GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR

Department of Mines and Energy **Mineral Lands Division**

Registry File Nos: 771 : 2767; 774 : 2223, 2265, 2521, 2524, 2683, 2824, 2945.	**Geological Survey No:** 012H/01/1793
	Confidential Until: ~~2003-10-13~~ OPEN

Mineral Rights:
☑ Licence ☐ Extended Licence ☐ Impost ☐ Mining Lease ☐ Regional ☐ Other _____

Licence/Property	No. of Claims	Assessment Year	Date Issued	NTS Map
4724	9	~~4~~	95-09-18	12H/1.
4559M	8	~~4~~	95-11-06	12H/1.
4560M	6	~~4~~	95-11-06	12H/1.
4643M	4	~~4~~	95-11-10	12H/1.
5138M	25	3	96-10-25	12H/1.
5139M	4	3	96-10-25	12H/1.
5144M	1	3	96-11-01	12H/1.
5400M	25	3	97-02-06	12H/1.
5644M	1	2	97-07-31	12H/1.
5854M	30	2	97-12-08	12H/1.

Continued next page ☐ Yes ☑ No

Number of Volumes: 1

Enclosures (indicate number of each):

CD-Roms:_____ Disketts:_____ Zip Disks:_____ Tapes:_____

Transparencies:_____ Paper Maps:_____ Microfiche:_____ Other:_____

Comments: Received 2000-10-13.

Signed: [signature]

Date: 2006-07-27

TABLE OF CONTENTS

I. INTRODUCTION

This report describes geological investigations carried out on the Copper Hill Resources Inc. (***Copper Hill***) claim blocks held under Licence No.'s 4724, 4559M, 4560M, 4643M, 5138M, 5139M, 5144M, 5644M, 5400M, and 5854 in central Newfoundland. The claims cover a series of mineral occurrences which constitute the Powderhorn Lake Property. These mineral occurrences include the (1) Main and Road Showings to the east of Powderhorn Lake which are nickel targets, and (2) the Old Powderhorn Lake, Pearl, Dead Tree and South Zones along the shoreline and to the north of the lake which are Cu-Zn VMS targets. Exploration has been carried out on portions of the claims since 1997 and has included geological mapping, lithological sampling, geophysical surveys and diamond drilling (Jacobs, 1999; Wilton, 1998a, and 1999); the bulk of the 1999 work was completed on the Pearl Zone.

The author visited these claims in November, 1998, for Canaco Resources Ltd. and in June, 1999, for ***Copper Hill***. He also wrote an assessment report on Licence 5400M, the southernmost claim block on the Powderhorn Lake Property (Wilton, 1998a).

Scope

The scope of this report will be to provide an overview of geological mapping and sampling, geochemical analyses and diamond drilling carried out on these claim blocks in 1999 and 2000. The author visited the claims in 1999 for ***Copper Hill*** and he has some general knowledge of VMS deposits in this region of central Newfoundland (Wilton, 1998b).

Location and Access

Table 1 lists the Licence Number, number of claims within, and staking date of each claim block. The general spatial location of the property is indicated on Figure 1 and the relative locations of each block are on Figure 2. The 113 claims in this region of central Newfoundland are disposed in ten contiguous map and ground-staked licences; from north to south these blocks are (1) Licence 5854M (30 claims), (2) Licence 5138M (25 claims), (3)

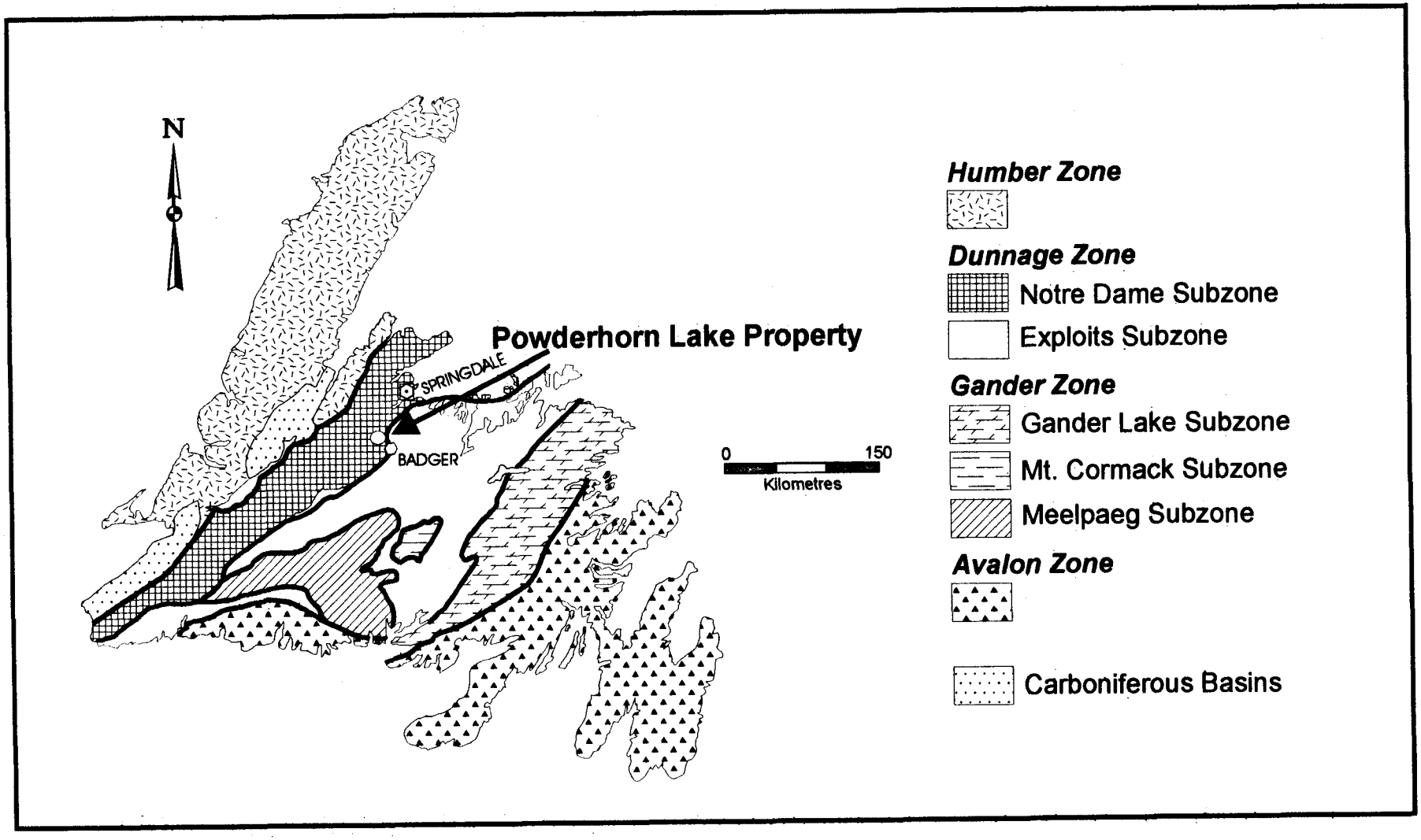

Figure 1: Tectonostratigraphic subdivisions of the Newfoundland Appalachians (after Williams *et al.*, 1988) and location of the Powderhorn Lake Property

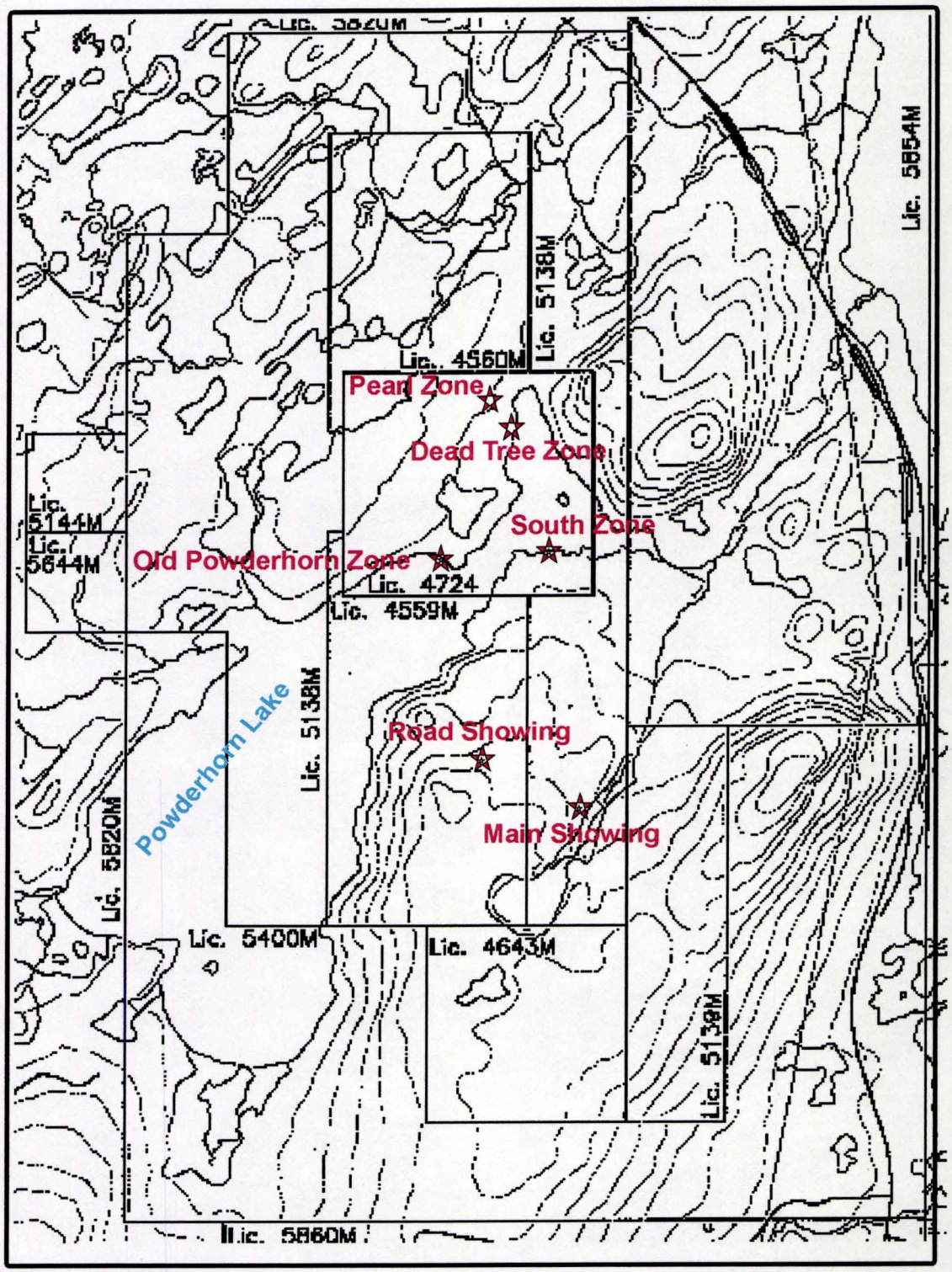

Figure 2: Claim Blocks, topography, and location of showings/zones, Powderhorn Lake Property.

Licence 4560M (6 claims), (4) Licence 4724 (9 claims), (5) Licence 5144 (1 claim), (6) Licence 5644 (1 claim), (7) Licence 4559M (8 claims), (8) Licence 5139M (4 claims), (9) Licence 4643M (4 claims), and (10) Licence 5400 (25 claims). They are located within NTS Mapsheet 12H/1.

The property is bounded to the west by the Trans Canada Highway (TCH); the eastern portions of Lic. 5400M are cut by the TCH and the TCH cuts through the centre of licence 5854M from SE to NW. Access to the interior of the claims can be made via a network of logging roads. The property is 12 km north of the town of Badger (Fig. 1) and 40 km south of the larger town of Springdale. Springdale has served as a supply and infrastructure base for the mineral exploration and mining industries in the region, and was the field operation base for the exploration program conducted by Canaco Ltd. (Jacobs, 1999). The largest regional town and equipment supply centre for the area is the town of Grand Falls-Windsor, 26 km east of Badger.

Physiography

Powderhorn Lake covers a significant portion of the west and central west portions of the property. A ridge lies along the central-eastern shore of the lake which is part of a larger NE-trending ridge that covers the east central to east-south portion of the property. Another ridge is present at the NE end of the lake (Fig. 2). Elevations range between 135 to 230 m above sea-level.

The southern half of the property is covered extensively by semi-mature to mature spruce and fir, intermingled with birch. The central claims area, just east of the lake, has recently been logged and is now characterized by clearings with isolated stands of timber. Much of the area to the north of the lake is underlain by flat open bog. Jacobs (1999) suggested that bedrock exposure, as determined from the mapped portion of the property, on the eastern side of lake, is approximately 3-5%.

Climate is characterized by a moderate to hot spring and summer which extend from early-mid May to mid-September. Winters can be amongst the coldest on the island of Newfoundland due to inland and low-elevation location of the claims.

Claims Disposition and Ownership

All licences were originally staked by prospectors Jacob Kennedy and William Mercer. Wilson Jacobs, consultant, subsequently earned an interest in the property through negotiations for an option agreement with the privately owned British Canadian Mines Ltd (BCML). Alex Turpin and Ross Burton also earned an interest in the property prior to the

Table 1

Licence	Number of Claims	Issue Date
4724	9	1995.09.18
4559M	8	1995.11.06
4560M	6	1995.11.06
4643M	4	1995.11.06
5138M	25	1996.10.25
5139M	4	1996.10.25
5144M	1	1996.11.01
5644M	1	1997.07.31
5400M	25	1997.02.06
5854M	30	1997.12.08

negotiations. The option agreement with BCML was signed on Dec 12, 1997. In a subsequent arrangement, BCML transferred the licences to Canaco Resources Ltd. (CSE) on May 1, 1998; CSE is based in Vancouver and listed on the Montréal Stock Exchange. Following mineral exploration work on the property in 1998 (Jacobs, 1999), CSE dropped its interest in the claims, and the property reverted back to the original consortium. In August, 1999, ***Copper Hill***, of St. John's, entered into an option agreement with the vendors for the claims; the owners/vendors consisted of Kennedy 45%, Mercer 40%, Jacobs 5%, Burton 5% and Turpin 5%; in August, 2000 Turpin sold his interest to ***Copper Hill*** outright. According to ***Copper Hill*** data, $209, 299.41 were spent on exploration in 1998; Lic. 4724 ($10,190.15), 4559M ($68,363.85), 4560M ($6129.78), 4643M ($18,536.06), 5138M ($60,194.14), 5139M ($17,991.84), 5144M ($3499.22), 5644M ($3767.71), and 5400M ($20,625.20).

On September 27, 2000, ***Copper Hill*** entered into an exploration agreement with Billiton Resources Canada Inc. (Billiton) on the Powderhorn Lake property. The agreement gives Billiton the right to earn a 70% participating interest in the project through spending C$2.0 million on the

properties over a period of four years. The initial exploration program is expected to commence in October, 2000. Details on the exploration expenditures on these claims in 1999 constitute Appendix I.

Regional Geology and Mineralization

Geologically the island of Newfoundland is part of the Appalachian Mountain Belt (or Orogenic Belt) and can be subdivided into four main tectonostratigraphic zones, *viz.*; Humber, Dunnage, Gander, and Avalon Zones (Figure 1 after Williams, 1979; Williams *et al.*, 1988). The Powderhorn Lake Property is localized within the Dunnage Zone. The Humber Zone is a continental block cored by Precambrian Grenville Province gneiss and the Avalon Zone is a continental block consisting of late Precambrian volcanic and sedimentary rocks. The Gander Zone represents a continental margin to the Avalon Zone continental block. Essentially the Humber Zone is a continental block with North American affinities, *i.e.*, was the continental margin of Laurentia, whilst the Gander and Avalon Zones represent a Gondwanan continental margin and core. The Dunnage Zone constitutes a Paleozoic mobile belt that records the opening, closing and subsequent destruction of the Paleozoic Iapetus Ocean (the precursor to the Atlantic Ocean). Lithologies in the Dunnage Zone consist of oceanic (or ophiolitic) and island arc volcanic and associated sedimentary rocks. The Dunnage and Gander Zones have been linked together by some authors and designated as the Central Mobile Belt between the Humber and Avalon Zones (*eg.* Swinden, 1991).

The Dunnage Zone rocks are the most important in terms of economic mineralization, containing the vast majority of known and worked mineral deposits in Newfoundland. The historically most significant, and important current, mineral exploration targets are base metal sulphide deposits of the Volcanogenic Massive Sulphide-type (VMS). The VMS deposits formed on the sea-floor by exhalations of hydrothermal fluids that had circulated through the oceanic substrate (*i.e.*, like the "black smokers" presently forming on the seafloor).

The Dunnage Zone has been further subdivided by Williams *et al.* (1988) into the Notre Dame and Exploits subzones. These subzones are separated by the Red Indian Line and differ on the basis of pre-accretionary lithologies, fossil affinities, structure, lead isotopic signatures,

plutonic suites, regional magnetic signatures and metallogeny. The Powderhorn Lake property lies within the Notre Dame subzone which consists of Cambrian to Early Ordovician island-arcs and back arc basins which fringed the Laurentian (Humber Zone) continental margin (*op cit.*). The Red Indian Line boundary occurs just to the east of the Powderhorn Property.

Kalliokoski (1951) produced the first geological map of the area. He outlined the general geology of the host rocks to the VMS mineralization at the Gullbridge mine site 7.5 km NW of the Powderhorn Lake Property. He suggested that the regional lithologies were Middle Ordovician rhyolite and rhyolite tuff with interbedded intermediate and basic lavas. He also noted the hornfelsing effect of the granitic intrusive rocks which produced cordierite and anthophyllite in the country rocks.

Extensive work was completed on exploration for, and production from, the Gullbridge Mine. Upadhyay and Smitheringale (1972) described the geology of the VMS deposit at Gullbridge.

Swinden (1984) subdivided the stratigraphy of the Roberts Arm Group in the Gullbridge area and assigned local and interformational names to some units. Swinden and Sacks (1986) derived a detailed, yet "relatively simple"(*op cit.*, p.219), stratigraphy for the Roberts Arm Group in the Gullbridge area which served as the fundamental subdivision for most later workers until the work of Pope and Calon (1990). According to Swinden and Sacks (1986), the Baker Brook basalt constituted the base of the Roberts Arm Formation and this was in turn overlain by the Gull Hill sediments, Burnt Island basalt, Gullbridge felsic volcanics and finally the South Brook basalt. Swinden (1988) also mapped the Roberts Arm Group in the Gullbridge region using Swinden and Sacks' (1986) stratigraphy. According to Swinden and Sacks (1996), the Powderhorn Lake Property lies within the Buchans - Roberts Arm Belt.

Following completion of very detailed structural mapping of the region, Pope and Calon (1990) defined the Roberts Arm Group as an east-verging fold and thrust belt that is comprised of five fault and fold panels. That Pope and Calon's geological revisions were viewed by most workers in the region as being correct is indicated by the most recent description of the geology of the Gullbridge area which was co-written with Swinden (Pope *et al.*, 1990).

The Powderhorn Lake property area was covered in 1988 by the Great Gull Pond regional

airborne EM and magnetic survey of the Geological Survey of Canada (GSC).

Dickson (2000) mapped the Powderhorn Property as being underlain by volcanic and sedimentary rocks of the Roberts Arm Group (Fig. 3). In particular, the rocks at the northern end of Powderhorn Lake were defined as felsic tuff. To the east of the property, Dickson (2000) mapped the Hodges Hill Intrusive Suite which is predominantly massive, medium-grained gabbro; this intrusive suite had previously been defined as the Twin Lakes Intrusive Complex.

Newman (1957) mapped the area south of the now exhausted Gullbridge Mine and around Powderhorn Lake for the New Jersey Zinc-BRINEX joint venture. He found eight small showings south of Gull Pond and west of Dawes Pond, but they are poorly located on his maps. The showings consist of pyrrhotite, pyrite and/or chalcopyrite in mafic and felsic volcanic rocks.

The only previously-reported mineral occurrence on the property itself is the Powderhorn Lake Showing (see Newfoundland Department of Mines, MODS files); this showing has been renamed the Old Powderhorn Lake Showing (Jacobs, 1999). The showing, located on the northwest shore of Powderhorn Lake, was originally reported on by Kalliokoski (1951). Newman (1957) described it as consisting of rusty, altered metasediments with pyrite, pyrrhotite and traces of chalcopyrite.

Property Geology and Mineralization

There are two styles of sulphide mineralization present on the property. The first comprises Cu-Zn sulphide within the metasedimentary rocks at the Old Powderhorn Lake, Pearl, Dead Tree and South Zones. The second consists of nickeliferous sulphide mineralization in a gabbroic dyke/sill system at the Main and Road Showings (Jacobs, 1999).

