REPORT

ON THE

DIAMOND DRILLING PROGRAM

ON THE

MAMMOTH PROPERTY

NELSON MINING DIVISION
BRITISH COLUMBIA

Latitude: 49° 22' North
Longitude: 117° 17' West
NTS: 82F/6W

Prepared For: **Bluebird Minerals Ltd.**
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1.0 INTRODUCTION

This report details the results of a diamond drilling program on the Mammoth Property(the property), located south of Nelson, British Columbia. The program was carried out by Bluebird Minerals Ltd. in the fall of 1998.

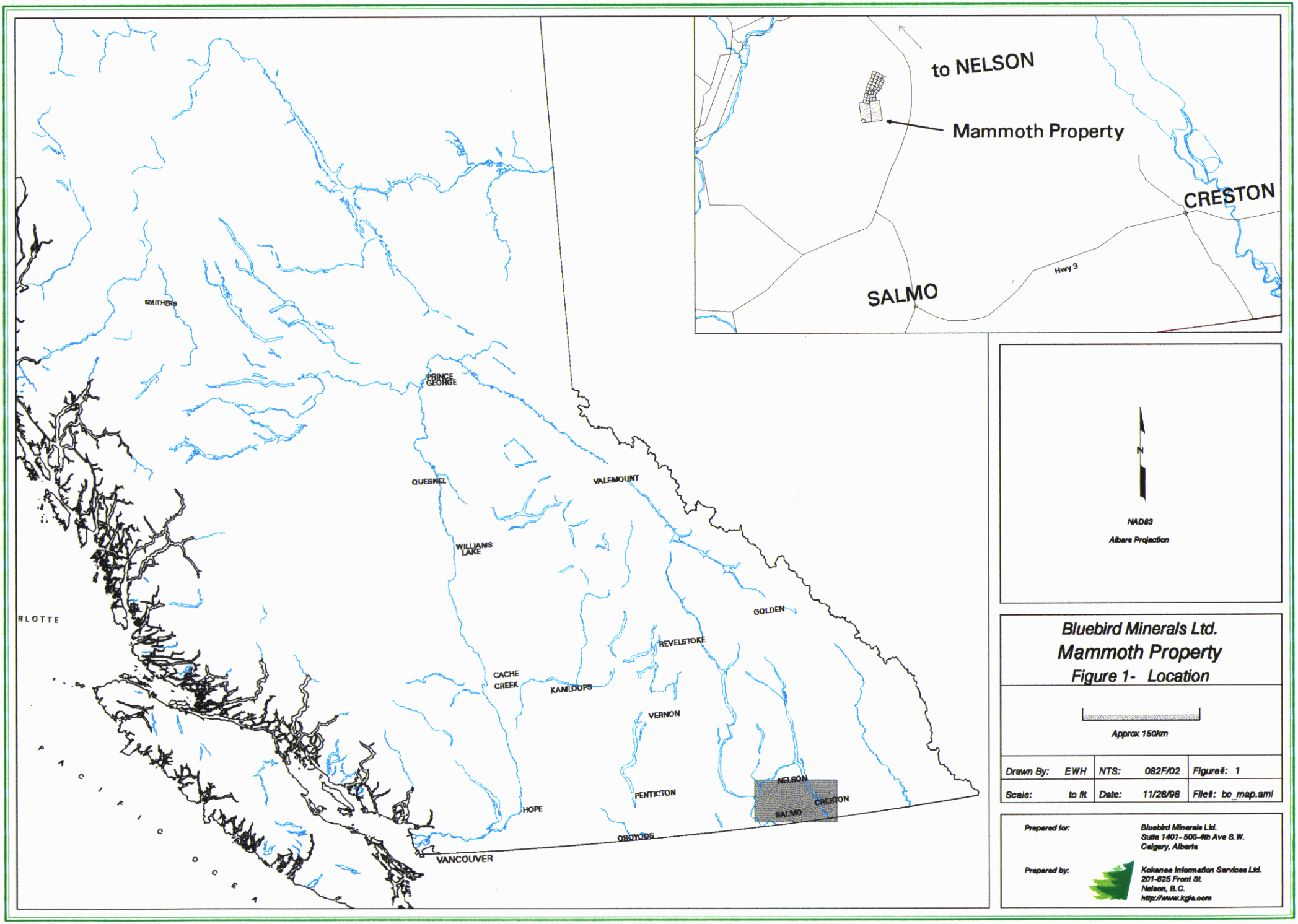
A total of 350.52 metres of NQ core were drilled in four holes. The program was designed to test coincident IP anomalies and surface copper-molybdenum mineralization. The program was deemed a success in that significant widths of economic grades of copper, molybdenum and gold mineralization were encountered in three of the four holes.

2.0 LOCATION, ACCESS AND PHYSIOGRAPHY

The Mammoth property is located in southeastern British Columbia approximately 15 kilometres due south of Nelson, BC., within what is known as the Bonnington Range of the Selkirk Mountains. The geographic center of the property is at latitude 49° 22' North and longitude 117° 17' West in the NTS map area 82F/6W, (See Fig. 1).

The property is readily accessed from BC Highway #6 at a point approximately 22 kilometres south of Nelson, BC. At this point access is initiated via the Porto Rico road which becomes the Barrett Creek Forest Service Road. This road is followed for 3.1 kilometres at which point a secondary road branches off to the right which is followed for approximately 3.5 kilometres to the current area of focus on the property. Four-wheel drive capability is necessary for the last section of road.

Topography on the property can be considered to be rugged overall with elevations ranging from 1067m to 1860m. The area of the main historic workings and current activity are situated on the top of an easterly trending ridge at an elevation of 1800m. Lost Lake to the west of the main workings and the creek draining it, are the primary sources of water and can be considered reliable year round.



Bluebird Minerals Ltd.

Mammoth Property

Figure 1- Location

Drawn By:	EWH	NTS:	082F/02	Figure#:	1
Scale:	to fit	Date:	11/26/98	File#:	bc_map.aml

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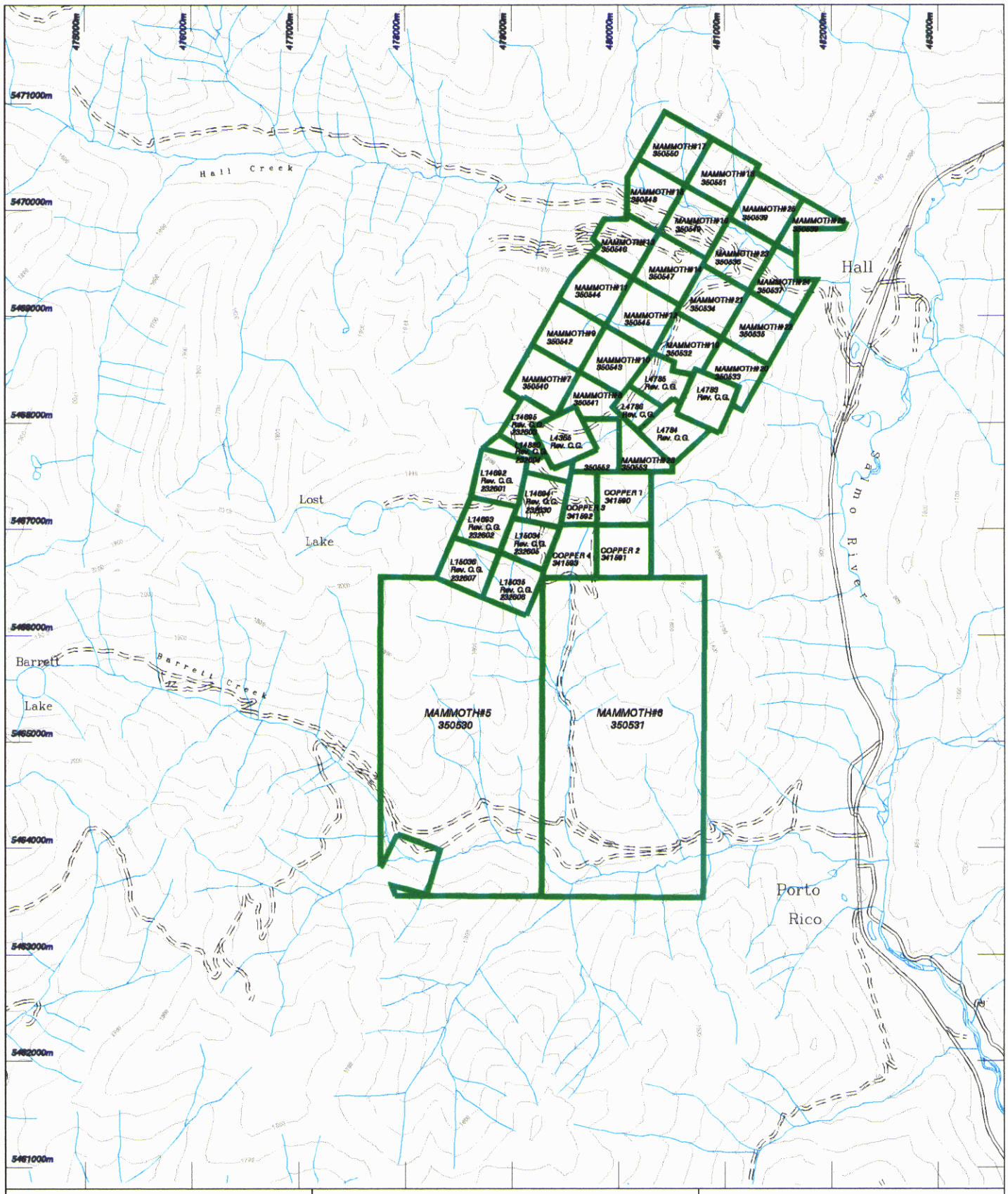
3.0 CLAIM STATUS

Bluebird Minerals Ltd. holds an exclusive option to purchase an undivided 100% interest in an underlying option agreement with respect to 36 mineral claims comprising the Mammoth property. The 36 mineral claims cover an area of approximately 1600 hectares. The claim holdings include two 4-post mineral claims of 18 mineral claim units each, twenty-six 2-post mineral claims and eight reverted Crown granted mineral claims for a total of 70 mineral claim units recorded in the Nelson Mining Division of British Columbia, (See Fig. 2). Pertinent claim data is provided in Table 1 below.

Table 1.

CLAIM STATUS	TENURE #	# OF UNITS	EXPIRY DATE*
TNT	232603	1	July 7, 2005
TNT FR.	232604	1	July 7, 2005
MAMMOTH FR.	232605	1	July 7, 2005
MAMMOTH No.4	232606	1	July 7, 2005
MAMMOTH No.3	232607	1	July 7, 2005
MAMMOTH No.2	232630	1	March 13, 2005
MAMMOTH 5	350530	18	September 13, 2005
MAMMOTH 6	350530	18	September 13, 2005
MAMMOTH 7	350530	1	September 12, 2005
MAMMOTH 8	350530	1	September 12, 2005
MAMMOTH 9	350530	1	September 12, 2005
MAMMOTH 10	350530	1	September 12, 2005
MAMMOTH 11	350530	1	September 12, 2005
MAMMOTH 12	350530	1	September 12, 2005
MAMMOTH 13	350530	1	September 12, 2005
MAMMOTH 14	350530	1	September 12, 2005
MAMMOTH 15	350530	1	September 12, 2005
MAMMOTH 16	350530	1	September 12, 2005
MAMMOTH 17	350530	1	September 12, 2005
MAMMOTH 18	350530	1	September 12, 2002
MAMMOTH 19	350530	1	September 12, 2002
MAMMOTH 20	350530	1	September 12, 2002
MAMMOTH 21	350530	1	September 12, 2002
MAMMOTH 22	350530	1	September 12, 2002
MAMMOTH 23	350530	1	September 12, 2002
MAMMOTH 24	350530	1	September 12, 2002
MAMMOTH 25	350530	1	September 12, 2002
MAMMOTH 26	350530	1	September 12, 2002
MAMMOTH 27	350530	1	September 12, 2001
MAMMOTH 28	350530	1	September 12, 2000

- Expiry dates given are contingent upon this assessment report being accepted.



N
W E
S

UTM Zone 11
NAD83
Grid North

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Bluebird Minerals Ltd.

Mammoth Property

Figure 2: Claim Map

0 m 500 m 1000 m 2000 m

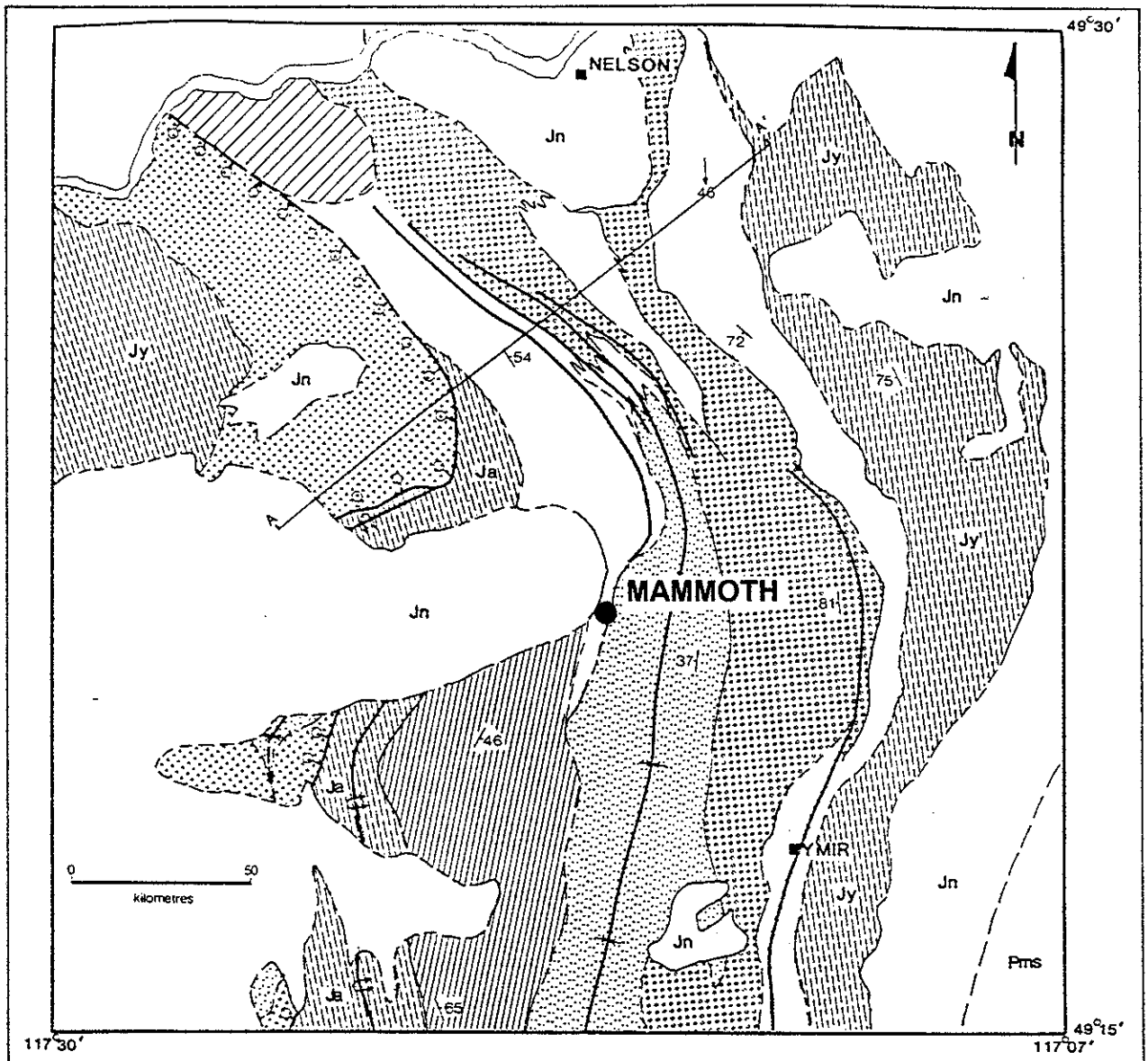
Figure#:	2
Scale:	1:50,000
NTS:	082F/02
Drawn By:	EWH
Date:	Nov 1998
File#:	fig2.aml

