecciation: frags of argillized wall rock, white to grey banded quartz vein and wall rock and rebrecciated frags of same, cemented by black sulphidic fg quartz. Stockwork stringers of latest black quartz cut periferal wall rock. Minor local ashy interbeds 1-2cm		«MOD-ST ARG FRAGS, INT SIL MATRIX» Fragments strongly argillized, some overprinted by strong silicification. Feldspars gone to green clay. Three narrow zones (<10cm) of strong iron stained wall rock at 55.5, 56 and 56 .5m.	«3-10% PYRITE» in black quartz matrix also «TRACE BLACK SULPHIDE» probably acanthite, sparsely disseminated throughout, mainly visible in pre-sulphide banded white to grey quartz. Black sulphide at 55.8m and 53.2m.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		thick are well bedded at 25. bedding Upper contact appears conformable. Latest quartz phase is vuggy white and barren.	25			
57.00 TO 67.20	«QUARTZ STOCKWORK»	Grey patchy moderate to strong black quartz+pyrite stockwork stringers with local jigsaw breccias containing a second phase of fg grey quartz and less often a third phase of vuggy white crystaline quartz. Hosted by bedded weakly welded feldspar crystal tuff. vitric shards welded into planes @ Feldspars 2-4mm 15-20% in vitric shard rich matrix {59.9-59.2} «Quartz Breccia» Stockwork blowout, jigsaw breccia as above. {61.4-62.1} «Quartz Breccia» as above. {64.0-64.5} «Oxide Zone-Quartz Vein» Fe stained hanging wall to 2cm qtz vn {66.0-66.5} «Quartz Breccia» as above.	30	«MOD ARG» alteration of wall rock. Strongly stockworked and brecciated areas are moderately silicified. feldspars altered to green clay.	«3-5% PYRITE» in mm black quartz stringers and as mm selvages and fragment rims in local breccias. Occurs only in first phase quartz, accomapnied by. «TRACE BLACK SULPHIDE»	Veins at low angle to core axis.
67.20 TO 69.10	«QUARTZ BRECCIA»	Black to grey, cg monolithic hydrothermal breccia of same welded crystal ash tuff. Angular frags <1cm to 30cm, almost clast suported, locally jigsaw. Three phases evident: silicification and pyritization of wall rock fragments, intense brecciation and cementation by pyrite rich black quartz, then minor brecciation and vuggy cementation by barren grey quartz.		«ST ARG, ST SIL» wall rock frags have been strongly argillized, bleached, then overprinted by strong silicification and patchy pyrite.	«3-10% PYRITE» as mm selvages rip ps and blebs within the matrix. Also occurs as sil-py replacement in altered frags.	Trace grey sulphides may occur with pyrite along vein selvages.
69.10 TO 78.20	«QUARTZ STOCKWORK»	Moderate grey to black quartz stockwork stringers with minor blowout jigsaw breccias. Both carry abundant fg pyrite, some frags are also pyritic. Paragenesis is: sil-py alteration and brecciation, cementation by pyrite rich grey quartz mixed with black sulphidic? quartz, lesser brecciation and cementation by vuggy grey barren quartz. {76.3-77.1} «Pyrite Breccia» black sulphidic? qtz		generally «MOD-ST ARG» alteration of wall rock, with patchy «MOD SIL» overprint, feldspars gone to pale green clay, some breccia frags are silicifed and pyritic. Minor white clay in late vugs	«3-10% PYRITE» in black quartz stringers and blowout breccias. Opaque black quartz may carry black sulphide?	
78.20 TO 87.50	«OXIDE ZONE»	Orange-brown oxidation halo around fault, overprints weak bull quartz stockwork. {79.3-81.1} «Fault» Oxidized gouge.		«ST FE OX» Strong fe stained feldspars.	«TRACE GREY SULPHIDE» remains, all pyrite has been leached.	
87.50 TO 99.70	«QUARTZ STOCKWORK»	Orange to grey, weak to moderate quartz stockwork with patchy late fe oxide overprint. Minor blowout breccias carry abundant pyrite. Smokey quartz lines vein walls and appears to replace mm selvages within the wall rock. This is followed by grey pyrite rich quartz, then late white bull quartz. Oxid		generally «ST ARG, W SIL» alteration with late fracture controlled «PATCHY FE OX» {88.5-89.5} «Oxide Zone» {90.5-91.0} «oxide Zone»	«3-5% PYRITE» in quartz stringers and breccias. purple irridescent bladed sulphide noted at 89.4m, black opaque sulphidic? quartz at 92.0m	Smokey quartz and opaque black quartz are new observations.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		e zones are late fracture controlled. ǂ89.5-90.5ǂ «Pyritic Quartz Breccia»				
99.70 TO 108.90	«FAULT ZONE»	Wide zone of fracturing and brecciation, pale grey gouge 60%		«INT ARG»	«1% PYRITE» in disrupted qtz stringers	
108.90 TO 113.90	«RHYOLITE BRECCIA»	Mixed interval of green and red chloritic and hema titic flow breccia, perlite and minor gougy fractu re zones.		«ST CHL, HEM, PATCHY ST ARG»	«TRACE PYRITE» in late clay filled frac tures.	
113.90 TO 133.00	«FLOW BAND RHYOLITE»	Pale green relatively homogenous interval of flow banded rhyolite, banded accentuated by red hematit e, late fractures filled by white clay and calcite banding @6 ǂ132.0-132.1ǂ «Quartz Breccia» drusy	80	«MOD HEM, CHL» hematite occurs as alter ation of flow bandes, chlorite as halos around late fractures. «ST SIL»	«TRACE PYRITE» in late fractures. «3% PYRITE»	This breccia suggests that faulting is syn rather than post mineralization, al lowing some leakage into footwall rhyo.
133.00 TO 137.30	«PERLITE - SPHERULITES »	Pale green fg perlitic rhyolite with scarce spheru lites averaging 5cm.		«MOD SIL» minor late fractures coated w ith white clay.		
TO 157.60						
137.30 TO 157.60	«RHYOLITE» EOH	Very pale green, mixed interval of perlite, hemati tic breccia and flow banded rhyolite. minor late f ractures. flow bands @	70	«MOD ARG» minor clay in late fractures.	«TRACE PYRITE» with clay.	

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38001	28.00	30.00	2.00	3.6	749	172	5	1.44	10	16	11	72	755		
38002	30.00	32.00	2.00	5.7	485	267	12	0.99	8	8	9	106	1085		
38003	32.00	33.50	1.50	11.4	1198	578	12	1.26	9	27	10	220	2445		
38004	33.50	35.50	2.00	5.9	538	433	28	1.28	11	21	8	216	2095		
38005	35.50	37.50	2.00	7.9	1091	718	13	1.71	7	25	11	385	2850		
38006	37.50	39.50	2.00	2.5	427	490	17	1.55	13	7	4	148	1585		
38007	39.50	41.50	2.00	5	890	690	22	1.66	7	32	6	198	1730		
38008	41.50	43.50	2.00	7.6	2492	560	51	1.97	14	85	4	399	1030		
38009	43.50	45.00	1.50	4.4	789	295	28	1.29	5	16	7	103	675		
38010	45.00	46.90	1.90	4	784	155	20	1.83	15	25	4	124	640		
38011	46.90	49.20	2.30	6.9	521	229	16	1.3	7	13	6	100	2230		
38012	49.20	51.00	1.80	22.4	424	342	10	1.25	5	11	6	59	845		
38013	51.00	52.00	1.00	3.8	215	559	18	1.32	8	14	2	47	705		
38014	52.00	53.00	1.00	8.3	605	767	29	1.81	9	31	3	136	2435		
38015	53.00	54.00	1.00	5.8	697	468	44	1.95	10	27	5	149	1045		
38016	54.00	55.00	1.00	7.6	895	532	39	1.98	5	52	3	226	2515		
38017	55.00	56.00	1.00	7.6	739	341	47	1.93	8	47	5	159	2450		
38018	56.00	57.00	1.00	14.6	1050	1074	43	1.96	9	61	7	248	3780		
38019	57.00	58.00	1.00	2.7	409	614	12	1.04	8	22	19	71	735		
38020	58.00	59.00	1.00	4.5	721	323	13	1.37	12	41	24	94	615		
38021	59.00	60.00	1.00	1.5	160	238	11	0.96	9	12	24	20	320	1.13	
38022	60.00	61.00	1.00	2.3	191	545	12	1.01	10	14	6	24	425	1.19	
38023	61.00	62.50	1.50	3.3	340	323	10	1.12	11	21	4	68	870	1.17	
38024	62.50	64.50	2.00	2.8	152	550	11	0.71	10	21	4	35	1555	0.54	
38025	64.50	66.00	1.50	3.9	344	463	34	1.14	11	21	23	52	1010	1.29	
38026	66.00	67.20	1.20	7.3	553	341	19	1.4	12	35	10	69	830	1.55	
38027	67.20	69.10	1.90	4.8	1271	514	13	1.85	13	51	20	160	1310	2.13	
38028	69.10	71.10	2.00	3.3	383	356	14	1.11	12	23	5	49	1000	1.26	
38029	71.10	73.10	2.00	3.7	388	408	15	1.4	13	24	4	50	845	1.64	
38030	73.10	75.10	2.00	2.3	204	462	15	1.05	10	13	3	35	430	1.18	
38031	75.10	76.30	1.20	4	299	1002	8	1.27	11	21	2	76	865	1.47	
38032	76.30	77.10	0.80	8.6	768	215	19	5.75	7	48	10	129	2160	6.28	
38033	77.10	78.20	1.10	3.5	484	1389	18	1.44	8	18	3	68	555	1.72	
38034	78.20	81.20	3.00	2.1	351	867	5	1.06	10	49	12	47	235	0.08	
38035	81.20	83.20	2.00	5.8	628	1290	5	1.54	13	32	16	41	495	0.05	
38036	83.20	85.20	2.00	3.1	359	207	3	1.03	8	19	12	13	215	0.03	
38037	85.20	87.50	2.30	7.8	446	1234	97	1.15	12	20	3	138	1450	1.24	
38038	87.50	88.50	1.00	3.3	641	905	4	1.8	9	46	17	45	155	0.05	