According to Colman-Sadd *et al.*'s (1990) geological map, the geology of the Powderhorn Lake Property consists of a thin ($\leq$ 5 km wide) belt of (meta)sedimentary rocks sandwiched between the Twin Lakes Intrusive Complex (TLIC) to the east, and the Dawes Pond Granite to the west. The TLIC contact parallels the Trans Canada Highway lying just to the west of the highway. The sedimentary rocks underlie Powderhorn Lake and the Dawes Pond Granite occurs along the western shoreline of the lake. Colman-Sadd *et al.* (*op cit.*) consider the sedimentary rocks to be part of the Sansom Greywacke of the Badger Group. This sedimentary

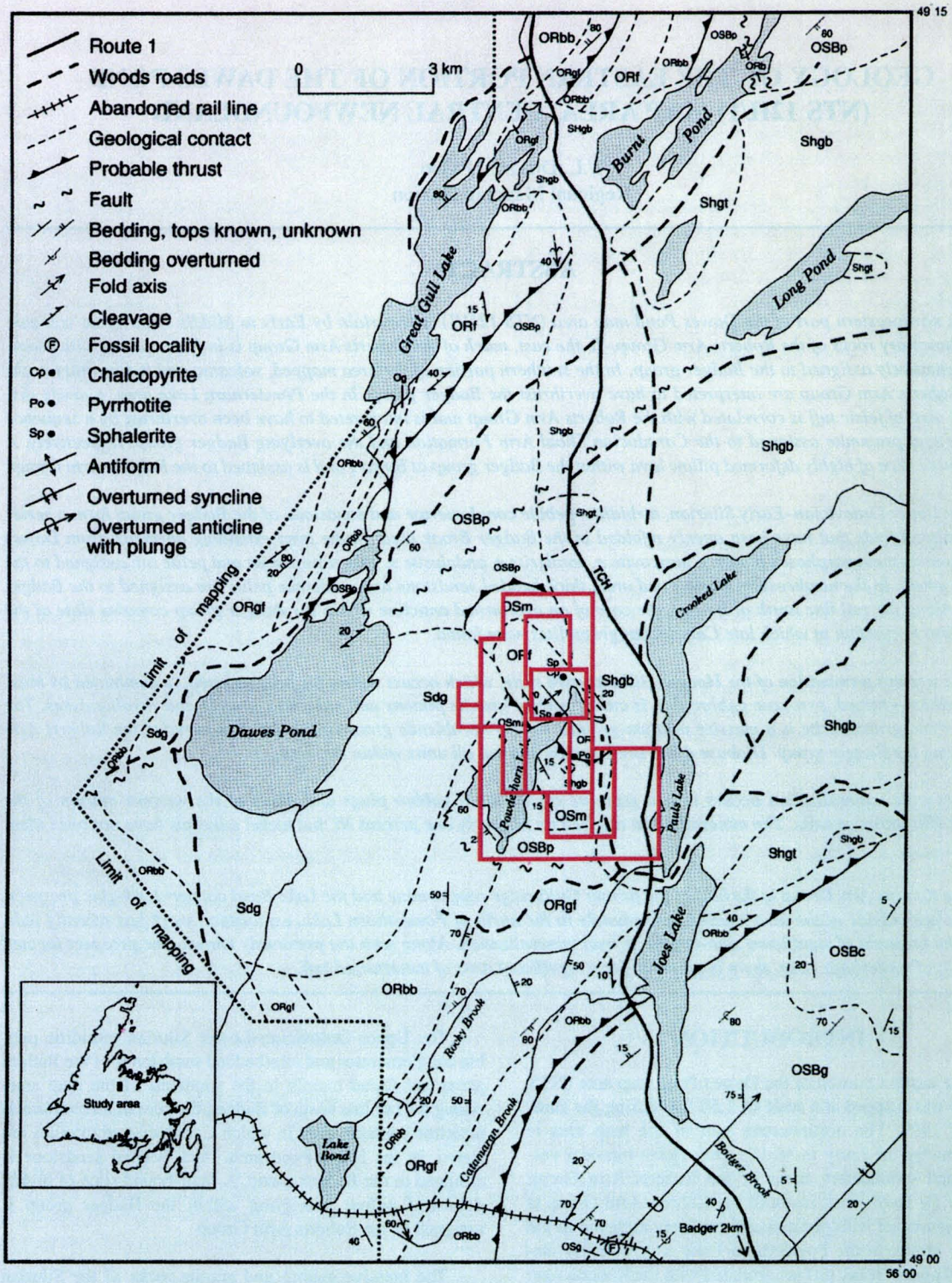

Figure 3: *General geology of the eastern portion of the Dawes Pond (NTS 12H/1) map area.*
With location of Powderhorn Property claim block (map from Dickson (2000).

unit as mapped (*op cit.*) is also in fault contact with the Roberts Arm Group to the south and west of the Powderhorn Lake Property.

Others (*e.g.*, Butler, 1990) have mapped the meta-sedimentary rocks near Powderhorn Lake simply as "Thermally Metamorphosed Sediments". This is an outgrowth of work by Swinden and Sacks (1986) who defined the sedimentary rocks as an unnamed metamorphic unit which cropped on the eastern side of the Dawes Pond Granite, whereas, Roberts Arm Group volcanic and volcaniclastic rocks were present on the western to southern sides of the granite; the Powderhorn Lake Property sedimentary rocks were defined to be in fault contact with the Roberts Arm Group along both southern and northern boundaries (*op cit.*).

The Dawes Pond Granite had a well documented thermal metamorphic (hornfelsing) effect on the Roberts Arm Group to the west and northwest of the granite (Swinden and Sacks, 1986; Pope *et al.*, 1990). In fact the hornfelsing has been so intense at the Gullbridge Mine so as to have effectively masked the original depositional textures of the VMS mineralization (Upadhyay and Smitheringale, 1972). According to Jacobs (1999) the magnetic features on the GSC's 1988 regional airborne survey of the area define a circular outline for the Dawes Pond Granite with associated semi-concentric zones of magnetite-hornfels within the surrounding volcanic and metasedimentary units.

As defined by Swinden and Sacks (1996), the claim blocks cover three fundamental geological units, *viz.*; (1) Early Ordovician to Late Silurian Metamorphic rocks: quartzite, andalusite- and staurolite-bearing pelite, and carbonaceous shale of uncertain derivation, (2) Early Silurian to Late Devonian Twin Lakes Complex diorite, quartz diorite, tonalite, granodiorite, gabbro and amphibolite, and (3) Early Silurian to Late Devonian Dawes Pond Granite, grey to pink, medium- to fine-grained granite, quartz monzonite and granodiorite.

Jacobs (1999), following a reconnaissance evaluation of the eastern Powderhorn Lake area, described the metasedimentary rocks, immediately east and southeast of Powder Horn Lake as consisting of dominantly interbedded meta-argillite and fine-grained meta-sandstone. Farther north, around the northeastern section of the lake, he mapped the metasediments as paragneisses. He suggested that the sedimentary rocks actually represent a separate, possible *"basement window"*, sequence of paragneisses. As such they would be more properly termed the

Powderhorn Lake Group. As described by Jacobs, these rocks consist of quartzofeldspathic, quartz-feldspar-biotite, quartz-biotite gneisses and graphitic schists. The metasedimentary rocks contain abundant sulphides and Jacobs (*op cit.*) reports that grab samples from these rocks assayed at up to 1% Zn and 0.5% Cu.

Jacobs (1999) describes both the Twin Lakes and Dawes Pond intrusions as having developed considerable thermal aureoles upon the metasedimentary rocks. He described the meta-argillites and paragneisses as exhibiting strong, recrystallized, hornfelsed textures with some units converted to staurolite-garnet and cordierite-garnet schists. He also stated that metasomatic and hydrothermal alteration, with associated mineralization, related to the intrusion of the Dawes Pond Granite, is widespread throughout the northeastern section of Powder Horn Lake, where he suggests the paragneisses have undergone variable degrees of silica and/or biotite replacement. In some places, intense silicification, in combination with the possible chemical breakdown and removal of mafic minerals, resulted in the formation of leucocratic zones having only a faint relic metamorphic fabric remaining (*op cit.*). Some minor muscovite-greisen (sericite) and hydrothermal dissolution cavities are associated (*op cit.*).

Along the northeastern-trending ridge south of Powderhorn Lake, CSE geologists and associated prospectors located a number of outcrops of medium-grained diorite and medium to coarse-grained gabbro intrusive into the metasedimentary rocks (Jacobs, 1999); presumably these are part of the TLIC, Dickson (2000) correlated the dykes with the Hungry Hill Intrusive Suite (his new name for the TLIC). Jacobs (1999) mapped fine-grained mafic dykes, up to a couple of metres in width, intrusive into the metasedimentary sequence. In the central area, southeast of the lake, a couple of coarse-grained gabbro dykes are up to 25-30 m wide, one of which hosts the Main Showing. He noted another intrusive in that area which consists of diorite with a possible stock-like form at the Road Showing. These intrusive rocks were found to contain up to 10% disseminated and network pyrrhotite mineralization, with lesser chalcopyrite. Grab samples from some of these sulphide zones assayed up to 0.62% Ni and 0.12% Cu.

According to Jacobs (1999), the Powderhorn Grid, south of Powderhorn Lake, is underlain by shallow-dipping meta-argillite interbedded with fine-grained meta-sandstones. There are also local thinly-bedded amphibolitic layers and a fairly extensive, strongly foliated, light grey

to cream-colored, quartz-phyric felsic unit also forms a conformable layer within the metasediments; this unit represents either a felsic volcanic tuff or a sill-like porphyry (*op cit.*).

The most recent and complete mapping of the property was conducted by Dickson (2000). According to his mapping (Fig. 3), the main units on the property range from the Lower Ordovician Roberts Arm Group, the Late Ordovician Shoal Arm Formation, to the Late Ordovician to Early Silurian (?) Badger Group, with intrusives from both the Dawes Pond Granodiorite and Hodges Hill intrusive suite. The area of the Pearl, Old Powderhorn, Dead Tree and South zones, along with the Main and Road showings, is underlain by a shallowly-dipping anticline of "thick- to thin-bedded felsic tuff, locally containing quartz and feldspar phenocrysts, and thick-bedded feldspathic sandstone; in the Powderhorn Lake area, the tuff is highly altered to rusty gossan and quartz-sericite schist and contains pyrite, pyrrhotite $\pm$ chalcopyrite $\pm$ sphalerite mineralization" (*op cit.*, p.129) of the Roberts Arm Group.

The Main and Road showings are in the upper panel of an E-W thrust fault which overlies Shoal Arm Formation "highly metamorphosed, grey to black, cordierite pelite interbedded with minor thick-bedded, quartz-rich sandstone; possibly equivalent to the Shoal Arm Formation" (*op cit.*, p.129). This unit grades to the south into "thin- to medium-bedded, biotite $\pm$ muscovite $\pm$ cordierite $\pm$ garnet semi-pelite and psammite" (*op cit.*, p.129) of the Badger Group. The SW and NW corners of Licence 5400M are underlain by"massive basalt flows and pillowed basalt; minor rhyolite and felsic tuff" (*op cit.*, p.129) of the Roberts Arm Group. Licences 5144M and 5644M are underlain by Dawes Pond Granodiorite ("massive, buff to grey, equigranular, medium-grained biotite $\pm$ hornblende granodiorite", as is the western edge of Licence 5138M. The eastern edges of Licences 5400M and 5138M are underlain by "massive, grey, equigranular, medium- to coarse-grained pyroxene gabbro".

Previous Work

In 1998 MAG, VLF-EM and Pulse EM ground geophysical surveys were carried out by Horizon Geophysics Inc., Langley, B.C., on the property; Candy (1998) provides a detailed overview on the geophysical surveys carried out on the property and the results of these surveys (Jacobs (1999) also provides details on techniques and instrumentation). The surveys included: (i)

a 0.6 km magnetic survey using 10 m-spaced lines over the site of the Main Showing, (ii) a repeat of the MAG/VLF-EM survey over the central grid area with 50 m line-spacings, (iii) a 9.8 km Max-Min EM survey over the central grid area, including the site of the main nickel prospect; a separate, smaller MAG/VLF-EM and Pulse EM survey adjacent to the northwest side of Powder Horn Lake to cover the site of an intense circular magnetic high identified on the 1988 GSC regional airborne survey map, and (iv) a down-hole Pulse EM probe of DDH-98-05 (Jacobs, 1999).

Trenching and a total of 73.5 m of diamond drilling were completed at four sites on the property in 1997. Trenching and minor blasting were carried out at the Main and Road Showings in 1998.The final phase of the CS/BCML project was a 529-meter diamond drill program, contracted to Petro Drilling Company Ltd, Springdale, in November, 1998. A total of five holes were drilled to examine the subsurface extent of the nickel\copper mineralization at the Main Showing and to test EM conductors outlined by the 1998 transient PEM survey.

From January to October, 1998, Ionex Ltd, Springdale, was contracted to complete grid construction. The initial grid was a reconnaissance grid with 100 m-spacings to a total of 100 km of lines. The grid baseline was oriented north-south, with east-west lines crossing the north-south trending contact between the Twin Lakes mafic intrusive Complex and the meta-sedimentary sequence (Jacobs, 1999). During the fall of 1998, a 17 km cut grid (covering 1.5 sq km) was superimposed over the central part of the reconnaissance grid to facilitate mapping control over an area where geophysics had defined a 500 x 1000 m area of magnetic and pulse EM anomalies (*op cit.*).

Geologists with Falconbridge Ltd. visited the property in 1998 and collected some samples of drill core and bedrock. A. Kerr and L. Dickson of the Newfoundland Department of Mines and Energy visited the property in late 1998 as well (Kerr, 1999).

Dead Tree and South Zones

According to Jacobs (1999), the original (Old) Powderhorn Lake Showing, located on the northwestern side of the lake, forms an impressive 10 to 12 m wide gossan traceable for some 50 m along the shoreline (Fig. 2). He describes the zone as consisting of intensely bleached and,

locally, silicified, paragneiss hosting 1 to 15% disseminated pyrite and pyrrhotite throughout, with trace to minor chalcopyrite and sphalerite visible in places. Four grab samples collected here, the highest assay results included 0.27% Zn, 1613 ppm Cu and 85 ppb Au (*op cit.*).

Prospecting and sampling by Mercer and Kennedy in 1995 to 1997, revealed widespread mineralization in paragneissic outcrop and frost-heaved, subcrop material around the northeast section of Powder Horn Lake. Jacobs (1999) stated that mineralization generally consists of 1-10% pyrite and pyrrhotite, with localized occurrences of sphalerite and chalcopyrite. Several occurrences of molybdenite were discovered as well (*op cit.*). Falconbridge reported up to 50% sphalerite in one grab sample.

The Dead Tree Zone, located 1.1 km across strike to the northeast of the original showing, consists of heavily-disseminated to semi-massive bands of sphalerite with associated disseminated chalcopyrite, paralleling the paragneissic fabric (Jacobs, 1999). At the Dead Tree Zone, six samples collected from mineralized paragneiss (with banded sphalerite and disseminated chalcopyrite), returned up to 3.4% Zn, 7553 ppm Cu, 305 ppm Pb, 476 ppb Au and 0.56 oz/t Ag (*op cit.*). The zone occurs, intermittently, over several metres of shoreline where the prospectors have obtained sample results of 1.56 to 4.5% Zn and up to 2.14 % Cu. Other anomalous results included up to 495 ppm Pb, 1.2 oz/t Ag, and 1200 ppb Au (Jacobs, 1999).

Jacobs (1998; 1999) states that two samples collected from angular frost-heaved float along the shoreline between the Powder Horn Lake Showing (gossan) and the Dead Tree Zone, returned anomalous values as well: PH-98-004 assayed 9933 ppm Cu and 204 ppb Au; PH-98-119, which contained coarse visible amounts of galena, sphalerite and chalcopyrite, assayed up to 2.23% Zn, 1678 ppm Cu, 860 ppb Au, 1.84% Pb, 1.96 oz/t Ag and 713 ppm As. A third sample (PH-98-118), hosting 10% disseminated pyrite and possible fluorite bands, returned no significant metal values.

The South Zone (Fig. 2) is on the opposite shoreline, 0.7 km along strike to the south. Here, minor sphalerite and chalcopyrite occurs as disseminations, fracture-fillings, and local coarse erratic blebs within a zone of silicified, bleached, and gossaneous Fe-stained paragneiss. Jacobs (1999) reported assays from this site of up to 2.5% Zn, 0.5% Cu, 0.3 oz/t Ag and 250 ppb Au.

Jacobs (1999) stated that there is a small molybdenite occurrence, approximately 30 m east along the shoreline from the South Zone present in a felsic dyke. Several other molybdenite occurrences are hosted by altered paragneissic float and subcrop, 50 to 200 m west of the zone.

Jacobs (1999) reported that visual inspection of a soil sample, which contained 383 ppm W, using an UV lamp, revealed scattered grains of scheelite. More sampling of the soil material produced a concentration of 1400 ppm W.

At the South Zone, Jacobs (1999) stated that local coarse concentrations of sphalerite and chalcopyrite are associated with a zone of intense metasomatic/ hydrothermal replacement in the paragneiss. The actual host rock protolith is somewhat dubious due to the high degree of bleaching, silicification and possibly kaolinitic alteration (*op cit.*). Scattered blue quartz eyes, within one part of the altered zone, suggests that part of the host consists of altered felsic porphyry dyke; fresh 'blue-eye' quartz-feldspar porphyry dykes are seen intruding the gneisses elsewhere on the shoreline of the lake (Jacobs, 1998). A couple of samples collected here, in 1997, produced up to 1230 ppm Zn and 205 ppm Cu, considerably less than that reported from the prospector samples taken in 1996 (*op cit.*).

Hole DDH-PH-97-04 was drilled to test South Zone copper and zinc mineralization. The hole was drilled at a 45° angle towards 274°. Due to technical problems, the hole had to be terminated at ~ 20 m depth, at a point directly below the surface mineralization. Jacobs (1999, p.21) asserts that "trace to minor disseminated sphalerite and chalcopyrite, with associated moderate to intense metasomatism (involving silica-sericite replacement and removal (dissolution) of mafic mineralogy), was (*sic*) found to be present throughout the entire hole. Eight representative samples taken along the entire section yielded consistently elevated Cu and Zn values throughout, including up to 2825 ppm Cu and 0.28 % Zn over various sample intervals of 0.67 to 1.55 m Interestingly, the highest Zn value was obtained from the very bottom of the hole where the possibility of increased mineralization was to be encountered based on vertical projection of the surface showing".

Main and Road Showings

Prospecting along newly constructed logging roads, 1.0 km east of Powder Horn Lake, in

August of 1997, resulted in the discovery of a gabbro outcrop that contained nickeliferous sulphides termed the Main and Road Showings (Fig. 2). A brief geological investigation of the area was made by Wilson Jacobs of White Bear Resources Ltd in September-October 1997. In October, 1997, Aurora Drilling Inc., Springdale, completed four short diamond-drill holes at the nickel showing, and the South Zone sedimentary-hosted sulphide occurrences on the shore of Powderhorn Lake, 1.2 km farther north. Discovery Geophysics Inc., Vancouver, B.C., completed a 2.8 km magnetic survey over the Main Showing following the drilling.

At the Main Showing (Fig. 4), Jacobs (1999) reported that nickeliferous sulphide mineralization is hosted by a coarse-grained gabbro. Quartz and metasedimentary inclusions were observed in the gabbro up to 400 m WSW from the Main Showing. Approx. 50 to 75 m WSW of the latter, quartz xenoliths, ranging from 3 to 15 cm in size, have significant concentrations as clusters within the gabbro; these xenoliths are rounded to sub-rounded presumably due to resorption by the magma, and typically are rimmed by amphibole.

Jacobs (1999) suggests that assimilation/ingestion of the silica-rich country rock into the gabbro at the Main Showing has locally produced a hybrid dioritic phase with gradational contacts to the gabbro. At a couple of localities, however, sharper contacts between the two phases were seen by Jacobs, which suggested to him that separate pulses of magma during the process of intrusion and assimilation. At one outcrop, a very coarse-grained gabbro xenolith is hosted by the dioritic phase, the coarse-grained texture of the xenolith was suggestive to Jacobs (*op cit.*) of a deeper, slower-cooled gabbro magma.

Jacobs (1999) describes the gabbro as a dyke based on the WSW-trending distribution of outcrops and the correlation of trench and diamond drill-hole data at the main showing, which to him suggested vertical intrusive contacts. A few fine-grained mafic dykes, ranging from several cm's to a couple of m's wide, intrude the main gabbro dyke in sub-parallel fashion (*op cit.*).

Jacobs (1999) describes the Main Showing (Fig. 4) as consisting of an 8 x 12 m surface exposure of magmatic sulphide mineralization; mainly pyrrhotite and lesser chalcopyrite. The pyrrhotite mineralization exhibits a range of textures, displaying immiscible disseminated, net-textured, and semi-massive forms (with local thin massive layers up to 5 cm thick) *i.e.*, sulphide contents range from a couple of percent in the more sparsely disseminated portion to

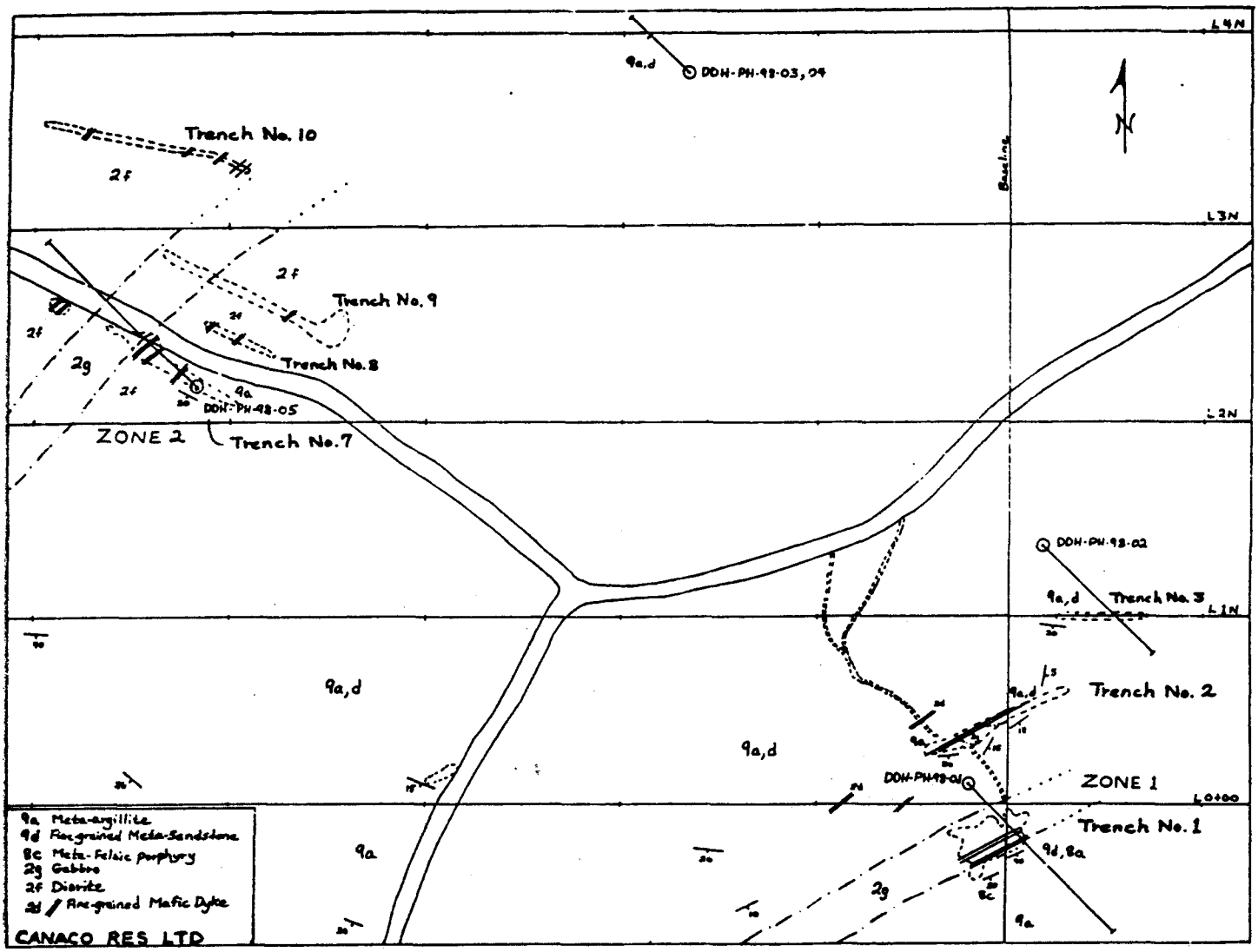

Figure 4: Outcrop, trench and diamond drill hole map for the Main (termed Zone 1 on map) and Road (termed Zone 2 on map) showings (from Jacobs, 1999).