4.0 REGIONAL AND LOCAL GEOLOGY

The Mammoth property is located in the southern Omineca Belt and is underlain by rocks of the Quesnellia terrane which include late Paleozoic and early Mesozoic volcanic, sedimentary and plutonic rocks. The Mesozoic rocks of this area are the Lower to Middle Jurassic Rossland Group volcanics and sediments which form an arcuate belt extending from Rossland to Nelson. The Rossland Group in turn is part of the Kootenay Arc, a 400 km long curving structural belt of early Paleozoic to Mesozoic sedimentary, volcanic and crystalline metamorphic rocks trending northeast for 160 kilometres across Washington state into British Columbia, then north along Kootenay Lake and northwest into the Revelstoke area. The Rossland Group includes basal, locally highly deformed clastic sedimentary units (Archibald and Ymir Formations) which are overlain by alkaline mafic flows and pyroclastic rocks of the Elise Formation, (See Fig. 3, Hoy & Andrew). The overlying Hall Formation consists of clastic sedimentary rocks. Rossland Group rocks are tightly folded about northerly trending axes with the intensity of deformation increasing to the east. South and southwest of Nelson, Rossland Group rocks are intruded by slightly younger Nelson granitic rocks, (Fig.3). Intrusions of dioritic affinity may be coeval with Elise Formation volcanic rocks.

The Mammoth property is situated on the west limb of a regional syncline, (Hoy and Andrew, 1989), and marginal to the eastern edge of the Bonnington pluton, part of the Nelson intrusions. Elise Formation volcanics form a 200 to 500 metre wide belt of northerly striking, and east-dipping sequence of flows and fragmental rocks sandwiched between the Nelson intrusions to the west and Hall Formation metasediments to the east. Monzonite to diorite porphyries occur as sill-like or dike-like intrusions,("Mammoth Intrusions") in the Elise-Hall contact area and may be either coeval or comagmatic with the Elise Formation. Further east, similar, but larger bodies of diorite porphyry contain screens of Hall Formation metasediments and are obviously part of a younger event.

The main known mineralized zones on the Mammoth property are hosted by a 200 metre wide belt of Elise Formation volcanics located between the Bonnington Pluton to the west and diorite porphry to the east. The steeply east-dipping contact between the volcanics and the diorite porphyry appears to be the major control for copper and molybdenum sulphide mineralization.



LEGEND

MIDDLE JURASSIC

Jn — NELSON intrusions

LOWER OR MIDDLE JURASSIC (?)

diorite (?)

LOWER JURASSIC

ROSSLAND GROUP

SILVER KING intrusions

HALL FORMATION

ELISE FORMATION

upper Elise

intermediate to mafic lapilli, crystal and fine tuff

intermediate lapilli and crystal tuff

lower Elise

mafic flow breccia, flows

mafic pyroclastic breccia, crystal tuff

Ja — ARCHIBALD FORMATION

Jy — YMIR GROUP

PALEOZOIC

Pms — metasedimentary rocks

Höy and Andrew (1989)

FIGURE 3 - MAMMOTH PROPERTY - REGIONAL GEOLOGY

In the vicinity of the historical workings, mineralization consists of pyrite, chalcopyrite, and molybdenite in fractures in garnet-epidote-magnetite skarn and hornfels,(Wells and Werle,1997).

5.0 EXPLORATION HISTORY

Exploration on the Mammoth property goes back as far as the early 1900's but the majority of work was done in two periods, 1917 to 1940 and post 1967. Early work included several adits, open cuts and a 40 foot shaft. Between 1967 and 1968 15 short diamond drill holes were drilled by Welland Mining Ltd. (N.P.L.). Results of this drilling were poorly recorded. In 1972, Welland Mining conducted some geophysical work consisting of magnetometer and Crone electromagnetic surveys, (Walcott, 1972). That same year Pechiney Development Ltd. conducted geological mapping and rock and soil geochemistry, (Nicolet, 1972). The claims were allowed to lapse after this period of work and were subsequently acquired by a local prospectors, Eric Denny, Jack Denny and Harry Sanders. Between 1981 and 1984 Greenwich Resources Ltd. did significant amounts of work including soil, silt and rock geochemistry, magnetometer surveys and geological mapping,(Hand, 1982; Senden and Evans, 1984). In 1989 a small geological and soil geochemistry program in the northern Keno claims was conducted by Euro Petroleum Corp. and copper and gold values were reported from vein samples, (Carriere, 1989). In 1991 and 1992 CME Consulting Ltd. under contract to Katie Mining Corp and Golden Mammoth Resources Ltd. conducted a more comprehensive exploration program consisting of grid establishment, soil geochemistry, high density magnetics and detailed IP/Resistivity surveys. Some geological mapping and limited sampling were also done, (Hawkins and Naciuk, 1992). In 1996 Rossmin Explorations Ltd. acquired the property and undertook detailed geological mapping on the 1992 grid and more detailed soil geochemistry sampling of previously identified anomalous areas, (Wells and Wehrle, 1997).

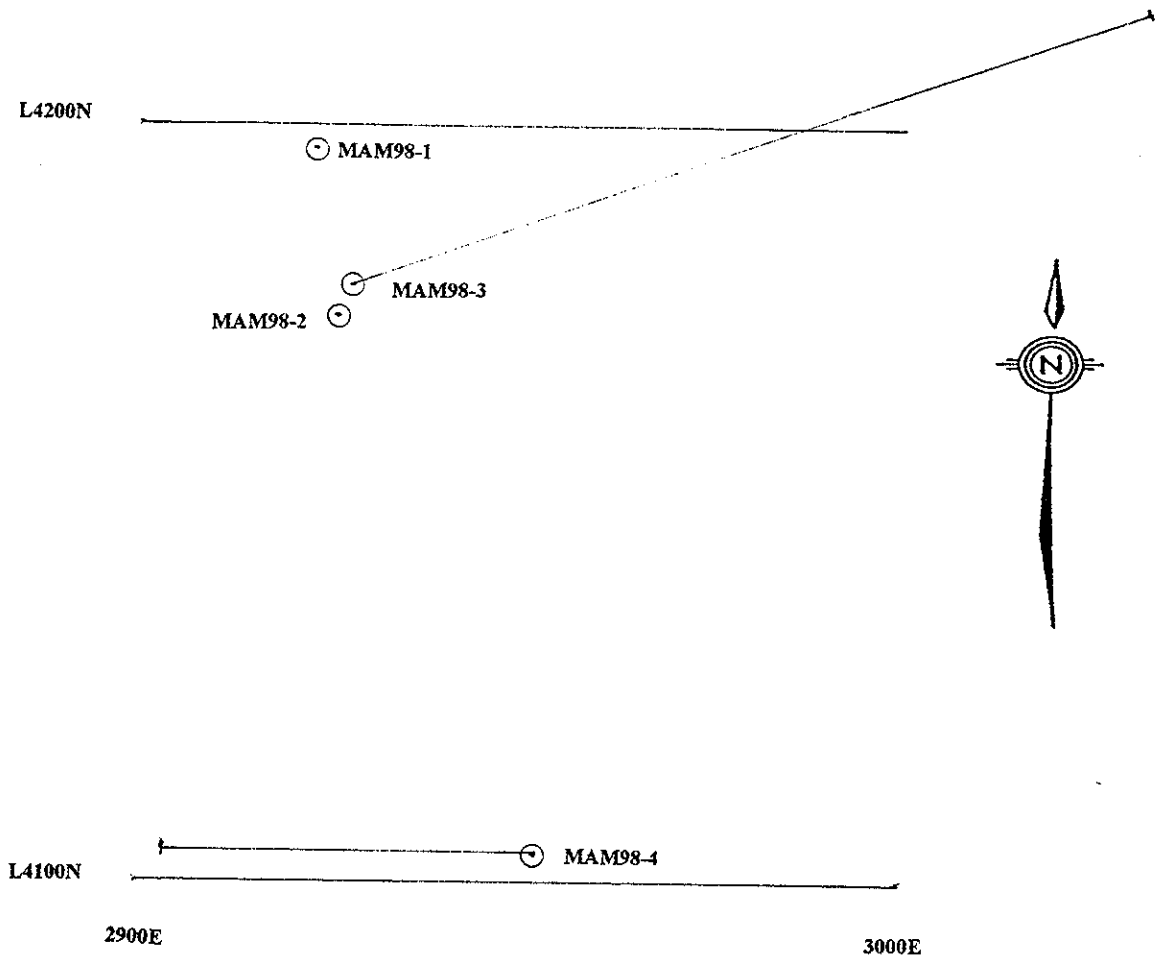
6.0 DIAMOND DRILLING

During September of 1998 Bluebird Minerals Ltd. conducted a diamond drilling program on their Mammoth Property in southwestern British Columbia. A total of 350.52 metres of NQ core were drilled in four holes, (See Fig.4). Pertinent drill data are listed below.

Table 2 Drill Hole Data

Hole #	Grid Coordinates		Dip of	Azimuth	Casing	Total
	Northing	Easting	Hole	of Hole	Length(M)	Length (M)
MAM98-1	**4197**	**2923**	**-90°**	**070°**	**0.30**	**58.83**
MAM98-2	**4175**	**2926**	**-90°**	**070°**	**0**	**43.59**
MAM98-3	**4179**	**2928**	**-50°**	**070°**	**0**	**171.60**
MAM98-4	**4104**	**2952**	**-50°**	**270°**	**0**	**76.50**

6.1 METHODOLOGY Leber Mines Ltd. of Kelowna, BC was contracted to drill approximately 350 metres of NQ core. A track-mounted Longyear 38 was utilized. This is a self-contained unit with both integral mud tanks and rod storage. The unitized mobile drill facilitated rapid drill moves and minimized site disturbance. A nearby stream draining Lost Lake provided a reliable water source. Target selection was predicated primarily upon surface copper and molybdenum mineralization and coincident IP chargeability anomalies. Samples selected for analyses were generally at 0.3 to 1 metre consecutive intervals in the better mineralized sections and at 2 to3 metre intervals in lesser mineralized sections. All samples were marked on the core boxes with half the core sent for analyses and half remaining in the core box for future reference. Approximately half of the sampled core was cut on a rock saw and half was split using a manual core splitter. All drill core is currently stored at #903 Richards Street in Nelson, BC.



BLUEBIRD MINERALS LTD.	
MAMMOTH PROJECT DRILL HOLE PLAN MAP	
Scale: 1:1000	Figure No. 4
Date: Nov. 1998	By: B. Augsten

6.2 GEOLOGY The geology encountered in the drilling is dominated by steeply east-dipping volcanic fragmental rocks belonging to the Elise Formation of the Jurassic-aged Rossland Group. Intrusive to these rocks are distinctive crowded feldspar porphyry sills and dikes of the Mammoth Intrusions. Minor aphanitic quartz porphyry intrusions were also encountered in one hole.

Heterolithic Andesite Fragmental: This rock unit comprises the bulk of the geology encountered in drill holes. In addition this unit hosts all the known mineralization seen to date. This is a fragmental rock with typically lapilli to block-sized clasts with the following clast types in order of abundance as seen in drill hole: 1. augite-phyric andesite, 2. feldspar-phyric andesite and 3. aphanitic andesitic ash tuff/flow. Where mineralized the clast lithology is difficult to discern due to the obliterating effect of the alteration. Clasts are typically subangular to subrounded and one to five centimetres in size. Overall colour of this unit is a pale to medium green colour which is overprinted by the pinkish-red to reddish-brown kspar and garnet alteration. This unit is usually clast-supported. The matrix to this fragmental unit is a fine grained tuffaceous material except in hole #MAM98-4 where the matrix is clearly calcite or recrystallized limestone. Limited surface exposures in this area revealed an outcrop with fossil fragments in the limey matrix to the fragmental. In the drill logs this unit is called the Calcareous Heterolithic Fragmental to distinguish it from the other fragmental units, but essentially it is the same rock with a different matrix composition.

Calcareous Andesite Fragmental: This is a distinctive fragmental rock similar to the heterolithic fragmental seen elsewhere except for the composition of the matrix. This rock features lapilli-sized clasts of variable andesitic composition within a recrystallized limestone matrix. Clast sizes vary from <2mm by 2mm to +10cm. Clast lithologies include augite-phyric andesite, aphanitic andesitic tuff and feldspar-phyric andesite flow. Clast colour ranges from medium green to darker green/brown. Matrix to this rock is a light grey to white colour and is typically unaltered with some exceptions where it is weakly skarned producing a pale green colour in the matrix. This rock is only seen in Hole# MAM98-4.