Sample	From (m)	To (m)	Length (m)	Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %
38039	88.50	89.50	1.00	24	564	1526	5	1.5	12	44	14	104	1345	0.07
38040	89.50	90.50	1.00	7.5	385	374	84	1.26	11	17	3	49	935	1.33
38041	90.50	92.50	2.00	2.4	505	1101	21	1.01	10	39	6	78	610	0.75
38042	92.50	94.50	2.00	2.6	295	584	10	1.06	11	34	5	135	575	0.85
38043	94.50	96.50	2.00	2.3	397	552	26	0.59	7	18	4	118	395	0.54

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: WEST PIT ZONE

PLOTTING COORDS GRID: UTM
NORTH: 41590.00N
EAST: 28600.00E
ELEV: 1335.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1335.00

COLLAR DIP: -45° 0' 0"
LENGTH OF THE HOLE: 185.00m
START DEPTH: 0.00m
FINAL DEPTH: 185.00m

COLLAR GRID AZIMUTH: 270° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: August 23, 1992
DATE COMPLETED: August 25, 1992
DATE LOGGED: August 26, 1992

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

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

CONTRACTOR: FRONTIER DRILLING
CASING: NONE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY, UNDER TEST PITS WHICH DID NOT REACH BEDROCK, BUT RECOVERED HYDROTHERMAL

DIRECTIONAL DATA: EXPLOSION BRECCIAS.

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
137.20	-	-46° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 30.50	«CASING»					
30.50 TO 30.80	«OVERBURDEN»	FB rhyolite				
30.80 TO 32.20	«WACKE»	Reworked,volcanically derived epiclastic, poorly bedded @	50 70			
32.20 TO 75.00	«STOCKWORK-FAULT ZONE»	Strong qtz stockworking in wide fault and fracture zone. Host is exceptionally amygdaloidal andesite flow breccia (frags 2-20 cm). Dense amygdules mm-2 cm in size lined with drusy white qtz stock-work veins of grey to black qtz are moderately pyritic. Minor blow out breccias occur locally, stockwork veins disrupted by latest faulting. Interval is extensively sheared and gougy. Widest competent interval is approx. 2 m		«ST-INT ARG» -interval is intensely argillically altered, approx. 40% is sheared and gougy -intense argillization decreases down section	«3-5% pyrite» -in black quartz stringer and breccia	Fault movement has been syn and post mineralization as demonstrated by broken stockwork veins in gougy zones and silicified gouge fragments within stockwork breccias
		┤34.1-34.6├ «black qtz bx» -indistinct frags, barren white qtz argillic wall rock and minor blue opal frags in grey f.gr. qtz matrix, 2 or 3 phases of brecciation		┤34.1-34.6├ «int sil»	┤34.1-34.6├ «1-3% py»	
		┤36.0-37.2├ «grey qtz bx vein» -2 phase, white qtz and w/r indistinct frags cemented by grey f.gr. qtz as above		┤36.0-37.2├ «int sil»		
		┤37.9-38.2├ «FAULT» -gouge zone		┤37.9-38.2├ «int arg»		
		┤39.7-42.8├ «FAULT» -gouge zone		┤39.7-42.8├ «int arg»		
		┤43.7-44.8├ «Amyg Ande» @ 30-40 deg. -competent interval of massive, weakly amygdal-oidal andesite	30	┤43.7-44.8├ «mod arg»		
		48.1-48.8 «black qtz bx vein», 2 phase, indistinct white qtz frags, minor pyrite	30	┤48.1-48.8├ «int sil»	┤48.1-48.8├ «1% py»	
		56.1-56.8		┤56.1-56.8├ «int sil├	┤56.1-56.8├ «5% py»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		«black qtz bx veins», single phase? "swirly" grey to black qtz bands, locally fibrous with green tinge			-in black qtz and within amyg frags	
		64.5-66.1 -competent interval of weakly amyg andesite	60	┤64.5-66.1├ «mod arg»		
		┤73.8-74.1├ «FAULT» -gouge				
75.00 TO 89.70	«STOCKWORK-BRECCIA»	Colour: black and grey Intensely silicified wall rock hosts strong black quartz stockwork and minor breccias		«int sil» -rare frags remain strongly argillized	-1-3% visible py in black quartz	Heterolithic breccia frags suggest host is lapilli tuff, but apparent qtz vein frags suggest fault breccia
		veins, <1 cm @	15			
		veins @	50			
		veins @	90			
		Host rock is intensely silicified, heterolithic lapill tuff (or possibly fault breccia) This interval is cut by later grey to white chalcedonic qtz breccia veins carrying significant black (silver?) sulphide				
		┤77.5-78.8├ «QTZ BRECCIA» -white to grey chalcedonic qtz veins cut black qtz stockwork, white qtz shows minor banding and one instance of bladed calcite replacement		┤77.5-78.8├ «int sil, ab. fe ox»	┤77.5-78.8├ «tr black sulphide» -significant black (silver) sulphide in white quartz is distinctly post pyrite	
		┤83.4-84.0├ «QUARTZ BRECCIA» -white vuggy, e.g. bull qtz	30	┤83.4-84.0├ «int sil» abundant fe oxide	-none	-barren
		┤86.0-86.5├ «QUARTZ BRECCIA» -black quartz jigsaw breccia plus later 2 cm f.gr. grey qtz vein lacking obvious sulphide	60	┤86.0-86.5├ «int sil»	┤86.0-86.5├ «1-3% py, tr blk sulphide» -in black qtz matrix, trace black sulphide in early grey qtz frags	-very similar to CL-91-22
		┤89.1-89.7├ «QUARTZ BRECCIA» -fg qtz cuts earlier black qtz stockwork bx		┤89.1-89.7├ «int sil»	-none	Later f.gr. grey qtz similar to previous interval, looks barren
89.70 TO 99.70	«STOCKWORK»	Moderate black quartz stockwork. veins <1 cm. Minor blowout jigsaw breccias Host is apparently silicified fault gouge, very grungy, argillized, over printed by silicification black qtz and stockwork		«st sil, st arg» -late 1-2 cm f.gr. grey qtz veins	«1-3% py» in black qtz stringer	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		┤97.7-99.7├ «QUARTZ BRECCIA» -f.gr. white to grey qtz "vein" is more like qtz flooded and replaced wall rock, fragments are washed out and indistinct. Quartz is moderately vuggy, grey patches, may be sulphidic		┤97.7-99.7├ «int. sil»	┤97.7-99.7├ «tr py + mc» -in patchy grey quartz	
99.70 TO 102.60	«FAULT»	-90% clay gouge shear fabric @ 50-70 deg to c.a.		«int. arg»	«trace py»	
102.60 TO 103.80	«SILICIFIED FAULT BRX»	Colour: grey to black Grain size: c.gr. Angular to rounded, intensely silicified wall rock and rebrecciated pyritic quartz frags in a coarse pyrite rich black quartz matrix. Lithology of fragments - indeterminate ┤103.3-103.6├ «PYRITIC BRECCIA» -strongest concentration of pyrite in fault breccia		«int sil» ┤103.3-103.6├ «int sil»	«3-5% pyrite» c.gr. euhedral cubes in quartz matrix and quartz frags ┤103.3-103.6├ «10-15% py»	
103.80 TO 104.80	«SILICIFIED FAULT BRX»	Colour: pale green Grain Size: c.gr. Silicified fault gouge comprised of balliferous rhyolite, 1-2 cm balls actually form 50% of the fragments, the rest are subrounded <1 cm rhyolite clasts -contact (qtz vein) @ 40-60 deg		«st. sil» -rock was once intensely argillized and gougey, now overprinted by st. silicification	«1-3% py» in late qtz stringers	Upper and lower contacts are sharp and occupied by a banded qtz-py vein 1 cm wide in both cases
104.80 TO 108.80	«STOCKWORK»	Colour: buff Weak quartz stockwork stringers with banded pyrite Host rock is spherulitic flow banded rhyolite brx, probably still part of the upper fault breccia rather than depositional		«st. sil» overprints moderate argillic alteration	«1-3% pyrite» -in late <1 cm grey quartz stringers	Spherolite contact decreases downstream suggesting balls are an alteration feature in fault zone.
108.80 TO 139.20	«RHYOLITE»	Colour: pale green Strongly altered grungy non-descript looking rhyolite, locally perlitic or flow brecciated		«ST ARG, ST CHL» -obscures original textures	«1% pyrite» -in sporadic late vuggy qtz fracture fill	
139.20 TO 151.50	«RHYOLITE BRECCIA»	Colour: pale green Same grungy alteration but primary textures now evident as classic flow banded rhyolite breccia		«MOD ARG, ST. CHL»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
151.50 TO 185.00	«RHYOLITE BRECCIA»	Colour: green and red Hematitic matrix rhyolite breccia. Flow banded and perlitic frags. Minor late calcite fracture fill E.O.H.		«W. ARG» «MOD CHL HEM» -classic, fizzy propylitic alteration	«trace diss. py»	