30-80% when in thin (local) semi-massive to massive bands (*op cit.*). Up to 5% chalcopyrite is locally present as irregular clots or blebs, but more frequently as fracture-fillings indicating local remobilization.

Based on the 1997 drill holes, Jacobs (1999) estimates that the mineralized zone has a true thickness of 3.5 m with an inferred 10° SW dip, ranging from disseminations at the top to more dense concentrations at the bottom with a west-southwest dip along the trend of the host gabbro. Minor occurrences of pyrrhotite with chalcopyrite rimming small extraneous quartz grains are present 75 m SW of the main showing, and as weak disseminations of sulphides in a rusty, gossaneous diorite-gabbro phase 325 m farther WSW (*op cit.*).

Sulphide is also fairly widespread in the meta-argillites at the Main Showing and consists, of minor blebs and stringers of pyrite and pyrrhotite parallel to the foliation/bedding plane (Jacobs, 1999) . One outcrop exposure on the west side of a logging road, 250 m WNW of the prospect is of hornfelsed graphitic metasediments with well-banded pyrite and pyrrhotite (up to 10%) and local blebs and stringers of chalcopyrite (*op cit.*). Minor amounts of pyrite, pyrrhotite and chalcopyrite are associated with small quartz veins and pods hosting graphitic inclusions.

Seventeen grab samples (LP-01 to LP-011 and PH-98 07 to PH-98-12) were collected from Trench No. 1 at the Main Showing (Jacobs, 1998; 1999); the LP samples were derived in 1997 from a small blasted trench. Assay values as reported in Jacobs (*op cit.*) ranged 0.12 to 0.48% Ni and 1091 to 4529 ppm Cu, with one sample containing 0.079% Co. The remaining five yielded 0.51% to 0.76% Ni, 0.056 to 0.089% Co, and 0.11% to 0.31% Cu. Analyses also returned one anomalous Au value of 203 ppb and three elevated arsenic values (55 to 154 ppm).

Four samples (PH-98-13 to 16) were taken ~ 100 m south of the Main Showing, on L1+00s, where trenching exposed altered metasediments and a conformable quartz-phyric felsic unit, both lithologies were characterized by intense, light grey to white, silicification, dark hornfels spotting, and 1 to 5% disseminated pyrite (Jacobs, 1999). Only slightly anomalous As values, of 29 and 58 ppm, were obtained here (*op cit.*).

Jacobs (1999) said that 14 samples (PH-98-101 to 112, LP-12 & PHL-015) were collected elsewhere generally well away from the main nickel showings; eight were taken from

mineralized meta-argillites, three from weakly pyritized diorite. Best assay results were from two samples of meta-argillite with 242 & 503 ppm Cu, 142 ppm Pb, 524 ppm V, and 96 & 167 ppb Au. The diorite exposed in a trench 400 m WSW of the Main Showing returned a value of 34 ppb Au.

Jacobs (1999) stated that the magmatic sulphide mineralization at the Main Showing has no obvious associated PEM response, which he found not to be surprising due to the disseminated style of mineralization present and the discontinuous nature of the thin, semi-massive, sulphide layers comprising the basal part of the zone. The NE/SW-trending gabbro dyke which traverses the Road Showing area, however has a strong coincidental magnetic expression according to Jacobs (1999).

Jacobs (1999) felt that there were three shallow conductive horizons apparent at 0+50E, L1+00N, at 6+00W, L2+00N, and 0+75W, L1+00S. Drilling at the former site determined the electrical conductance to be caused by significant concentrations of banded pyrrhotite in meta-argillite (*op cit.*).

A bore-hole Pulse EM test for DDH-98-05 detected a strong off-hole response at a depth of 15 to 20 m with the conductor at least 20 m off hole (Jacobs, 1999). Jacobs (*op cit.*) also noted another strong off-hole response building up from about 90 m depth to the end of the hole at 150.9 m.

Drill-hole testing of two Pulse EM conductors determined that sulphide-laminated meta-argillite was the anomalous source (Jacobs, 1999). Jacobs (*op cit.*) suggests, however, that other conductive sources are implied, including the possibility of magmatic sulphide zones.

Two holes were drilled at the Main Showing in 1997, from the same position; DDH-PH-97-02 was drilled at 90° to a depth of 11.58 m , and hole DDH-PH-97-03 was drilled at 45° along 211°, to a depth of 13.6 m. The core revealed a shallow zone of magmatic-style sulphide mineralization, exhibiting a downward layering effect from coarsely disseminated, through net-textured, to thin (< 5 cm wide), semi-massive and massive pyrrhotite layers (Jacobs, 1999). Minor chalcopyrite was present as irregular clots interstitial to the pyrrhotite mineralization and Jacobs (1999) suggests that this mode indicates it was the last sulphide phase to crystallize out.

Jacobs (1999, p. 20) comments that "a total of thirteen samples were selected for assay from the two holes. A 3.28 m sample section from the top of DDH-97-02 contained a 1.5 m interval of 0.82 % Ni, 0.07 % Co, and 0.23 % Cu, and an adjoining 0.5 m interval of 0.58 % Cu and 0.29 % Ni (a re-check of the 1.5 m core section for Pt and Pd yielded 23 ppb Pt and 1 ppb Pd). Selected chips from a grounded section of massive sulphides, having an estimated 0.3 m of core loss, returned an assay of 0.86 % Ni, 0.24 % Cu, and 0.08 % Co. A small piece of massive pyrrhotite selected from the grounded core section for analysis, by prospector, Jacob Kennedy, assayed 1.2% Ni. DDH-97-03, sampled over a continuous 10.37 m interval, yielded 0.4 % Ni over 7 m. Specific sample results included 0.7 % Ni and 0.09 % Co over 1.0m, and 0.82 % Ni and 0.08 % Co over 1.1m"

Drill hole DDH-PH98-01 was collared at 010N and 020W to test for deeper extension of the mineralized gabbroic dyke at the Main Showing. The hole was drilled at -45° to 135° a depth of 152.4 meters. Jacobs (1999, p. 21) reporting on drill logs written by Larry Pilgrim of Island Arc Services, Kings Point, stated that "Sub-surface mineralization in the 30 metre wide dyke was minimal with less than 1% total sulphides (po\py, minor cpy) and was, therefore, not sampled. Sampling of DDH-PH98-01 was confined to silicified, hornfelsed metasediments intruded by the dyke. An elevated gold value of 190 ppb was returned from a very siliceous zone near the top of the hole. This section contained 5-10% pyrite and 1-2% arsenopyrite. Associated base metal results were insignificant. The earlier prospector drilling at the showing indicates that the higher grade mineralization may be dipping or plunging to the west-southwest. Therefore, the drill-hole may have undershot any potential extension of this zone".

The author briefly inspected the core from hole PH98-01 in June, 1999. He felt that the core could have been logged in much more detail and that there were numerous geologically important textures and features present down to the base of the hole.

Diamond drill holes PH-98-02 to 04 were drilled to test PEM conductor horizons. Jacobs (1999, p.21) asserts that "DDH-PH98-02 was located at 136N and 017E. The hole was drilled at an azimuth of 135 degrees, at an inclination of -45 degrees, and to a depth of 114.9 meters. Holes PH98-03 and -04 were drilled from a common set-up at 378N and 167W, at an azimuth of 315 degrees. PH98-03 was drilled at an inclination of -45 degrees to a depth of 57.1m, and

PH98-04, at -60 degrees to a depth of 53.6m.

All three holes intersected weakly to strongly altered meta-argillite and meta-sandstone cut by numerous fine-grained mafic dykes. The shallow PEM conductors were possibly explained by pyrrhotite\pyrite bands and stringers and minor chalcopyrite associated with the less silicified, and possibly more graphitic, horizons near surface. Analysis of the pyrrhotite-rich zones recorded elevated Ni up to 196 ppm, and Zn and Cu up to 606 and 344 ppm, respectively".

Petrographic studies of sulphide-bearing drill core from these intrusives by Kerr (1998) have confirmed the orthomagmatic nature of the sulphide mineralization, to whit (p.3) "sulphides were present at the late magmatic stage, and were not introduced after crystallization". Kerr also noted the presence of quartz in some of the samples. The presence of this silicious material is suggestive of assimilation of country rocks.

At the Road Showing and general vicinity, 400-500 m NW of the Main Showing, Jacobs (1999) reports that a medium-grained, pyrrhotite-rich dioritic intrusive is exposed in trenches (Trenches 7-10) and outcrops over a 120 x 200 m area (Fig. 4). Jacobs (*op cit.*) states that the outcrop distribution pattern suggests a large, stock-like body. The intrusive is light bluish-grey in color, with a "dusted" appearance in places. The intrusive is cut by numerous small (generally 0.5-1.0 m wide) fine-grained mafic dykes as well as a 25 m-wide, coarse-grained, gabbro dyke, very similar to that hosting the Main Showing mineralization (*op cit.*).

In the scattered outcrops between Main and Road Showings, assimilation textures of sulfur- and silica-rich (metasedimentary) country rock with mafic to intermediate intrusives is quite common. The xenoliths are visibly melted along the margins and "eaten away" by the magma.

At this showing, Jacobs (1999) described pyrrhotite as being present as weak to strong disseminations (0.5 to 2%), and at Trenches 7 and 9, an intense gossan is developed over the zone. The trenches expose a strong partially-assimilated mixture of intrusive and rusty xenolithic metasedimentary material (*op cit.*). Locally, coarse accumulations of pyrrhotite and lesser chalcopyrite, up to a couple of cm's thick, occur adjacent to the rusty xenoliths, as well as, local coarse blebs of fracture-controlled chalcopyrite (*op cit.*).

According to Jacobs (1999), some crystalline textures in the diorite are of coarse bladed

growths of quartz and plagioclase (micro-pegmatitic phases) which he suggests indicate H_2O-enriched magma with the H_2O derived from ingestion of country rock.

Petrographic examinations, conducted by Kerr (1998) on samples collected from the Road Showing, reveal the presence of both xenocrystic and primary interstitial quartz in the diorite. Kerr suggested that the intrusive body hosting the Main Showing was characterized by a gabbro-diorite composition (though having suffered some retrogressive? alteration effects) while that hosting the Road Showing represented a more-differentiated quartz-dioritic composition.

Jacobs (1999, p. 14) states that twenty grab samples "(PH-98-17 to PH-98-36) were collected from trenches covering the area of the Road Showing. Analyses for Ni returned values ranging from 0.14 to 0.92%, however, the majority of the samples returned nickel ranging from 0.01 to 0.09%. Cu values were generally elevated, but ranged from 0.11 to 0.45% in 5 of the samples. Several of the samples returned slightly elevated Au, including up to 128 ppb. Slightly elevated As, up to 80 ppm, was obtained as well. An earlier sample collected from the Road Showing, in 1997, returned only 1406 ppm Cu, 180 ppm Co, and 977 ppm Ni. Still earlier sampling by the prospectors at this site, in 1996, had produced grab sample values of up to 0.62 % Ni, 1200 ppm Cu, 500 ppm Co, and 30 ppb Pt".

DDH-PH-97-01 was drilled at the Road Showing as a 47° degree hole, oriented 310°. The hole intersected pyrrhotite-rich diorite cut by a few fine-grained mafic dykes before terminating in a dyke at 27.7 m depth (Jacobs, 1999). The hole collared in a 1.34 m section of diorite containing 10-15% disseminated pyrrhotite and a 5 cm-wide section of massive pyrrhotite (*op cit.*). The remaining diorite sections exhibited decreasing pyrrhotite contents downhole, diminishing to 3% (*op cit.*). Thus the drilling did not reveal any vertical continuation to the surface mineralization. Jacobs (1999, p.20) stated that "three samples selected for assay from this hole with no significant results. However, a sample from the best mineralized section at the top of the hole assayed 1800 ppm Ni, 360 ppm Cu, 119 ppm Co, 22 ppb Pt and 9 ppb Pd".

Jacobs (1999, p.22) states that "Mineralized diorite, cut by numerous mafic to felsic dykes, was encountered throughout the hole. The dykes consisted of fine-grained mafic (diabase?), microgabbro, and quartz-feldspar porphyry. The 25m- wide coarse-grained gabbro dyke cutting the mineralized zone on surface was also intersected. Sulphides occur within the

diorite as disseminated pyrrhotite and pyrite with minor chalcopyrite and, locally, as narrow massive fracture-fillings near the top of the hole. Assays for Ni ranged up to 495 ppm while Cu values were recorded up to 193 ppm. The hole ended in highly-altered meta-sediments.

The rock types encountered in drilling were consistent with those exposed on surface and as described in the 1998 fall mapping over the area, i.e. inter-bedded, flat-lying to gently dipping, meta-argillites and meta-sandstones. In drill-hole, the less-altered meta-argillites are dark grey to black in colour and locally contain smears of graphite along foliation planes. Moderate to strong pyrrhotite/pyrite banding (as laminations) occur in places, along with minor wisps of chalcopyrite. The meta-sandstones are fine to medium-grained and thinly bedded with the meta-argillites. At depth, the metasediments become increasingly altered, i.e. with silicification increasing down-hole. Minor greisening effects, indicating pneumatolytic alteration (possibly due to the nearby Dawes Pond Granite) are also seen.

The more intense alteration is accompanied by injections of silicic material along foliation planes, which form mottled and banded textures with alteration fronts commonly pervading outwards from bedding and fracture planes. Minor small quartz veins normally occur cross-cutting the sequence".

PH98-05 was collared at 219N and 416W to test for the presence of copper and nickel-bearing sulphides in diorite exposed at the Road Showing. The hole was inclined -45° towards 315° with a depth of 150.9 m.

II. 1999 EXPLORATION PROGRAM

Work conducted in 1999 included prospecting, mapping and sampling, which ultimately culminated in the drilling of two diamond drill holes from October 15 to 22; the holes were drilled on the Pearl Zone (Fig. 5). Property visits were carried out by a number of different exploration companies during 1999.

Rock and soil sampling program

During an exploration program in June, 1999, on the Pearl Zone the vendors/prospectors group, collected seven grab samples, three chip samples from subcrop on either of the woods road

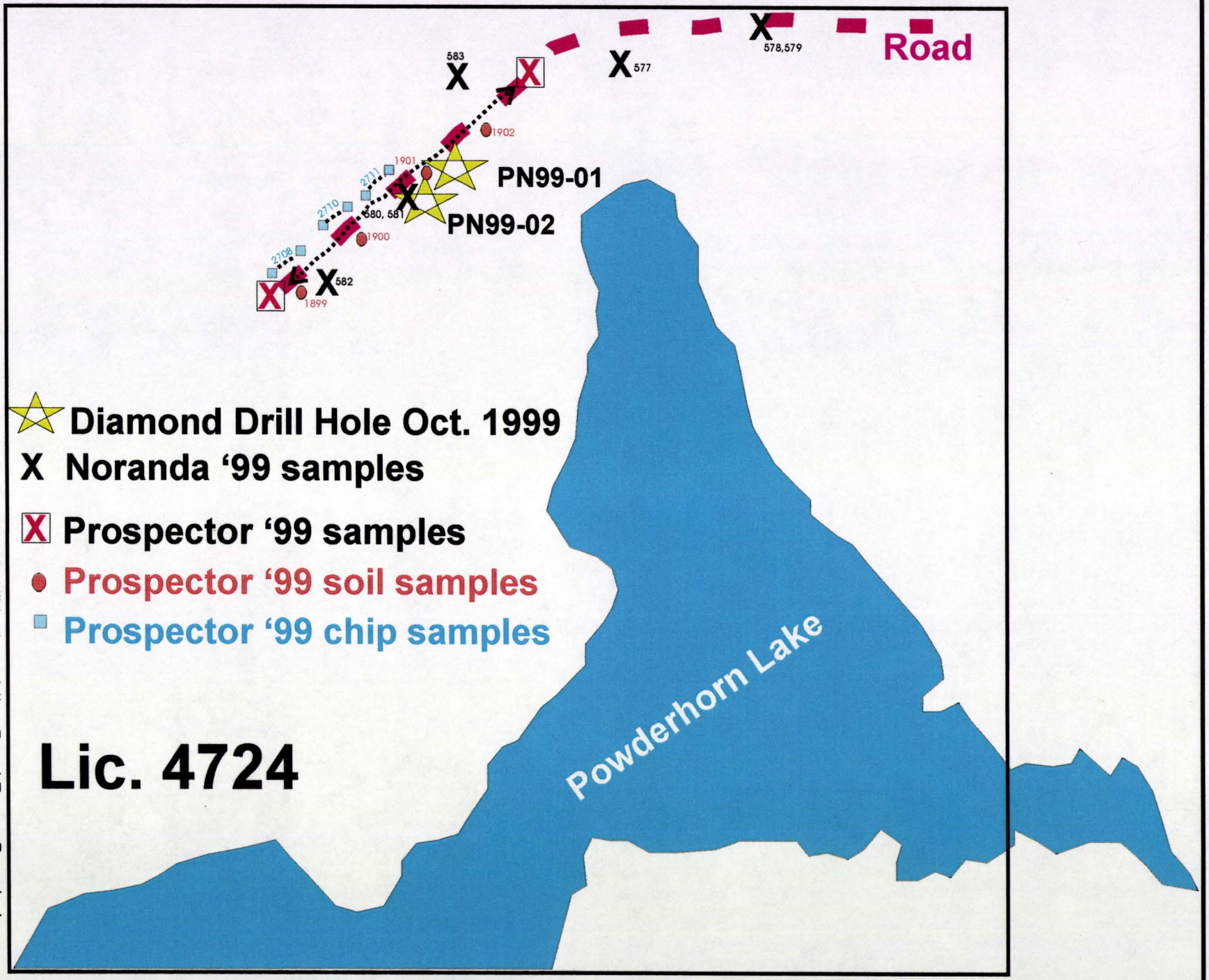

Figure 5: Location of geological samples and diamond drill holes at the Pearl Zone, Powderhorn Lake Property.

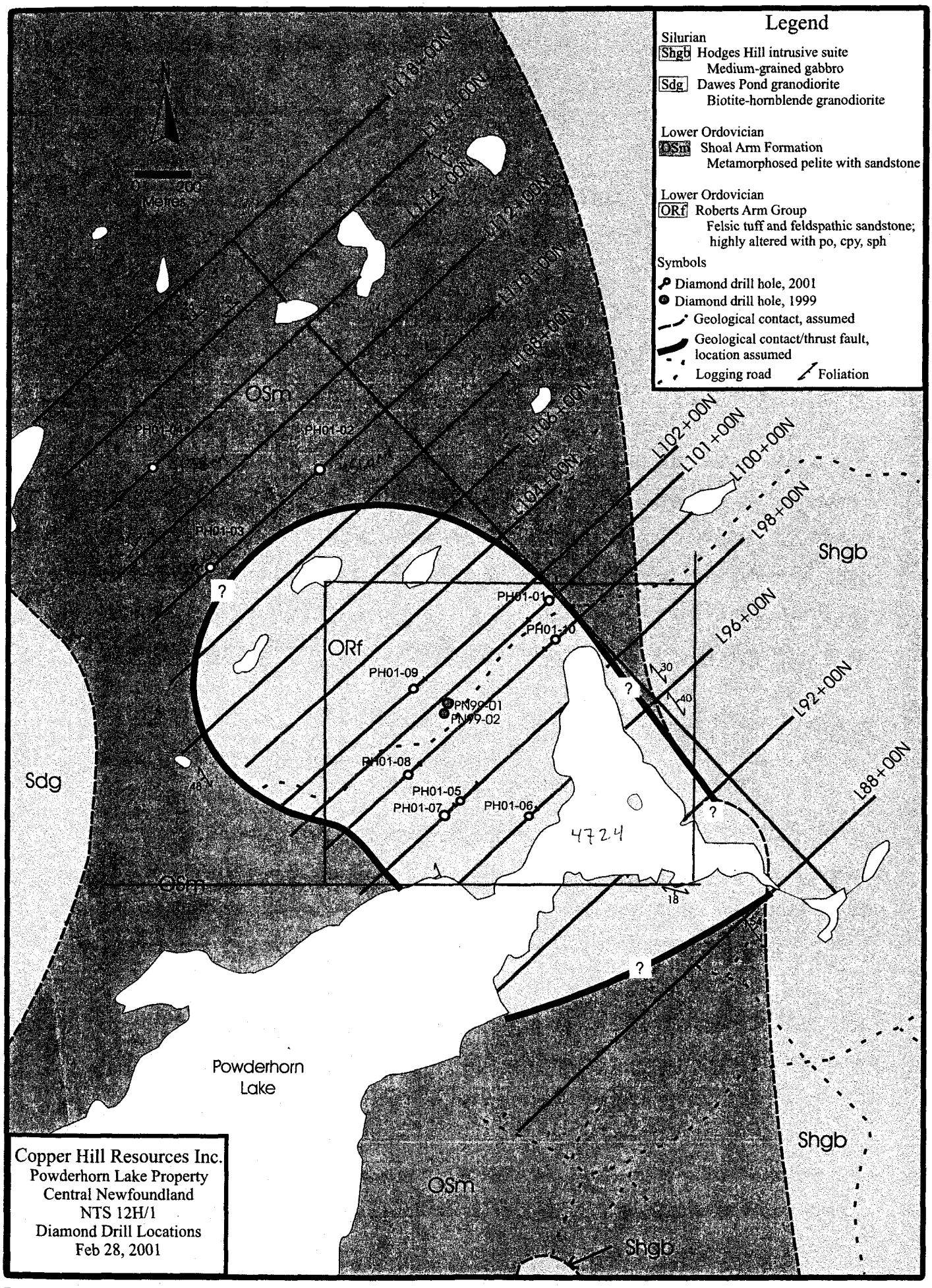

Figure 5 Geology map showing the locations of the boreholes on the Powderhorn Lake property.

north of the lake, and four soil samples were also collected away from the road (Fig. 5). The best base metal concentrations in the soil samples (Appendix II) were 121 ppm Zn and 146 ppm Cu in sample 1901. In the grab samples, sample 2702 had 0.76% Zn, 2703 contained 1.18% Cu and 37 oz/t Ag, in sample 2705 there was 1.94% Cu, 0.31% Zn and 0.52 oz/t Ag. Chip samples 2708 and 2711 contained 9.20% and 0.35% Zn, respectively.

Property examinations

A group of directors from ***Copper Hill*** visited the property in June, 1999, including Dr. Frank Puskas, Dr. Paris Georghiou, John Hansuld. They were accompanied by consultants Wilson Jacobs, P. Geo., and Dr. Derek Wilton, P. Geo..