Feldspar-porphyry Intrusions: This is a medium grey to dark grey coloured rock characterized by a definitive porphyritic texture manifested by 20 – 25% light grey to white, randomly distributed subhedral to euhedral feldspar phenocrysts set in an aphanitic medium grey to dark grey groundmass. Feldspar phenocrysts are typically 1mm by 1.5mm but range in size from (small) 0.5mm by 0.2mm to (large) 4mm by 3mm. Glomeroporphyritic aggregates are present but rare. Contacts between this unit and others are always sharp.

Feldspar-phyric Flow/Feldspar crystal Tuff: This is a dark green-brown to brown-black aphanitic rock with variable amounts (15-25%) of feldspar phenocrysts. Feldspars are commonly lath-like or tabular and 1.0-1.5mm by 0.3-0.5mm in size, and more rarely stubby to irregularly shaped. When tabular, the crystals often display a preferred orientation. Contacts appear gradational.

Quartz-porphyry Intrusions: This rock unit was only seen in MAM98-3 and is tentatively indentified as a quartz-porphyry intrusion. It occurs as two small dikes/sills near the bottom of MAM98-3, both of which are less than 1 metre thick. This aphanitic rock has a medium grey to slightly purplish-grey colour, with 7% very fine, <0.7mm by 0.5mm, chloritized and/or carbonatized mafic phenocrysts and rare <0.5% quartz 'eyes' (phenocrysts), typically 2mm by 3mm in size. The quartz phenocrysts have a blue/grey glassy look and are fractured and infilled by calcite. The rock has strong pervasive calcite and about 3% fracture-controlled calcite. Minor disseminated pyrite occurs in this rock as well as 1 – 1.5% fracture-controlled pyrite.

6.3 MINERALIZATION AND ALTERATION Copper and molybdenum sulphide mineralization is itimately associated with intense potassium feldspar and garnet metasomatism. Copper and molybdenum sulphide mineralization is best displayed in the top portions of holes #MAM98-1,2 and 3, especially well in holes #MAM98-2 & 3. Potassium feldspar occurs as a flesh to salmon-coloured pervasive wash and to a lesser extent as a fracture-controlled alteration of the same colour. The intensity of this alteration in the top portions of holes 98-2, & 3 is such that the protolith textures are for the most part obliterated. Garnet occurs predominantly as a reddish-brown fracture

controlled mineral and is strong in the mineralized zones but persists outside the mineralized zones. Calcite occurs as a patchy pervasive mineral and to a lesser extent as veinlets and fracture controlled. In hole #98-4 calcite is a primary mineral occurring as the matrix to the fragmental. Overall the rock is weakly oxidized to relatively shallow depths, manifesting itself as fracture controlled limonite. Secondary biotite occurs outside the mineralized zones as an aphanitic patchy purplish/brown mineral often seen replacing clasts in the fragmental unit .

Economic sulphide mineralization consists of chalcopyrite and molybdenite. Other sulphides observed, include pyrrhotite and minor overall pyrite. Trace amounts of malachite were also observed. Chalcopyrite occurs as blebby and disseminated grains as well as fracture-controlled but not typically along measureable planar fractures. In one instance chalcopyrite and pyrrhotite occur as a 4cm massive sulphide vein and in MAM98-1 chalcopyrite, pyrrhotite, molybdenite and magnetite are seen together as a 14cm semi-massive to massive 'vein'. Molybdenite is seen mostly as disseminated grains and blebs and more rarely as massive aggregates or accumulations to 1cm. Pyrrhotite is particularly apparent in the less altered portions of the holes as fine-grained disseminated grains up to 3% with some occurring along fractures. Pyrite is less common as disseminated grains usually much less than 1% and often only in trace amounts. Fracture-controlled magnetite was only observed in MAM98-1 in a heavily mineralized section with coarse chalcopyrite, pyrrhotite and molybdenite.

6.4 RESULTS Drilling results established a strong link between copper, gold and molybdenum mineralization and strongly skarned and altered fragmental volcanic rocks. The program was successful in that three of the four holes intersected significant widths carrying economic grades of copper, gold and molybdenum. Notable drill results are listed in Table 2. The certificate for analyses, AK 98-587, AK 98-571 can be consulted in Appendix II.

Table 3 **Significant Drill Intercepts**

HOLE #	SAMPLE #	FROM (m)	TO (m)	WIDTH (m)	Cu (PPM)*	Mo (PPM)	Au (PPB)*
MAM98-1	24151	0.30	1.60	1.30	207	1479	5
MAM98-1	24152	1.60	1.90	0.30	0.36%	1944	70
MAM98-1	24153	1.90	3.00	1.10	843	974	30
MAM98-1	24154	3.00	4.00	1.00	293	142	25
MAM98-1	24155	4.00	5.00	1.00	157	2855	25
MAM98-1	24156	5.00	6.00	1.00	154	30	10
MAM98-1	24157	6.00	7.00	1.00	56	10	5
MAM98-1	24158	7.00	9.00	2.00	1199	24	165
MAM98-1	24159	9.00	11.00	2.00	760	499	65
MAM98-1	24160	11.00	12.35	1.35	521	389	190
MAM98-1	24161	12.35	14.35	2.00	1.05%	452	1.76 g/t
MAM98-2	24179	0.00	2.00	2.00	0.55%	256	510
MAM98-2	24180	2.00	4.00	2.00	0.62%	2157	460
MAM98-2	24181	4.00	5.87	1.87	0.89%	540	445
MAM98-2	24182	5.87	7.10	1.23	0.94%	936	1.47 g/t
MAM98-2	24183	7.10	9.00	1.90	0.36%	372	510
MAM98-2	24184	9.00	11.00	2.00	0.40%	151	370
MAM98-2	24185	11.00	12.00	1.00	0.28%	3032	195
MAM98-2	24186	12.00	13.28	1.28	1.71%	89	675
MAM98-3	24199	0.00	1.83	1.83	1461	<1	120
MAM98-3	24200	1.83	3.96	2.13	0.23%	3	210
MAM98-3	24401	3.96	5.77	1.81	1147	5	275
MAM98-3	24402	5.77	6.70	0.93	1.43%	21	510
MAM98-3	24403	6.70	7.70	1.00	1.86%	60	2.00g/t
MAM98-3	24404	7.70	8.70	1.00	1.42%	2584	850
MAM98-3	24405	8.70	9.05	0.35	0.48%	53	635
MAM98-3	24406	9.05	10.25	1.20	1845	58	235
MAM98-3	24407	10.25	13.15	2.90	112	10	5
MAM98-3	24408	13.15	14.95	1.80	0.57%	37	865

- unless otherwise indicated, ie. copper in %, and gold in grams per tonne

MAM98-1: This hole was spotted to test continuity and grade of surface mineralization and coincident IP chargeability anomalies. This hole was well mineralized from surface to a depth of 14.35 metres. Copper sulphides drop off abruptly at this point as does the intensity of alteration. Copper and molybdenum sulphides are associated with intense potassium feldspar and garnet alteration. The host lithology is a heterolithic andesitic fragmental, probably a lapilli to blocky tephra. Average grade over 14.35 metres was 0.30 g/t Au, 0.20% Cu, and 0.063% Mo.

MAM98-2: This hole was also located to test continuity and grade of surface mineralization and coincident IP chargeability anomalies. This hole was well-mineralized to a depth of 13.28 metres with overall significantly higher grades than hole # 98-1. Once again the economic sulphide mineralization is related to intense potassium and garnet alteration within a heterolithic andesitic fragmental. Also in this hole the copper and molybenum sulphides stop abruptly even though the lithology does not appear to change. There may be a change in the matrix composition that has not been recognized. Average grade over 13.28 metres in this hole was 0.55 g/t Au, 0.69% Cu and 0.084% Mo.

MAM98-3: This hole was collared close to hole #98-2 and angled to the northeast (070°) to further test surface mineralization, and also to attempt to understand the contact relationship with the nearby porphyritic intrusions. In addition this hole would test very high chargeabiltiy anomalies east of the surface workings. Similarily to hole #98-2, this hole was well-mineralized to a downhole depth of 14.95 metres. However, there was a break in the continuity of the mineralization at 10.25 to 13.13 metres where an unmineralized feldspar porphyry dike was encountered. Below this dike economic sulphide mineralization continued to 14.95 metres at which point another larger unmineralized feldspar dike was intersected. Once again in this hole the economic sulphides occurred in a strongly altered heterolithic fragmental andesite. The average grade over 14.95 metres was 0.44 g/t Au, 0.47% Cu, and 0.019% Mo, which includes the unmineralized dike. This hole was deepened to test higher chargeability anomalies east of the surface sulphide exposures. However, drilling failed to explain the anomalies. Relatively low levels of sulphides were present in the rest of the hole, primarily as disseminated pyrrhotite to 2% with minor pyrite. It is

possible more pyrrhotite was present than identified as an extremely fine-grained dissemination.

MAM98-4: This hole was collared to undercut surface exposures which carried disseminated and fracture-controlled copper and molybdenum mineralization. No significant values were obtained in this hole. The hole intersected a calcareous heterolithic fragmental, that is, a fragmental with a recrystallized limy matrix. The rock was only weakly altered with no copper or molybdenum mineralization. The mineralization at surface must have some other control on it other than a strictly lithological control. Further drilling would be necessary to decide whether the mineralization at surface has any subsurface continuity.

7.0 CONCLUSIONS AND RECOMMENDATIONS

While limited in scope, this diamond drill program nonetheless succeeded in intersecting significant widths of copper, molybdenum and gold mineralization hosted in a strongly skarned and altered fragmental volcanic rock. Economic grades were encountered in three of the four holes drilled.

The drilling accomplished the following:

1. Economic Cu-Mo-Au mineralization has a stratabound component to it.
2. High IP chargeability anomalies do not necessarily correspond with best mineralization.
3. Strong correlation between high copper and higher gold content.
4. Strong spatial relationship between feldspar-porphyry intrusions and mineralized volcanics.

Because of the limited scope of this program and its resultant success, a more robust program of diamond drilling is recommended to test the contact area both north and south along strike. It is necessary to determine the strike extensions of this zone and also to ascertain whether or not there is any plunge to the mineralization. Future drilling should be from the east drilling westward as the contacts are dipping steeply to the east.

In light of the relationships observed between copper and molybdenum sulphides and known IP chargeability anomalies, a reinterpretation of the IP data may be prudent prior to further drilling. The fact that the very high chargeability anomalies do not correspond to economic mineralization is in encouraging in the sense that the more moderate chargeability anomalies represent a larger prospecting area.

8.0 REFERENCES

Carriere, G. (1989): 1989 Geochemical Program on the Mammoth Group, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report 18235

Hand, John S. (1982): Assessment Report, Mammoth Property, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report 10416

Hawkins, T.G. and Naciuk, T.M. (1992): Report on Geology, Geochemistry and Geophysics on the Mammoth Project, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report

Hoy, Trygve and Andrew, Kathryn (1989): The Rossland Group, Nelson Map-Area, Southeastern British Columbia (82F/6), B.C. Ministry of Energy Mines and Petroleum Resources, Geological Fieldwork, 1988, Paper 1988-1, pp.33-43

Nicolet, J.P.(1972): Geological and Geochemical Survey on the Mammoth Leases and Grace Claims, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report 4035

Senden, G.W. and Evans, David S. (1984): Geochemical Report, Mammoth Property, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report 13515

Walcott, Peter E.(1972): Report on Ground Magnetometer Survey, Nelson Area, B.C., B.C. Ministry of Energy and Mines Assessment Report 4034

Wells, R.C. and Wehrle, D.M. (1972): Geological and Geochemical Reports for the 1996 Exploration on the Mammoth Property, Nelson Mining Division, B.C. Ministry of Energy and Mines Assessment Report.

9.0 STATEMENT OF QUALIFICATIONS

I, Bernhardt E.K. Augsten of the City of Nelson, British Columbia, hereby certify that:

1. I am a graduate of Carleton University with a B.Sc. Hons. in Geology (1985)

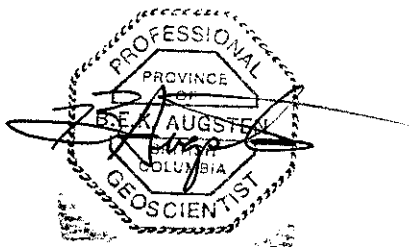
2. I am presently self-employed as a Consulting Geologist

3. I have practised as a geologist for the last 13 years in Ontario, Quebec, Manitoba, British Columbia, Arizona and Mexico

4. I logged all the core in this diamond drill program

5. I have worked on several other projects in the region over the last nine years

6. I am a registered Professional Geoscientist, registered in the Province of British Columbia.



APPENDIX I

COST STATEMENT

Diamond drilling	Leber Mines Ltd.	20,651.00
Core Analysis	Eco-Tech Laboratories Ltd.	2,188.21
Shipping	Nelson to Kamloops via Greyhound	451.67
Labour	B.Augsten (core logging/geology) 10.5 days @ $350.00	3,632.25
	K. Murray (Project management) 15 days @ $250.00	3,750.00
	M. Murray (core splitting/cutting) 8 days @ $150.00	1,200.00
Vehicle Rental		1,284.50
Fuel		226.00
Consummables		79.78
Rock Saw Rental		1,409.04
Report		2,247.00
	TOTAL EXPENDITURES	$37,119.45

APPENDIX II

ANALYTICAL RESULTS

Eco-Tech LABORATORIES LTD.