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
	0.00	0.00	0.00												
38059	32.00	34.10	2.10	1.9	212	115	27	3.77	12	17	82	58	1040	3.93	
38060	34.10	36.00	1.90	2.2	146	74	16	2.57	5	17	47	36	910	2.77	
38061	36.00	37.90	1.90	2.9	371	46	19	2.89	11	29	56	81	2500	3.35	
38062	37.90	39.70	1.80	2	214	54	21	3.14	10	25	52	82	1480	3.7	
38063	46.10	48.10	2.00	1.3	283	44	18	3.12	7	25	58	51	1685	3.38	
38064	48.10	48.80	0.70	0.8	143	38	10	1.55	5	11	28	26	700	1.55	
38065	48.80	50.30	1.50	1.9	447	48	18	3.44	7	28	63	42	1555	3.78	
38066	51.80	53.90	2.10	2.4	635	44	23	3.28	7	30	63	92	1780	3.74	
38067	53.90	56.10	2.20	2.4	1195	120	15	3.04	12	49	77	118	955	3.28	
38068	56.10	56.80	0.70	1	265	29	10	1.78	5	16	32	50	625	1.96	
38069	56.80	58.90	2.10	1.7	742	59	20	3.07	10	28	62	88	1075	3.34	
38070	60.00	62.00	2.00	1.5	482	59	16	3.68	11	15	48	83	525	4.11	
38071	62.00	64.50	2.50	1.6	278	67	15	2.77	10	9	41	116	345	3.15	
38072	64.50	66.10	1.60	0.9	466	61	21	2.92	12	14	65	87	410	3.07	
38073	66.10	68.10	2.00	1.8	718	52	24	3.09	11	17	61	97	335	2.93	
38074	68.10	70.00	1.90	1.6	695	42	26	2.89	11	13	60	84	285	2.24	
38044	75.00	77.50	2.50	1.5	102	50	13	0.46	6	5	22	61	325	0.31	
38045	77.50	78.80	1.30	1.7	94	98	10	0.58	8	6	14	36	395	0.3	
38046	78.80	80.80	2.00	2.1	252	108	13	0.81	12	10	16	33	755	0.65	
38047	80.80	82.70	1.90	1.2	195	85	11	0.74	8	6	21	25	650	0.61	
38048	82.70	83.40	0.70	1.2	132	94	9	0.64	9	3	32	24	185	0.49	
38049	83.40	84.00	0.60	2.4	45	57	8	0.39	5	2	9	38	65	0.14	
38050	84.00	86.50	2.50	1.2	156	85	10	0.69	9	4	18	28	435	0.34	
38051	86.50	87.50	1.00	1.8	164	83	21	0.97	9	6	17	37	450	0.41	
38052	87.50	89.10	1.60	1.9	87	87	19	0.93	7	6	23	24	185	0.17	
38053	89.10	89.70	0.60	1.2	114	34	6	0.63	6	4	20	38	200	0.23	
38054	89.70	91.70	2.00	1.6	178	65	11	0.92	13	4	30	30	215	0.72	
38055	91.70	93.70	2.00	1.7	150	52	12	0.69	9	3	25	16	125	0.64	
38056	93.70	95.70	2.00	0.9	154	43	7	0.73	13	3	29	19	90	0.65	
38057	95.70	97.70	2.00	1	56	46	21	0.43	6	2	34	10	45	0.3	
38058	97.70	99.70	2.00	1.7	116	84	27	0.87	6	6	21	5	40	0.59	
38075	102.60	103.80	1.20	19.6	189	69	86	2.32	13	7	50	82	25	2.42	
38081	103.80	104.80	1.00	1.4	100	57	22	1.04	10	5	31	27	110	1.18	
38082	104.80	106.80	2.00	1	137	68	18	1.56	11	5	44	30	85	1.88	
38083	106.80	108.80	2.00	2.3	231	65	31	1.08	12	10	61	124	95	1.25	

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992	PLOTTING COORDS GRID: UTM	ALTERNATE COORDS GRID:	COLLAR DIP: -55° 0' 0"
PROJECT NUMBER: 667	NORTH: 41500.00N	NORTH: 0+ 0	LENGTH OF THE HOLE: 168.60m
CLAIM NUMBER:	EAST: 28650.00E	EAST: 0+ 0	START DEPTH: 0.00m
LOCATION: WEST PIT ZONE	ELEV: 1345.00	ELEV: 1345.00	FINAL DEPTH: 168.60m

COLLAR GRID AZIMUTH: 270° 0' 0"   COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: August 26, 1992	COLLAR SURVEY: NO	PULSE EM SURVEY: NO	CONTRACTOR: FRONTIER DRILLING
DATE COMPLETED: August 27, 1992	MULTISHOT SURVEY: NO	PLUGGED: NO	CASING: 10' LEFT IN HOLE
DATE LOGGED: August 29, 1992	RQD LOG: YES	HOLE SIZE: NQ	CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY ALONG STRIKE, SOUTH OF CL-92-23

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
168.50	-	-58° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 9.10	«CASING»					
9.10 TO 23.90	«FQXT»	Orange, coarse grained, moderately silicified, oxidized FQXT with recrystalization of qtz eyes.	45	Patchy mod-strong silicification and weak argillic alteration. «m-s Sil»	Trace of sulphides. Pyrite cubes <1mm.	
23.90 TO 24.40	«GOUGE»	White clay gouge with silicified clasts and minor broken vein material.		Strong arg alt. «s. arg»		
24.40 TO 27.70	«FQXT»	This interval is more silicified and fractured and grades into an aphanitic ash tuff.	30	Some druzy vugs, mod-strong silicifctn and mod arg alt. «m-s sil; m arg»	Trace of pyrite.«py tr»	
27.70 TO 28.50	«FAULT»	Oxidized gouge with silicified clasts. Pyritic stockworking.		«sil clasts»	«Py stwk - 1-2%»	
28.50 TO 32.30	«HYDROBRX»	Orange, grey, white, highly fractured, oxidized black matrix brx. Minor post brx druzy qtz veins. ⟨29.4-29.7⟩ intense silicification. ⟨32.25-32.3⟩«FAULT»		Strong silicification. «s.sil» «i.sil»	«1-2% py»	
32.30 TO 32.60	«ASH TUFF»	Grey fine grained ash tuff with some welding textures. The occasional subhedral qtz eye and 5% green clay altered feldspar frags <4mm. This unit grades into FQXT.	60	Silicification increases with depth. «m.sil»	Trace of pyrite as cubes <1mm. «Py tr»	This ash tuff unit seems to have hosted the mineralization.
32.60 TO 100.40	«FQXT»	Grey to orange xtal tuff. Silicified throughout with variable intensity. Patchy oxidized intervals in the more fractured zones. Grain size varies from aphanitic to feldspars 1.5cm long. Druzy fracture surfaces and partly healed fractures common with occasional qtz veinlet. Grades into ash tuff at bottom of this interval. ⟨37.5-42.3⟩ oxidized fracture zone. ⟨66.2-74.0⟩oxidized fracture zone. ⟨77.6-77.7⟩ small fault. ⟨83.0-83.5⟩«fault» ⟨85.4-86.0⟩ «silicified fault bx.» ⟨92.0-95.4⟩ «oxidized fracture zone.»		⟨37.5-42.3⟩ «Oxidized Fracture Zone» ⟨66.2-74.0⟩ «Oxidized Fault Zone» ⟨85.4-86.0⟩ «s.sil - Fault Bx» ⟨92.0-95.4⟩ «Oxidized Fault Zone»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
100.40 TO 100.80	«FAULT»	Top 20cm is silicified and flooded with fine grained pyrite. Bottom half is white and gougy and grades into FBR.	60	Strong arg alt. «s.arg»	«1-2% py»	FQXT/FBR contact.
100.80 TO 107.00	«FAULT ZONE»	Highly fractured perlitic and flow banded rhyolite with intermittent 10-30 cm gouge zones and local black qtz healed fault bx.				
107.00 TO 168.60	«RHYOLITE»	Green rhyolite with flow banding and perlitic textures. Flow breccias. hematitic matrix breccias and minor faults throughout. Mod arg alt. 116-118 «fault zone» 122-126 «fault zone» 153-155 «flow breccia» 159-165 «hematitic breccia»				
168.60 TO 168.60	«EOH»					

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38076	23.70	25.70	2.00	0.2	43	95	6	0.67	7	3	19	22	70	0.01	
38077	25.70	27.70	2.00	0.7	77	101	6	0.97	13	2	18	33	85	0.59	
38078	27.70	29.70	2.00	1.8	174	206	19	2.36	7	5	50	79	110	0.76	
38079	29.70	32.30	2.60	1	62	587	14	0.92	5	2	21	39	135	0.16	
38080	32.30	34.30	2.00	0.5	66	82	10	1.09	18	1	25	26	55	0.47	

HOLE NUMBER: CL-92-25

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: POND ZONE

PLOTTING COORDS GRID: UTM
NORTH: 41035.00N
EAST: 28950.00E
ELEV: 1345.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1345.00