In June, 1999, Falconbridge Ltd. personnel collected 11 whole rock samples from the property in the vicinity of the Dead Tree Zone and Main-Road Showings for geochemical analyses (Appendix III). Ten of these samples were of drill core from the 1997/1998 CSE program on the Ni showings. The best assay in this group was 6234 ppm Ni and 2436 ppm Cu (hole PH97-03, 4-4.3 m). The other sample was of quartz-rich sedimentary rock with 50% sphalerite from the "north part of the property". This sample (D-71768) assayed 7672 ppm Cu and > 20, 000 ppm Zn.

Noranda Ltd. personnel examined the northern part of the property in July, 1999, and collected seven whole rock samples (Appendix IV) from the Pearl Zone. The best assays were from samples 121577 and 121579 which contained 1.58% Cu- 5.27% Zn, and 1.08% Cu - 3.36% Zn, respectively.

In October, 1999, Jan Akkerman of QNI Exploration and Development Ltd. examined documents and visited the property between October 1 to 5, 1999. During his property visit he collected three whole rock samples for assay (Appendix V). One sample from the Main Showing yielded an assay of 4560 ppm Ni and 0.37% Cu; two samples from boulders in the Pearl Zone contained 7.1 g/t Ag, 0.57% Cu and 2.75% Zn (PL1) and 0.7g/t Ag, 0.03% Cu and 0.01% Zn (PL2). Akkerman's main conclusion was that the VMS style of mineralization at the Pearl Zone was of more interest to QNI-Billiton than the Ni sulphides at the Main Showing. He passed this information unto the Billiton office in Grand Falls-Windsor, who subsequently entered into

negotiations with ***Copper Hill*** for a joint-venture.

Drilling Program

Following the signing of the agreement with the prospectors/vendors, ***Copper Hill*** contracted Aurora Drilling of Springdale, Newfoundland, to drill two holes in the Pearl Zone (Fig. 5). From October 15-20, 1999 holes PN99-01 and PN99-02 were drilled just to the south of the woods road that cuts the Pearl Zone. Hole PN99-01 was drilled to a depth of 36 m at an angle of 90°, and hole PN99-02 was completed to a depth of 58.52 m, also at a vertical angle.

The holes were logged on site by Wilson Jacobs and re-logged in more detail by Frank Puskas from December 21-22, 1999. Both sets of logs are attached as Appendix VI. According to Jacobs' logs, the predominant lithology in both holes is felsic volcanic/rhyolite with quartz phenocrysts, there were also minor mafic dykes and mafic volcanics(?). The best mineralization is in hole PN99-01 where there are bands of semi-massive to massive pyrrhotite-pyrite-sphalerite±chalcopyrite up to 10-20 cm thick; silicification and "bleaching" of the host rocks are associated with the sulphide bands. In hole PN99-02, Jacobs described the mineralization as more disseminated with fewer semi-massive to massive sulphide bands.

Puskas' logs provide much more detail on the lithologies and their textures in drill core. He also noted "skarn" like alteration assemblages; Jacobs reported some secondary garnet alteration in the core. Puskas also wrote a synthesis of his logging, dated December 29, 1999 (Appendix VII). In his synopsis, Puskas describes the host rocks to the sulphide mineralization as being finely laminated on a mm to cm scale.

A total of 49 core samples were assayed, 24 from hole PN99-01 and 25 from hole PN99-02 (Appendix VIII). The best interval was from 34.5 to 44.15 m in hole PN99-01, over this 9.65 m each of the eight samples (12 to 19) contained > 0.34% Zn and > 374 ppm Cu; the best section was 42-43 m (sample 17) which contained 7.4% Zn and 1933 ppm Cu. The best interval in hole PN99-02 was 0.41% Zn and 722 ppm Cu from 29-29.5 m.

III. CONCLUSIONS AND RECOMMENDATIONS

Jacobs (1999) suggested that were two intrusive-related, but distinctly different, mineralizing systems related to the emplacement into metasedimentary rocks of the Twin Lakes

Complex and the Dawes Pond Granite. The mineralizing systems are: Type 1 an orthomagmatic system in which Cu and Ni sulphides precipitated from a mafic magma upon its assimilation of silica- and sulfur-rich paragneisses, and Type 2 pneumatolytic/metasomatic alteration and mineralization related to a volatile, metal-rich, fluid/gas phase exsolved from a hydrous granite source. Jacobs (*op cit.*) suggests that these environments were juxtaposed together, in a proximal to overlapping fashion, in the area of Powder Horn Lake.

Wilton (1999) agreed that there are two different styles of mineralization present on the Powderhorn Lake Property, but disagreed with Jacobs' (1999) designation of Type 2. Wilton (*op cit.*) suggested that the Zn-rich mineralization along the shoreline and north of Powderhorn Lake represented a primary syngenetic, presumably exhalative, style of mineralization. Undoubtably the Dawes Pond Granite hornfelsed the host rocks and mineralization at Powderhorn Lake, but at most caused some slight remobilization. The exploration target, therefore, should be an exhalative horizon, rather than the thermal aureole of the granite.

As for Type 1, Wilton (1999) suggested that the discovery of apparently syngenetic nickeliferous sulphides associated with mafic intrusive rocks that intrude sulphide-rich metasedimentary/paragneissic schists at Powderhorn Lake suggest a new metallogenic possibility for the Powderhorn Lake Property.

To form orthomagmatic nickel sulphide deposits (*eg.* Naldrett, 1997) the key features needed are a mafic-ultramafic magma and some mechanism to induce sulphur saturation within the magma, prior to removal of Ni through the precipitation of olivine. There are two commonly perceived methods (*op cit.*) to induce sulphur saturation, *viz.*; assimilation of either (1) sulphur, or (2) silica, from country rock. The recognition of the Powderhorn Lake Group as a sequence of sulphide-bearing silicious metasedimentary rocks provides a reasonable contaminant for a mafic magma, and obviously the TLIC provide a potential magmatic source for Ni.

Nickel-bearing sulphide deposits associated with mafic intrusive suites and sills are known from elsewhere in the Appalachian - Caledonide Orogenic belt. These include the Moxie pluton and Katahdin gabbro in Maine (Thompson and Naldrett, 1985), the Mechanic intrusion of New Brunswick (Paktunc, 1989), and the Bruvann deposit of Norway (Boyd *et al.*, 1987). Hence there is no metallogenic reason that the Powderhorn Lake Property (Jacobs, 1998) is not similar to these other Paleozoic intrusive suites.

There are two exploration targets on the Powderhorn Property: (1) nickeliferous sulphides hosted by mafic intrusives, and (2) base metal sulphides hosted by metasedimentary rocks. In Type 1, economically exploitable reserves would be expected at some point in the intrusive architecture of the host gabbro where they (i) are in contact with and assimilated sulphide-bearing country rock, and (ii) the resultant immiscible sulphide liquids could be collected together in a trap. At present even the detailed contact relationships of the gabbro are so poorly documented, that it can not be definitively stated as to whether it is a sill or dyke, whether it contains olivine, and how many different phases constitute the intrusive suite.

For Type 2, economically exploitable reserves would occur where there is sufficiently thick and laterally extensive mineralization to form a massive to semi-massive horizon. This type should be considered the most significant target on the property as: (1) the geological sampling and diamond drilling in the Pearl Zone have defined some very significant concentrations of Cu, Zn (and potentially Ag), and (2) Dickson's (2000) definition of the host rocks on the property as mainly felsic volcanic rocks of the Roberts Arm Group indicates that metallogenetically, the rocks are part of the Buchans -Roberts Arm Belt from there has been very significant base metal production, most especially the Buchans deposits (*eg.*, Swinden,1991).

As an exploration program it is suggested that detailed map compilations of all available the data be completed. A grid should be laid over the Pearl Zone from which geological mapping, soil sampling and ground geophysics should be conducted with follow-up diamond drilling as suggested by the results. Further work could also include petrographic and geochemical examination of rocks and core samples for sulphide-silicate relationships, sulphide mineralogies, and alteration systematics.

Taking into account all available the data, it would appear that the Powderhorn Lake Property, and in particular the Pearl Zone, have considerable potential to host economically interesting base metal sulphide concentrations in volcanogenic massive sulphide-style occurrences.

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Appendix I: Statement of Expenses (data as provided by Copper Hill Resources Inc.)

Item **Powderhorn Lake Properties- Exploration Expenditures**

			Total Expend. Issue date:	4724 9 Claims 1995.09.18	4559M 8 Claims 1995.11.06	4560M 6 Claims 1995.11.06	4643M 4 Claims 1995.11.06	5400M 25 Claims 1997.02.06	5138M 25 Claims 1996.10.25	5139M 4 Claims 1996.10.25	5144M 1 Claims 1996.11.01	5644M 1 Claim 1997.07.31	5854M 30 Claims 1997.12.08
					4th Year Expenditures				*3rd Year Expenditures*			*2nd Year Expenditures*	
1	G. Giovanezzo: field trip- Falconbridge Ltd.: 2 days: June 1999	Incurred during a site visit (reported) to evaluate all claims.	$4,400.00	$350.44	$311.50	$233.63	$155.75	$973.45	$973.45	$155.75	$38.94	$38.94	$1,168.14
2	Assays on Powderhorn Lake samples: Intertek Testing Services	Results for samples collected on claims#4724; 4559M and 5138I	$495.00	$106.07	$94.29	-	-	-	$294.64	-	-	-	-
3	G. Woods: field trip- Noranda: 2 days: July, 1999	Incurred during a site visit (reported) to evaluate all claims.	$4,400.00	$990.00	-	$660.00	-	-	$2,750.00	-	-	-	-
4	Assys on Powderhorn Lake samples: XRAL Laboratories	Results for samples collected on claims#4724 and 4560M	$562.12	$337.27	-	$224.85	-	-	$0.00	-	-	-	-
5	J. Hansuld, Ph.D.: field trip travel+expenses: 3 days: June, 1999	Incurred during a site visit (reported) to evaluate all claims.	$2,705.89	$215.51	$191.57	$143.68	$95.78	$598.65	$598.65	$95.78	$23.95	$23.95	$718.38
6	F. Puskas: field trip travel+expenses: 3 days:June 1999	Incurred during a site visit (reported) to evaluate all claims.	$3,089.24	$246.05	$218.71	$164.03	$109.35	$683.46	$683.46	$109.35	$27.34	$27.34	$820.15
7	F. Puskas: core log. and consult: 6 days(travel+expenses) Dec., 19	Consulting: core re-logging and data evaluation.	$4,552.48	$4,552.48	-	-	-	-	-	-	-	-	-
8	P. Georghiou, Ph.D.: field trip:	Incurred during a site visit (reported) to evaluate all claims.	$1,351.47	$107.64	$95.68	$71.76	$47.84	$299.00	$299.00	$47.84	$11.96	$11.96	$358.80
9	P. Georghiou, Ph.D.: field trip:	3 days (@$350)+ shared travel exp. W.J. & J. A.: Oct 2-4, 1999	$1,238.74	$484.72	$430.87	$323.15	-	-	-	-	-	-	-
10	P. Georghiou, Ph.D.: field trip:	3 days: Oct 15-19, 1999	$1,638.10	$640.99	$569.77	$427.33	-	-	-	-	-	-	-
11	W. Jacobs: field trip: 3 days, June, 1999	Incurred during a site visit (reported) to evaluate all claims.	$1,201.47	$95.69	$85.06	$63.79	$42.53	$265.81	$265.81	$42.53	$10.63	$10.63	$318.97
12	W. Jacobs: field trip: 3 days, Oct 2-4, 1999	3 days (@$350)+ shared travel exp. W.J. & J. A.: Oct 2-4, 1999	$1,776.84	$695.28	$618.03	$463.52	-	-	-	-	-	-	-
13	W. Jacobs: drilling supervision: 8 days: Oct 15-22, 1999	3 days: Oct 15-19, 1999	$3,542.79	$3,542.79	-	-	-	-	-	-	-	-	-
14	W. Jacobs: consulting; drill core logging: 10 days Nov. 1999-June 2	Drill core logging: 10 days Nov. 1999-June 2000:	$3,000.00	$3,000.00	-	-	-	-	-	-	-	-	-
15	J. Akkerman: field trip QNI/Billiton Oct2-4,1999	Site explor. (reported) to evaluate claims for QNI: with P.G.; W.J.	$5,981.00	$476.36	$423.43	$317.58	$211.72	$1,323.23	$1,323.23	$211.72	$52.93	$52.93	$1,587.88
16	R. Burton: drilling supervision & logistical support: 8 days: Oct-Dec, 1999		$1,500.00	$1,500.00	-	-	-	-	-	-	-	-	-
17	D. Wilton: field trip travel+shared travel expenses: 3 days:June 199	Advance pymts. made as per contract: vist to evalaute all claims	$2,175.00	$173.23	$153.98	$115.49	$76.99	$481.19	$481.19	$76.99	$19.25	$19.25	$577.43
18	D. Wilton: consulting: 3 days, June-Sept 1999	Advance payments made as per contract	$2,342.81	$916.75	$814.89	$611.17	-	-	-	-	-	-	-
19	J. Kennedy: 30 days prospecting Jul 1999-July 2000		$5,550.00	$442.04	$392.92	$294.69	$196.46	$1,227.88	$1,227.88	$196.46	$49.12	$49.12	$1,473.45
20	W. Mercer: 30 days prospecting July 1999- July 2000		$5,550.00	$442.04	$392.92	$294.69	$196.46	$1,227.88	$1,227.88	$196.46	$49.12	$49.12	$1,473.45
21	Aurora Drilling: October 15-22, 1999		$9,010.81	$9,010.81	-	-	-	-	-	-	-	-	-
22	Eastern Analytical : Analyses of drill core samples+ shipping cost (DRL)		$1,376.10	$1,376.10	-	-	-	-	-	-	-	-	-
23	Chemex labs: drill core analyses		$128.08	$128.08	-	-	-	-	-	-	-	-	-
24	R. Soper: Core spliiting		$325.00	$325.00	-	-	-	-	-	-	-	-	-
	Sub-Total		$67,892.92	$30,155.35	$4,793.62	$4,409.35	$1,132.89	$7,080.54	$10,125.19	$1,132.89	$283.22	$283.22	$8,496.65
	Overheads on Sub-Total @ 15%:		$10,183.94	$4,523.30	$719.04	$661.40	$169.93	$1,062.08	$1,518.78	$169.93	$42.48	$42.48	$1,274.50
	Total allowable exploration expenses:		**$78,076.86**	**$34,678.66**	**$5,512.66**	**$5,070.75**	**$1,302.82**	**$8,142.63**	**$11,643.96**	**$1,302.82**	**$325.71**	**$325.71**	**$9,771.15**

Appendix II: Geochemical data from prospector/vendor group

ICP Geochemistry Certificate

Client: Jacob Kennedy
Geologist:
Project:
Sample: Rocks/Soils

DskFile: 119-8759

DateIn: June 27, 1999
DateOut: June 29, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale,
Newfoundland.

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by:_____
G. Smith
(Concentrations in assay range may cause interferences in associated elements.)

ICP Geochemistry Certificate

Client: Jacob Kennedy
Geologist:
Project:
Sample: Rocks/Soils

DskFile: 119-8759

DateIn: June 27, 1999
DateOut: June 29, 1999

Eastern Analytical Limited
P.O. Box 187,
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Phone: 709-673-3909
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Email: eanalytical@thezone.net

Signed by:_____
G. Smith
(Concentrations in assay range may cause interferences in associated elements.)

Sample Number	Ce ppm	Sr ppm	Ba ppm	Fe %	P %	Hg ppm	Mg %	As ppm	V ppm	Na %	Mo ppm	Al %	Be ppm	Ca %	Zn ppm	Cu ppm	Sb ppm	Ag ppm	Pb ppm	Bi ppm	Ti %	Cd ppm	Co ppm	Ni ppm	W ppm	La ppm	K %	Mn ppm	Rb ppm	Cr ppm
LD-01	17	61	52	0.80	>1.10	1	0.02	14	2	0.13	1	0.21	0.5	1.46	12	13	5	0.6	45	2	0.01	0.5	4	12	10	10	0.01	6312	20	188
2701	10	2	14	7.81	0.01	1	0.26	7	1	0.15	20	0.43	0.5	0.01	434	5142	5	5.0	22	9	0.01	0.5	2	2	10	10	0.10	194	20	202
2702	10	2	17	5.71	0.02	1	0.74	7	2	0.13	9	0.93	0.5	0.03	>2200	2992	7	3.8	17	4	0.01	35.0	6	1	10	10	0.10	456	20	106
2703	10	2	19	9.52	0.04	1	0.42	5	3	0.29	11	0.72	0.5	0.01	1080	>10000	5	>6.0	8	12	0.01	10.9	1	3	10	10	0.11	281	20	271
2704	10	2	15	5.79	0.02	1	0.11	8	3	0.45	>220	0.58	0.5	0.01	>2200	7748	26	>6.0	364	16	0.01	>110.0	6	5	10	10	0.05	196	20	183
2705	10	1	10	4.84	0.01	1	0.17	5	1	0.31	10	0.34	0.5	0.01	>2200	>10000	6	>6.0	8	15	0.01	20.3	2	5	10	10	0.06	152	20	295
2706	10	1	14	4.60	0.01	1	0.12	5	1	0.13	68	0.31	0.5	0.01	998	2667	5	1.9	28	4	0.01	0.5	2	3	10	10	0.08	160	20	148
2707	10	2	21	6.01	0.02	3	0.92	5	10	0.13	20	0.94	0.5	0.01	>2200	7442	18	>6.0	29	12	0.01	97.3	2	1	10	10	0.17	353	20	154
2708	10	1	10	9.33	0.01	>22	0.10	17	1	0.17	123	0.24	0.5	0.01	>2200	1123	46	4.1	17	32	0.01	>110.0	10	186	10	10	0.07	344	20	186
2709	10	5	31	4.91	0.02	1	0.71	5	2	0.13	23	0.99	0.5	0.09	857	265	5	1.2	10	3	0.01	3.9	2	10	10	10	0.29	310	20	176
2710	10	4	26	5.51	0.02	1	0.34	5	7	0.15	13	0.73	0.5	0.14	1625	2314	5	3.6	44	5	0.02	11.5	5	3	10	10	0.22	175	20	124
2711	10	3	36	5.03	0.02	1	0.61	101	17	0.16	19	0.78	0.5	0.07	>2200	2014	5	2.3	27	4	0.01	18.1	4	5	10	10	0.26	167	20	179
1899	24	2	22	2.08	0.07	1	0.19	14	45	0.01	1	3.41	0.6	0.02	68	24	5	0.2	7	2	0.11	0.5	5	6	10	10	0.01	135	20	27
1900	18	2	17	2.17	0.08	11	0.23	13	50	0.01	1	2.99	0.5	0.02	52	26	5	0.5	5	2	0.12	0.5	4	4	10	10	0.02	110	20	17
1901	10	2	13	3.49	0.09	1	0.17	15	48	0.01	7	3.49	0.5	0.02	121	146	5	1.6	18	2	0.10	0.5	3	1	10	10	0.01	98	20	22
1902	10	1	10	3.70	0.08	1	0.09	12	69	0.01	3	2.67	0.5	0.01	49	84	5	1.9	9	2	0.12	0.5	2	1	10	10	0.01	42	20	18

Assay Certificate

Client: Jacob Kennedy
Geologist:
Project:
Sample: Rocks

DskFile: 119-8765

DateIn: June 27, 1999
DateOut: June 29, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale, Nfld
A0J 1T0

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by:_____
Graham Smith

SAMPLE NUMBER	Cu %	Zn %	Ag oz/T

Assay Certificate

Client: Jacob Kennedy
Geologist:
Project:
Sample: Rocks

DskFile: 119-8765

DateIn: June 27, 1999
DateOut: June 29, 1999

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A0J 1T0

Phone: 709-673-3909
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Email: eanalytical@thezone.net

Signed by:_____
Graham Smith

SAMPLE NUMBER	Cu %	Zn %	Ag oz/T
2702	----	0.76	----
2703	1.18	----	0.37
2704	----	3.20	0.31
2705	1.94	0.31	0.52
2707	----	1.35	0.25
2708	----	9.20	----
2711	----	0.33	----

Appendix III: Geochemical data from Falconbridge Property visit

[redacted]

Data reported in Report

FALCONBRIDGE

Memorandum

Date:	**09/10/99**
To:	**Paris Georghiou, Copper Hill Resources**
Copies to:	**C.S. Bruce, File**
From:	**D. Giovenazzo**
Subject:	**Powderhorn samples.**

These are the description of the core samples taken from drill holes of the Powderhorn property. The half core samples were sent today. They should be arriving to your office on Monday.

D-71760 – PH98-01, 23.9m to 24.2m. Gabbro, medium grained, sub-ophitic to diabasic texture, 2 pyroxenes? 20% Opx, tr-1% Pyrite disseminations, 40% Plag laths, not magnetic

D-71761 – PH98-01, 42.82m to 43.15m. Melano-gabbro fine to medium grained, <15 % Plag. Contains sediment xenoliths, one of them is a layered sediment with Po. Contains 10-15% Po, tr. Cp disseminated and in stringers. Very magnetic

D-71762 – PH98-01, 43.65m to 48.9m. Gabbro, fine grained, contains 30% of mafic volcanics and sedimentary xenoliths <2cm. Magnetic. Contains 2-3% finely disseminated Po and in stringers with tr. Cp.

D-71763 – PH-97-02, 11.10m to 11.45m. Mesogabbro- norite, 25-30% Plagioclase, ophitic texture. Not magnetic. Tr to 1% disseminated Pyrite

D-71764 – PH 98-03, 48.16m to 48.32m. Melanogabbro fine grained. Contains 2% felsic fragments <0.5cm. Very magnetic with traces of Pyrite.

D-71765 – PH 98-05, 15m to 15.20m. Leucogabbro with about 55-60% large Plagioclase crystals and interstitial quartz (<5%) and biotite (<3%). Very magnetic with 4-5% disseminated Po and traces of Cp.

D-71766 – PH 98-05, 46m to 46.16m. Gabbro norite with diabasic texture (dyke), 35% Plagioclase laths. Fine to medium grained. Magnetic with traces of Py and Po.

D-71758 – PH 97-01, 21.8m to 22.1m. Leucogabbro ? Medium grained with 70% plagioclase and <10% interstitial quartz with 5% Biotite. Not magnetic with 2-3% disseminated Po and traces of Cp.

D-71759 – PH 97-03, 4.0m to 4.2m (half core). Melanogabbro, amphibolitized? Fine grained, Contains 25-35% Po in interstitial position to the silicates and traces of Cp in stringers, some secondary Pyrite. Magnetic.