ASSAYING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ENVIRONMENTAL TESTING

10041 E. Trans Canada Hwy., R.R. #2, Kamloops, B.C. V2C 6T4
Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@mail.wkpowerlink.com

CERTIFICATE OF ASSAY AK 98-571

1-Oct-98

BLUEBIRD MINERALS LTD.
1401-500 4TH AVENUE S.W.
CALGARY, AB
T2P 2V6

ATTENTION: TOM GORKOFF

No. of samples received: 38
Sample type: Core
PROJECT #: MAMMOTH
SHIPMENT #: None Given
Samples submitted by: Ken Murray

ET #.	Tag #	Au (g/t)	Au (oz/t)	Cu (%)
2	24152	-	-	0.36
11	24161	1.76	0.051	1.05
29	24179	-	-	0.55
30	24180	-	-	0.62
31	24181	-	-	0.89
32	24182	1.47	0.043	0.94
33	24183	-	-	0.36
34	24184	-	-	0.4
35	24185	-	-	0.28
36	24186	-	-	1.71

QC DATA:

Repeat:

11	24161	1.78	0.052	

Standard:

STD-M		1.54	0.045	
MPla				1.44

ECO-TECH LABORATORIES LTD.
per Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

XLS/98
Fax cc: 250-354-4067/ken murray

30-Sep-98

ECO-TECH LABORATORIES LTD.
10041 East Trans Canada Highway
KAMLOOPS, B.C.
V2C 6T4

Phone: 604-573-5700
Fax : 604-573-4557

ICP CERTIFICATE OF ANALYSIS AK 98-571

BLUEBIRD MINERALS LTD.
1401-500 4TH AVENUE S.W.
CALGARY, AB
T2P 2V6

ATTENTION: TOM GORKOFF

No. of samples received: 38
Sample type: Core
PROJECT #: MAMMOTH
SHIPMENT #: None Given
Samples submitted by: Ken Murray

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
1	24151	5	<0.2	0.78	<5	15	<5	2.50	<1	19	97	207	2.16	<10	0.09	589	1479	0.04	44	1190	4	<5	<20	34	0.07	<10	39	<10	<1	18
2	24152	70	1.8	0.56	<5	80	<5	1.04	2	612	70	3124	>10	<10	0.05	380	1944	0.02	1044	420	<2	<5	<20	23	0.04	30	17	350	<1	104
3	24153	30	0.2	0.63	<5	20	<5	2.53	<1	38	96	843	4.60	<10	0.08	706	974	0.02	65	1150	<2	<5	<20	36	0.07	<10	35	90	<1	32
4	24154	25	<0.2	0.59	5	10	<5	3.89	<1	34	83	293	2.23	<10	0.08	611	142	0.01	63	1130	<2	<5	<20	45	0.07	<10	31	90	<1	12
5	24155	25	<0.2	0.73	<5	5	<5	4.10	<1	25	180	157	1.96	<10	0.07	747	2855	0.01	54	1270	4	<5	<20	27	0.05	<10	35	10	<1	11
6	24156	10	<0.2	0.83	<5	5	<5	4.21	<1	16	92	154	1.87	<10	0.09	801	30	0.01	32	1070	<2	<5	<20	28	0.06	<10	40	<10	<1	24
7	24157	5	<0.2	0.65	5	10	<5	3.28	<1	17	93	56	1.59	<10	0.09	598	10	0.01	48	1110	<2	<5	<20	23	0.05	<10	32	10	<1	25
8	24158	165	0.4	0.64	<5	5	<5	3.85	<1	18	76	1199	1.69	<10	0.08	642	24	0.01	39	1130	<2	<5	<20	34	0.06	<10	34	10	<1	41
9	24159	65	0.2	0.65	<5	10	<5	3.71	<1	16	236	760	1.68	<10	0.07	643	499	0.01	34	1260	4	<5	<20	37	0.07	<10	34	<10	<1	58
10	24160*	190	<0.2	0.54	<5	10	<5	3.23	1	11	65	521	1.16	<10	0.10	445	389	0.02	25	1250	<2	<5	<20	38	0.06	<10	26	20	<1	53
11	24161	>1000	5.2	0.68	<5	20	<5	3.62	6	56	73	>10000	4.86	<10	0.05	769	452	<0.01	46	570	<2	<5	<20	22	0.05	<10	32	250	<1	350
12	24162	20	<0.2	1.35	10	10	<5	2.49	<1	24	82	499	1.52	<10	0.20	252	48	0.13	66	1260	6	<5	<20	173	0.08	<10	29	<10	1	48
13	24163	30	<0.2	1.21	10	10	<5	2.80	<1	18	109	316	1.51	<10	0.23	359	26	0.12	55	1370	8	<5	<20	161	0.09	<10	30	<10	2	39
14	24164	5	<0.2	0.53	5	<5	<5	2.90	<1	22	70	460	1.17	<10	0.12	224	1	0.04	62	1330	4	<5	<20	87	0.09	<10	22	10	1	67
15	24165	35	<0.2	0.96	10	5	<5	2.57	<1	19	85	721	1.32	<10	0.18	230	1	0.10	55	1390	10	<5	<20	131	0.08	<10	28	<10	2	42
16	24166	5	<0.2	1.80	5	40	<5	2.01	<1	30	122	166	2.60	<10	0.69	227	2	0.19	69	1270	8	<5	<20	123	0.12	<10	72	<10	2	26
17	24167	20	0.2	1.60	5	30	<5	3.00	1	50	109	380	3.11	<10	0.57	244	1	0.15	95	1420	16	<5	<20	125	0.12	<10	67	<10	<1	61
18	24168	5	1.2	1.00	<5	40	<5	2.43	2	39	64	414	3.02	<10	0.51	293	3	0.04	56	1440	40	<5	<20	46	0.11	<10	65	<10	2	81
19	24169	5	0.4	1.19	5	35	<5	3.13	<1	31	59	235	3.18	<10	0.51	351	3	0.08	33	1560	6	<5	<20	75	0.11	<10	77	<10	2	48
20	24170	5	<0.2	1.22	10	60	<5	2.60	<1	35	61	128	3.28	<10	0.68	372	3	0.07	41	1530	4	<5	<20	64	0.14	<10	100	<10	2	52

BLUEBIRD MINERALS LTD.

ICP CERTIFICATE OF ANALYSIS AK 98-571

ECO-TECH LABORATORIES LTD.

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
21	24171	5	<0.2	1.32	<5	55	<5	2.27	<1	24	45	114	3.11	<10	0.75	440	3	0.10	23	1510	6	<5	<20	69	0.13	<10	94	<10	3	46
22	24172	5	<0.2	1.30	<5	40	<5	2.64	<1	16	41	97	2.88	<10	0.63	395	<1	0.14	10	1480	6	<5	<20	120	0.12	<10	96	<10	3	34
23	24173	5	<0.2	1.13	<5	25	<5	2.07	<1	16	52	113	2.44	<10	0.47	397	<1	0.14	14	1550	6	<5	<20	84	0.12	<10	86	<10	3	34
24	24174	5	<0.2	1.62	<5	85	<5	2.40	<1	22	45	333	3.77	<10	0.91	497	<1	0.11	19	1560	6	<5	<20	81	0.15	<10	127	<10	3	79
25	24175	5	<0.2	1.09	5	35	<5	3.78	<1	18	73	93	2.04	<10	0.52	429	<1	0.08	36	1310	2	5	<20	96	0.10	<10	66	<10	1	30
26	24176	5	<0.2	1.29	15	15	<5	5.81	<1	18	78	107	2.49	<10	0.51	544	4	0.09	29	1270	2	<5	<20	116	0.09	<10	79	<10	2	32
27	24177	25	<0.2	1.61	75	20	<5	6.37	<1	34	67	95	3.46	<10	0.94	709	3	0.06	43	1210	2	5	<20	162	0.06	<10	113	<10	<1	32
28	24178	5	<0.2	0.85	10	10	<5	3.97	<1	23	55	90	1.73	<10	0.33	348	<1	0.04	35	1180	2	<5	<20	104	0.09	<10	53	<10	<1	24
29	24179	510	5.6	0.69	15	20	<5	1.93	4	37	72	5382	2.67	<10	0.21	664	256	0.02	47	1360	<2	<5	<20	45	0.07	<10	34	60	<1	258
30	24180	460	5.8	0.61	5	10	<5	2.46	5	39	63	6006	2.51	<10	0.19	567	2157	0.01	54	1120	6	<5	<20	39	0.06	<10	27	<10	<1	282
31	24181	445	8.6	0.65	40	15	<5	2.77	4	51	90	8711	3.02	<10	0.19	734	540	<0.01	60	940	<2	<5	<20	39	0.05	<10	26	420	<1	276
32	24182	>1000	9.4	0.59	30	15	<5	2.31	5	44	87	9021	3.03	<10	0.19	695	936	<0.01	62	910	2	<5	<20	32	0.05	<10	25	10	<1	278
33	24183	510	3.2	0.72	15	10	<5	3.61	3	20	68	3523	1.94	<10	0.17	694	372	<0.01	34	1020	2	<5	<20	30	0.05	<10	27	10	<1	134
34	24184	370	3.8	0.87	20	10	<5	4.55	3	28	95	4171	2.64	<10	0.22	768	151	0.02	55	1100	2	<5	<20	50	0.07	<10	35	10	<1	151
35	24185	195	2.0	0.87	<5	5	<5	5.57	2	14	97	2729	1.93	<10	0.25	734	3032	0.01	23	1210	2	<5	<20	68	0.07	<10	41	340	<1	109
36	24186	675	14.0	0.96	10	20	<5	4.23	6	43	89	>10000	4.10	<10	0.14	661	89	0.04	43	430	<2	<5	<20	73	0.05	<10	31	520	<1	349
37	24187	35	0.2	2.53	45	20	<5	6.74	<1	32	136	463	3.77	<10	1.28	811	17	0.16	71	1260	6	5	<20	269	0.06	<10	79	<10	<1	57
38	24188	120	0.6	1.36	10	20	<5	3.14	<1	23	93	699	1.86	<10	0.41	358	8	0.12	70	1350	6	<5	<20	177	0.09	<10	41	<10	1	53
QC DATA:																														
Resplit:																														
1	24151	5	<0.2	0.82	<5	10	<5	2.85	<1	21	98	217	2.25	<10	0.10	596	1451	0.05	45	1220	4	<5	<20	38	0.09	<10	42	10	<1	20
36	24186	650	12.0	1.02	10	15	<5	4.44	5	40	89	>10000	3.83	<10	0.15	670	94	0.04	42	460	<2	<5	<20	77	0.05	<10	32	1120	<1	317
Repeat:																														
1	24151	5	<0.2	0.82	<5	10	<5	2.63	<1	19	91	208	2.20	<10	0.09	618	1494	0.04	38	1210	4	<5	<20	33	0.08	<10	41	10	<1	18
10	24160*	15	<0.2	0.57	<5	<5	<5	3.31	<1	11	66	512	1.19	<10	0.10	454	380	0.02	24	1260	2	<5	<20	38	0.07	<10	28	10	<1	54
19	24169	5	0.2	1.24	10	40	<5	3.20	<1	31	60	239	3.21	<10	0.53	353	<1	0.09	32	1550	4	<5	<20	82	0.12	<10	80	<10	2	47
36	24186	950	14.0	0.97	5	15	<5	4.26	6	43	82	>10000	4.14	<10	0.14	631	85	0.04	40	450	<2	<5	<20	72	0.05	<10	31	460	<1	359
Standard:																														
GEO'98		140	1.2	1.84	60	170	<5	1.84	<1	20	62	82	4.15	<10	0.98	721	2	0.03	20	690	22	<5	<20	65	0.12	<10	79	<10	5	74
GEO'98		-	1.4	1.71	60	160	<5	1.82	<1	19	62	84	3.96	<10	0.98	681	<1	0.02	22	660	22	<5	<20	58	0.10	<10	75	<10	4	69

*NOTE: * = Metallic gold suspected, screen assay recommended.*

df/571
XLS/98
Fax cc: 250-354-4067/ken murray

ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

Eco-Tech
LABORATORIES LTD.

ASSAYING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
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10041 E. Trans Canada Hwy., R.R. #2, Kamloops, B.C. V2C 6T4
Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@mail.wkpowerlink.com

CERTIFICATE OF ASSAY AK 98-587

BLUEBIRD MINERALS LTD.
1401-500 4TH AVENUE S.W.
CALGARY, AB
T2P 2V6

8-Oct-98

ATTENTION: TOM GORKOFF

No. of samples received: 43
Sample type: Core
PROJECT #: MAMMOTH
SHIPMENT #: None Given
Samples submitted by: Ken Murray

ET #.	Tag #	Au (g/t)	Au (oz/t)	Cu (%)
12	24200	-	-	0.23
14	24402	-	-	1.43
15	24403	2.00	0.058	1.86
16	24404	-	-	1.42
17	24405	-	-	0.48
20	24408	-	-	0.57

QC DATA:

Repeat:

15	24403	2.00	0.058	-

Standard:

STD-M	1.55	0.045	-
MPIa	-	-	1.44

ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

XLS/98
Fax cc: 250-354-4067/ken murray

8-Oct-98

ECO-TECH LABORATORIES LTD.
10041 East Trans Canada Highway
KAMLOOPS, B.C.
V2C 6T4

Phone: 604-573-5700
Fax : 604-573-4557

ICP CERTIFICATE OF ANALYSIS AK 98-587

BLUEBIRD MINERALS LTD.
1401-500 4TH AVENUE S.W.
CALGARY, AB
T2P 2V6

ATTENTION: TOM GORKOFF

No. of samples received: 43
Sample type: Core
PROJECT #: MAMMOTH
SHIPMENT #: None Given
Samples submitted by: Ken Murray