COLLAR DIP: -45° 0' 0"
LENGTH OF THE HOLE: 101.20m
START DEPTH: 0.00m
FINAL DEPTH: 101.20m

COLLAR GRID AZIMUTH: 90° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: August 28, 1992
DATE COMPLETED: August 29, 1992
DATE LOGGED: September 1, 1992

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

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

CONTRACTOR: FRONTIER
CASING: 10' LEFT IN HOLE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY AND VEIN EXPOSED IN CREEK

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
101.20	-	-47° 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 46.30	«CASING»					
46.30 TO 56.30	«STOCKWORK FAULT ZONE»	Colour: yellow and grey Amygdaloidal andesite fault zone, 40% gouge. Mod. white to grey qtz stockwork with abundant pyrite Paragenesis difficult to see but appears that white qtz is later, and vague bladed textures suggest calcite replacement veins @ Post mineral faulting has disrupted more than one half of the stockwork stringers	45	«INT. ARG» abundant yellow-green clay in amygdules and late fractures	«1-5% PY» -in late stringers and in earlier broken qtz stringers	Syn and post mineralization. Fault movement
56.30 TO 57.00	«SILICIFIED FAULT BRECCIA»	Colour: grey -<2 cm angular argillic wall rock frags cemented by grey f.gr. qtz		«ST ARG, MOD SIL» -alteration of wall rock	«1-3% PY» -mainly replacing wall rock frags	
57.00 TO 59.80	«QUARTZ VEIN»	Colour: light grey Grain Size: f.gr. Broken interval of what looks like massive f.gr. white qtz vein. On closer inspection several different textures become apparent. At least half of the interval is totally silica replaced wall rock, which might have been a bedded crystal tuff or wacke. Half of the "vein" has a fibrous texture, suggesing replacement of calcite blades, breccia textures of white sil wall rock/qtz in black qtz matrix are minor and rather washed out. Smokey brown calcite disseminated locally. Banded, black sulphidic quartz @ 58.4 m is most interesting feature, black bands are visibly sulphidic and separate fibrous white qtz from apparent silicified wall rock breccia		«Int sil» -of wall rock, possible replacement of bladed calcite	«tr black sulphide» -barren of pyrite, but trace black sulphide in banded sutures @ 58.4 m	
59.80 TO 61.50	«SILICIFIED FAULT BRECCIA»	Colour: dark grey Grain Size: c.gr. Intensely silicified and pyritic fault breccia frags, 22 cm of sil rock and qtz vein material. Rare white banded qtz vein frags differs from above interval in sulphide and wall rock content		«int sil»	«5-10% py» -in grey qtz bx matrix	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
61.50 TO 62.30	«FAULT»	-90% clay gouge	45	«int arg»	-trace pyrite»	
62.30 TO 70.40	«RHYOLITE BRECCIA»	Colour: grey green Grungy interval of fracture gougey breccia consisting of perlitic and flow banded rhyolite ┤63.8-65.0├ «hematitic breccia» ┤65.0-65.2├ «fault»		«str. int. arg» «mod chl» -locally gougy		
70.40 TO 73.50	«SIL ZONE»	Silicified perlitic rhyolite. Interval hosts 2x 2cm black qtz healed wall rock microbreccia @ ┤71.3-71.6├ «black qtz vein» and ┤72.6-72.9├ «wht. qtz bx» -white c.gr. bull qtz heals a wall rock breccia of 1-2 cm angular frags matrix supported	60	«mod sil» ┤71.3-71.6├ «int sil»	«tr py» ┤71.3-71.6├ «1-2% sulphide»	
73.50 TO 101.20 E.O.H.	«RHYOLITE BRECCIA»	Colour: grey green Mixed highly fractured locally gougy interval of perlitic and flow banded rhyolite. Minor feldspar phyric interval between 74-77m ┤80.0-85.6├ «Fault» Gouge		«st.- int arg» -mod chl	«tr py»	

HOLE NUMBER: CL-92-25 ASSAY SHEET DATE: 11-December-1992

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
	0.00	0.00	0.00	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPB	PPB	%	
	0.00	0.00	0.00												
38091	46.30	47.90	1.60	1.9	533	124	50	2.45	4	14	60	41	690	2.75	
38092	47.90	49.90	2.00	1.5	361	170	40	2.36	4	4	38	30	520	2.2	
38093	49.90	52.00	2.10	1.4	457	157	44	2.96	7	9	73	36	610	2.51	
38094	52.00	54.00	2.00	2.7	691	188	46	2.88	6	13	123	51	1130	2.44	
38095	54.00	56.00	2.00	2.6	635	130	27	2.85	5	10	102	81	870	2.27	
38096	56.00	57.00	1.00	1.9	289	99	16	1.34	2	3	57	35	400	1.13	
38097	57.00	59.80	2.80	24.7	34	22	11	0.29	3	4	8	32	25	0.09	
38098	59.80	61.50	1.70	4	270	45	17	1.27	6	13	20	56	110	1.3	
38099	61.50	62.30	0.80	1	187	73	14	1.6	7	7	46	9	75	1.71	
38100	62.30	64.20	1.90	0.8	283	173	20	1.39	27	6	78	50	60	0.92	
38101	71.30	73.30	2.00	0.6	326	150	27	1.13	3	2	41	41	50	0.34	

HOLE NUMBER: CL-92-26

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: WEST LAKE ZONE

PLOTTING COORDS GRID: UTM
NORTH: 41385.00N
EAST: 29250.00E
ELEV: 1310.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1310.00

COLLAR DIP: -55° 0' 0"
LENGTH OF THE HOLE: 76.20m
START DEPTH: 0.00m
FINAL DEPTH: 76.20m

COLLAR GRID AZIMUTH: 270° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 270° 0' 0"

DATE STARTED: August 30, 1992
DATE COMPLETED: August 30, 1992
DATE LOGGED: September 1, 1992

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

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

CONTRACTOR: FRONTIER
CASING: 10' LEFT IN HOLE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY AND VEINS EXPOSED IN TRENCHES

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
76.20	-	-52° 0'	ACID	OK		-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 15.20	«CASING»					
15.20 TO 62.20	«FQXT»	Classic feldspar-quartz crystal tuff. Quartz eyes 4-6mm, 5%, feldspars 3-8mm 30%, fairly homogenous, interval is strongly fractured and oxidized, moderately leached and vuggy. 22.1-23.2 «Red Ochre» on late fractures. 32.8-33.0 «Fault» 39.7-40.0 «Fault» 53.5-53.6 «Fault» 60.3-62.2 «FAULT ZONE» 80% Gouge.		«MOD ARG, WEAK SIL» Rock is uniformly argillized throughout locally weakly silicified, some fractures are partially healed by quartz. «INT ARG»	none	Sample taken for XRD.
62.20 TO 109.20	«RHYOLITE BRECCIA»	Grungy green interval of mixed flow banded and perlitic rhyolite frags and hematitic breccias, strongly fractured and locally gougey. 62.2-64.5 «FAULT BRECCIA» 80% Gouge matrix to rhyolite clasts.		«ST-INT ARG» 30% gouge. «INT ARG»	none	

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %		COMMENTS

HOLE NUMBER: CL-92-27

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992 PROJECT NUMBER: 66780 CLAIM NUMBER: LOCATION: WEST LAKE	PLOTTING COORDS GRID: UTM NORTH: 41375.00N EAST: 29000.00E ELEV: 1320.00	ALTERNATE COORDS GRID: NORTH: 0+ 0 EAST: 0+ 0 ELEV: 1320.00	COLLAR DIP: -45° 0' 0" LENGTH OF THE HOLE: 121.00m START DEPTH: 0.00m FINAL DEPTH: 121.00m
	COLLAR GRID AZIMUTH: 90° 0' 0"	COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"	
DATE STARTED: August 28, 1992 DATE COMPLETED: August 29, 1992 DATE LOGGED: September 4, 1992	COLLAR SURVEY: NO MULTISHOT SURVEY: NO RQD LOG: NO	PULSE EM SURVEY: NO PLUGGED: NO HOLE SIZE: NQ	CONTRACTOR: FRONTIER DRILLING CASING: 10 FEET LEFT IN HOLE CORE STORAGE:

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
121.00	-	-47° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 39.60	«CASING»					
39.60 TO 46.00	«FQXT»	Colour: orange Grain Size: m.gr. Classic FQXT, 5% rounded qtz eyes, 30% fsp, moderately fractured and oxidized		«ST FE OX» «MOD ARG» Strongly oxidized ?? only slightly bleached	none	
46.00 TO 58.80	«FAULT»	Wide zone of extreme shearing and gouge, 95% clay gouge. Rare prserved clasts of strongly argillized FQXT and fsp ash tuff. Veins and shearing pretty much perpendicular to c.a.	90	«INT-EXT ARG»	«1-3% PY» in broken sheared qtz-py stringers	
58.80 TO 60.00	«SILICIFIED FAULT ZONE»	Intensely silicified wall rock and fault breccia with possible hydrothermal brecciation component Massive f.gr. grey to black qtz cements silicified wall rock. (fsp crystal ash tuff) and less f.gr. white bull qtz fragments Interval is approx 50% sil w/r 50% bx. Single later qtz stringer <1 cm wide cuts bx and has black vein selvages which might carry black sulphide		«INT SIL»	«1-5% py» in black qtz bx matrix «tr black sulphide»	
60.00 TO 60.40	«FAULT»	95% clay gouge		«EXT ARG»	none	
60.40 TO 62.20	«STOCKWORK BRECCIA»	Colour: grey and black Grain Size: c.gr. Strong stockwork to jigsaw breccia of black sulphidic qtz cementing angular clasts of silicified wall rock (fault gouge/breccia) and rare white to grey qtz vein material. Interval is moderately fractured, minor gouge @ 62.0 m -bx veins @	10	«ST INT SIL»	«3-5% py» in black quartz breccia matrix «trace black sulphide» occurs sporadically along vein selvages	2 phase brecciation to produce clasts of qtz vein and wall rock
62.20 TO 63.90	«BLACK QTZ BRECCIA»	Colour: grey to black Grain Size: Intensely silicified multiphase hydrothermal-fault breccia. Clasts of silicified fault gouge wall rock, f.gr. grey quartz with abundant pyrite. 50% of matrix is black quartz, maybe 20% is later		«INT SIL»	«1-3% py» as irregular clots and disseminations in grey qtz and silicified wall rock «1-2% black sulphide» in late vuggy crystaline qtz vein @ 62.8	Paragenesis -wall rock silicification and barren f.gr. grey qtz, brecciation and cementation by sulphidic f.gr. grey qtz. Rebrecciation and cementation