FALCONBRIDGE

Samples taken from the Powderhorn Property, Newfoundland in June 1999

Sample#	Zone	UTME	UTMN	Trench#	DDH	From	to	Rock type	Mineralization	Source
D-71758	21	565309	5438976		PH97-01	15.0	15.2	Magnetic gabbro	1-3% Po diss, tr. Cp	FL, June 1999
D-71760	21	565730	5438739		PH98-01	23.9	24.2	Gabbro		FL, June 1999
D-71761	21	565730	5438739		PH98-01	42.8	43.2	Melanogabbro		FL, June 1999
D-71762	21	565730	5438739		PH98-01	48.7	48.9	Melanogabbro		FL, June 1999
D-71763	21	565750	5438720		PH97-02	11.1	11.5	Mesogabbro		FL, June 1999
D-71764	21	565588	5439105		PH98-03	48.2	48.3	Melanogabbro		FL, June 1999
D-71765	21	565335	5438955		PH98-05	15.0	15.2	Granodiorite	4-5% Po diss, tr. Cp	FL, June 1999
D-71766	21	565335	5438955		PH98-05	46.0	46.2	Melanogabbro dyke	tr. Py+Po	FL, June 1999
D-71767	21	565246	5439027					Mesogabbro	Blebs, 2% Po	FL, June 1999
D-71768	21			North part of property				Qtz-rich sediment	50% black sphalerite, 1% Cp	FL, June 1999
D-71759	21	565750	5438720		PH97-03	4.0	4.3	Melanogabbro	NT, 30-35% Po, tr. Cp	FL, June 1999

Intertek Testing Services
Chimitec Bondar Clegg

Certificat D'Analyse
Assay Lab Report

RAPPORT: C99-61369.0 (COMPLET) RÉFÉRENCE: PN202

CLIENT: FALCONBRIDGE LTD. SOUMIS PAR: D. GIOVENAZZO

PROJET: PN202 DATE RECU: 21-JUN-99 DATE DE L'IMPRESSION: 23-JUL-99

DATE APPROUVÉ	COMMANDE	ÉLÉMENT		NOMBRE D'ANALYSES	LIMITE INFÉRIEURE DE DETECTION	EXTRACTION	MÉTHODE
990701	1	Ni	Nickel	9	1 PPM	HF-HNO3-HCLO4-HCL	ABSORPTION ATOMIQUE
990701	2	Cu	Cuivre	9	1 PPM	HF-HNO3-HCLO4-HCL	ABSORPTION ATOMIQUE
990701	3	Co	Cobalt	9	3 PPM	HF-HNO3-HCLO4-HCL	ABSORPTION ATOMIQUE
990701	4	Au	Or - Pyro Analyse	9	1 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990701	5	Pt	Platine	9	5 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990701	6	Pd	Palladium	9	1 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990701	7	S Tot	Soufre (Total)	9	0.02 PCT		LECO

TYPES D'ÉCHANTILLONS	NOMBRE	FRACTION UTILISÉE	NOMBRE	PREP. DE L'ÉCHAN.	NOMBRE
CAROTTE DE FORAGE	9	-150	9	CONCASSER, PULVERISE	9
				SCIER CAROTTE	9

COPIES DU RAPPORT À: MME D. GIOVENAZZO FACTURE À: MME D. GIOVENAZZO

ITS - Chimitec - Bondar Clegg
1322-B rue Harricana, Val d'Or, Québec, J9P 3X6
Tél: (819) 825-0178, Fax: (819) 825-0256

JP

Intertek Testing Services
Chimitec Bondar Clegg

Certificat D'Analyse
Assay Lab Report

CLIENT : FALCONBRIDGE LTD.
RAPPORT: C99-61369.0 (COMPLET)
PROJET: Pm202
DATE RECU: 21-JUN-99
DATE DE L'IMPRESSION: 23-JUL-99

NUMÉRO DE L'ÉCHANTILLON	ÉLÉMENT UNITÉS	Ni PPM	Cu PPM	Co PPM	Au PPB	Pt PPB	Pd PPB	S Tot PCT
D-71758		32	109	46	17	<5	<1	2.56
D-71759		4234	2436	476	11	<5	6	16.01
D-71760		91	50	48	<1	<5	<1	0.17
D-71761		75	121	56	10	<5	2	1.85
D-71762		59	107	28	8	<5	3	1.43
D-71763		94	53	51	28	<5	<1	0.16
D-71764		98	51	57	<1	<5	<1	0.21
D-71765		182	78	64	7	<5	<1	2.09
D-71766		123	51	48	6	<5	<1	0.23

ITS - Chimitec - Bondar Clegg
1322-B rue Harricana, Val d'Or, Québec, J9P 3X6
Tél: (819) 825-0178, Fax: (819) 825-0256

Intertek Testing Services
Chimitec — Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

RAPPORT: G99-61370.0 (COMPLET) RÉFÉRENCE:

CLIENT: FALCONBRIDGE LTD. SOUMIS PAR: D. BIOVENAZZO

PROJET: PN202 DATE REÇU: 21-JUN-99 DATE DE L'IMPRESSION: 7-JUL-99

DATE APPROUVÉ	COMMANDE	ÉLÉMENT	NOMBRE D'ANALYSES	LIMITE INFÉRIEURE DE DÉTECTION	EXTRACTION	MÉTHODE
990706	1 Au	Or - Pyro Analyse	1	1 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990706	2 Pt	Platine	1	5 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990706	3 Pd	Palladium	1	1 PPB	PYRO ANALYSE	PYROANALYSE-DCP
990706	4 Ag	Argent	1	0.5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	5 Al	Aluminum	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	6 As	Arsenic	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	7 Ba	Barium	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	8 Bi	Bismuth	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	9 Ca	Calcium	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	10 Cd	Cadmium	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	11 Co	Cobalt	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	12 Cr	Chrome	1	2 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	13 Cu	Cuivre	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	14 Fe Tot	Fer Total	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	15 Ga	Gallium	1	10 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	16 K	Potassium	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	17 La	Lanthane	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	18 Li	Lithium	1	2 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	19 Mg	Magnesium	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	20 Mn	Manganese	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	21 Mo	Molybdene	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	22 Na	Sodium	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	23 Nb	Niobium	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	24 Ni	Nickel	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	25 Pb	Plomb	1	2 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	26 Sb	Antimoine	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	27 Sc	Scandium	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	28 Sn	Etain	1	20 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	29 Sr	Strontium	1	1 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	30 Ta	Tantale	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	31 Te	Tellure	1	25 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	32 Ti	Titane	1	0.01 PCT	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	33 V	Vanadium	1	2 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	34 W	Tungstene	1	20 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	35 Y	Yttrium	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA
990706	36 Zn	Zinc	1	2 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASMA

DATE APPROUVÉ	COMMANDE	ÉLÉMENT	NOMBRE D'ANALYSES	LIMITE INFÉRIEURE DE DÉTECTION	EXTRACTION	MÉTHODE
990706	37 ZnOL	Zinc, soluble	1	0.1 PCT	HF-HNO3-HCLO4-HCL	ABSORPTION ATOMIQU
990706	38 Zr	Zirconium	1	5 PPM	HF-HNO3-HCLO4-HCL	INDUC. COUP. PLASM
990706	39 S Tot	Soufre (total)	1	0.02 PCT		LECO
990706	40 Hg	Mercure	1	0.010 PPM	HCL:HNO3 (3:1)	ABSORPTION ATOMIQU
990706	41 Zn	Zinc	1	0.01 PCT	HF-HNO3-HCLO4-HCL	ABSORPTION ATOMIQU

TYPES D'ÉCHANTILLONS	NOMBRE	FRACTION UTILISÉE	NOMBRE	PRÉP. DE L'ÉCHAN.	NOMBR
CAROTTE DE FORAGE	1	-150	1	CONCASSER, PULVERISE	2

REMARQUES: UNE CONCENTRATION >1% EN ZINC INTERFERE SUR LE TUNGSTENE.

COPIES DU RAPPORT À: MME D. BIOVENAZZO FACTURE À: MME D. BIOVENAZZO

Intertek Testing Services
Chimitec — Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

CLIENT : FALCONBRIDGE LTD.
RAPPORT: C99-61370.0 (COMPLET)

PROJET: PH262
DATE REÇU : 21-JUN-99 DATE DE L'IMPRESSION: 7-JUL-99 PAGE 1A(1/ 6)

NUMERO DE L'ÉCHANTILLON	ÉLÉMENT UNITÉS	Au PPB	Pt PPB	Pd PPB	Ag PPM	Al PCT	As PPM	Ba PPM	Bi PPM	Ca PCT	Cd PPM	Co PPM	Cr PPM	Cu PPM	Fe PCT	Ga PPM	K PCT	La PPM	Li PPM	Mg PCT	Mn PPM	Mo PPM	Na PCT	Nb PPM	Ni PPM	Pb PPM	Rb PPM	Sc PPM	Sn PPM	Sr PPM	Ta PPM	Te PPM	Ti PCT	V PPM	W PPM	Y PPM	Zn PPM	ZrOL PCT	Zr PPM
D-71768		265	<5	2	0.4	3.51	11	180	<5	0.10	346	10	173	7672	>10.00	16	0.56	<5	5	0.11	510	33	0.48	<5	31	65	38	<5	<20	25	<5	47	0.05	12	302	6	>20000	4.5	31

Intertek Testing Services
Chimitec Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

RAPPORT: G99-61467.1 (COMPLET)

RÉFÉRENCE: PH202

CLIENT: FALCONBRIDGE LTD.

SOUMIS PAR: D. GIOVENAZZO

PROJET: PH202

DATE REÇU: 21-JUN-99 DATE DE L'IMPRESSION: 9-JUL-99

DATE APPROUVÉ	COMMANDE	ÉLÉMENT		NOMBRE D'ANALYSES	LIMITE INFÉRIEURE DE DÉTECTION		EXTRACTION	MÉTHODE
990709	1	SiO2	Silice (SiO2)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	2	TiO2	Titane (TiO2)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	3	Al2O3	Alumine (Al2O3)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	4	Fe2O3*	Fer Total (Fe2O3)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	5	MnO	Manganese (MnO)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	6	MgO	Magnesium (MgO)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	7	CaO	Calcium (CaO)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	8	Na2O	Sodium (Na2O)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	9	P2O5	Phosphore (P2O5)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	10	Cr2O3	Oxyde de Chrome	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	11	K2O	Potassium (K2O)	1	0.01	PCT	FUSION BORATE	XRAY FLUORESCENCE
990709	12	LOI	Perte au feu	1	0.01	PCT	Perte au feu 1000 C	GRAVIMETRIE
990709	13	Total	Elements majeurs Tot	1	0.01	PCT		
990709	14	Ba	Barium	1	10	PPM	Pressed Pellet	XRAY FLUORESCENCE
990709	15	Nb	Niobium	1	2	PPM	Pressed Pellet	XRAY FLUORESCENCE
990709	16	Rb	Rubidium	1	2	PPM	Pressed Pellet	XRAY FLUORESCENCE
990709	17	Sr	Strontium	1	1	PPM	Pressed Pellet	XRAY FLUORESCENCE
990709	18	Y	Yttrium	1	1	PPM	Pressed Pellet	XRAY FLUORESCENCE
990709	19	Zr	Zirconium	1	1	PPM	Pressed Pellet	XRAY FLUORESCENCE

TYPES D'ÉCHANTILLONS	NOMBRE	FRACTION UTILISÉE	NOMBRE	PRÉP. DE L'ÉCHAN.	NOMBRE
CAROTTE DE FORAGE	1	-150	1	TEL QUE REÇU	1

COPIES DU RAPPORT À: MME D. GIOVENAZZO

FACTURE À: MME D. GIOVENAZZO

Intertek Testing Services
Chimitec — Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

CLIENT : FALCONBRIDGE LTD.
RAPPORT: D99-61467.1 (COMPLET)
PROJET: PH202
DATE RECU : 21-JUN-99 DATE DE L'IMPRESSION: 9-JUL-99 PAGE 1 DE 2

NUMÉRO DE L'ÉCHANTILLON	ÉLÉMENT UNITÉS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	P2O5 PCT	Cr2O3 PCT	K2O PCT	LOI PCT	Total PCT	Ba PPM	Sb PPM	Sc PPM	Sr PPM	V PPM	Zr PPM
D-71767		47.47	1.25	13.24	11.36	0.18	12.07	7.14	1.98	0.22	0.08	1.25	3.06	99.34	111	3	22	321	21	109

ITS Intertek Testing Services
Chimitec Bondar Clegg

Certificat D'Analyse
Assay Lab Report

CLIENT : FALCONBRIDGE LTD.
RAPPORT: C99-61467.0 (COMPLET)
PROJET: PN202
DATE REÇU: 21-JUN-99
DATE DE L'IMPRESSION: 6-JUL-99

NUMÉRO DE L'ÉCHANTILLON	ÉLÉMENT UNITÉS	Ni PPM	Cu PPM	Co PPM	Au PPB	Pt PPB	Pd PPB	S Tot PCT
D-71767		969	355	82	4	8	2	2.10

ITS - Chimitec - Bondar Clegg
1322-B rue Harricana, Val d'Or, Québec, J9P 3X6

Intertek Testing Services
Chimitec Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

RAPPORT: C99-61369.1 (COMPLET)

RÉFÉRENCE: -

CLIENT: FALCONBRIDGE LTD.

SOUMIS PAR: D. GIOVENAZZO

PROJET: PN202

DATE REÇU: 28-JUN-99 DATE DE L'IMPRESSION: 12-JUL-99

DATE APPROUVÉ	COMMANDE	ÉLÉMENT		NOMBRE D'ANALYSES	LIMITE INFÉRIEURE DE DETECTION	EXTRACTION	MÉTHODE
[redacted]							
990712	1	SiO2	Silica (SiO2)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	2	TiO2	Titane (TiO2)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	3	Al2O3	Alumine (Al2O3)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	4	Fe2O3*	Fer Total (Fe2O3)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	5	MnO	Manganese (MnO)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	6	MgO	Magnesium (MgO)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	7	CaO	Calcium (CaO)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	8	Na2O	Sodium (Na2O)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	9	P2O5	Phosphore (P2O5)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	10	Cr2O3	Oxyde de Chrome	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	11	K2O	Potassium (K2O)	7	0.01 PCT	FUSION BORATE	XRAY FLUORESCENCE
990712	12	LOI	Perte au feu	7	0.01 PCT	Perte au feu 1000 C	GRAVIMETRIE
990712	13	Total	Elements majeurs Tot	7	0.01 PCT		
990712	14	Ba	Barium	7	10 PPM	Pressed Pellet	XRAY FLUORESCENCE
990712	15	Nb	Niobium	7	2 PPM	Pressed Pellet	XRAY FLUORESCENCE
990712	16	Rb	Rubidium	7	2 PPM	Pressed Pellet	XRAY FLUORESCENCE
990712	17	Sr	Strontium	7	1 PPM	Pressed Pellet	XRAY FLUORESCENCE
990712	18	Y	Yttrium	7	1 PPM	Pressed Pellet	XRAY FLUORESCENCE
[redacted]	2	19	Zr	Zirconium	7	1 PPM	Pressed Pellet	XRAY FLUORESCENCE

TYPES D'ÉCHANTILLONS	NOMBRE	FRACTION UTILISÉE	NOMBRE	PRÉP. DE L'ÉCHAN.	NOMBRE
CAROTTE DE FORAGE	7	-150	7	TEL QUE REÇU	7

COPIES DU RAPPORT À: MME D. GIOVENAZZO

FACTURE À: MME D. GIOVENAZZO

Intertek Testing Services
Chimitec Bondar Clegg

Rapport Lab Geochimie
Geochemical Lab Report

CLIENT : FALCONBRIDGE LTD.
RAPPORT: C99-61369.1 (COMPLET)

PROJET: PK202
DATE RECU : 28-JUN-99 DATE DE L'IMPRESSION: 12-JUL-99 PAGE 1 DE 2

NUMÉRO DE L'ÉCHANTILLON	ÉLÉMENT UNITÉS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	P2O5 PCT	Cr2O3 PCT	K2O PCT	LOI PCT	Total PCT	Sc PPM	Rb PPM	Ba PPM	Sr PPM	Y PPM	Zr PPM
D-71758		51.46	1.39	17.41	10.55	0.15	5.79	8.38	3.21	0.29	0.08	0.92	2.46	99.83	220	3	20,312	29	116
D-71760		48.86	1.56	16.80	10.97	0.16	7.28	10.20	2.65	0.21	0.05	0.44	1.26	99.84	121	4	7,459	20	100
D-71762		59.77	0.87	17.02	8.30	0.25	2.77	1.52	1.36	0.18	0.03	4.00	3.35	99.42	833	14	171	126	36	172
D-71763		49.44	1.57	16.53	10.56	0.17	7.43	9.27	2.97	0.28	0.05	0.49	1.11	99.86	260	4	8,430	25	133
D-71764		46.99	2.33	15.87	12.62	0.19	7.65	9.22	2.67	0.36	0.04	0.69	1.43	100.04	176	7	15,333	30	160
D-71765		47.42	1.09	14.50	10.39	0.18	11.30	7.22	2.04	0.22	0.05	2.01	2.88	99.50	209	3	27,245	21	86
D-71766		48.28	2.07	15.44	11.78	0.20	7.79	8.26	2.81	0.40	0.04	0.97	1.51	99.46	211	7	21,328	32	154

Chimitec Bondar Clegg 1922-B Harricana, Val-d'Or, P.Quebec, J9P 3X6, (819) 825-0178

Appendix IV: Geochemical data from Noranda Property visit

noranda

Noranda Inc.

P.O. Box 30,
920 Bridge Street
Bathurst, New Brunswick E2A 3Z1

Tel. (506) 545-7600
Fax (506) 545-7626
Internet noranda@nbnet.nb.ca

TELECOPIER TRANSMITTAL SHEET

DELIVER TO: EARL BENSON **FAX:** 709 739 4785

SUBJECT: POWDERHORN LK. PH. 4780

FROM: GARY WOODS **DATE:** SEPT 17/99

NO. OF PAGES: 5 **(EXCLUDING COVERAGE PAGE)**

IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL BACK AS SOON AS POSSIBLE AT THE FOLLOWING NUMBERS:

TELEPHONE: (506) 545-7600 **FAX NUMBER: (506) 545-7626**

EARL - THIS IS ALL THE DATA I HAVE ON POWDERHORN LK. NO SAMPLES WERE TAKEN FROM THE Ni AREA.

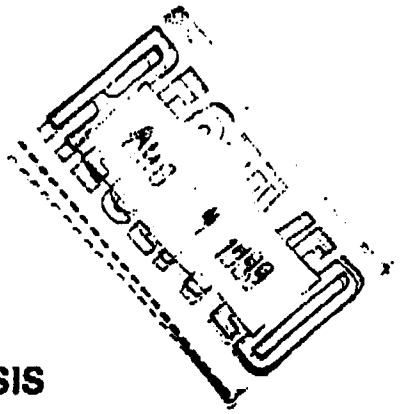
I AM INTERESTED IN THE Cu-Zn SYSTEM AT POWDERHORN BUT IT IS TOO GRASS-ROOTS FOR NORANDA AT THIS POINT. IF YOU UPGRADE THE PROPERTY I WOULD APPRECIATE BEING KEPT UP TO DATE.

GOOD LUCK WITH THE PROPERTY.

Gary

☐ FOR YOUR INFO ☐ AS REQUESTED ☐ URGENT

☐ DELIVER IMMEDIATELY ☐ YOUR COMMENTS ☐ CONFIDENTIAL



XRAL Laboratories
A Division of SGS Canada Inc.

1885 Leslie Street
Don Mills, Ontario
Canada M3B 3J4
Telephone (416) 445-5755
Fax (416) 445-4152

CERTIFICATE OF ANALYSIS

Work Order: 055822

To: **Noranda Exploration Company Ltd.**
Attn: Gary Woods
920 Bridge Street
P.O. Box 30
BATHURST
NEW BRUNSWICK, CANADA E2A 3Z1

Date : 29/07/99

Copy 1 to :

Copy 2 to :

P.O. No.	:	
Project No.	:	CENEX-1200
No. of Samples	:	7 Rock
Date Submitted	:	08/07/99
Report Comprises	:	Cover Sheet plus Pages 1 to 1

Distribution of unused material:
Pulps: To be discarded after 90 days of reporting
Rejects: To be discarded after 30 days of reporting

Certified By :

Dr. Hugh de Souza, General Manager
XRAL Laboratories

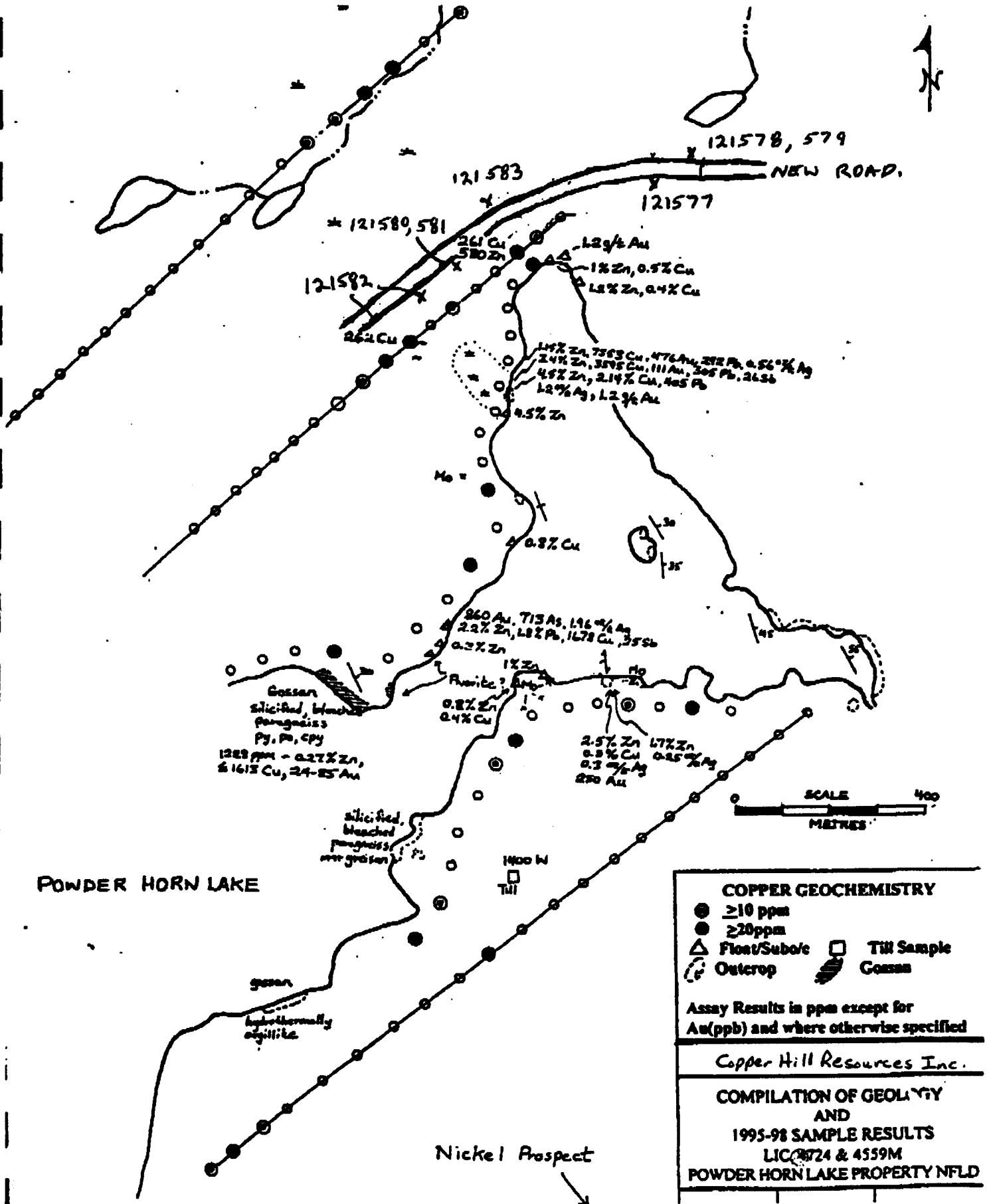
ISO 9002 REGISTERED

Report Footer:
L.N.R. = Listed not received
n.a. = Not applicable
*INF = Composition of this sample makes detection impossible by this method
I.S. = Insufficient Sample
-- = No result
M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

XRAL Laboratories
A Division of SGS Canada Inc.