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
1	24189	50	<0.2	1.06	5	<5	<5	5.11	<1	17	108	624	1.55	<10	0.12	525	237	0.03	33	1270	6	<5	<20	108	0.14	<10	51	10	<1	24
2	24190	75	<0.2	0.90	<5	10	<5	3.36	2	25	91	610	1.71	<10	0.14	335	4	0.04	51	1340	6	<5	<20	120	0.14	<10	38	10	<1	42
3	24191	40	<0.2	1.78	<5	105	<5	1.41	<1	47	172	245	4.18	<10	1.13	327	<1	0.11	88	1320	8	<5	<20	74	0.25	<10	130	<10	<1	39
4	24192	5	<0.2	1.72	<5	60	<5	2.26	<1	39	117	140	2.90	<10	0.67	239	<1	0.18	75	1270	10	<5	<20	131	0.20	<10	92	<10	1	27
5	24193	5	<0.2	1.15	<5	45	<5	2.70	1	46	53	152	4.01	<10	0.58	295	<1	0.07	54	1530	6	<5	<20	75	0.21	<10	108	<10	1	56
6	24194	5	<0.2	1.37	<5	40	<5	2.62	<1	47	49	243	4.35	<10	0.64	326	<1	0.11	44	1560	8	<5	<20	85	0.21	<10	112	<10	2	34
7	24195	5	<0.2	1.43	<5	50	<5	2.60	<1	43	55	165	3.99	<10	0.65	346	<1	0.09	52	1450	8	<5	<20	75	0.19	<10	123	<10	1	32
8	24196	10	<0.2	1.73	<5	60	<5	2.67	<1	34	49	130	3.26	<10	0.57	359	<1	0.17	39	1600	10	<5	<20	124	0.20	<10	119	<10	3	32
9	24197	5	<0.2	1.75	<5	90	<5	2.07	<1	38	43	129	3.50	<10	0.78	358	<1	0.14	47	1540	12	<5	<20	89	0.20	<10	127	<10	2	39
10	24198	5	<0.2	1.46	<5	80	<5	2.48	<1	33	45	123	3.54	<10	0.74	460	<1	0.14	34	1520	8	<5	<20	73	0.21	<10	145	<10	4	42
11	24199	120	0.4	1.42	25	50	<5	2.02	2	36	71	1461	3.16	<10	0.63	712	<1	0.07	67	1420	14	<5	<20	89	0.16	<10	76	<10	1	83
12	24200	210	1.6	1.31	20	60	<5	3.54	1	21	70	2015	2.50	<10	0.24	964	3	0.02	50	1200	8	<5	<20	68	0.12	<10	65	<10	1	49
13	24401	275	0.4	1.25	5	15	<5	3.74	2	12	90	1147	2.08	<10	0.19	1027	5	<0.01	23	1260	8	<5	<20	84	0.11	<10	59	<10	<1	39
14	24402	510	11.2	1.27	30	15	<5	6.44	7	52	91	>10000	4.24	<10	0.15	1024	21	<0.01	78	760	<2	<5	<20	49	0.08	<10	57	10	<1	265
15	24403	>1000	20.6	1.44	40	15	<5	7.15	8	69	66	>10000	5.40	<10	0.17	1313	60	<0.01	76	380	<2	<5	<20	48	0.07	<10	53	150	<1	310
16	24404	850	14.0	1.44	30	50	<5	6.81	7	50	117	>10000	5.52	<10	0.17	1567	2584	<0.01	96	590	6	<5	<20	56	0.06	<10	62	10	<1	265
17	24405	635	9.8	0.80	2495	80	<5	>10	<1	156	45	4570	7.35	<10	1.11	1998	53	<0.01	64	310	<2	400	<20	410	0.02	<10	46	60	<1	178
18	24406	235	2.4	1.74	25	20	<5	6.44	2	27	65	1845	3.53	<10	0.37	1455	58	0.09	30	1200	10	<5	<20	127	0.11	<10	74	<10	<1	71
19	24407	5	<0.2	1.39	65	35	<5	2.71	<1	13	70	112	3.03	<10	0.79	775	10	0.05	9	990	10	<5	<20	58	0.04	<10	53	<10	7	29
20	24408	865	5.0	1.63	175	45	<5	5.89	3	279	71	5633	>10	<10	0.20	1692	37	0.01	308	790	20	<5	<20	37	0.08	<10	68	740	<1	171

BLUEBIRD MINERALS LTD.

ICP CERTIFICATE OF ANALYSIS AK 98-587

ECO-TECH LABORATORIES LTD.

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
21	24409	10	<0.2	1.41	40	20	<5	4.77	<1	14	77	140	2.62	<10	0.49	835	12	0.05	21	1220	8	<5	<20	84	0.06	<10	55	10	4	35
22	24410	10	<0.2	1.37	<5	30	<5	1.41	<1	15	65	60	2.73	<10	0.67	551	<1	0.12	7	1020	10	<5	<20	48	0.14	<10	56	<10	2	21
23	24411	5	<0.2	0.93	<5	30	<5	1.56	<1	11	57	24	1.90	<10	0.50	365	<1	0.08	7	1050	8	<5	<20	55	0.12	<10	43	<10	4	13
24	24412	5	<0.2	1.43	<5	45	<5	2.59	<1	13	56	45	3.40	<10	0.83	707	<1	0.05	7	1010	8	<5	<20	93	0.06	<10	55	<10	6	21
25	24413	5	<0.2	1.13	<5	35	5	2.01	<1	13	73	33	3.12	<10	0.75	625	1	0.06	7	990	8	<5	<20	74	0.11	<10	58	<10	4	22
26	24414	15	<0.2	1.32	<5	30	5	1.91	<1	12	63	39	3.06	<10	0.77	572	<1	0.07	7	1000	8	<5	<20	60	0.12	<10	61	<10	3	21
27	24415	10	<0.2	1.67	5	45	<5	2.04	<1	13	72	30	3.27	<10	0.91	646	<1	0.11	7	1020	12	<5	<20	69	0.13	<10	66	<10	3	20
28	24416	5	<0.2	2.89	10	55	<5	2.59	<1	14	62	46	2.56	<10	0.80	350	<1	0.31	7	1010	22	<5	<20	166	0.13	<10	58	<10	3	18
29	24417	5	<0.2	1.62	5	50	<5	1.94	<1	14	59	31	2.01	<10	0.57	342	4	0.17	8	1040	14	5	<20	107	0.12	<10	45	<10	3	14
30	24418	5	<0.2	0.74	10	20	<5	>10	<1	44	47	119	4.01	<10	0.19	467	<1	0.07	87	1360	4	<5	<20	148	0.15	<10	53	<10	<1	16
31	24419	5	<0.2	1.93	70	60	<5	4.85	<1	43	43	383	5.27	<10	1.24	667	3	0.07	44	1520	10	<5	<20	149	0.15	<10	156	<10	4	35
32	24420	5	<0.2	2.53	40	105	<5	5.05	<1	37	41	123	5.59	<10	1.74	929	<1	0.07	43	1450	14	<5	<20	172	0.15	<10	206	<10	2	36
33	24421	5	<0.2	2.49	60	90	<5	4.99	<1	46	45	138	5.57	<10	1.74	885	<1	0.07	54	1470	12	<5	<20	162	0.13	<10	195	<10	5	35
34	24422	10	<0.2	1.18	<5	20	<5	2.50	<1	37	39	751	3.22	<10	0.31	211	<1	0.13	39	1590	8	<5	<20	146	0.18	<10	76	<10	2	22
35	24423	5	<0.2	1.49	<5	30	<5	7.43	<1	45	41	386	4.89	<10	0.41	394	<1	0.17	65	1590	8	<5	<20	188	0.18	<10	70	<10	<1	14
36	24424	5	<0.2	1.34	10	25	<5	>10	<1	52	75	282	4.79	<10	0.93	780	<1	0.03	103	1360	4	5	<20	160	0.13	<10	144	10	2	20
37	24425	5	<0.2	1.25	<5	35	<5	>10	<1	32	130	106	3.98	<10	1.14	855	<1	0.05	63	1420	4	10	<20	209	0.16	<10	115	<10	<1	18
38	24426	5	<0.2	1.31	<5	55	<5	9.88	<1	39	88	194	3.44	<10	0.56	448	<1	0.15	79	1360	8	<5	<20	209	0.16	<10	70	<10	<1	18
39	24427	5	<0.2	1.32	<5	30	<5	>10	<1	36	50	252	3.41	<10	0.23	517	<1	0.18	67	1110	6	<5	<20	265	0.12	<10	31	10	<1	7
40	24428	5	<0.2	1.40	5	30	<5	3.75	<1	33	80	300	2.37	<10	0.27	222	<1	0.14	68	1350	12	<5	<20	134	0.15	<10	42	10	<1	13
41	24429	5	<0.2	1.94	<5	35	<5	7.96	<1	29	103	105	2.49	<10	0.59	425	<1	0.23	63	1300	14	<5	<20	275	0.15	<10	80	10	1	20
42	24430	10	<0.2	1.42	5	25	<5	3.43	<1	45	72	146	3.03	<10	0.38	202	<1	0.12	71	1490	22	<5	<20	175	0.17	<10	56	<10	<1	33
43	24431	5	<0.2	1.62	20	35	<5	4.27	<1	70	56	277	4.79	<10	0.90	496	<1	0.11	109	1460	18	<5	<20	109	0.19	<10	131	10	<1	36

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
QC DATA:																														
Resplit:																														
1	24189	40	0.2	1.04	5	<5	<5	5.27	<1	19	105	660	1.60	<10	0.12	534	257	0.03	36	1370	8	<5	<20	108	0.14	<10	51	20	<1	28
36	24424	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repeat:																														
1	24189	40	0.2	1.10	5	<5	<5	5.32	1	17	111	657	1.61	<10	0.13	540	255	0.03	35	1310	4	<5	<20	113	0.14	<10	53	<10	<1	24
10	24198	40	<0.2	1.52	<5	80	<5	2.58	<1	34	47	131	3.71	<10	0.77	492	<1	0.14	37	1610	8	<5	<20	76	0.22	<10	151	<10	3	44
19	24407	5	<0.2	1.38	60	35	<5	2.71	<1	12	70	107	3.02	<10	0.79	774	10	0.05	8	1010	12	<5	<20	59	0.04	<10	53	<10	7	28
36	24424	5	<0.2	1.43	15	30	<5	>10	<1	55	81	277	5.13	<10	0.98	843	<1	0.04	109	1490	8	<5	<20	175	0.14	<10	154	10	<1	21
Standard:																														
GEO'98		130	1.0	1.98	65	175	<5	1.90	<1	21	69	84	4.30	<10	0.99	713	<1	0.02	22	680	22	<5	<20	64	0.14	<10	88	<10	5	70
GEO'98		140	0.8	2.00	60	175	<5	1.94	<1	22	69	85	4.40	<10	1.02	734	<1	0.01	22	710	22	<5	<20	64	0.14	<10	88	<10	6	68

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per ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

APPENDIX III

DRILL LOGS

BLUEBIRD MINERALS LTD. MAMMOTH PROJECT Geological Log Hole-ID: MAM98-1 Page 1 of 5

SURVEY DATA

SURVEY	DEPTH		DIP		TRUE AZIMUTH			GRID			
	(ft.)	(m)	True		Degrees	Minutes	Seconds	SYSTEM	NORTHING (m)	EASTING (m)	ELEVATION (m)
Collar			90°		----						
Down Hole	(ft.)	(m)	Read	True	Read	True					

DRILLING DATA

GRID SYSTEM	MINE	
APPROX. NORTHING (m)	4197	
APPROX. EASTING (m)	2923	
APPROX. ELEVATION (m)	1800m	
DATE DRILLING STARTED	Sept 15, 1998	
DATE DRILLING ENDED	Sept 16, 1998	
	(ft.)	(m)
TOTAL DEPTH	193	58.83
CASING DEPTH	1	0.30
CASING	IN	
STEEL IN HOLE	YES	Ft.
LOGGED BY	B. Augsten	
LOGGING DATE	Sept 16, 1998	

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
0	0.30		CASING – Collared on bedrock	0.30	1.60	24151	1.30m
0.30	29.20		**HETEROLITHIC ANDESITE FRAGMENTAL:** - Protolith is a heterolithic andesitic flow to possible autobrecciated flow, likely part of the Elise Formation of the Rossland group. - Extremely strong potassic alteration (as will be described further) obliterates most textures; however, the fragmental nature is still somewhat discernible and includes the following dust types in order of abundance: 1. Augite-phisic andesite 2. Feldspar ± augite physic andesite 3. Aphanitic andesitic tuff/flow. - Overall colour of this unit is a pale to medium green, which is overprinted by the pale to medium pinkish/red. Kspar alteration and locally strong, darker brownish/red garnet alteration. Generally, within this unit, sulphide mineralization includes chacopyrite, molybdenite, pyrrhotite and lesser pyrite. Sulphides occur as blebs and disseminations primarily and, to a lesser extent, fracture-controlled. Oxide mineralization includes limonite on fractures to 5.69m and, more importantly, magnetite, which occurs in veins and veinlets, fractures and disseminations. More detailed lithology, alteration and sulphide mineralization to follow.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd)				
			0.30 – 1.60: Lithology: as per previous description. Note: within this section, rock is quite broken.				
			Alteration: Kspar: 15-20% of rock occurring as a medium pink replacement peripheral to fractures sometimes 2-3mm on either side and as complete 'flooding' over larger areas.				
			Limonite: strong limonite on fracture surfaces.				
			Garnet: 2-3% garnet as a darker reddish/brown mineral – fracture controlled – at times difficult to discern from Kspar.				
			Mineralization: Cpy – 1-2% disseminated <1% F.C.				
			MoS_2 – 1-1.5% disseminated				
			Po – 1-2% disseminated				
			Mt – trace *** <1% F.C.				
			Py – trace				
			Note on Mineralization: Sulphides in particular cpy & MoS_2 appear as fine to very fine grains, usually <0.3mm and as aggregates / blebs to 1-3mm, which may be more fracture-controlled.				
			1.60 – 1.90: Strongly mineralized section with somewhat gradational boundaries, but likely related to a 14cm section 1.70 to 1.84 of massive to semi-massive 'vein' consisting of pyrrhotite, magnetite, chalcopyrite and molybdenite. 'Vein' also displays brecciated textures with andesitic fragments.	1.60	1.90	24152	0.30m
			- L.C. of vein @ 30° to C.A.				
			Mineralization: Cpy – 3-5% F.C. ± disseminated.				
			MoS_2 – 3-5% disseminated and F.C.				
			Po – 7-10% F.C.				
			Mt – 5-7% F.C.				
			1.90 – 12.35 Lithology: As per page 1.	1.90	3.00	24153	1.1m
			Alteration: *Kspar – intense to strong as flooding predominantly effecting 45-60% of the rock.	3.00	4.00	24154	1.0m
				4.00	5.00	24155	1.0m
			*Garnet – moderate occurring along fxs 5-7%.	5.00	6.00	24156	1.0m
			* possibly some garnet/kspar confusion – staining kit not available.	6.00	7.00	24157	1.0m
			Epidote – weak occurring as fxs/veins ± mt.	7.00	9.00	24158	2.0m
			- overall <0.5%.	9.00	11.00	24159	2.0m
			Calcite – 1-2% as veinlets / F.C. Veinlets typically @ 30-35° to C.A.	11.00	12.35	24160	1.35m
			Po often occurs within calcite veinlets.				
			-- 3-5% pervasive calcite.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd) Possible minor albite alteration @ 3.85m Mineralization: Cpy - <0.5% disseminated overall w/local higher amounts to 3%. 1.90 to 2.10 – 3%. MoS_2 - <0.3% disseminated overall w/much higher amounts locally. 4.20 to 4.65 – 3-4% F.C. ; 1-2% disseminated. Po – 1% disseminated and <0.5% F.C. overall. Mt - <0.3% overall (disseminated ±F.C.). *Note: Intensity of Kspar alteration decreases somewhat toward lower end of section: At 10.30 to 10.80 strong F.C. garnet mineralization. Lower contact not a lithological break, but defined more by changes in alteration and sulphide content. 12.35 – 14.35 Zone of intensely alterated and mineralized flow with moderately sharp boundaries that do not appear to be lithologically controlled; however, the intense alteration within the 'zone' pretty much obliterates any texture. Alteration: Kspar – intense flooding effecting 60-70% of the rock. Garnet – locally strong "gt" possibly overprinting the Kspar; overall, 10% gt. Calcite – weak to none pervasive calcite. Feox – minor F.C. oxidation (weak). Mineralization: Cpy – 5-6% F.C. 1-2% disseminated. MoS_2 - <0.5% F.C. ±disseminated. Po - <1% F.C. 14.35 – 21.65 Continues as heterolithic flow w/weakening Kspar alteration, thus protolith textures more readily visible. Flow dominated by augite-phyric clasts typically 1-5cm in size, appears to be clast supported. Pyroxene phenocrysts dark green subhedral to eshedral and about 1mm x 1mm average size. Alteration: Kspar – patchy pervasive flooding 15-20% of rock as a medium pink aphoritic replacement. *Note: Entire rock unit is extremely hard – 'silicified'? or K-altered even where not K-altered. Generally, where not obviously K-altered, the andesite is a pale green colour. Garnet – 2-3% garnet as F.C. – locally over 5cm much stronger. Albite – patchy cream-coloured alteration replacing entire rock except for pyroxene crystals. This alteration is more prominent in this section than elsewhere, up to 5%. I'm not absolutely sure this is albite or 'sodic alteration'. Calcite – very weak calcite only as F.C. (Veinlets less than 1mm.	12.35	14.35	24161	2.0m
				14.35	16.00	24162	1.65m
				16.00	18.00	24163	2.00m
				18.00	20.00	24164	2.00m
				20.00	21.65	24165	1.65m