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		white vuggy quartz that is generally barren, but locally carried significant black sulphide.				by grey/clear qtz, evolving to white/ clear crystalinge qtz carrying no pyrite but locally 1-2% black sulphide
63.90 TO 70.70	«STOCKWORK FAULT ZONE»	Wide zone of faulting with 50% gougy zones overprints moderate black qtz stockwork carrying minor pyrite ┤63.9-64.2├ «GOUGE» 50% broken qtz vn frag ┤67.1-67.6├ «GOUGE» -90% clay	40	«ST INT ARG» «PATCHY MOD SIL» generally strongly argillized wall rock with local fault gouge and patchy silicification assoc. with stockwork veinlets	«1-3% py» in black quartz stringers and breccias. Pyrite is f.gr., sporadic and occurs as vein selvages and rimming fragments	
70.70 TO 75.60	«BLACK QTZ BRECCIA»	Colour: black and white Multiphase hydrothermal breccia overprints tectonic breccia. Hydrothermal breccia consists of black f.gr. almost opaque sulphidic qtz cementing angular frags (<1 cm to 20 cm) of earlier white f.gr. banded qtz-ccd-adularia and silicified wall rock fragment. Tectonic bx consists of extremely altered host rock fault gouge/breccia, probably a fsp crystal/ash tuff. Now silicified, this fault gouge forms the host rock for the hydrothermal breccia. Breccia varies from jigsaw, clast supported to matrix supported. 80% of clasts are silicified fault gouge. 20% white qtz frags ┤72.7-73.3├ «black qtz vein» -massive fragment poor section of black qtz breccia		«INT SIL» overprints previously intensely argillized wall rock fault gouge ┤72.7-73.3├ «Int sil»	«1-2% py» is visible as local vein selvages and fragment rims. Black qtz probably contains finely disseminated pyrite «tr grey sulphides» observed only in white quartz ┤72.7-73.3├ «1% py» visible	Paragenesis Tectonic brecciation, st. argillic alteration of FXT fault gouge, silicification of same to form competent rock. Hydrothermal brecciation and cementation by banded white qtz-ccd-adularia. Rebrecciation and cementation by black sulphidic qtz. Black sulphide only visible in white qtz (early and late) so difficult to nail down its timing 75.5 sample for KD also 81.6 for sulphide ID, adularia ID and fluid inclusions
75.60 TO 84.40	«STOCKWORK FB RHYO»	Colour: pale grey Weak to moderate stockwork of black sulphidic qtz. Stringers generally <1 cm with minor micro blowouts <3 cm. Host rock is flow banded feldspar phyric rhyolite (classic FB Latite). All fsp gone to clay, flow bands commonly silicified FB @ Vns @ 70-80 deg	25 70	«MOD-ST ARG» overprinted by «PATCHY SIL» ┤82.9-84.4├ «bleached zone. str. arg»	«1-3% py» easily visible in grey qtz stringers as vein selvages and irregular "swirls", locally up to 5%	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
84.40 TO 84.70	«FAULT»	Gougy FB rhyolite		«INT ARG»		
84.70 TO 94.00	«STOCKWORK FB RHYO»	Colour: grey Grain Size: f.gr. Weak to moderate stockwork as above but increased silicification of host rhyolite. Black qtz stringers carry slightly more pyrite than above interval Fb's @ 20-30 deg Vns @ Two hydrobreccias @ 85.1-85.4 «black qtz bx» 93.4-93.6 «black qtz bx»	20 80	85.1-85.4 «INT SIL» 93.4-93.6 «INT SIL»	85.1-85.4 «5% py» 93.4-93.6 «5% py»	
94.00 TO 101.20	«FAULT ZONE STWK»	Strongly altered locally gougy hanging wall fracture zone to fault below. Minor broken qtz-py stockwork stringers		«ST INT ARG»	«1-2% py» in broken qtz stringers	
101.20 TO 107.60	«FAULT»	Colour: grey Major gouge zone with 20% intensely argillized fb rhyo frags		«EXT ARG»	«trace py»	
107.60 TO 111.00	«RHYOLITE BX»	Colour: grey Strongly argillized autoclastic flow bx, frags strongly perlitized		«INT ARG»	none	
111.00 TO 121.00	«PERLITIC» E.O.H.	Strongly argillized perlitic rhyolite		«ST ARG»	«tr pyrite»	

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38102	44.00	46.00	2.00	0.1	220	427	3	0.73	1	4	6	49	165	0.03	
38103	46.00	48.00	2.00	0.7	264	208	107	6.34	3	10	11	65	4000	5.46	
38104	48.00	50.00	2.00	4.1	45	879	156	1.6	7	53	12	57	2275	1.81	
38105	50.00	53.00	3.00	0.5	24	201	161	5.45	2	33	15	53	4485	5.38	
38106	53.00	55.00	2.00	0.3	576	252	60	5.84	3	28	16	135	18375	5.53	
38107	55.00	57.00	2.00	1.3	56	236	18	4.11	1	1	7	30	2670	4.38	
38108	57.00	58.80	1.80	1.6	9	130	15	3.93	1	1	5	26	1165	4.1	
38109	58.80	60.00	1.20	6.3	249	66	10	1.29	5	5	36	92	55	1.36	
38110	60.00	62.20	2.20	5.1	154	64	12	1.51	8	5	30	55	1295	1.53	
38111	62.20	63.90	1.70	13.7	70	32	12	0.47	7	4	23	80	45	0.39	
38112	63.90	64.90	1.00	1.9	134	42	9	0.56	8	5	21	56	190	0.52	
38113	64.90	67.10	2.20	3.5	288	41	12	1.02	9	19	23	75	625	1	
38114	67.10	69.10	2.00	2.8	117	74	15	0.76	5	3	22	39	505	0.67	
38115	69.10	70.70	1.60	1.6	183	58	10	0.61	10	8	45	39	380	0.6	
38116	70.70	72.70	2.00	5	183	42	15	0.73	7	11	25	42	600	0.72	
38117	72.70	73.60	0.90	2.9	119	22	7	0.6	5	6	25	23	275	0.52	
38118	73.60	75.60	2.00	4.4	150	34	7	0.74	4	10	61	28	805	0.59	
38119	75.60	77.60	2.00	10.4	228	67	9	0.87	97	12	108	32	1400	0.83	
38120	77.60	79.60	2.00	2.5	220	87	13	0.75	99	7	140	24	755	0.64	
38121	79.60	81.40	1.80	1.8	213	87	7	0.8	11	10	36	22	1025	0.75	
38122	81.40	82.90	1.50	7.5	451	554	10	1.59	10	25	34	64	2235	1.59	
38123	82.90	84.70	1.80	1.6	240	47	7	0.91	8	7	41	27	765	1	
38124	84.70	86.70	2.00	5.1	427	73	9	1.69	14	19	37	53	1655	1.75	
38125	86.70	88.70	2.00	3.2	206	135	9	0.96	13	7	37	26	835	0.94	
38126	88.70	90.70	2.00	3	147	163	9	0.77	9	4	30	14	680	0.8	
38127	90.70	92.50	1.80	1.7	126	57	7	0.67	9	2	25	17	365	0.6	
38128	92.50	94.00	1.50	1.7	210	58	7	0.76	10	7	32	22	1045	0.93	

Sample	From (m)	To (m)	Length (m)	Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppb	Au ppb	Hg ppb	S %
	0.00	0.00	0.00											

HOLE NUMBER: CL-92-28

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992	PLOTTING COORDS GRID: UTM	ALTERNATE COORDS GRID:	COLLAR DIP: -50° 0' 0"
PROJECT NUMBER: 667	NORTH: 39328.00N	NORTH: 0+ 0	LENGTH OF THE HOLE: 154.50m
CLAIM NUMBER:	EAST: 29755.00E	EAST: 0+ 0	START DEPTH: 0.00m
LOCATION: SOUTH ZONE	ELEV: 1292.00	ELEV: 1292.00	FINAL DEPTH: 154.50m

COLLAR GRID AZIMUTH: 90° 0' 0" COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: September 2, 1992	COLLAR SURVEY: NO	PULSE EM SURVEY: NO	CONTRACTOR: FRONTIER DRILLING
DATE COMPLETED: September 3, 1992	MULTISHOT SURVEY: NO	PLUGGED: NO	CASING: 10' LEFT IN HOLE
DATE LOGGED: September 5, 1992	RQD LOG: YES	HOLE SIZE: NQ	CORE STORAGE: CAMP