Work Order: 055822 **Date:** 29/07/99 **FINAL**

Element.	Au	Cu	Pb	Zn	Mo	Sn	Ag	W
Method.	FA301	ICAY50	ICAY50	ICAY50	ICAY50	ICAY50	AA73	ICAY50
Det.Lim.	1	0.01	0.01	0.01	50	0.01	0.3	0.01
Units.	ppb	%	%	%	ppm	%	g/mt	%
121577	52	0.07	0.03	5.27	94	0.02	2.6	<0.01
121578	479	1.58	<0.01	0.05	<50	0.01	7.8	<0.01
121579	960	1.08	0.14	3.36	57	0.01	39.0	<0.01
121580	46	0.45	<0.01	0.27	100	0.02	4.7	<0.01
121581	361	0.24	0.01	4.22	<50	0.02	7.7	<0.01
121582	8	<0.01	<0.01	<0.01	<50	0.02	<0.3	<0.01
121583	1160	1.18	<0.01	0.66	<50	0.02	11.8	<0.01
*Dup 121577	57	0.06	0.03	5.21	92	0.02	2.8	<0.01



COPPER GEOCHEMISTRY

- ≥10 ppm
- ≥20ppm
- Float/Subc/c
- Till Sample
- Outcrop
- Gossan

Assay Results in ppm except for Au(ppb) and where otherwise specified

Copper Hill Resources Inc.

COMPILATION OF GEOLOGY AND 1995-98 SAMPLE RESULTS LIC 3724 & 4559M POWDER HORN LAKE PROPERTY NFLD

POWDERHORN LAKE
PROPERTY VISIT

STOP 1: ROUGHLY 25M NORTH OF ROAD – QTZ – BIOT SCH TO QTZITIC / SILICIFIED ROCK WITH BANDS, STREAKS AND DISSEMINATIONS OF CPY +/- SPHAL
SAMPLE 121578,9

STOP 2: ON SOUTH SIDE OF ROAD ACROSS FROM STOP 1 – WHITE TO GY QUARTZITIC ROCK WITH 5% BIOT, 2-3% CPY AND TR PY
SAMPLE 121577

STOP 6: >1M BOULDER ON SOUTH SIDE OFF ROAD - 1-2 CM BANDS, STREAKS, NETWORKS OF CPY, PO, SPHAL(?) IN QTZITIC HOST
SAMPLE 121580, 121581

STOP 7: NUMEROUS SMALL ANGULAR PYRITIC BOULDERS OF WEAKLY BIOTITIC QTZITE WITH MINOR PYRITE THROUGHOUT
NO VISIBLE BASE METALS
SAMPLE 121582

XRAL Laboratories
A Division of SGS Canada Inc.

Work Order: 055822 **Date:** 03/08/99 **PRELIMINARY**

Element.	Au	Cu	Pb	Zn	Mo	Sn	Ag	W
Method.	FA301	ICAY50	ICAY50	ICAY50	ICAY50	ICAY50	AA73	ICAY50
Det.Lim.	1	0.01	0.01	0.01	50	0.01	0.3	0.01
Units.	ppb	%	%	%	ppm	%	g/mt	%
121577	52	0.07	0.03	5.27	94	0.02	2.6	<0.01
121578	479	1.58	<0.01	0.05	<50	0.01	7.8	<0.01
121579	960	1.08	0.14	3.36	57	0.01	39.0	<0.01
121580	46	0.45	<0.01	0.27	100	0.02	4.7	<0.01
121581	361	0.24	0.01	4.22	<50	0.02	7.7	<0.01
121582	8	<0.01	<0.01	<0.01	<50	0.02	<0.3	<0.01
121583	1160	1.18	<0.01	0.66	<50	0.02	11.8	<0.01
*Dup 121[illegible]	57	0.06	0.03	5.21	92	0.02	2.8	<0.01

Appendix V: Geochemical data from QNI Property visit

To: Paris E. Georghiou
Chairman and Director of Copper Hill Corporation

From: Jan H. Akkerman
Business Development Manager
QNI Exploration and development Ply., Ltd

Subject: Visit Note on the POWDERHORN Prospect, Newfoundland Canada

Date: 14-08-2000

Introduction:
This note provides a brief summary of a technical review by QNI of the Powderhorn Nickel prospect at the request of Copper Hill Corporation, in addition to E-mail correspondence and verbal discussions with Copper Hill representatives at the time of the visit in October 1999.

Background and Scope:
QNI (a 100% subsidiary of the Billiton group) is actively engaged in the screening of exploration opportunities for nickel sulphide deposits in Canada since 1998, as part of Billiton's world-wide exploration program. The company was invited to participate in the Powderhorn prospect by Copper Hill following a contact with QNI's exploration manager A.B. Mostert in early September 1999.
The scope of the technical review conducted between October 1st and 5th was as follows:

1. Study of literature and publications on the prospect (1/2 day)
2. Review of technical documentation and reports submitted by Copper Hill, subject to a confidentiality Agreement signed between the parties (1/2 day)
3. Introductory meeting between QNI representative (JHA) and Copper Hill in St. John's to explain respective objectives and requirements and explore possible JV terms and conditions (1/2 day)
4. Field visit to the Property (1 day) accompanied by PG and Wilson Jacobs, with stops at principle outcrops and trenches, inspect geological features and setting of the nickel mineralisation and collect relevant check samples. A reconnaissance traverse was done across a different zone with copper-zinc manifestations Northeast of Powderhorn Lake along a logging road.
5. Joint discussion on features observed with Billiton resident geologist in grand Falls on the VMS-style mineralisation in view of potential interest to incorporate the Powderhorn prospect in Billton's Buchan;s project. (1 hour)
6. Wrap-up meeting for feedback to Copper Hill on observations made and conclusions reached (2 hours)

Expenditures:
Direct Costs incurred by J.H. Akkerman for the 3 day evaluation of the Powderhorn exploration opportunity totalled Can$ 5,981. These do not include general overheads of QNI or time spent by other QNI staff reviewing and discussing the prospect.
A breakdown of the costs is tabled below:

Airfares:	Montreal – St'John's	
	St.John's-Gander-St'John's	
	St. John's – Amsterdam	1,660. Can $
Hotels, meals	3 days, 4 nights	1,036
Rental Car for	overland transport Gander –project	375
Time J.H.A.	2 ½ days at 900 US$/day	3,285
Total Cost:		5,981 Can $

Results and Conclusions:

Observations and made and conclusions reached are described in the attached notes and figures. Overall the conclusion was reached that the Powderhorn Ni-occurrence is unlikely to host sufficient tonnage potential to meet QNI's minimum tonnage requirement for a project with a minimum annual output of 15 kts nickel over a 25 year period. This conclusion was largely based on the unfavourable geotectonic setting and age of the mineralisation, the shape, size and chemistry of the hostrock to the mineralisation, as well as the limited residual exploration potential following negative results obtained in numerous trenches and drillholes conducted in the past on the two centres of known mineralisation at Powderhorn.

One check sample collected (PL-3) returned the following assays:

Sample Ident	Au	Ag	Cu	Pb	Zn	Ni
Scheme Code	FA301	AA73	ICAY50	ICAY50	ICAY50	ICAY50
Analysis Unit	ppb	g/mt	%	%	%	ppm
Detection Limit	1	0.3	0.01	0.01	0.01	10
PL1	40	7.1	0.57	0.02	2.75	28
PL2	33	0.7	0.03	0.02	0.01	15
PL3	9	1.9	0.37	0.02	0.02	4560
DUP-PL1	37	7.1	0.58	0.02	2.79	25

The short traverse examined north of Powderhorn Lake (and 2 samples taken; PL 1-2) did lead to the other conclusion that the potential for VMS-style Cu-Zn-Ag-Au is much more attractive compared to the Ni-occurrences. Reason why geologists from Billiton responsible for the Buchans project were notified and relevant information and reports were transferred to the Billiton office in Grand Falls for follow-up study and discussions with Copper Hill.

J.H.A.
Leidschendam,
14-08-2000

Appendix VI: Drill hole logs for holes PN99-01 and PN99-02

1.

Diamond Drill Hole: DDH- PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: —
Collar Dip: 90
Hole Depth: 36.0 m
Area: Powderhorn Lake North Property

Drilled by: Aurora Drilling Inc. for Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

P. 1 of 7

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)		Assay
0.0	6.4	Casing / Overburden						
6.4	26.8	Felsic (Rhyolite?) Volcanic Flow Porphyritic texture, with 1-3mm size blue quartz phenocrysts scattered throughout. Fine-grained matrix characterized by strongly beaded/foliated, mottled-colored, dark and light grey to greenish-grey colors reflecting variable degrees of silicification and lesser sericitization. Dark grey and green (chloritic?) material defining same foliation bands.	65-70°					

2

Diamond Drill Hole: DDH- PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth: 36.0 m
Area: Powderhorn Lake North

Drilled by: Aurora Drilling Inc. For: Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

P. 2 of 7

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-Qtz phyric Felsic Volc unit -- continued ... 6.4 - 10.4 Weathered zone: Strongly bleached, pale greenish-white to white siliceous rock with trace to 0.5% dissem. py. Abundant rusty fractures. @ 7.0 - 8.6 m - 0.5m core loss @ 9.4 - 10.4 m - 1.0m core loss 10.4 - 12.0 Strongly silicified with occasional scattered (possible relic tuff) fragments altered to chlorite and sericite. Zones of white silicification occur as bands parallel to foliation, local cross-cutting veinlets, and as irregular replacement zones up to 20 cm wide (Bands and		py	PN01-99-001 PN01-99-002 PN01-99-003	6.4 - 9.4 (2.5m recoverable core) 9.4 - 10.4 (0.5m recoverable core) 10.4 - 12.0	3.0 (2.5) 1.0 (0.5) 1.6	

B. **Diamond Drill Hole: DDH- PN-99-01**

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth: 36.0m
Area: Powderhorn Lake North

Drilled by: Aurora Drilling Inc. for Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 21/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

P. 3 of 7

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-Gte porphyritic Felsics contin.						
		veinlets of silica have diffusive (non-discrete) boundaries. Trace finely dissem. pyrite						
		12.0 - 18.0						
		Variably-colored, mottled textured, pale green, gray to creamy white felsic resulting from variable degrees of silica flooding throughout. Silicification occurs mainly as bands parallel to foliation though, locally, as 1-2 cm wide veinlets. The latter shows some pytgmatic folding and dissagration in places due to metamorphism. Tr dissem pyrite.			PN01-99-004 PN01-99-005 PN01-99-006 PN01-99-007	12.0 - 14.0 14.0 - 15.0 15.0 - 17.0 17.0 - 18.0	2.0 1.0 2.0 1.0	
		@ 14.4m - 4mm x-cutting silica veinlets (w/ micro-breccia) hosting						

3

4.

Diamond Drill Hole: DDH-PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth: 36.0 m
Area: Powderhorn Lake North Area

Drilled by: Aurora Drilling Inc. for Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

P. 487

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-Gm porphyritic felsic lobes carbon...						
		small orange-brown spots indicating possibly K-feldspar (potassic alteration?).						
		18.0-20.0						
		Dark green, more finely banded unit reflecting alternating silica-rich and possibly chlorite-rich compositional layering.			PN01-99-008	18.0-19.0	1.0	
					PN01-99-009	19.0-20.0	1.0	
		@ 18.0-19.0 - Trace dissem py		Tr py				
		@ 19.0-20.0 - Trace dissem py chalcopyrite & sphalerite (cpy + sph up to 0.5% locally)		Tr py, cpy + sph				
		20.0-24.5						
		Strongly banded, light grey and black-grey silicification (mottled coloration) with minor			PN01-99-010	20.0-21.0	1.0	
					PN01-99-011	21.0-22.3	1.3	
					PN01-99-012	22.3-23.0	0.7	
					PN01-99-013	23.0-24.0	1.0	
					PN01-99-014	24.0-24.5	0.5	

5.

Diamond Drill Hole: DDH-PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — **Collar Dip:** 90°
Hole Depth: 36.0 m
Area: Powderhorn Lake North Area

Drilled by: Aurora Drilling Inc for Copper Hill Res. Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

P. 5987

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-qtz porphyritic felsic volc+ carbon....						
		Pinkish-brown patches within the silicic zones. Slight crenulation folds/fabrics in places. Generally 0.5-1% disseminated, stringer and fracture-fillings of pyrite, pyrrhotite, chalcopyrite and sphalerite (Mineralization aligned along the foliation planes). Occasional distinct blue quartz phenocrysts 1-2mm in size.	60°	Py, Po, Cpy & Sph				
		24.5-26.8 Strongly foliated/banded, light-to medium greenish-grey with 10-20% dark burgundy-colored bands of semi-massive sphalerite (0.3-2.0 cm wide) these consisting also of 0.5-1% clotty pyrite and trace to 0.5% chalcopyrite. A couple of 10-20 cm wide sphalerite-rich sections having repetitive banding every 0.5-1.0 cm intervals.	55-60°	semi-massive sph mar Py, Cpy	PN01-99-015 PN01-99-016 PN01-99-017 PN01-99-018 PN01-99-019	24.5-25.0 25.0-25.5 25.5-25.58 25.58-26.0 26.0-26.8	0.5 0.5 0.08 0.42 0.8	

6.

Diamond Drill Hole: DDH- PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth: 36.0 m
Area: Powderhorn Lake North

Drilled by: Aurora Drilling Inc. For Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 124/1

P. 687

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
26.8	29.0	Felsic Crystal Tuff ? Dark grey to bluish grey siliceous matrix having an abundance of 0.5-2.0 mm size bluish quartz crystals. Strongly magnetic. Fine-grained, indistinct, black hairline stringer material occurring parallel to foliation.	60-70°		PN01-99-020 PN01-99-021	26.8 - 27.0 27.0 - 29.0	0.2 2.0	
29.0	29.8	Mafic Volcanic Unit Fine-grained, blackish-green to dark purplish-brown, banded texture with patchy epidote bands/lenses, 0.5-4.0 cm wide. Small reddish-brown patches within the epidote representing fine-grained garnet clusters. Magnetic 0.5-1% fine pyrite stringers parallel to foliation.			PN01-99-022	29.0 - 29.8	0.8	

7.

Diamond Drill Hole: DDH- PN-99-01

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth: 36.0 m
Area: Powder Horn Lake North

Drilled by: Arrow Drilling Inc For Copper Hill Res. Inc.
Core Size: BQ
Date: Oct 21-22/99
Logged by: W. Jacobs
Licence:
NTS: 114/1

P. 7 of 7

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
29.8	33.8	Felsic Volcanics Siliceous, dark-/light bluish-grey to greenish-grey banded (& mottled) texture/color			PN01-99-023 PN01-99-024	29.8 - 31.8 31.8 - 33.8	2.0 2.0	
		@ 30.0 - 32.0 →	60-65°					
		@ 32.0 - 33.0 →	50°					
33.8	36.0	Mafic Dyke Fine-grained, blackish-green, strongly magnetic Non-foliated.						

FROM : JACOBA-RESOURCES PHONE NO. : 7097455128 Nov. 10 1999 12:44 PM P8

Diamond Drill Hole: DDH- PN-99-02

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Powderhorn Lake North Area

Drilled by: Aurora Drilling Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: N. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
0.0	7.6	Overburden / Casing Possible Boulders						
7.6	8.84 Possibly boulder on bedrock	Bleached gray silicified felsic unit, strongly banded/foliated w trace to 0.5% fine diss py; rusty oxidized fractures (strongly broken core) 8.5-8.84m Thin laminations of reddish-brown garnet is locally 0.5-1% disseminated pyrite and chalcopyrite.	60°	py	PN02-99-001	7.6 - 8.84	1.24	
8.84	25.3	Diorite Dyke Medium-grained, grey massive plagioclase-porphyritic diorite dyke (becoming progressively darker colored & finer-grained (albeit w coarse plagioclase phenocrysts) towards bottom of the unit) Moderately-strongly magnetic with trace disseminated specks of pyrite throughout.						

Diamond Drill Hole: DDH- PN-99-02

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Powderhorn Lake North Area

Drilled by: Aurora Drilling Inc. for Copper Hill Res. Inc
Core Size: BQ
Date: Oct 23-24/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		@ 19.7m 10 cm wide quartz-vein, silicified section with 2% disseminated pyrite.		Py	PN02-99-002	19.6 - 19.7	0.1	
25.3	25.8	Mafic Volcanics? Strongly foliated, blackish-green unit with a non-distinct, though apparently fine-grained, texture (possible early, pre-deformation dyke) local intermittant patches of quartz (silicification) and possibly epidote. 1-5% dissem. pyrite	60°	Py	PN02-99-003	25.3 - 25.8	0.5	
25.8	52.7	Felsic (Rhyolitic) Volcanics strongly banded/foliated greenish-grey to bluish-grey & bluish-white (mottled colored) with 1-3 mm size blue quartz phenocrysts scattered throughout. Alternating light-colored bands reflecting intense silicification with possible...						

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Pashkokogan Lake North Area

Drilled by: Aurora Drilling Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blu-Qtz porphyritic felsic volc continued...						
		slight sericite alteration. All variably-colored bands exhibit diffusive (gradational) boundary changes, i.e., with no sharp or discrete contacts. Bands most likely reflect original flow-differentiation now accentuated by moderate metamorphism (minor fan-scale folds occur locally). Occasional purplish-brown bands reflect probable biotite concentrations. Trace – 0.5% disseminated sulphides of pyrite and pyrrhotite throughout Hanson, intermittent patches of 1-2% disseminated & stringer pyrite and pyrrhotite with trace chalcopyrite.	60°	Py, po Trace cpy				
		25.8 – 26.5 Strongly banded/foliated with pale purplish brown, grey-green, yellow-green & orange-brown colors Silicic-epidote-garnet patches 2-10 cm wide, and 1-2% fracture-fill pyrite assoc.			AN02-99-004	25.8 – 26.5	0.7	

Diamond Drill Hole: DDH- AN-99-02

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area:

Drilled by: Aurora Drilling Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: N. Jacobs
Licence:
NTS: 12 H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(M)	Assay
		Blue-Qtz porphyritic felsic unit continued...						
		26.5-27.0 2-3% dissem. + stringer pyrrhotite and lesser pyrite concentrated along/parallel to foliation planes.	60-70°	Po, Py	AN02-99-005	26.5-27.0	0.5	
		27.0-29.0 1-2% Pyrrhotite + pyrite	70-80°	Po, Py	AN02-99-006	27.0-29.0	2.0	
		29.0-29.5 1-5% pyrite, sphalerite, lesser pyrrhotite + trace chalcopyrite assoc. with intense silicification. Sphalerite occasionally forming [illegible] cm wide, burgundy-brown colored bands parallel to foliation.	60°	Py, sph, po + cpy	AN02-99-007	29.0-29.5	0.5	
		29.5-31.0 Grey, sugary-grained texture with an abundance of the blue quartz phenocrysts. 0.5-1% diss., chalcopyrite + stringer pyrrhotite (& trace chalcopyrite).		Po, tr cpy	AN02-99-008	29.5-31.0	1.5	

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: **Collar Dip:**
Hole Depth:
Area:

Drilled by: Aurora Drilling Inc. For Copperhill Resources Corp.
Core Size: BQ
Date: Oct 23-24/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-qtz porphyritic felsic Unit.... continued.						
		31.0 - 32.0 Same as previous section.	60°	po, tr cpy	PM02-99-009	31.0 - 32.0	1.0	
		32.0 - 33.0 Same			PM02-99-010	32.0 - 33.0	1.0	
		33.0 - 34.0 *0.6m core loss 0.5 % dissem. pyrite		py	PM02-99-011	33.0 - 34.0	1.0	
34.0	34.5	Aplite Dyke Fine-grained, olive-green with quartz-porphyritic texture (non-foliated).						
34.5	49.0	Felsic Volcanics (Blue-qtz Phyric) (as previous to dyke).						
		34.5 - 36.5 Greenish-grey flow with 0.5 - 1% dissem. pyrite.		py	PM02-99-012	34.5 - 36.5	2.0	

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Powderhorn Lake North

Drilled by: Aurora Drilling Inc. for Copper Hill Res. Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		36.5 - 38.0 2-5% dissem, stringer and fracture-fill Pyrite. Trace chalcopyrite in places.		Py, tr cpy	PW2-99-013	36.5 - 38.0	1.5	
		38.0 - 39.0 Burgundy-brown biotite-rich section with trace - 0.5% dissem. Pyrite		Py	PW2-99-014	38.0 - 39.0	1.0	
		39.0 - 41.0 Dominantly greenish-grey with thin burgundy-brown colored bands of biotite-rich material Trace - 1% dissem. pyrite + pyrrhotite. Abundant blue quartz phenocrysts			PW2-99-015	39.0 - 41.0	2.0	

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: —
Collar Dip: 90°
Hole Depth:
Area: Powderhorn Lake North

Drilled by: Aurora Drilling Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: W. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		41.0-42.0 Greenish-gray sugary texture with 0.5-2% dissem. and stringer pyrite, pyrrhotite, and trace-minor sphalerite. Couple of fracture-fillings and bands of pyrite up to 3mm wide.		Py, Po Tr-mnr sph	PW02-99-016	41.0-42.0	1.0	
		42.0-43.0 1-3% dissem. & stringer pyrrhotite. Fabric/foliation crenulated & folded with core-angle varying from 40-60°.	40-60°	Po	PW02-99-017	42.0-43.0	1.0	
		43.0-43.5 5-8% dissem. & stringer pyrrhotite and trace chalcopyrite.	Variable 40-70°	Po, tr cpy	PW02-99-018	43.0-43.5	0.5	

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Pinderhorn Lake Uplift

Drilled by: Arsenault Drilling Inc. for Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: M. Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
		Blue-Qtz Phyric Felsic Volc contd...						
		43.5 - 44.15 Bluish-grey felsics with semi-massive (10-20%) to massive (80%) pyrrhotite with minor scattered coarse blebs of chalcopyrite and possibly sphalerite.		semi-massive to massive po, tr cpy, sph.	PN02-99-019	43.5 - 44.15	0.65	
		44.15 - 49.0 Bluish-grey to pale greenish-grey silicification with patchy yellow-green coloration in places representing possible sericite? Trace - 0.5% disseminated pyrite. Occasional fracture-fillings of pyrite, pyrrhotite & trace chalcopyrite. Minor cross-cutting silica veinlets.			PN02-99-020	44.15 - 45.0	0.85	
					PN02-99-021	45.0 - 46.0	1.0	
					PN02-99-022	46.0 - 48.0	2.0	
					PN02-99-023	48.0 - 49.0	1.0	
		Variable foliation pattern indicating folding → 44.15-45.0 → 0-10° → 45.0-49.0 → 65-75°						

Diamond Drill Hole: DDH-

Northing(m):
Easting (m):
Elevation (m):
Collar Azimuth: — Collar Dip: 90°
Hole Depth:
Area: Pardoshorn Lake North

Drilled by: Aurora Drilling Inc. for Copper Hill Resources Inc.
Core Size: BQ
Date: Oct 23-24/99
Logged by: N Jacobs
Licence:
NTS: 12H/1

From (m)	To (m)	Description	Core Angle	Mineralization	Sample No.	Interval (m)	(m)	Assay
49.0	52.6	Felsic Volcanic (Rhyolitic?) TUFF Mottled bluish-gray, yellowish green & purplish-brown felsics with possible relic fragmental (tuffaceous?) textures obscured by silicification.	65°					
		49.0 - 51.0 Abundant purplish-brown bands of possibly biotite-rich mat. Tr disem. sulphides			PN02-99-024	49.0 - 51.0	2.0	
		51.0 - 52.6 Weak - moderate sericitization			PN02-99-025	51.0 - 52.6	1.6	
52.6	E.O.H @52.52	Aplite Dyke Massive, quartz-K-feldspar phyric texture to homogeneous to marbled coloration ranging from olive green to orange-green, pinkish orange and dark pinkish-brown colors.	Dyke contact angle @ 30°					

Copper Hill Resources Inc.