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd) Mineralization: Cpy - <0.5% overall as dissemination / minor F.C. MoS_2 – none. Po – 1-2% F.C. Mt – none. 21.65 – 29.20 Continuing within hereolithic fragmental unit, although fragmental texture is not always easy to recognize. This may be a function of large clasts, clast-supported nature and alteration overprint. What distinguishes this subunit is the abrupt appearance of secondary hydrothermal biotite. This biotite occurs as an aphanitic, dark brown to black patchy pervasive replacement, usually with 'ragged' boundaries. Kspar in the form of orthoclase disappears, although there is some garnet, which may have some Kspar with it. Alteration: Kspar – weak to none. Biotite – intense to strong: 30-40% of rock mass. Albite – weak: <5%. Calcite – weak F.C. Garnet – overall weak: locally strong over 15cm. Mineralization: Cpy - < 0.1% dissemination and F.C. MoS_2 – none. Po - ^ 1% F.C. 1-2% dissemination. Mt – none. Py - < 1% F.C. and dissemination. The lower contact of this zone also marks the lower contact of the heterolithic fragmental unit; however, the contact is vague, hampered in part by the alteration, likely because it is likely a gradational contact.	21.65 24.00 27.00	24.00 27.00 29.20	24166 24167 24168	2.35m 3.00m 2.2m
29.20	47.70		**FELDSPAR-PHYRIC FLOW/FELDSPAR – CRYSTAL TUFF:** Dark green/brown to brown/black aphanitic rock containing variable amounts of feldspar phenocrysts (15-25%). Feldspar phenocrysts often lath-like/tabular and 1.0 to 1.5mm x 0.3 to 0.5mm in size. Not consistently, but often feldspars have a preferred orientation when tabular. Other crystals appear stubby to irregular. The consistent dark colour/texture of the rock is interrupted by a fracture-controlled mottled texture manifested by pale green and pink alteration. This alteration is fracture-controlled and often occurs as pinkish to salmon-coloured centers with pale green/yellowish envelopes. The pink alteration is Kspar, the pale green possibly saussurite. In addition, locally, garnet appears to replace this alteration.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			Alteration: Biotite – strong to intense – pervasive. Kspar – moderate F.C. Saussirite – moderate F.C. Garnet – weak F.C. (locally over 5-10cm stronger). Calcite – weak F.C. Mineralization: Cpy – trace dissemination and F.C. Po – 1% dissemination and 1% F.C. Py – trace dissemination. Mt – trace. *Note: Sulphide content gradually diminishes downhole in this unit. @ 38.35m a 1cm quartz/calcite vein @ 30° to C.A. Vein has a 2cm bleached envelope with pervasive calcite (7%). N.V.S. L.C. gradational into a heterolithic fragmental unit.	35.00 38.00 41.00 44.00	38.00 41.00 44.00 47.70	24171 24172 24173 24174	3.00m 3.00m 3.00m 3.70m
47.70	58.83		**HETEROLITHIC ANDESITE FRAGMENTAL** Similar to fragmental unit at top of hole with fragments of augite-phyric andesite and feldspar-phyric andesitic flows predominating. Fragmental texture again is not readily apparent, partly because the clasts quite often are large and the rock is clast supported and alteration obliterates textures and produces pseudo-fragmental texture. Overall, the rock unit has a pale to medium green colour overprinted by a mottle pink to yellowish green alteration. Alteration: Kspar – weak; patchy, pervasive. Garnet – weak to medium; intergrown with K-alteration; similarities in colour cause some problems in separating the two. Calcite – medium to strong; variable through unit but locally very strong pervasive calcite. Saussurite – moderate to strong; pale yellow/green pervasive alteration typically peripheral to K-alteration. Biotite – weak to strong; locally very well-developed. *Note: B/W: 51.35 and 55.15 moderate to strong pervasive calcite often occurring with pervasive pinkish/red alteration (probably garnet). @ 51.90, a 2cm quartz/calcite vein @ 20° to C.A. @ 54.30 to 54.50, a limonite/calcite vein @ 45° to C.A. – strong, pervasive and F.C. calcite above the vein for 1m and below the vein for 30cm. Mineralization: Cpy – trace dissemination and F.C. Po – 1-2% dissemination and < 0.5% F.C. Py – trace. Mt – none.	47.70 50.00 53.00	50.00 53.00 56.00 58.83	24175 24176 24177 24178	2.30m 3.00m 3.00m 2.83m

BLUEBIRD MINERALS LTD. MAMMOTH PROJECT Geological Log Hole-ID: MAM98-2 Page 1 of 4

SURVEY DATA

SURVEY	DEPTH		DIP		TRUE AZIMUTH			GRID			
	(ft.)	(m)	True		Degrees	Minutes	Seconds	SYSTEM	NORTHING (m)	EASTING (m)	ELEVATION (m)
Collar			-90°		-----						
Down Hole	(ft.)	(m)	Read	True	Read	True					

DRILLING DATA

GRID SYSTEM	MINE	
APPROX. NORTHING (m)	4175	
APPROX. EASTING (m)	2926	
APPROX. ELEVATION (m)	1799	
DATE DRILLING STARTED	Sept 17, 1998	
DATE DRILLING ENDED	Sept 18, 1998	
	(ft.)	(m)
TOTAL DEPTH	143	43.59
CASING DEPTH	0	0
CASING	IN	
STEEL IN HOLE	YES	Ft.
LOGGED BY	B. Augsten	
LOGGING DATE	Sept 19-20, 1998	

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HOLE – Collared on bedrock				
0	13.28		**HETEROLITHIC ANDESITE FRAGMENTAL:** - Strongly altered fragmental volcanic rock consisting of lapilli size rounded clasts of augite-phyric andesite, apharitic andesite flow/tuff and lesser feldspar-physic andesite. The fragmental texture is difficult to discern, primarily because of the alteration overprint which, in itself, often produces a 'pseudo-fragmental' texture, and the size of the clasts – some are quite large (+10cm) and the more or less similarity in clast-type. The rock is clast-supported. - Overall, the rock has a medium green and pinkish/brown mottled colour. - The alteration assemblage is dominated by both patchy, pervasive Kspar and fracture-controlled Kspar – both a light to medium pink to salmon-coloured. This alteration overprints a weakly chloritized (pervasive) andesite. In addition to Kspar, fracture-controlled garnet occurs as a darker reddish/brown coloured mineral. In places, the garnet appears to replace the K-alteration. However, the similarities in colour between garnet and Kspar make it difficult sometimes to distinguish without a Kspar staining kit. - Sulphides in this section are dominated by chalcopyrite, molybdenite, minor pyrrhotite, trace pyrite and possible trace biotite. Sulphides occur disseminated and fracture-controlled.	0 2.0 4.0	2.0 4.0 5.87	24179 24180 24181	2.0m 230m 1.87m

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd)				
			Alteration: Kspar: strong to intense F.C. and pervasive. Garnet: medium to strong F.C. Calcite: none. Biotite: none. Epidote: minor F.C. *Limonite: moderate on fractures to 8m.				
			Mineralization: Cpy – 4-6% overall (3-4% dissemination, 1-2% F.C.) MoS_2 – 0.5 to 0.8% dissemination overall with locally much higher sections. Po – <1% F.C. overall Py – <0.3% F.C. overall; Trace disseminated pyrite.	5.87	7.10	24182	1.23m
			Note: From 5.87 to 7.10 Strongly weathered section with moderate to strong oxidation, including a section of rubble (recovery poor); however, chalcopyrite still visible with minor malachite.	7.10	9.00	24183	1.90m
				9.00	11.00	24184	2.00m
			@ 7.90 a 1.2cm zoned calcite/saussurite (epidote) veinlet @ 45° to C.A.				
			Note: The Kspar and garnet alteration is particularly intense from 7.10 to 12.75.				
			@11.49m a 0.4cm white to light grey calcite vein @ 30° to C.A. Noteworthy, however, is a texture/feature where the veinlet cuts across a dark grey, almost black mass, very fine grained, containing very fine dissemination of chalcopyrite and molybdenite. The dark grey material is being replaced by fine grained orthoclase ± garnet.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			From 11.90 to 12.75, the rock is almost completely replaced by garnet and Kspar. Sulphides (chalcopyrite and MoS_2) are particularly strong). Cpy – 7-10% MoS_2 - 1-2% Po – 3-4% @ 12.44, a 4cm wide massive chalcopyrite and pyrrhotite (60/40) vein @ 55-60° to C.A. @ 12.59, a 0.5cm calcite vein @ 80° to C.A. with chalcopyrite, Po ± MoS_2 and small amounts of a dark grey metallic mineral.	11.00 12.00	12.00 13.28	24185 24186	1.0m 1.28m
13.28	15.30		**HETEROLITHIC FRAGMENTAL:** Prolith in this unit is the same as unit above – rock hasn't changed, but the alteration is different. In this section, calcite both fracture-controlled and pervasive, and the dominant alteration. Kspar and garnet (F.C.) are present locally, but overall represent a minor component. The overall colour of the rock is a medium green colour and fragmental texture is still difficult to distinguish. Also, start to see some secondary biotite, possible selectively replacing clasts or as patchy pervasive clots to 3cm. The other notable feature is the rapid reduction in chalcopyrite and MoS_2. Contacts between sections are not sharp and can be classed more as overlapping alteration fronts! Alteration: Calcite – medium to strong dissemination and F.C. Biotite – overall weak but locally strong. Kspar – overall weak but strong in very local areas over 10cm. Garnet – weak. Mineralization: Cpy – < 0.3% dissemination. MoS_2 – trace. Po – 2-3% dissemination Py – trace dissemination.	13.28 12.35	15.30 14.35	24187 24161	2.02m 2.0m
15.30	20.70		**HETEROLITHIC FRAGMENTAL:** Similar fragmental unit as at top of hole with the exception that the alteration is less intense and the sulphide content is considerably lower. Clast types are dominated by augite-phyric andesite (70%) with feldspar-phyric flow clasts (25%) and aphanitic andesitic flow/tuff (5%) as subordinate clast type. Once again, distinguishing clear boundaries between clasts is not automatic, in large part due to the alteration and overall similarities in clast lithology. The overall colour of the rock is a pale to medium green colour modified by the fracture-controlled and patchy pervasive Kspar and garnet, which produces overall a green and pink mottled look to the rock.	15.30 17.00 19.00	17.00 19.00 20.70	24188 24189 24190	1.70m 2.00m 1.70m

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
20.70	43.59		**HETEROLITHIC FRAGMENTAL (cont'd)** Same rock unit as rest of the hold distinguished once again by its alteration and sulphide mineralization. There is an abrupt change @ 20.70 into an alteration assemblage dominated almost completely by secondary hydrothermal biotite, giving the rock a mottled green/black/brown colour. Biotite occurs as a fine-grained replacement, sometimes as selective replacement of clasts? And elsewhere complete pervasive replacement. Overall sulphide content is low. Where the rock is not replaced by biotite, it has a pale to medium green colour. Alteration: Kspar – weak F.C., increases somewhat down to E.O.H. Garnet – weak, some locally (5cm) strong patches. Calcite – weak F.C. Albite – very minor (weak), rare. Mineralization: Cpy – trace dissemination. Po – < 1% dissemination. Note: Disseminated pyrrhotite more prevalent in the biotitized areas. Rock is weakly magnetic due to disseminated pyrrhotite. From 35.0 to 43.59 (E.O.H.) The fragmental unit becomes dominated by feldspar-phyric flow/tuff clasts. The clasts are all biotitized strongly. What sometimes appears as a light to medium green aphanitic fracture controlled alteration, I think is actually often the matrix to the fragmental (good example @ 39.9 to 40.0). I think this matrix then is differentially altered w.r.t. clasts. The pale green/yellow (saussurite) and Kspar/garnet alteration/replacement occur in the matrix. Because the matrix makes up 10-12% of the rock, this alteration in this section is lesser. The strongly biotitized clasts are the obvious alteration feature.	20.70 23.00 26.00 29.00 32.00 35.00 38.00 41.00	23.00 26.00 29.00 32.00 35.00 38.00 41.00 43.59	24191 24192 24193 24194 24195 24196 24197 24198	2.30m 3.00m 3.00m 3.00m 3.00m 3.00m 3.00m 2.59m

BLUEBIRD MINERALS LTD. MAMMOTH PROJECT Geological Log Hole-ID: MAM98-3 Page 1 of 8

SURVEY DATA											
SURVEY	DEPTH		DIP		TRUE AZIMUTH			GRID			
	(ft.)	(m)	True		Degrees	Minutes	Seconds	SYSTEM	NORTHING (m)	EASTING (m)	ELEVATION (m)
Collar			-50°		070°						
Down Hole	(ft.)	(m)	Read	True	Read	True					

DRILLING DATA		
GRID SYSTEM	MINE	
APPROX. NORTHING (m)	4179	
APPROX. EASTING (m)	2928	
APPROX. ELEVATION (m)	1799	
DATE DRILLING STARTED	Sept 18, 1998	
DATE DRILLING ENDED	Sept 24, 1998	
	(ft.)	(m)
TOTAL DEPTH	563	171.6
CASING DEPTH	0	0
CASING	IN	
STEEL IN HOLE	YES	Ft.
LOGGED BY	B. Augsten	
LOGGING DATE	Sept 21-25, 1998	