PURPOSE: TEST IP ANOMALY AND TRENCHES

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
154.50	-	-52° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 42.70	«CASING»					
42.70 TO 57.00	«QUARTZ STOCKWORK»	Moderate to strong stockwork of pyritic quartz. Stringers generally <1cm, about 30% of interval is tight jigsaw breccia. 2 phases of quartz: early pyritic grey quartz, later white to blue quartz is barren. 1st phase stringers have .5cm sil halo in wall rock. Host is sparsely amygdaloidal andesite, with only 5-10% <5mm amygs filled by clay, chlorite or qtz.		«MOD-ST ARG» alteration of wall rock. Narrow .5cm envelopes of silicification around quartz stringers. ╢42.7-46.3╟ «ST-INT ARG»	«1-3%PY» in grey quartz stringers, no black sulphides observed.	Small amounts of smokey brown calcite also noted, occurs between 1st and 2nd phase of quartz @ 51.1m, 51.3m, 51.6m.
57.00 TO 58.00	«FAULT»	Grey gougy highly fractured interval, with abundant broken quartz vein and sil wall rock clasts.	40	«ST-INT ARG»	«TRACE PY»	
58.00 TO 69.30	«BLACK QUARTZ BRECCIA»	A wide zone of intense silicification. 3 types of breccia are recognized: Upper 3rd is hydrothermal breccia of amyg andesite, grading down into tecton ic fault breccia. Fault was intensely argillized a and gougy at one time, but is now intensely silici fied and rebrecciated. Lower 3rd of interval is obvious pyroclastic breccia, silicified and hydro thermally rebrecciated Overprinting hydrothermal breccia consists of a chaotic jumble of grey to black banded aphanitic quartz or chalcedony, pyritic quartz and silici-fied wall rock, and white crystalline quartz. Aprox. 50% of interval is sil w/r, 30% grey to black pyritic quartz, 10% late vuggy quartz.		«INT SIL»	«1-3% PY» irregularly distributed in grey quartz breccia matrix, as pyritic quartz clasts and in rare qtz stringers	3 breccia types: fault breccia at contact between andesite flow and pyroclastic breccia, all silicified and overprinted by hydrothermal brecciation This demonstrates relationships btwn fault conduits for hydrothermal silicif ication for ground preparation for hydr othermal brecciation and mineralization Paragenesis is confusing but seems to be: grey-black banded chalcedony, cut by pyritic grey quartz, cut by white vuggy crystalline quartz. This is similar to most other breccias intersected elsewhere on the property.
69.30 TO 71.20	«TUFF BRECCIA»	Polymictic pyroclastic breccia. Frags angular to subrounded aphanitic ash tuff, perlite, flow band rhyolite feldspar phyric rhyolite, rare quartz vein frags. Green ╢69.3-69.5╟ «FAULT BRECCIA» Abundant quartz vein frags suggest tectonic origin although clay rich gouge is lacking.		«INT SIL» «INT SIL»	trace pyrite	
71.20 TO 72.00	«SIL FAULT»	Grey, intensely silicified pyritic fault zone. Intensely argillized wall rock frags composed of fault gouge and perlitic rhyolite. Interval includes 2cm grey ccd vein with black mm selvages and minor pyrite. Late white vuggy quartz veinlets are barren.		«INT SIL»	«1% PYRITE»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
72.00 TO 75.60	«RHYOLITE»	Green, weakly stockworked perlitic rhyolite. Grey quartz stringers plus late vuggy white barren qtz.		«MOD ARG, WEAK SIL»	«TRACE PY» in weak grey quartz veinlets	
75.60 TO 79.00	«QUARTZ STOCKWORK»	Grey green, moderately stockworked perlitic rhyolite. Strongly fractured, sheared and locally gougy, with patchy quartz flooding.		«MOD-ST ARG, PATCHY SIL» ┤76.0-76.7├ «30% GOUGE»	«1-2% PYRITE» in early grey quartz.	Interval represents hangingwall fracture zone associated with fault below.
79.00 TO 81.80	«STOCKWORK BRECCIA»	Strongly stockworked and brecciated partially healed fault zone. Strongly fractured and locally gougy. Early pyritic quartz, minor black quartz, and abundant barren white vuggy quartz.		«MOD-ST ARG, PATCHY SIL» 20% gougy patches ┤80.5-81.8├ «50% Gouge»	«1-3% PYRITE» in early grey quartz stringers and breccia fillings.	
81.80 TO 92.70	«TUFF BRECCIA»	Green and brown relatively fresh rhyolite tuff breccia, with 5-30cm frags of FB rhyolite and lesser perlite. Sparse late calcite fracture fill. Gradational lower contact.		«WEAK ARG»		Pyroclastic block tuff breccia.
92.70 TO 93.40	«LAPILLI TUFF BRECCIA»	Interbed of tuff breccia with heterolithic frags 1-5cm, FB rhyolite, perlite, ash tuff. Gradational upper contact.		«WEAK ARG» variable degree of alteration of clasts.	none	
93.40 TO 96.30	«FELDSPAR PORPHYRY»	Classic feldspar porphyry rhyolite, with 20% plag ghosts in vaguely banded aphanitic matrix. Mafics not obvious. Contacts @	80	«MOD SIL»	None	Interbreccia lava flow?
96.30 TO 100.90	«TUFF BRECCIA»	Similar to previous intervals, gradational from lapilli dominant frgas in upper metre to block sized frags below.		«WEAK ARG»	trace py	
100.90 TO 136.20	«RHYOLITE FLOW»	Green and red, aphanitic, a discrete rhyolite flow with minor autoclastic breccia at upper contact. Interval shows some pretty wild flow banding and perlitic textures, with hematitic and chloritic matrices producing vivid red and green coloration.		«MOD PROP» Moderate propylitic alt. Weak calcite stringers throughout. Generally pretty fresh, almost glassy locally.	Trace pyrite disseminated throughout.	
136.20 TO 154.50	«TUFF BRECCIA»	Green, mixed pyroclastic interval of interbedded crystal ash tuffs, lapilli tuffs and block breccias. Generally fining upwards to laminated sandy crystal ash tuffs. Cobbles of FB rhyolite dominate in lower 1/2 of interval.		«WEAK ARG»	Trace pyrite.	

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38137	44.70	46.70	2.00	0.1	67	347	20	3.53	7	1	62	7	565	2.36	
38138	48.70	50.70	2.00	1.7	610	192	20	3.84	8	11	61	25	1670	3.96	
38139	50.70	52.70	2.00	1.3	407	161	21	3.9	2	9	74	40	1710	3.76	
38140	52.70	54.70	2.00	1.7	457	102	17	4.05	2	2	70	57	2445	3.41	
38141	54.70	57.00	2.30	1	266	103	19	3.7	3	1	71	54	755	3.21	
38142	57.00	58.00	1.00	10.5	354	377	19	2.74	8	34	64	49	2720	3.05	
38143	58.00	60.00	2.00	2.4	232	146	14	2.75	5	22	46	80	680	2.97	
38144	60.00	62.00	2.00	2.2	238	114	12	2.26	4	16	38	93	495	2.43	
38145	62.00	63.00	1.00	3.7	233	100	13	1.86	5	17	37	189	545	1.76	
38146	63.00	64.00	1.00	2.4	211	80	12	2.02	6	17	24	114	535	2.05	
38147	64.00	65.00	1.00	1.9	191	148	11	1.67	1	24	29	78	800	1.8	
38148	65.00	66.00	1.00	1.2	213	61	11	1.27	2	7	25	79	190	1	
38149	66.00	67.00	1.00	1.1	187	76	9	1.11	4	6	30	54	145	0.73	
38150	67.00	68.00	1.00	1.9	325	78	13	1.68	4	8	40	163	125	1.57	
38151	68.00	69.30	1.30	2.2	330	75	12	1.98	2	7	27	294	300	1.74	
38152	69.30	71.20	1.90	1.5	104	165	27	1.44	2	1	41	61	130	0.75	
38153	71.20	72.00	0.80	2.5	204	108	25	1.53	18	3	68	65	100	1.2	
38154	72.00	74.00	2.00	0.3	38	158	60	2.11	1	1	52	17	75	0.56	
38155	74.00	75.60	1.60	0.3	4	197	65	1.76	1	1	43	9	60	0.17	
38156	75.60	77.10	1.50	0.5	61	228	28	2.01	3	1	59	18	180	1.06	
38157	77.10	79.00	1.90												
38158	79.00	79.90	0.90	3.7	168	277	30	1.07	8	5	31	40	300	0.72	
38159	79.90	81.80	1.90	3.1	332	237	15	1.17	9	10	28	42	235	0.82	
38160	81.80	83.80	2.00	0.6	43	204	48	1.25	15	1	40	14	60	0.48	

HOLE NUMBER: CL-92-29

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: METRIC UNITS: X

PROJECT NAME: 1992
PROJECT NUMBER: 667
CLAIM NUMBER:
LOCATION: SOUTH ZONE

PLOTTING COORDS GRID: UTM
NORTH: 39220.00N
EAST: 29765.00E
ELEV: 1290.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 1290.00

COLLAR DIP: -50° 0' 0"
LENGTH OF THE HOLE: 78.30m
START DEPTH: 0.00m
FINAL DEPTH: 78.30m

COLLAR GRID AZIMUTH: 90° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 90° 0' 0"