Diamond Drill Log

Drill Hole No.: PN-99-01	Depth: 36.0M
Coordinates:	Core Size: BQ
Inclination: 090°	Elevation:
Azimuth: —	Claim No.: N.T.S. 12H/1
Started: OCT 21/99	Contractor: AURORA DRILLING INC.
Completed: OCT 22/99	Logged By: FRANK PUSKAS

Purpose: TO DETERMINE THE APPROXIMATE DEPTH EXTENT OF THE ZINC RICH, POLYMETALLIC SULPHIDE MINERALIZATION. AT THE SAME TIME ASSESS THE VARIATION IN COMPOSITION OF THE BANDS OR LAMINAE (PROBABLE BEDDING). PROPER DETERMINATION OF HOST LITHOLOGY SHOULD ENABLE PRELIMINARY ATTEMPTS TO IDENTIFYING PALEOSETTING. AND GENESIS OF THE SULPHIDE MINERALIZATION.

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date: DEC 21/99	Page # 1 - 11
From	To	Lithology	Description	Structure	Comments
00	6.4	OVERBURDEN	CASING		
6.4	26.87	TUFF	TUFFACEOUS SEDIMENTS ARE STRONGLY LAMINATED OR BANDED ON A MILLIMETER SCALE TO ONE CENTIMETER SCALE; THE OVERALL COLOUR IS LIGHT CONFEDERATE GREY WITH DARKER GREY (INVARIABLY MINERALIZED WITH SULPHIDES) LAMINAE; THROUGHOUT THIS LOG THE DARKER GREY (INVARIABLY MINERALIZED WITH SULPHIDES) LAMINAE WILL BE REFERED TO AS LAMINA OR BED 'A' OR JUST 'A' FOR BREVITY REASONS. THE LIGHT GREY LAMINAE ± CAN CONTAIN LESS BUT SIGNIFICANT SULPHIDES LARGELY AS PIN POINT SIZED DISSEMINATIONS AND/OR LINEAR, BLADED (IN APPEARANCE), GRAINS. THE DIAGNOSTIC FEATURES OF THE TWO BED/LAMINA TYPES IDENTIFIED ARE AS FOLLOWS. BED/LAMINAE TYPE 'A': comprised of well sorted, round and subspherical grains of clear (unfrosted) quartz ± minor wavy books of phyllosilicate (phlogopite-biotite) can be present ± minor laths of sillimanite or anthophyllite are contorted and appear to be 'welded' on some quartz grains ± actinolite can occur associated with quartz to for a mero ultramafic	Banding / bedding is at 070° (or 290°)	THIN NATURE OF LAMINATION (LAMINAE HAVE MINERALOGICAL DIFFERENCES) ATTEST TO RAPID REPETITION IN DEPOSIONAL CHARACTERISTICS.

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 2-11
From	To	Lithology	Description	Structure	Comments
			bed/lamina s/ sulphides describe a net texturing so as to enclose the quartz; sulphides are dominantly sphalerite - pyrrhotite - pyrite, and rarely chalcopyrite. s/ the sulphides can be present up to 60 volume percent. 7/ magnetic susceptibility readings are up to 19.4		
			BED/LAMINAE TYPE 'B' ; comprised of poorly sorted quartz involving pin point grains with a variable number of elliptic -al quartz grains (sometimes amethystine blue in colour and not internally fract -ured or distended) up to 2-3 mm s/ matrix was determined to be comprised of Kspar. 3/ lineated laths of silliman -ite or anthophyllite are common. 4/ sulphides describe either a pin point dusting or linear blade-like grains; sulphides are dominantly pyrite and/or pyrrhotite and chalcopyrite. 5/ the sulphides can be present up to 6-8 volume percent. 6/ magnetic susceptib -ility readings are 0.05 to generally less than 1.0.		Kspar identification was made by etch (with HF acid) stain (sodium cobal -tinitrite solution)
			6.4 to 9.4 angular rubbly section of limonite stained laminated 'B' greater than 'A'; presence of amythystine quartz 'eyes', two mica ess	Cut by ptygmatic quartz veins (9mm and 35mm wide) 7.47 to 7.57m	Sample PN-01-99-001 Magnetic suscept. reading at 7m (0.07), at 8.87 (0.02)

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 3-11
From	To	Lithology	Description	Structure	Comments
			-emblage (muscovite-biotite/phlogopite), 'A' laminae with actinolite w/wout pyrite at 7.9m		
			9.4 to 10.4m missing core, only 0.5m recovered, predominantly 'B'		Sample PN-01-99-002 Mag. susceptibility (MS) at approx 10m at 0.05.
			10.4 to 12.0 actual laminae of 'A' give spotted appearance because discontinuous. 'A' can be actinolitic and lepidolitic. 'B' with 2% pin point py and with quartz 'eyes'. Small net texture reddish sphalerite at 10.45; 10.91-11.0 pin point pyrite; 11.0-11.13 net textured pyrrhotite, 3-5% po-py.; 11.13-11.28 qtz 'eyes' pin point py and no sphalerite; 11.28-11.39 qtz 'eyes', pin point py, po; 11.40-11.51 pin point pyrite small 1-2mm discontin. trains of red sphalerite, pyrite veins near perpendic. to fabric; 11.51-11.70 pin point py; 11.70 to -11.86 amythystine quartz 'eyes', net textured sphalerite at 060 parallel to fabric,	Ptygmatic quartz 'veins' at 11.6 (at 070° or 290°), 11.8 (at 050° cuts fabric at 105°), 11.89 to 12.0 at 025° and 065.	Sample PN-01-99-003 MS at 10.55 (0.1), at 10.70 (0.38), at 10.85-10.91 (0.16), at 10.91-11.0 (0.06), 11.0-11.17 (0.15), 11.17-11.23 (0.18), 11.3 (0.3), 11.4 (0.21), 11.5 (0.21), 11.6 (0.10), 11.75 (0.19),
			12.0-14.0 thinly laminated 'A'-'B' with quartz 'eyes' both white and amythystine; 12.04-12.18 2 diss and net pyrite with con formable laminae of sphalerite (2-3%) 12.18-12.50 ditto 12.04, 4% pin point pyrite in two mica 'A'-'B', conformable sphalerite laminae (discontinuous) up to 4% 12.50-14.0 ditto, no sphalerite, pin point pyrite with pyrrhotite. up to 2-3%,	lamination regular at 080 or 280°	Sample PN-01-99-004 Absence of ptygmatic veins of quartz or Kspar (stained)-quartz. One K+Q vein 12.0 to 12.04 M.S readings: at 12.3 (0.09), 12.50-12.58 (0.08), 12.92 (0.04), 13.0 (0.18), 13.14 (0.16) 13.26 (0.14), 13.3 (0.11), 13.41

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 4-11
From	To	Lithology	Description	Structure	Comments
				13.74 – 13.88 probable bedding folding with fold axis at 080° at 13.77 and down hole limb at 035	13.48 (0.28), 13.63 (0.77 – with 8-10% net textured pyrrhotite), 13.74 – 13.86 (0.96), 13.86 – 13.94 (0.24) 13.94 – 14.0 (0.9).
			14.0 – 15.0 darker blue grey laminated (colour due to more phyllosilicate). 3% pinpoint py at 14.15, with/without amythystine quartz 'eyes', 2% pinpoint py-po at 14.5, 1-3% py at 14.63, rods or lineated sulphide parallel banding at 14.7 with 3-4% sulphides; specks cpy at 14.9, 1½% py-po with trace sphalerite.	Qtz 'vein' from 14.42 to 14.45 at 075°; from 14.88 to 14.91 and at 14.97	Sample PN-01-99-005 MS at 14.04 (0.9), 14.14 (1.12) 14.5 (1.6), 14.7 (0.87), 14.9 (0.79), 14.93 (2.8 with 2-3 % pyrrho greater than pyrite), 14.95 (0.5)
			15.0 – 17.0 thinly laminated phyllosilicate rich, with qtz 'eyes' generally amethystine; Sulphides as follows: specks cpy at 15.02, with 4% po, 15.14 lineated sulphides (in 'B') with 2-3% pinpoint po, 15.24 2-3 pinpoint po, 15.40 (3-4% pinpoint pyrite-pyrrhotite), 15.5 – 15.6 1½-2 pinpoint pyrite, 15.65 (2% pinpoint po-py), 15.85 (2-3 pinpoint py-po with discontinuous sphalerite (from 15.9 – 17.0), sulphides lineated at 16.13, 16.38, 16.55, 16.63, 16.9,	Thin 8mm wide ptygmatic quartz veins as follows: 16.15 (at 060° near parallel fabric), 16.36 (at 090°) 16.39 (at 085), at 16.41 to 16.43 'V' configuration essentially parallel fabric), 16.89 (080 parallel fabric) 16.92 – 17.0 (essentially 0°).	Sample PN-01-99-006 MS as follows: 15.18 (1.1), 15.3 (1.20), 15.4 (0.54), 15.56 (0.56), 15.67 (0.94), 15.76 (0.10), 15.87 (0.51) 16.14 (0.6), 16.30 (0.86), 16.75 (0.13), 16.87 (0.28).
			17.0 – 18.0 ditto 14.0 darker blue grey due to phyllosilicates and amphibole (tremolite-actinolite); note presence of amythystine quartz 'eyes' Sulphides as follows: 4% py and pinpoint py at 17.02 'A' with 4% py and 'B' with 1½ at 17.2; 2 py at 17.26 no sphalerite; 17.3 no sph, py veinlet at 320°	Fabric at 070 or 290; thin 8mm wide qtz veins ptygmatically folded occur as follows: 17.0 – 17.05 030 and 300 at depth, 17.09 – 17.22 at 040 and 015; at	Sample PN-01-99-007 MS as follows: 17.04 (0.18), 17.16 (0.75), 17.34 (0.8), 17.47 (1.0), 17.55 (0.73), 17.66 (0.77), 17.78 (1.0), 17.82 (2.8), 17.93 (1.2), 17.80 (1.6)

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 5-11
From	To	Lithology	Description	Structure	Comments
			and bedding at 070; 'A' with 8% po py at 17.38 and 5% pyrrot py at 17.4 no sphalerite; 4-6 py at 17.58; 2 in B and 4-6 py. po in 'A' at 17.6-17.65, 17.7 2% py, py veining (parallel bedding) and 4-6 po (greater than py) not textured; and 2-3 py po in 'B' and 6-8 in 'A' at 17.72; 3% net py-po at 17.76;	17.61 - 17.65 at 045	
			18.0 - 19.0 ditto previous with darker colour due to presence of actinolite and GARNET (first recognized - 18.1 to 18.2 with bed 'B' with 4% pin point po-py, and 7% pin point po (vug hole); 'A' with 8-10% po from 18.5 - 18.61, 'A' with 6-8% po at 18.88-18.90 with specks of cpy in adjacent 'B' - note py veinlet at 18.92 at 290.	Phyomatic boudinaged qtz vein from 18.2 - 18.29	Sample PN-01-99-008 The laminated appearance is strongly reminescent of the po-py bearing 'cherts' from the fold area in Marathon, Ont.
			19.0 - 20.0 ditto previous; presence of quartz 'eyes' Sulphides from 8-10% po-(py)-(cpy) From 19.0 - 19.16 ditto 18.0	Probable fold (slump) axis at 19.86 at 075 with 'A' having 15% po-py	Sample PN-01-99-009 MS readings: 19.0 - 19.15 (17.2), 19.15 - 19.28 (3.8), 19.28 - 19.39 (12.0), 19.39 - 19.49 (5.3) 19.60 - 19.70 (3.4), No quartz veining
			20.0 - 21.0 ditto previous, regular lamination at 070 (or 290) Bed 'A' at 20.68 - 20.71 contains net textured sph - specks cpy with total sulphides up to 15%, bed 'B' 20.71 - 20.75 pin point sulphides, bed 'A' 20.75 - 20.77 with 20% net textured po-py marginal sphalerite; 20.77 - 20.81 discontin. laminae of sphalerite,	Somewhat conformable veins of quartz at 20.14 - 20.26 at 070°	Sample PN-01-99-010 MS readings: 20.07 (0.65), 20.37 (0.57) 20.46 (0.16) 20.50 (0.17) 20.66 (0.34)

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 6-11
From	To	Lithology	Description	Structure	Comments
			parallel to fabric at 070° (or 290), 20.81 - 20.88 lamina 'A' with 20% net textured po-py-marginal sphalerite	at 21 a possible fold (?)	
			21.0 - 22.3 dk grey and light milky white grey banded sequence; 22.1 - 22.3 brown resinous phlogopitic/biotitic (former mudstone) with bed 'A' with 9-11% net textured po-py	bedding angles vary due to crenulation (slump fold-ing) and possibly cross-bedding; average dip is 070°	Sample PN-01-99-011 No quartz veining evident; MS readings: 21.07 (0.2), 21.10 (0.2), 21.2 (2.7), 21.45 (1.26) 21.71 (0.97), 21.83 (0.98), 21.95 (0.85)
			22.3 - 23.0 bed type 'B' are more flinty like and cryptocrystalline in appearance with laminae type 'A' appearing very dark due to high sulphide content and sometimes the presence of actinolite; Sulphides 22.4 - 22.48 are 25-40% po-py-with oxide (magnetite) and sphalerite - sphalerite as discontinuous laminae; 22.61 - 22.68 laminae 'A' contain net textured and lineated py-po-sph. up to 30%, laminae 'B' contain 2-3% pinpoint py with sphal trains and accessory cpy	laminations generally reg-ular at 065 (or 295) but strong suggestion of folding partic from 22.37 - 22.48 with suggested fold axis trending at 065 (parallel fabric) at 22.45	Sample PN-01-99-013 MS readings: 20.5 (22.4 - 22.48 is laminae 'A'), 1.0 (22.48 - 2255 is predominantly laminae 'B'), 8.2 (226 - 22.66 predom laminae 'A') 1.5 (22.7 - 22.81 (predom laminae 'B'), 22.9 (1.2), 23 (0.9). Vein sulphide at high angle to band-ing at 350° at 22.84 - 22.86
			23.0 - 24.0 thinly laminated with laminae 'A' having net textured sulphides including red sphalerite; note presence of quartz 'eyes' sometimes amythystine	Presence of crenulations sug-gests folding (slumping); av-erage bedding at 055, fold closure at 23.26 (axis parall-els lamination at 050°), crenulation at 23.53 - 23.73 with fold closure at 23.68 (fold axis at 040°)	Sample PN-01-99-013 MS readings: 0.65 (2305), 1.11 (23.16) 23.27 (1.25) 23.47 (1.0), 23.60 (0.9), 23.77 (0.39) 23.90 (2.1), 23.95 (0.56) 23.98 (0.67)

			Hole #	Date	Page # 7-11
From	To	Lithology	Description	Structure	Comments
24.0	24.5		The mineralized sequence is compositionally and mineralogically banded, bands (beds?) can appear parallel and regular to somewhat irregular and anastamosing (possibly / probably due to soft sediment slumpage and post boudinage). A possible / probable depositional pair of laminae is comprised of lamina / bed rich in sulphides (varying composition) as net textured matrix to unglazed, sized grains of quartz (lamina or bed 'A' — for detail refer to Comments). The sulphide-poor laminae or beds (designated 'B') are 6mm to 20mm thick and can contain non-transparent, more elliptical 'eyes' of amythystene quartz 3/ anthophyllite / sillimanite bend (weld) around some grains 3/ contain minor poikiloblasts (?) of phyllosilicate (muscovite?) 4/ contain lineated and sometimes anastamosing seams of anthophyllite / sillimanite 5/ can contain lineated to acicular shaped sulphides, most have fairly straight sides; lineated (rodded?) sulphides are or can be dominantly chalcopyrite 6/ sulphides rarely to never exhibit net textures, if plagioclase quartz is matrixed by K spar (positive sodium cobaltinitrite stain) The K spar does not appear as grains or prominant crystals. Very rarely do sulphides occur in the "flood" K spar	The lensy appearance is due to the presence of laminae type A and B (see detail for each). If A and B are a depositional set then A is 'pure' grains of quartz and B is finer grained, poorer sorted with 'eyes' of amethystene quartz, and more argillaceous. A would appear to be basal to B. B is always more linated and ductile sheared. Sulphides can be predominantly chalcopyrite. - as lineated rods parallel to lineated and anastamosing seams of anthophyllite / sillimanite.	The sulphides (sphalerite, pyrrhotite, pyrite, chalcopyrite) are more abundant if not entirely restricted to (granular, unglazed, rounded and sized) quartz-rich laminae. Laminae are 2mm to 15mm thick, impart a lensy appearance to their distribution. The sulphide-granular quartz laminae are not deformed or mylonitized although rarely contained anthophyllite / sillimanite can appear crenulated. Laminae exhibit grain dominated contacts with outermost limits represented by single to double crystal width anthophyllite / sillimanite schist. Sulphides occur as net textured matrix to quartz grains. If sphalerite is absent pyrite occurs as internally situated megacrysts mantled by lacy pyrrhotite. Where sphalerite is present, pyrrhotite is internally contained. Chalcopyrite is minor to rare within the sulphid-granular quartz laminae. Magnetic susceptability reading of sulphide laminae is approximately 3:2.