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
0	10.25		**HETEROLITHIC ANDESITE FRAGMENTAL:** - Lapilli-size fragmental rock dominated by clasts of augite-phyric andesite, feldspar-phyric andesite and lesser aphanitic andesitic flow/ash tuff clasts. The intensity and pervasivity of alteration preclude really accurate lithology description. - The overall colour of the rock is a mottled pinkish/red to green colour. - Overall alteration is dominated by Kspar flooding and fracture controlled Kspar and garnet. Fracture-controlled and more pervasive oxidation persists to about 5.77m. - Sulphide mineralogy consists of chalcopyrite, pyrrhotite, pyrite and molybdenite. Some malachite is observed in the oxidized portions. - Overall recoveries are excellent, except from top of hole to about 3.96m. Detailed alteration and mineralogy are as follows: 0 to 5.77 Alteration: Kspar: strong to intense flooding ± F.C. Garnet: strong F.C. Limonite: strong F.C., weak pervasive. Calcite: locally moderate pervasive calcite, overall weak to none. Mineralization: Cpy – < 0.5% disseminated overall. Po – < 0.5% disseminated. Py – trace. MoS_2 – trace; Malachite: trace.	0 1.83 3.96	1.83 3.96 5.77	24199 24200 24401	1.83m 2.13m 1.81m

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd)				
			5.77 to 8.70 This section is differentiated from others by the combination of intense Kspar/garnet alteration and very high copper ± molybdenum content. The rock is almost completely replaced by garnet and Kspar. Similarities in colour between Kspar and garnet make differentiation problematic.	5.77	6.70	24402	0.93m
				6.70	7.70	24403	1.00m
				7.70	8.70	24404	1.00m
			Alteration: Kspar: intense flooding. Garnet: strong to intense replacement. Calcite: moderate pervasive & minor F.C.				
			Mineralization: Cpy: 7-10% overall; locally to 15% as blebby, disseminated and F.C. but not along plan as measurable fractures. MoS_2: < 0.5% blebby overall, locally over 20cm (@ 8.2) up to 3%. Po: 1-2% blebby aggregates. Py: trace F.C.				
			@ 7.60 m: a 1-2cm wide gray to white calcite and quartz veinlet @ 15° to C.A. vein has minor peripheral bleaching on upper side, but 3-4cm of a pale green/yellow bleaching on the lower (downhole) side.				
			@ 8.87m: a 2-3 quartz/$FeCO_3$/calcite vein @ 30-35° to C.A. Veinlet has 17cm of limonite/calcite alteration on upper side and grey pervasive calcite alteration on lower side for 4cm with disseminated Py, Po and Cpy.	8.70	9.05	24405	0.35m
			@ 9.05 to 10.25: continuing strong pervasive pink Kspar and garnet alteration. The noteworthy characteristic of this section is the lack of sulphides. Of note, the pervasive 'pinkish' alteration has also strong pervasive calcite. Perhaps this pinkish alteration has no Kspar – just fine-grained garnet replacing a ***calcareous*** matrix.	9.05	10.25	24406	1.20m
			Alteration: *Kspar: strong to intense flooding. Garnet: strong. Calcite: moderate to strong pervasive; weak F.C.				
			Mineralization: Cpy: trace dissemination; < 0.3% F.C. Po: 1-15% F.C. Py: < 0.3% on dry fractures.				
			*				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
10.25	13.15		**FELDSPAR-PORHYRY DIKE:** Medium grey to dark grey coloured rock characterized by a definitive porphyritic texture manifested by 20-25% light grey to white, randomly distributed subhedral to euhedral feldspar phenocrysts set in any aphanitic medium to dark grey groundmass. Feldspar phenocrysts are typically 1m x 1.5m but range in size from (small) @ 0.5mm x 0.2mm to (large) @ 4mm x 3mm. Glomeroporphyritic aggregates are present but rare. This rock has an overall 'fuzzy' appearance because of pervasive calcite alteration that is variable in intensity. Sulphide content is low. U.C. @ 25° to C.A., L.C. @ 25° to C.A. Alteration: Calcite – moderate to strong pervasive; weak to moderate F.C. Biotite – weak 2° biotite. ?? Mineralization: Py – trace disseminated. Trace fine-grained silvery metallic mineral – arsenopyrite??	10.25	13.15	24407	1.90m
13.15	14.95		**HETEROLITHIC ANDESITE FRAGMENTAL:** Strongly altered rock to a pinkish aphonitis mass with some fragmental textures remaining. The pinkish alteration is hard and looks like K-feldspar but is calcareous. Garnet alteration is part of the mass as well. From 16.83 to 14.75 Coarse F.C. pyrrhotite, pyrite and chalcopyrite parallelling the core axis but not really a vein – more of a breccio matrix. This rich sulphide zone appears <u>black</u> on core surface. Alteration: Kspar: strong to intense. Garnet: strong. Calcite: strong pervasive. Mineralization: Cpy: 5-6% F.C. Po: 3-5% F.C. Py: 10% F.C. Lower contact marked by a 0.5cm calcite/limonite vein/shear @ 15° to C.A.	13.15	14.95	24408	1.80m
14.95	41.48		**FELDSPAR PORPHYRY DIKE:** More or less the same as the previous FP dike. From 14.95 to 15.80, it has been strongly, pervasively carbonatized. Also, from 16.15 to 16.85 large clast, xenolith ? of K-altered heterolithic fragmental. From 16.85 downward, relatively unaltered with weak F.C. calcite and probably weak biotitization of ground mass, weak sericitization of feldspar.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			FELDSPAR PORPHYRY DIKE (cont'd) Alteration: Calcite – moderate to strong pervasive at/near contacts; none elsewhere. - weak F.C. throughout (2%). Sericite – weak alteration of phenocrysts. Biotite – weak alteration of ground mass. Limonite – weak F.C. / sporadic. } This rock is extremely hard-either pervasively silicified or K-altered. Mineralization: Py – trace dissemination. Throughout the dike are sporadic sections of alteration which tend to diffuse / blur the porphyritic texture. These sections tend to have moderate pervasive calcite. Where unaltered, which is the majority of the unit, the porphyritic texture is quite unambiguous with sharp, euhedral to subhedral, white to cream coloured feldspar phenocryts set in a dark grey to almost black aphonitic ground mass. Phenocrysts comprise 25% of the rock. Typical size of the feldspars is 1.0 – 1.5mm x 1.0mm, but range somewhat is size with glomeroporphyritic phenocrysts present but rare. From 32.20 to 38.77 See increase in biotitization of ground mass manifested as an aphanitic medium purplish/brown colour. This alteration is more sporadic from 38.77 to end of section. L.C. sharp @ 30° to C.A.	23.00 26.00 29.00 32.00 35.00	26.00 29.00 32.00 35.00 38.00	24409 24410 24411 24412 24413	3.0m 3.0m 3.0m 3.0m 3.0m
41.48	76.20		**HETEROLITHIC ANDESITE FRAGMENTAL:** Overall, a dark coloured rock, dark grey to black with a somewhat mottled texture. Rock is mostly a clast-supported fragmental with predominantly aphanitic andesitic clasts, some augite-phyric clasts near top of section, amygdaloidal clasts with calcite amygdules. In general, the clasts have a brownish/black colour due to moderate biotitization (hornfels). The matrix tends to be a pale to medium green/grey colour. Pervasive calcite is the dominant alteration of the matrix with minor garnet development in matrix as well. Overall sulphide content is low with pyrrhotite, pyrite and rare disseminated chalcopyrite. The overall clast:matrix ratio is about 30:20.				
41.48	76.20		Alteration: Biotite – moderate pervasive of clasts. Calcite – moderate to strong pervasive of matrix; 2° or 1° weak to medium. Garnet – weak overall in matrix.	38.00 41.48	41.48 42.96	24414 24415	3.48m 1.48m

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd) Mineralization: Pyrrhotite - < 0.5% disseminated and < 0.1% F.C. Pyrite – trace disseminated. 41.48 to 42.96 Light to medium grey coloured section of more of a matrix supported fragmental with strong pervasive calcite, some sericite?/saussurite. Clast to matrix ratio is about 50:50. Alteration: Calcite – strong pervasive. -- weak F.C. Mineralization: Pyrrhotite - ^ 1% disseminated and trace F.C. Pyrite - < 0.2% disseminated. From 49.60 downward, the clasts become quite large, +15cm typically, in places the rock does not look fragmental – more of an autobrecciated flow; however, exotic clasts, i.e. amygdaloidal andesite and clear breccia/fragmental textures point toward some sort of volcanic fragmental / breccia. Because of the clasts size, rock would be classified more as a volcanic breccia rather than lapilli tuff. Overall, this unit is distinguished by its low sulphide content, alteration characteristics, i.e. calcite in matrix-may even be primary and moderate biotititization (hornfels) of clasts, weak overall garnet in matrix. Also characterized by larger clasts. Toward the lower contact, see an increase in garnet replacement within matrix to 'breccia'. Sulphide content remains low and fine grained and mostly pyrrhotite with trace pyrite. @ 76.20 lower contact sharp @ 25° to C.A.				
76.20	105.55		**FELDSPAR PORPHYRY DIKE** Overall dark green to black rock with a spotted white texture. Rock consists of 25-30% subhedral to euhedral feldspar phenocrysts, typically 1mm x 1mm, but variable in size from 0.3mm x 0.2mm to 3mm x 2mm, and minor fine grained mafic phenorcrysts in an aphanitic dark grey groundmass. Some feldspars display 'zoning' with a white core and a narrow light grey rim. Alteration is dominated by a weak to moderate pervasive biotitization of the ground mass (hornfels). Calcite occurs as a weak fracture-controlled alteration with calcite fractures and sometime peripheral pervasive calcite enveloping the fractures. (3%). Sulphide mineralization is uniformly low. Pyrrhotite – < 0.5% disseminated. Py – trace F.C. and disseminated. The rock is very weakly and sporadically magnetic due to the disseminated pyrrhotite. L.C. sharp @ 10-12° to C.A.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
105.55	140.30		**HETEROLITHIC ANDESITE FRAGMENTAL:** This is a predominantly clast-supported fragmental (locally over 30cm, it is matrix supported) volcanic rock, consisting of andesitic clasts of varying textural compositions. Aphanitic andesitic tuff/flow; feldspar-phyric andesite flow; augite-phyric andesitic flow. The overall colour of the rock is a mottled dark brown/grey and the matrix a pale green, sometimes yellow/green, colour. Alteration is manifested in two main ways, with exceptions. The dark brown colour of the clasts is due to a fine-grained secondary biotite (hornfels). The pale green matrix is still quite hard rock and may represent a weak sericitization. Very locally and sporadically see patchy pervasive saussurite(?) as a yellow/cream coloured alteration and also locally get sporadic garnet replacement within the rock. Calcite occurs overall as a weak fracture-controlled, strong pervasive patches with some exceptions. Sulphide mineralogy is dominated by disseminated pyrrhotite. At first glance, sulphides appear minimal, but very fine disseminated pyrrhotite occurs throughout. Alteration: Biotite – strong pervasive biotite hornfels of clasts. Sericite – weak pervasive in matrix. Calcite – weak F.C. throughout; locally intense pervasive patches. Garnet – weak replacement within matrix throughout (2%). Chlorite – weak on fractures. Mineralization: Pyrrhotite – 1-1.5% disseminated throughout. Pyrite – trace. Cpy – trace disseminated. From 117.42 to 148.80 zone of very strong F.C. calcite and moderate to strong pervasive calcite overprinting the biotitized fragmental. @ 117.42 minor shearing to 30° to C.A. and throughout this section calcite veinlets @ 5 to 40° to C.A. Sulphides: 2-2.5% disseminated Po; < 1% F.C. Po; < 0.5% disseminated Py; trace Cpy. From 118.80 to 122.42 continued strong to intense pervasive calcite but weak fracture controlled calcite. Intense carbonization of the matrix produces a medium grey coloured rock which tends to obliterate textures (e.g. @ 119.90, 121.20m), elsewhere, even though pervasive, calcite strong, fragmental texture clear. Sulphides: Po – 2% disseminated, 1% F.C. Py – trace disseminated. Cpy – trace disseminated.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd): Overall, except where pervasively carbonatized, this rock is extremely hard. Clasts of feldspar-phyric flow seem to predominate throughout this unit and they tend to be larger than smaller (+10cm). @ 140.10 a 2.5cm calcite vein @ 27° to C.A. This vein marks contact with felsic dike below.				
140.30	141.05		**QUARTZ PORPHYRY DIKE:** Medium grey to slight purplish-grey, aphanitic rock with 7% very fine < 0.7mm x 0.5mm quartz 'eyes' + phenocrysts) 2mm x 2mm. Within 20cm of lower contact, see some ghost-like remnant feldspar phenocrysts. The quartz phenocrysts have a blue/grey glassy look and are fractured and infilled by calcite. The rock itself has strong to intense pervasive calcite. In addition, there is ^ 3% F.C. calcite. The lower 3cm of dike are bleached somewhat to a pale green/grey colour, and a 1cm grey quartz/calcite vein marks the contact itself. Sulphides consists of ^ 1-1.5% F.C. pyrite, minor disseminated pyrite. U.C. @ 27° to C.A. L.C. @ 38° to C.A.				
141.05	141.93		**HETEROLITHIC ANDESITE FRAGMENTAL:** Same unit as above the dike with strong pervasive calcite and 2-3% F.C. calcite.				
141.93	142.36		**QUARTZ PORPHYRY DIKE:** Same rock as at 140.30 to 141.05; mafic phenocrysta blacker, possibly amphiboles below. Quartz phenocrysts rare! U.C. @ 35° to C.A. L.C. @ 30° to C.A. -some chlorite on fractures!				
142.36	171.60		**HETEROLITHIC ANDESITE FRAGMENTAL (cont'd):** Below the ***felsic dike***, the fragmental is strong, pervasively carbonitized to 143.35 and then in patches (10-20cm) to 146.20m. Overall, sulphide content remains relatively low ~ < 1.5% disseminated pyrrhotite with trace pyrite, trace disseminated chalcopyrite. The overall magnetic susceptibility of the rock is low and influenced by the pyrrhotite. Occasionally, very localized higher concentrations of pyrrhotite will give higher magnetic susceptibility. The high magnetic spike in the geophysics has not been explained. Similarly, the high chargeability between 29-50E and 30-00E on L42N has not been satisfactorily explained – can 2% Po produce this effect?? @ 148.70 a 1.5cm calcite vein @ 32° to C.A. Vein has strong peripheral bleaching and carbonatization for 10cm above and below vein.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			HETEROLITHIC ANDESITE FRAGMENTAL (cont'd): From 150.80 to 158.40, the fragmental becomes more matrix supported or at least less large dark colour clasts. Within the matrix, small clasts tend to be bleached – some may be albitized. @ 156.70 distinctive texture created by a creamy to whitish 0.7mm wide alteration rim (albite?) on clasts in fragmental. @ 157.10 heavy matrix pyrrhotite over 10cm with higher chalcopyrite. From 158.40 to 171.60 (E.O.H.), fragmental is dominated by clasts of feldspar-phyric flow and is more clast supported (90:10 clast & matrix). @ 168.40 a 4cm wide calcite vein @ 42° to C.A. Sulphides remain low to the end of the hole. Rock is weakly magnetic due to disseminated pyrrhotite (< 1.5%).				