DATE STARTED: September 3, 1992
DATE COMPLETED: September 4, 1992
DATE LOGGED: September 5, 1992

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

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

CONTRACTOR: FRONTIER DRILLING
CASING: 10' LEFT IN HOLE
CORE STORAGE: CAMP

PURPOSE: TO TEST IP ANOMALY AND TRENCHES

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
78.30	-	-50° 0'	ACID	OK		-	-	-	-	-	
-	-	-	-	-		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 33.50	«CASING»					
33.50 TO 40.50	«AMYG ANDE»	Grey, fg, sparsely to moderately amydaloidal andesite, amygs filled by quartz and clay. Sparse grey to white quartz stockwork veinlets to 2cm, 1st phase grey sulphidic quartz with 1-2mm bands of fg py along selvages; then 2nd phase banded white quartz and adularia? with no visible sulphides. veins @ ⌊39.4-39.9⌋ «FAULT»	45 55	«MOD-ST ARG» ⌊33.5-33.8⌋ «INT ARG» «INT ARG»	«1-3% PYRITE» overall, in grey to white quartz stringers, locally to 5% as fg wavy bands along vein selvages and rimming frags.	
40.50 TO 44.20	«QUARTZ-PY BRECCIA»	Grey, cg, highly sulphidic quartz healed wall rock breccia. Wall rock is amydaloidal andesite, comprising clasts <1cm-25cm in size, all strongly argillized, generally NOT silicified. Looks to be only a 2 phase breccia, mainly tectonic with silica healing. 1st phase grey quartz with very abundant pyrite forming bands along vein selvages up to 1cm thick; then after minor re-brecciation, healing by blue-white relatively barren quartz.		Wall rock and frags are generally «ST ARG» and only locally weakly silicified.	«10-20% PYRITE» overall, locally semi-massive (50%) as botroidal 1cm bands along vein walls or rimming frags. Interval LACKS any trace of black qtz or black sulphide.	1st phase pyrite and 2nd phase quartz both show 2-4mm bands suggesting that conduits in clast supposted breccia were open and system was quiescent.
44.20 TO 47.50	«AMYG ANDE»	Grey weakly stockworked, strongly argillized interval of amygdaloidal andesite. Stockwork stringers <1cm carry abundant pyrite in fg grey quartz, while later blue-white quartz is barren. veins @	90	«ST-INT ARG»	«1% PY» in early grey quartz.	Similar paragenesis to previous interval.
47.50 TO 50.90	«BLACK QUARTZ BRECCIA»	More typical of the pyritic black quartz breccias seen in other holes, this interval is nearly 80% massive black quartz, obviously pyritic, with 10% late vuggy white bull quartz and a single banded grey ccd vein or fragment @ 50.7m. Rare blue quartz noted @48.0m.		«INT SIL»	«3-5% PYRITE» fg, disseminated in black quartz breccia matrix also less frequently as mm blebs and blades.	No obvious black sulphide.
50.90 TO 51.90	«FAULT»	Grey intensely argillized, gougy, sheared, rhyolite breccia, 60% clay gouge.	40	«INT ARG»	«TRACE PY»	
51.90 TO 78.30	«RHYOLITE BRECCIA»	Grey-green, fg, mixed interval of FB rhyolite, and perlite fragments in a mainly hematitic matrix, generally strongly fractured, and locally gougy. ⌊53.9-57.6⌋ «Fault Zone» 60% clay gouge.		«ST-INT ARG» «INT ARG»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		69.2-69.5 «Fault» Gouge. 64.0-64.3 «Fault» Gouge. 72.3-72.7 «Fault» Gouge. EOH.				

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38129	38.50	40.50	2.00	0.1	89	176	22	5.17	1	1	97	12	720	3.35	
38130	40.50	42.50	2.00	2.6	442	101	21	12.16	1	49	59	51	7500	13.7	
38131	42.50	44.20	1.70	4	835	60	23	8.4	2	45	75	164	5120	10	
38132	44.20	45.70	1.50	0.6	307	57	20	4.29	2	6	97	40	490	3.79	
38133	45.70	47.50	1.80	1.2	459	61	19	4.56	2	8	91	32	650	4.37	
38134	47.50	48.80	1.30	3.1	591	68	14	4.03	7	44	262	67	1275	4.38	
38135	48.80	50.90	2.10	3.9	291	62	14	2.09	4	30	62	63	640	2	
38136	50.90	52.90	2.00	0.5	102	58	33	1.83	7	1	68	28	185	0.74	

MINNOVA INC.
DRILL HOLE RECORD

HOLE NUMBER: CL-92-30 | IMPERIAL UNITS: | METRIC UNITS: X

PROJECT NAME: 1992	PLOTTING COORDS GRID: UTM	ALTERNATE COORDS GRID:	COLLAR DIP: -50° 0' 0"
PROJECT NUMBER: 667	NORTH: 39328.00N	NORTH: 0+ 0	LENGTH OF THE HOLE: 107.00m
CLAIM NUMBER:	EAST: 29752.00E	EAST: 0+ 0	START DEPTH: 0.00m
LOCATION: SOUTH ZONE	ELEV: 1292.00	ELEV: 1292.00	FINAL DEPTH: 107.00m

COLLAR GRID AZIMUTH: 120° 0' 0"   COLLAR ASTRONOMIC AZIMUTH: 120° 0' 0"

DATE STARTED: September 4, 1992	COLLAR SURVEY: NO	PULSE EM SURVEY: NO	CONTRACTOR: FRONTIER DRILLING
DATE COMPLETED: September 5, 1992	MULTISHOT SURVEY: NO	PLUGGED: NO	CASING: 10' LEFT IN HOLE
DATE LOGGED: September 6, 1992	RQD LOG: YES	HOLE SIZE: NQ	CORE STORAGE: CAMP

PURPOSE:

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
61.00	-	-50° 0'	ACID	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 18.30	«CASING»					
18.30 TO 24.70	«AMYG ANDE»	Locally gougy, densely amygdaloidal andesite flow breccia. grey green.		«ST-INT ARG, MOD CHL-CAL»	None	Autoclastic flow breccia.
24.70 TO 28.00	«QUARTZ STOCKWORK»	Intensely argillized gougy wall rock hosts broken fg grey quartz stockwork. Quartz is multibanded grey, brown, and blue-white. Occurs as hydrothermal and fault breccia matrix, mainly as rounded chunks in gouge of recent faulting.		«ST-INT ARG»	«1% PYRITE» in grey quartz breccia.	Fault zone.
28.00 TO 28.60	«FAULT»	90% clay gouge.				
28.60 TO 40.50	«ANDESITE BRECCIA»	Grey-green, strongly argillized amygdaloidal andesite breccia, looks auto or pyroclastic, but is healed by dull grey pyritic quartz. Frags variably amygdaloidal, interval is strongly fractured and locally gougy.		«ST ARG, MOD CHL, CAL» «PATCHY SIL» Frags are strongly argillized, amygs filled by chl+cal, matrix preferentially silicified.	«1% PYRITE» in sil breccia matrix.	
40.50 TO 42.50	«FAULT»	70% clay gouge. Minor broken qtz vein frags.		«INT ARG»		
42.50 TO 46.40	«QTZ-CAL STOCKWORK»	Relatively competent interval of fg grey quartz and white cg calcite filling hydro jigsaw breccias		«ST ARG»	Early quartz carries «1-2% PYRITE» Later calcite is barren.	Minor brown calcite noted.
46.40 TO 46.90	«FAULT»	70% clay gouge.				
46.90 TO 57.20	«ANDESITE BRECCIA»	Grungy interval of strongly argillized andesite breccia, with minor silicified zones preserved. Typical fault halo.		«ST-INT ARG, PATCHY SIL» Silicification increases down section, mainly as amyg filling and healing breccia matrices.	Trace py.	Hanging wall to fault.
57.20 TO 58.30	«FAULT»	80% clay gouge.		«INT ARG»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
58.30 TO 62.40	«QTZ-PY STOCKWORK»	Strong stockworking of intensely silicified primary breccia of amygdaloidal andesite. Grey quartz stringers <1cm carry abundant pyrite. Late vuggy quartz veinlets are barren. Andesite is extremely amygdaloidal, most <1cm long, flattened at 1:4. veins @	20 40 70	Wall rock was first strongly argillized amygs filled by clay, then overprinted by strong silicification. «ST SIL»	«2-5% PYRITE» in grey quartz stringers.	Suspected adularia at 60m, ppt with late vuggy crystalline quartz.
62.40 TO 70.20	«SILICIFIED BRECCIA»	Intensely silicified fault breccia. Contact btwn amyg andesite and underlying perlitic rhyolite. Major multiphase hydrothermal overprint as rebrecciation of sil fault gouge, deposition of fg grey to black locally pyritic quartz and after repeated brecciation, final healing by vuggy cg crystalline white to clear quartz. Clasts include silicified pyritic wall rock, pyritic grey or black quartz and massive white to brown qtz.		«INT SIL» Intensely silicified hydrothermally overprinted fault breccia.	«1-2% PYRITE» irregularly distributed in early fg quartz stringers or replacing silicified wall rock frags or as frags of above in late white quartz matrix.	Some late vuggy quartz veins show drip textures indicating vertical dip of vns
		┤63.3-66.2├ «Quartz Vein» Massive white quartz breccia vein, not distinctly separate or even crosscutting, but rather just white quartz dominant, with patches of smokey brown calcite, similar to hydrocarbon rich brown qtz at McLaughlin.		«INT SIL»	«Trace Balck Sulphide» noted as irregular disseminations in white quartz. May also be present in black quartz but is not visibly obvious. No significant pyrite.	Smokey brown calcite @ 64.0m, 65.6m.
		┤69.7-70.2├ «BANDED VEIN» Beautiful multi-banded quartz-chalcedony-adularia vein. See original field log for sketch. Interval actually consists of 3 such veinlets 2-4 cm wide, showing the same paragenetic sequence: pyritic qtz, grey qtz, adul, grey ccd, microbreccia, comb qtz, pyritic qtz.		«INT SIL»	«Trace Pyrite» in grey ccd.	Sawn sample to K. Dunne.
70.20 TO 76.60	«QUARTZ STOCKWORK»	Strong quartz stockwork, weak pyrite, with patchy quartz flooded fault breccias and/or stwk blowouts Veinlets are dominantly late vuggy white quartz. Early quartz is only weakly sulphidic.		«ST ARG» overprinted by «PATCHY SIL»	«1% PYRITE» in grey quartz stringers. Possible black sulphide in black quartz -adularia 1cm banded vein @76.3m	Another example of hydrothermal breccia tion overprinting fault brecciation.
76.60 TO 100.10	«RHYOLITE BRECCIA»	Rhyolite flow breccia with mixed angular frags, rather washed out and indistinct, 1-30cm, of perlite, FB rhyolite, and minor hematitic (black) microbreccias. Interval is shot through with qtz and later calcite microstringers, both barren.		«ST ARG» is pervasive. «PATCHY SIL» accompanies quartz healing of faults and fractures.	«Trace pyrite»	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
100.10 TO 102.70	«FAULT»	Partially quartz healed fault contact btwn rhyo breccia and underlying porphyry. Fault gouge and b breccia has been 80% resilicifed, leaving only 20% clay gouge. Lower contact is occupied by a fg black quartz healed breccia.		«INT ARG» is progressively silicified toward the lower contact where «INT SIL» dominates.	«1% PYRITE» euhedra disseminated in fault gouge.	
102.70 TO 107.00	«FELDSPAR PORPHYRY»	Classic feldspar porphyry rhyolite flow with aphanitic groundmass hosting 20-30% 2-4mm plag-ioclase phenos.		«MOD SIL»	«Trace Pyrite» disseminated euhedra.	obvious flow rock, probably andesitic b chemistry, WR sample taken, 2PCLW056

Sample	From (m)	To (m)	Length (m)	GEOCHEMICAL Ag ppm	As ppm	Ba ppm	Cu ppm	Fe %	Pb ppm	Sb ppm	Zn ppm	Au ppb	Hg ppb	S %	COMMENTS
38176	24.70	27.70	3.00												
38177	29.60	31.70	2.10												
38178	42.50	44.40	1.90												
38179	44.40	46.40	2.00												
38180	47.50	49.50	2.00												
38161	56.50	58.30	1.80	2.8	424	71	30	3.37	9	11	79	69	590	3.41	
38162	58.30	60.30	2.00	4	764	133	20	3.84	10	19	59	228	1130	3.7	
38163	60.30	62.40	2.10	4.4	600	212	20	3.62	10	19	59	100	610	3.5	
38164	62.40	63.30	0.90	4.7	626	132	23	2.84	10	47	36	134	2100	2.96	
38165	63.30	64.30	1.00	1.2	112	275	7	0.96	3	17	17	16	1290	0.86	
38166	64.30	65.30	1.00	1.2	96	37	6	0.97	5	6	13	40	285	0.58	
38167	65.30	66.20	0.90	0.9	71	34	6	0.68	3	6	11	35	275	0.31	
38168	66.20	67.20	1.00	0.6	88	18	6	0.69	3	7	14	23	245	0.34	
38169	67.20	68.20	1.00	1.4	143	51	8	0.94	1	5	36	79	155	0.5	
38170	68.20	69.20	1.00	1.4	278	78	10	1.11	6	9	39	114	75	0.87	
38171	69.20	70.20	1.00	1.3	204	217	14	0.97	4	6	28	84	70	0.6	
38172	70.20	72.20	2.00	0.5	95	63	35	1.2	4	1	42	28	65	0.34	
38173	72.20	74.20	2.00	0.5	95	70	13	1.36	9	1	52	20	45	0.51	
38174	74.20	76.60	2.40	1.2	146	67	57	1.63	5	1	48	39	85	0.81	
38175	76.60	78.60	2.00	0.4	14	140	124	2.13	2	1	43	10	65	0.41	

APPENDIX III
STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, David Heberlein of 12221 Makinson Street, Maple Ridge, 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.

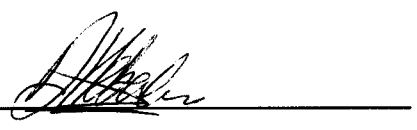
4. I am a Fellow of the Geological Association of Canada (F5050).

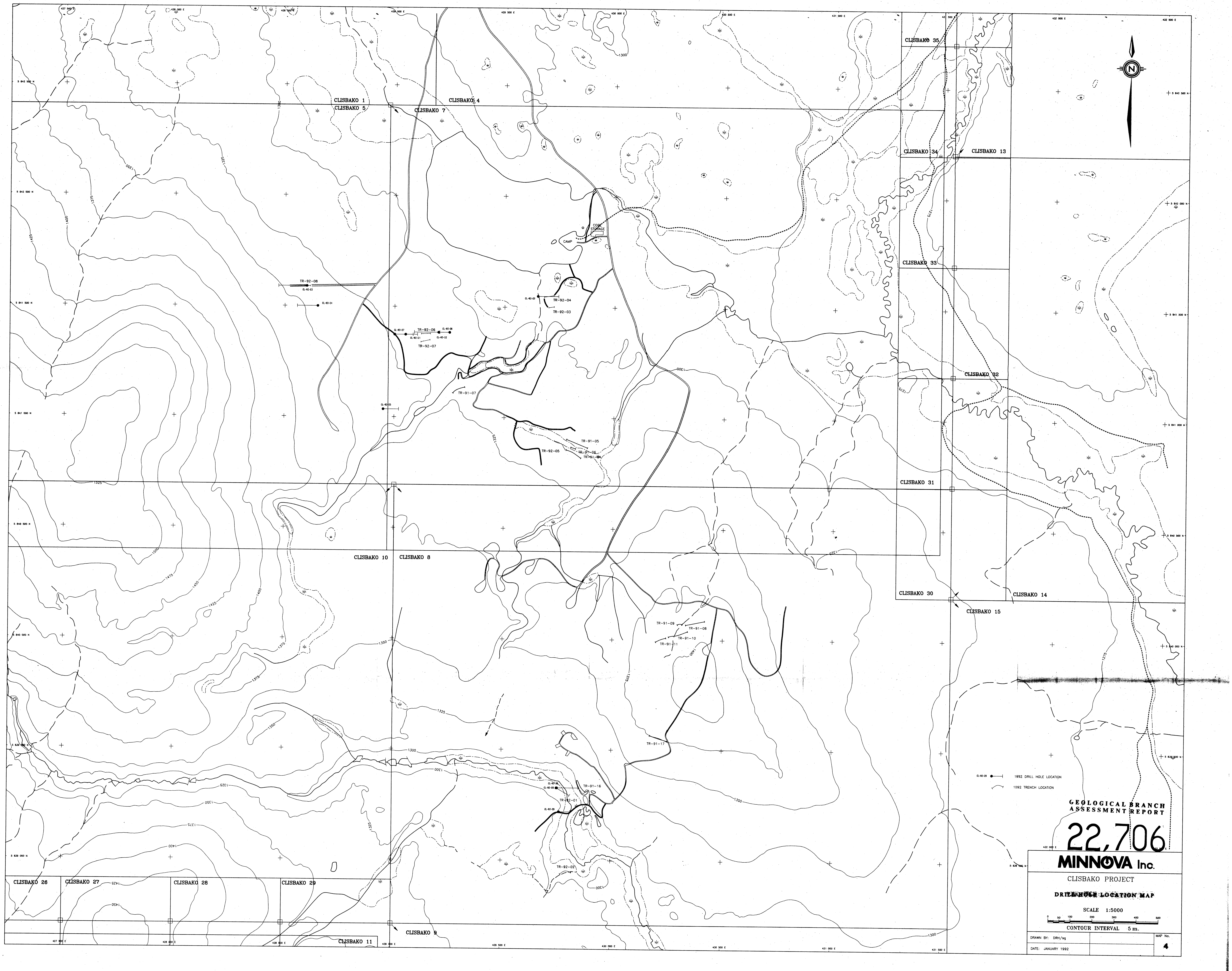
5. I am a Registered Professional Geoscientist of the Province of British Columbia.

6. I am currently employed by Minnova Inc. as a Senior Project Geologist.

7. Work described in this report was carried out under my direct supervision.

Date: December 15, 1992

Signature: 



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CORE STORAGE
CAMP
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TR-92-03
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1992 DRILL HOLE LOCATION
1992 TRENCH LOCATION
GEOLOGICAL BRANCH
ASSESSMENT REPORT
22,706
MINNOVA Inc.
CLISBAKO PROJECT
DRILL HOLE LOCATION MAP
SCALE 1:5000
0 50 100 200 300 400 500
CONTOUR INTERVAL 5 m.
DRAWN BY: DRH/sg
DATE: JANUARY 1992
MAP No.
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