BLUEBIRD MINERALS LTD. MAMMOTH PROJECT Geological Log Hole-ID: MAM98-4 Page 1 of 4

SURVEY DATA											
SURVEY	DEPTH		DIP		TRUE AZIMUTH			GRID			
	(ft.)	(m)	True		Degrees	Minutes	Seconds	SYSTEM	NORTHING (m)	EASTING (m)	ELEVATION (m)
Collar			-50°		270°						
Down Hole	(ft.)	(m)	Read	True	Read	True					

DRILLING DATA		
GRID SYSTEM	MINE	
APPROX. NORTHING (m)	4104	
APPROX. EASTING (m)	2952	
APPROX. ELEVATION (m)	1797	
DATE DRILLING STARTED	Sept 24, 1998	
DATE DRILLING ENDED	Sept 26, 1998	
	(ft.)	(m)
TOTAL DEPTH	251	76.5
CASING DEPTH	0	0
CASING	IN	
STEEL IN HOLE	YES	Ft.
LOGGED BY	B. Augsten	
LOGGING DATE	Sept 26-27, 1998	

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
0	11.63		**CALCEREOUS HETEROLITHIC ANDESITE FRAGMENTAL:**	0	2.00	24423	2.0m
			- Distinctive fragmental rock consisting of rounded to subangular fragments, clasts of variable volcanic lithologies within a recrystallized limestone? Matrix. The rock varies from clast to matrix supported and clast size varies from < 2mmx2mm to + 10cm.	2.00	4.00	24424	2.0m
				4.00	6.00	24425	2.0m
				6.00	8.00	24426	2.0m
				8.00	10.00	24427	2.0m
				10.00	11.63	24428	1.63m
			- Clast lithologies include augite phyric andesite, aphanitic andesite tuff and feldspar phyric andesite. Clasts vary in colour from medium green to darker green/brown. The matrix is a light grey to white colour.				
			Alteration is generally weak:				
			1. volcanic clasts have been variably hornfelsed, producing a fine biotite replacement, which results in a brown colouration.				
			2. matrix is mostly unaltered with some exceptions where it has been weakly skarned, producing a pale green colour to the matrix.				
			Sulphides: Predominant sulphide is pyrrhotite as blebs, disseminations and minor F.C. (1-1.5% overall).				
			Trace amounts of disseminated pyrite.				
			Trace amounts of disseminated chalcopyrite.				
			From 8.48 to 8.80: clast poor section and rock has a banded/bedded appearance, composed primarily of calcite (crystallized limestone).				
			Banding @ 65° to C.A.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			CALCAREOUS HETEROLITHIC ANDESITE FRAGMENTAL (cont'd):				
			From 8.96 to 11.63: rock has been weakly skarned to a pale green colour including much of the matrix. Also, see some weak garnet development and possibly some weak 2° Kspar.	5.77	6.70	24402	0.93m
				6.70	7.70	24403	1.00m
				7.70	8.70	24404	1.00m
			Note: @ 8.96, the skarn zone has an alteration 'front' measurable @ 54°. The lower contact sharp @ 62° to C.A.				
11.63	38.15		FELDSPAR PORPHYRY: Purple/brown to dark grey/black rock with a porphyritic texture manifested by 20-25% euhedral to subhedral feldspar phenocrysts. Feldspar phenocrysts commonly 1mm x 1mm, but range in size from < 0.5mm x 0.5mm to 1.5mm x 3mm. Glomeroporphyritic crystals are present but rare. Phenocrysts are set in an aphanitic groundmass, now variably hornfelsed to a purple/brown colour caused by 2° biotite. This rock is extremely hard.				
			Alteration: Biotite Hornfels – strong to intense. Calcite – weak F.C. (2%).				
			Sulphide Minerology: minor disseminated Po and ± Py; minor F.C. Po ± Py.				
			Calcite veinlets/fracture-fillings typically accompanied by peripheral bleaching often 0.5cm on either side of a 1-2cm veinlet. The red strong biotite hornfels is more prominent near the top of this unit and less so near bottom. However, the rock is extremely hard throughout – siliceous. Lower contact sharp @ 40° to C.A. Contact marked by very weak bleaching in the feldspar porphyry for ~ 3cm in from contact.				
38.15	44.00		**CALCEREOUS HETEROLITHIC ANDESITE FRAGMENTAL:** Similar to unit from 0.0m to 11.63m. Variably matrix to clast supported fragmental rock with heterolithic andesitic clasts including feldspar phyric clasts (e.g. @ 40.36m), augite-phyric andesite (e.g. @ 38.65). Overall, this unit is relatively unaltered; however, weak to moderate skarning is present in local areas. Where present, the matrix is typically altered to a pale yellow/green colour – scapolite? And a pinkish to reddish/brown colour which is mostly garnet and possibly some 2° Kspar. Despite the predominantly calcareous matrix, this rock is still quite hard – cannot scratch the clasts with steel.				

GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			CALCAREOUS HETEROLITHIC FRAGMENTAL (cont'd): Overall, sulphide content is low with < 0.5% disseminated Po and trace disseminated Py. From 40.92 to 42.10: Completely silicified section with fragmental texture still quite identifiable. From 42.80 to 44.00: Completely silicified and weakly skarned equivalent of the calcereous fragmental. Matrix is altered to a weak pale green colour with weak garnet ± Kspar alteration. ~ 1% F.C. Po; trace to < 0.2% F.C. Py; < 0.3% disseminated Po; trace disseminated Py.	42.00 43.00	43.00 44.00	24429 24430	1.0m 1.0m
44.00	59.15		**AUTO-BRECCIATED FELDSPAR-PHYRIC FLOW:** Rock composed of dark brown angular to delicately edged clasts of feldspar-phyric andesitic flow in a variably textured matrix, ranging from a pale green aphanitic tuffaceous? Matrix to a pale green feldspar crystal-rich mush. The clasts are lapilli-sized, averaging 1cm x 2cm, but quite variable in size, ranging from 1mm x 3mm to 7cm x 8cm. Alteration effects vary somewhat downhole. Clasts are variably hornfelsed, producing the brown colouration from fine-grained biotite. The matrix is variably weakly skarned, producing pale green colour to the matrix with patchy garnet ± Kspar development. Detailed changes in alteration described below. Sulphide content is uniformly low, around 1.5 – 2.0% disseminated ± F.C. pyrrhotite with < 0.3% disseminated pyrite and trace disseminated chalcopyrite. From 44.00 to 47.90 Alteration: Biotite Hornfels of clasts – strong to intense Matrix calc-silicate skarn – weak. Matrix garnet – weak (1%). From 47.90 to 57.00 Alteration: Biotite Hornfels of clasts – weak. Matrix calc-silicate skarn – weak to moderate. Matrix garnet – weak (2%). Calcite – F.C. weak. @ 48.7 narrow calcite veinlets 1-2mm with chloritic slips @ 35° to C.A. @ 51.85m a 15cm aphanitic dark grey to black mafic dike, now partly serpentinized; @ 40° to C.A. weakly magnetic. Rock is porphyritic with 3-5% greenish phenocrysts (chloritized) 1mm x 1mm; moderate to weak pervasive & F.C. calcite.				

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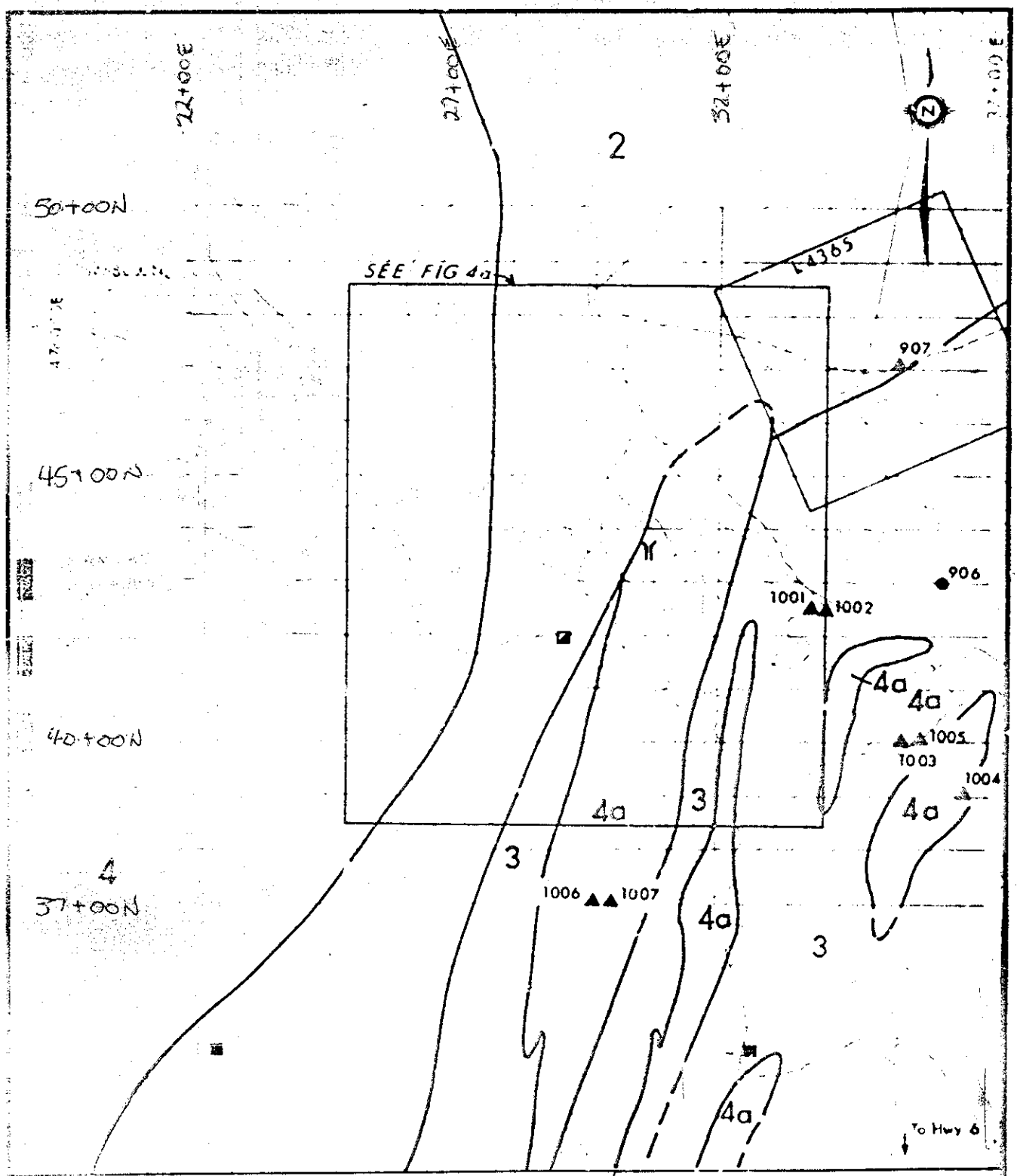
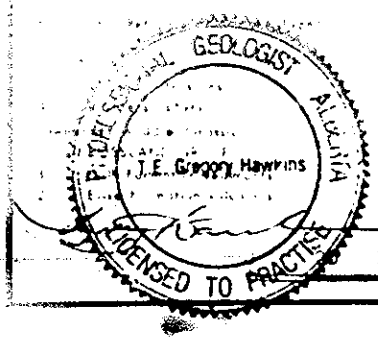
GEOLOGICAL INTERVAL		LITHO CODE	LITHOLOGICAL DESCRIPTION	SAMPLE LOG			
				SAMPLE INTERVAL		SAMPLE NUMBER	SAMPLE DESCRIPTION
From (m)	To (m)			From (m)	To (m)		
			AUTOBRECCIATED FELDSPAR PHYRIC FLOW (cont'd): From 57.00 to 59.15 more of a non-brecciated flow with lesser fracturing/brecciation. Lower contact gradational.				
59.15	76.50		**CALCAREOUS HETEROLITHIC ANDEISTE FRAGMENTAL:** Similar to unit from 38.15 to 44.00. Weakly skarned heterolithic fragmental with a strongly calcareous (recrystallized limestone) matrix. Clasts consist of feldspar-phyric andesitic flow, augite-phyric andesitic flow; aphanitic andesite. Overall alteration is weak with locally, weakly developed skarn mineralization of pale green calc-silicate alteration of matrix and minor garnet ± Kspar alteration. Weak (1-2%) F.C. calcite throughout. Biotite hornfelsing is weak to non-existent to 64.75 and weak to moderate in clasts from 64.75 to 68.40. Sulphide content low in non-skarned sections. Trace disseminated Po. From 71.90 to 76.50 moderate calc-silicate skarning of matrix producing a pale green colour to the matrix with some weak pinkish Kspar and reddish/brown garnet. Most of section completely silicified with some local areas of strong pervasive calcite. < 0.3% F.C. Py; ~ 1% disseminated Py; 2-3% disseminated Po; < 0.5% F.C. Po; possible some 2° albite near bottom of hole. Most of this unit displays little alteration other than recrystallization of the 'limy' matrix. The rock is weakly magnetic due to disseminated pyrrhotite and disseminated magnetite. The more calcareous, non-skarned sections have low sulphides, but are still magnetic due to disseminated magnetite.	74.50	76.50	24431	2.0m



LEGEND



KATIE MINING CORP.

GEOLOGY AND ROCK SAMPLING

MAMMOTH PROJECT

LILLOOET MINING DIVISION

Project No	By
Scale	Drawn
Drawing No	Date

CME CME Consulting Ltd.