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 8-11
From	To	Lithology	Description	Structure	Comments
			24.0 - 24.5 (continued from page 07)	Although laminations appear	MS readings: 2.1 (24.18),
			ditto previous. Sulphides are prominent in 'A'	regular closures point to	0.38 (24.44)
			type laminae with significant red sphalerite;	folding; lamination at 065	Sample PN-01-99-014
			laminae 'B' do contain K-spar (etch-stain)	with fold closures of	
				24.19 (fold axis at 055°)	
				and 24.22 (axis at 055°)	
			24.5 - 25.0 ditto 24.0 with whispy appearance	Regular lamination at 060,	Qtz 'veins' 24.69 - 24.72
			of 'A' type laminae. Note presence of a few	suggested fold closure at	MS readings: 24.75 (1.9),
			amythystine elliptical qtz 'eyes'	24.89 at 065	24.86 (1.5)
					Sample PN-01-99-015
			25.0 - 25.5 ditto 24.5 with both whispy	Banding appears regular at	Sample PN-01-99-016
			appearing and thicker beds/laminae of 'A' up to	065° but crenulations are	MS readings: 0.5 (25.05),
			25mm. At least 24 lamina - 'A' type present	indicative of the presence	2.5 (25.10), 1.9 (25.33), 1.45
			with up to 50% sulphides - predominantly net	of folds	(25.45).
			textured sphalerite with 'core' po. (such laminae		For further detail refer to
			at 25.15 - 25.17, 25.31, 25.4 - 25.48; 'B' type		page 07.
			lamina contain fin-point quartz matrixed by K-spar		
			with lineated sillimanite/anthophyllite and		
			lineated sulphides (lineation parallels fabric,		
			see 25.28 — 25.32 where 'B' contains 8%		Chalcopyrite appears common
			pyrite - pyrrhotite - minor globs of chalcopyrite.		to only 'B' type laminae
			Note presence of amythystine quartz 'eyes'		
			25.5 - 25.58 ditto previous; interval comprised	lamination at 065	Sample PN-01-99-017
			of four laminae, 'A'-type, up to 22mm wide		MS reading: 1.96
			with up to 50-60% net textured po-sph; the		
			alternating 'B'-type laminae comprised of		
			anthophyllite/sillimanite		
			25.58 - 26.0 ditto 24.5 net textured sphalerite	Fabric at 060	Sample PN-01-99-018

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 9-11
From	To	Lithology	Description	Structure	Comments
			laminae, type 'A' are approx 4mm wide; laminae 'B'-type show positive K-spar staining throughout elliptical amythystine quartz 'eyes' more typical of 'B';		MS readings: 25.59 (1.94), 25.68 (1.9), 25.73 (1.6), 25.77 (1.28), 25.81 (1.57), 25.89 (1.69) 26 (1.3)
			26.0 - 26.8 'A' laminae are relatively prominent (78mm) to whispy (1mm) alternating with 'B' laminae with amythystine quartz 'eyes', 'B' stained K-spar positive.; 2-3% to 5% pin point sulphides; 'B' with 4-5% pin point py	regular banding at 070; folding at 26.0 - 26.05 show fold closures with fold axes parallel to banding at 070	Sample PN 01-99-019 MS readings: at 26.05 (1.36) at 26.08 ('B' bed, 1.8), 26.19 (1.9), 26.21 - 26.24 ('A' bed, 3.2), 26.5 (3.0), 26.6 (0.77) 26.75 (0.76)
			at 26.27-26.3 - sulphides lineated, note specks of cpy; 'A' laminae at 26.34-26.36 has 15% net textured po greater than py; 26.4 - 26.5 the whispy 'A' lamina have 15-20% net textured po with marginal specks of cpy, 'B' exhibit lucky sillimanite/anthophyllite; specks cpy at 26.52 - 26.57; prominent sphalerite trains from 26.57 - 26.66		
			[redacted]		
26.87	27.0	Tuff	Possible mixed provinence with a medium grey massive banded or striped appearance; oxide rich with pin point solitary garnets. Intercalated 'bed' of qtz - garnet - epidote/actinolite are conformable at 070	Widely dispersed qtz 'eyes', some amythystine impart an augen gneiss texture with mica-oxide laminae banding around the 'eyes' banding at 080	Sample PN-01-99-020 MS readings: 0.28 (26.8), 10.1 (26.85), 4.0/12.6 (26.95)
			27.0 - 29.0 augen textured oxide rich tuff ditto 26.87 with disseminated solitary garnets and epi-actin-garnet-quartz ± py 'beds'		Sample PN-01-99-021 MS readings 10.7 (27.02), 89.1 (27.1), 19.6 (27.3), 17.8 (27.35) 27.58 (6.6) 27.64 (11.3) 27.8 (17.8), 28 (17.3) 28.3 (28.8)

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 10 – 11
From	To	Lithology	Description	Structure	Comments
					28.45 (27.1) 28.58 (31.3) 28.7 (17.9). 28.8 (46% biotitic mudstone 'bed'), 28.88 (32.2 ditto previous), 28.9 – 28.99 (ditto previous, 10%)
			29.0 – 29.8 a facies of the previous assemblage with 25–30 mm wide 'beds' of epidote/actinolite – garnet – quartz +/- west py. There is one bed from 29.59 – 29.64 with lineated sulphides (po–py) up to 3–5%, pyrite seam parallel fabric at 29.8	Skarn beds are located as follows: 29.05 – 29.06, 29.14 – 29.16, 29.34 – 29.34, 29.37 – 29.40, 29.41, 29.43 – 29.44, 29.51 – 29.52, 29.53 – 29.54, 29.56 – 29.58, 29.64 – 29.67, 29.76	Sample PN-01-99-022 These skarn-like 'beds' may have been more calcareous precursors. MS readings 2.7 (29.07), 4.3 (29.15), 8.16 (29.23–29.29), 29.40 (5.9), 29.5 (4), 29.55 (6).
			29.8 – 31.8 a more recrystallized (coarser textured) variant of 'A' – 'B' with husky sillimanite – anthophyllite – some skarn interbeds – some oxide facies with solitary garnets; the sulphides are dominantly net textured po – with py, rare sphalerite (at 30.87) Sulphides: 7% po–py lineated at 29.8 – 29.84, 7% po–py (30.26 – 30.32), 30% net po–py 30.90 – 30.93 & ditto 31.12 – 31.20, 12% net po–py 31.4 to 31.5.	Fabric/banding at 060, some K+D veins – conformable 31.08 – 31.11 (at 065) and 31.24 – 31.31 (at 055) and 31.36 – 31.4 (at 060)	Sample PN-01-99-023 A mix oxide–skarn–'A'–'B' assemblage. MS readings 29.8 (4.6) 29.93 (18.2), 30.0 (12.8), 30.06 (24.8), dissem. garnets at 30.12, 30.15 (27.6), 19.5 (30.34), 5.6 (30.54), 6.0 (30.66), 3.5 (30.86), 5.3 (30.89), 9.0 (30.99), 9.9 (31.45) 9.3 (31.66), 7.0 (31.75)
			31.8 – 33.8 whispy laminated appears more coarser recrystallized variant of mixed oxide – sulphide 'A' – 'B' – very husky sillimanite/ anthophyllite: pin point sulphides in 'B' are coarse; at 32.5 9% net po with disc oxide py mineralization	banding 040 – 050, sharp disconformable contact (with chilled plagioclase porphyry felted trachyte) at 33.8 at ~~030~~ 040 bedding 060	Sample PN-01-99-024 MS readings: 3196 (9.75), 32.18 (21.6), 32.5 (34), 32.6 (34), 32.7 (30), 32.8 (18) 32.88 (18.8), 32.97 (33.9)

COPPER HILL RESOURCES INC.			Hole # PN-99-01	Date:	Page # 11 - 11
From	To	Lithology	Description	Structure	Comments
			Sulphides from 33.56 - 33.8 are 13 to 7%		33.2 (29.2), 33.37 (13.3)
			net textured po-py and are traces of sphalerite		33.57 (11)
			at 33.79.		
33.8	36.0	Trachyte	dyke, a massive very dark green plagioclase	Pyrite plating at 34.08 at	M.S. readings 33.9 (18.5), 34.0
			porphyry - plag phenocrysts set in a very plag	320°	(40), 34.8 (24), 35.3 (30),
			rich finer grained matrix.		35.5 (21), 35.8 (15), 35.9
					(20.6).
	36.0	E.O.H.			

Copper Hill Resources Inc.

Diamond Drill Log

Drill Hole No.: PN - 99 - 02	Depth: 58.52
Coordinates:	Core Size: BQ
Inclination: 090°	Elevation:
Azimuth: —	Claim No.: NTS 12 H/1
Started: Oct 23 /99	Contractor: Aurora Drilling Inc
Completed: Oct 24 /99	Logged By: FRANK PUSKAS

Purpose:

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 1
From	To	Lithology	Description	Structure	Comments
0.0	7.6	Overburden	Casing		
7.6	8.84	Tuff	Comprised of laminae of 'A' type alternating with laminae of 'B' type. Sulphide distribution is as follows: 'B' has 2-3% disseminated py and 'A' (actinolitic) has 3-5% net textured py-py from 7.6 - 7.73; 'B' with amythyst. qtz 'eye' and 1½% py from 7.73 to 7.8, ½ diss. py from 7.83 - 7.9. 7.9 - 8.11 rubble, 1% py with amythyst qtz 'eye' at 8.15. 2% diss py 8.24, 8.38 (1% py), 8.4 - 8.57 (½% py); 8.58 - 8.84 the sphalerite bearing section with up to 10% net textured (py) sphalerite.	Attitude of banding or lamination is 070°. Presence of one 30 mm wide vein of K+Q at 7.95 - 7.99. 7.6 to 8.84 is weathered and variably stained by limonite. At 8.84 rubble, missing contact, rubble comprised of chill - suggested contact at 020° at 8.90	Sample PN-02-99-001 For a detail description of silicate and/or sulphide mineralogy diagnostic to each type of laminae refer to Borehole log PN-99-02 page 07.
8.84	25.3	Trachyte	A very massive plagioclase (zoned) porphyry with chilled intrusive contacts, an internal septa or inclusion of host tuff; amygdules of core chlorite w/wout pyrite and mantle of quartz-feldspar appear to decrease in relative size and concentration toward the core. The downhole portion beneath the septa appears to be more magnetic. 8.90 - 9.0 1 to 1½% py. amygdules 2-3mm M.Susceptability reading 10.5. 9.0 - 9.18 chlorite cored amyg. more prominent to 6mm, MS at 10.5 9.18 - 9.45 more widely spaced amyg to 8-10 mm. 9.82 - 9.9 MS 8.4 / 8.7		

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 2
From	To	Lithology	Description	Structure	Comments
			10.5 - 10.62 3/4% disem py, few chlorite cored amygdules to ~~8mm~~ 5mm MS at 6.3		
			10.84 - 10.9 one 5mm amygdule, MS at 8.0		
			10.94 - 11.07 2% diss pyrite		
			12.12 - 12.38 few amygdules to 4mm, 1/2% diss py, MS 7.9 / 8.1		
			12.70 MS at 8.2		
			13.0 one chlorite cored amyg to 9mm,		
			13.26 - 13.33 MS 8.2		
			13.33 - 13.43 1% diss py, MS at 8.7		
			13.5 one chl with pyrite amygdule 7mm		
			13.75 MS at 8.9		
			14.6 MS 8.8		
			14.9 - 15 one chlorite cored amygdule to 5mm, MS at 9.4		
			15.7 MS at 9.9		
			16.2 MS at 8.7		
			17.7 one chlor amygdule 8mm, MS at 9.2		
			18.0 - 18.26 one 5mm amygdule, vein pyrite curve essentially parallel to core axis, 1 1/2% py		
			18.4 - 18.5 MS 10.2 to 10.1		
			18.6 MS 9.8.		
			18.7 MS 9.9		
			18.8 MS 10.1		
			18.9 MS 7.7		
			19.0 MS 10.4		
			19.0 - 19.14 vein py 030, 1/2% py; MS at 10.3		
			19.23 - 19.4 amygdules from 3mm to 9mm		

COPPER HILL RESOURCES INC.			Hole # PN - 99-02	Date:	Page # 3
From	To	Lithology	Description	Structure	Comments
			19.47 - 19.6 a 12mm chill at 040 (or 320)		
			and approximately parallel to contact with		
			septa at 19.6. M.S of porphyry is 11.2, vein of		
			~~[illegible]~~ pyrite at 30° is nearly perpendicular		
			to chill.		
19.6	19.7	Tuff	Septa of host tuff with 8% py, M.S reading		Sample PN.02.99.002
			is 1.0 At 19.7 contact rolls from near parallel		
			to core axis to 35° with depth - note very		
			thin chill at depth. Contact with septa suggests	Thin chill is 10mm thick	
			septa to be concave - are: arcuate termination		
			or a ball like inclusion. Discordant contact at		
			19.7 with fabric of 'inclusion' at 15° Caaxc		
			perpendicular to contact.		
19.7	25.2	Trachyte	19.7 - 19.91 trachytic dyke with small amygdules		
			2-3mm, ½% diss py, MS at 19.76 is 10.9, at		
			~~19.~~ 19.87 is 11.4		
			20.0 one 4mm amygdules, MS 12.1		
			20.12 amygdules to 8mm, MS 12.4.		
			20.25 MS 11.8		
			20.34 MS 9.9 chlorite amygdule 6mm.		
			20.47 MS 12.3, chlorite amyg. 5mm		
			20.5 MS 12.6		
			20.6 - 20.75 amygdules 5 to 4mm MS 12.9		
			21.5 - 21.75 1% dissem py		
			21.9 ½ - ½% diss py. MS 14.8		
			21.9 - 22.09 1 - 1½% diss py with some granular		
			pyrite veins parallel C.A., MS 15.1 to 15.5		
			22.14 MS 11.7		

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 4
From	To	Lithology	Description	Structure	Comments
			22.24 etch stain sample, no visible K or quartz — lithology is plagioclase porphyry andesite / trachyte		
			22.87 – 23.38 vein py at 10°, ½% diss py		
			MS of 12.9 and 13.7		
			23.40 – 23.71 2mm amygdules, MS 14.6 to 14.7 to 14.7.		
			24.7 MS 13.8, 1% diss py, trace cpy		
			24.8 – 24.89 granular py veins at 0°, MS 13.1 sharp contact with coarse grained diorite with megacrysts of amphibole (10mm). Upper contact (24.9) at 50°, lower contact at 24.97 at 315°		
			25 – 25.17 a cross made by pyrite veining. at 25°, MS of coarse phase at 9.5, MS at 25 (16.4), at 25.05 (14.6), at 25.12 (13.2)		
			at 25.17 a suggested gradual contact toward lower crystallinity with depth		
			25.2 MS at 14		
			25.25 MS at 10.6		
			25.0 – 25.2 a roll in the chill contact of trachyte with the host tuffs. Contact is markedly discordant with fabric of tuff; upper chill contact is 40° to 10° with depth to a blunt protrusion with a 60° dip at depth at 25.2.	Tuff fabric is 50°, cut by a K spar-Q vein; contains 8% pyrite	Chill is 10mm thick. This tuff variably engulfed by chill trachyte was included in Sample PN-02.99.003
25.3	25.8	Tuff	'A' lamina is very actinolitic with biotite mudstone interbeds with lineated py (15%)	fabric varies to 60°	Sample PN-02-99-003

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 5
From	To	Lithology	Description	Structure	Comments
			boudinaged skarn-type laminae with garnets at 25.51-25.52 (at 75°), 25.55, 25.62-25.64, 25.67	Garnet skarn bed at 25.62-25.64 exhibits pinch and swell (i.e. boudinage)	MS reading is 0.5 to 0.4 MS reading at 25.7 to 25.8 is 30.9
			25.8 to 26.5 tuff of possible mixed provinence with intercalated 'beds' of qtz-garnet-epidote/actinolite Ca skarn-like assemblage which always has a distribution of mineralogy so as to preserve an imaginary plane of symmetry through the approximate centre of the 'bed'; brown phyllosilicate (biotite) bed 25.71-25.75 (at 70°), oxide rich (MS reading is 35.5) Overall interval is light grey and dense unit 'B' with 6% pin point py and py veining at 345° (perpendicular to banding) and 0.10, discontinuous trains of brown sphalerite parallel to banding and first recognized at 25.94	Sample PN-02.99.004 In bookshelf PN-99-02 a similar section from 26.87 to 27.8 contained significant oxide MS readings at 25.76 (7.4), 25.86 (1.8), 25.94 (1.8)
			Quartz-garnet-epidote/actinolite skarn assemblages as beds at 26.0-26.01, 26.02-26.03, 26.05-26.06, 26.07-26.08, 26.14-26.16. Skarn beds alternate with 'B' with pin-point py up to 6%; at 26.17-26.23 'B' with lineated po-py (at 70°) upto 4-5% & 26.23-26.42 ditto 'B' with amythystene quartz 'eyes' and pin point po-py upto 5% and few sphalerite trains parallel to banding at 26.29 (at 70°)	Skarn 'beds' at 80° Py vein at 26.25 (at 10°) and extends to 26.5; Vein or pyrite plating at 26.35 at 25° (or 335°). 26.43-26.5 Qtz 'veined' 'B'	MS readings: 26.06 (0.6), 26.2 (24.6), 7.3 (26.28), 2.2 (26.39)
			26.5-27.0 thin to whispy banded 'A' in light	'B' sulphides lineated at 26.55	Sample PN-02.99.005

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 6
From	To	Lithology	Description	Structure	Comments
			grey 'B'; 'A' with 8 to 10% net textured po (subordinate py) with near conformable trains of sphalerite, 'B' with 3% pin point py-po at 26.69 and 4% at 26.82.		MS readings as follows: 6.8 (26.53), 2.2 (26.62), 2.7 (26.7) 6.4 (26.9), 4.5 (26.98)
			27.0 - 29.0 ditto previous with mm thin 'A' and 'B' laminae, banding varies from 85° (27.05) to 70° and kinked at 28.38, 70° at 28.74, 90° at 28.9. Sulphides are predom disseminated and/or lineated with minor net texturing and overall total sulphides are low. Examples: 27.6 - 27.75 .5% net tex. po-py.; 28.74 - 28.97 'A' lamina with 15% net po-py, 'B' with 2-3 lineated sulphides. At 28.95 - 28.955 'A' lamina with 60% net sphalerite on po.	Thin mm scale banding at 85° Quartz veining as follows 27.44 to 27.56 (at 60° parallel to banding with 10% py up to 5mm), 27.7, 27.72 - 27.74, 27.94 - 27.99 (at 45°). Fold closure suggested at 27.6 with fold axis at 75°	Sample PN.02 99.006 Mag. Suscept readings: 27.05 (1.5) 27.15 (0.4), 27.24 (0.6), 27.7 (1.4) 27.95 (0.23) 28.05 (2.9), 28.18 (1.7), 28.24 (2.0), 28.32 (1.1) 28.43 (2.3), 28.5 (0.9), 28.6 (1.7) 28.71 (0.6), 28.8 (1.3) 28.9 (0.8) 28.95 (2.4 with 'A' laminae with 60% net tex sphalerite on po).
			29.0 - 29.5 ditto 27.0, same mm thin laminations	laminations at 80° - 70°	Sample PN.02.99.007 MS readings: 29.05 (4.6) 29.16 (4.2), 29.25 (2.0) 29.33 (3.3), 29.38 (1.5), 29.46 (2.8)
			29.5 - 31.0 ditto 27.0. Example of sulphide distribution: 29.65 - 29.80 'A' laminae at 60° at 29.68 - 29.69 (15% net po) 29.64 - 29.72 'B' with 2% pin point py-po. 29.72 ditto 29.68, 29.72 - 29.75 'B' with 2% pin point py-po; 29.75 - 29.78 'A' lamina with 12% net tex po-py (MS reading 2.2). B	vein of qtz + cpy + po at 0° (near perpendicular to banding), 'B' with amythystine quartz 'eyes'. Py vein from 30.25 - 30.32 at 15°	Sample PN.02.99.008 MS readings: 29.54 (3.6), 29.66 (1.1), 29.77 (2.2), 29.84 (1.0), 29.95 (0.8), 30.1 (0.9), 30.09 (0.9), 30.38 (0.8), 30.47 (1.0) 30.56 (0.8), 30.52 (0.6) 30.6 (1.4), 30.8 (0.4), 30.96 (0.2)
			31.0 - 32.0 ditto previous. Sulphides in 'A' at 11% net tex py-po and amythyst. qtz 'eye' 'B' with 1% pin point py, sphalerite seam at 31.06	banding at 70°, 9mm Qtz vein at 31.94 - 31.95 at 45° with marginal and core located	Sample PN-02-99-009 MS readings: 0.1 at 31.12, 0.3 at 31.25, 0.1 at 31.35, 0.1 at

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 7
From	To	Lithology	Description	Structure	Comments
			at 75°	molybenite,	31.43, 0.1 at 31.51, 0.1 at 31.73, 0.1 at 31.80.
			32.0 - 33.0 ditto previous, lamina 'A' commonly exhibit unglazed quartz in phyllosilicate (phlogopite question mark) - in other words the phyllo have taken the place of net-tex sulphides, note presence of elliptical 'eyes' of amythystone quartz. Sulphide example at 32.65 - 32.80 'A' lamina with 12% net tex and intergranular po-py, and lamina 'B' with up to 5% pin point py-po.	Veinlet of pyrite at 32.1 at approx 10°, laminations at 80°	Sample PN-02-99-010 MS readings: 32.05 (0.2), 32.16 (0.1), 32.37 (0.1), 32.44 (0.1), 32.56 (0.4), 32.66 (0.8), 32.73 (1.0), 32.89 (0.06)
			33.0 - 34.0 ditto previous, cubbly with 4.5% pinpoint py-po (MS reading 0.1)		Sample PN-02-99-011 Note: 0.6 meter loss in core recovery.
34.0	34.5	Porphyry	Massive light yellowish green plagioclase glomeroporphyritic trachyte; stain sample indicates absence of quartz phenocrysts and K spar; matrix exhibits a primary flow textured snowflake appearance (flow fabric at 34.3 at 0° (parallel core axis) and in sample flow fabric parallels downhole contact at 35°	few specks of disseminated pyrite, up to 2%, 1½% - 34.32	Upper contact in vicinity of 34.0 is lost to core grinding - recovery. MS reading at 34.15' at 0.03 34.32 (0.09)
			At 34.38 sharp contact at 340° (or 20°)		
34.5	36.5	Tuff	Ditto 32.0 tuff contains elliptical amythystene quartz 'eye'	banding at 34.6 at 45°; py-cpy veinlet at 34.8 at 20°	Sample PN-02-99-012 In general terms tuff appears coarser grained (recrystallized)
			'B' lamina at 34.6 has 3% pin point py-po, and lamina 'A' with 10% more net textured po-py; at 34.9 1½% py-po; at 35.1 - 35.18 7-9 net tex po-py	5mm qtz vein at 35.04 at 35°	Sulphides appear recrystallized py cubis up to 1mm
				Ptygmatic Qtz/K+Q veinlets	

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 8
From	To	Lithology	Description	Structure	Comments
			At 35.6 recrystallized variety of tuff with prominent (2mm) elliptical amythyst qtz 'eyes' and 12% net to intergranular po-py; 36.62 to 36.66 30% net tex po-py containing non-glazed quartz.	at 35.51 at 70°, and 35.7 - 35.72 at 275 and 35.74 - 35.76	MS readings: 08 (at 34.74) 1.1 (at 35.10), 0.7 (at 35.3) 1.0 (at 35.4), 35.55 (0.16), 35.84 (0.3), 35.94 (0.4) 36.18 (0.24), 36.27 (0.17)
			36.5 - 38.0 ditto 36.6 recrystallized variety of tuff; example of mineralization: 36.79 - 36.93 10% net-tex py-po bed 'A' and 3.5% py (up to 2+mm) in bed 'B';	Qtz veins at 37.79 - 37.81 and 3791 - 3792 (at 275°) and 37.94 (at 275°). Qtz-py veinlet at 3796 at 340°	Sample PN-02-99-013 Recrystallization (thermal event) produces coarser pyrite in 'A' and 'B'; silicate matrix in 'B' coarsens sillimanite/anthophyllite coarsens. MS readings: 36.8 (0.4) 36.9 (1.0), 37.03 (0.4) 37.09 (0.3), 37.2 (0.3) 37.37 (0.5), 3776 (0.1), 3784 (0.2) 37.88 (0.1) 37.90 (0.1) 37.92 (0.4) 38.0 (1.5).
			38.0 - 39.0 ditto 36.6 At 38.01 bed 'A' has 15% po-py as net tex. (MS reading of 1.5)	Qtz 'vein' at 38.73 (at 60) to 38.79 (at 55) and 38.81 to 38.82 (at 090).	Sample PN-02-99-014
			39.0 - 41.0 ditto 36.6; relatively poorly to weakly mineralized, 'A' lamina at 40.1 to 40.12 (090) with 50% net po-py (MS reading 2.27);	lamination at 080°	Sample PN-02-99-015 MS readings: 40.24 (0.6), 40.33 (0.07), 40.45 (0.6) 40.55 (0.9), 40.63 (0.3), 40.7 (0.3), 40.8 (0.4), 40.9 (0.3)

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 9
From	To	Lithology	Description	Structure	Comments
			410 - 420 ditto 36.6 whispy lamination at 70°; at 41.85 py vein (2-3mm) at 25°; 41.85 - 41.95 'A' laminae at 41.87 (at 40°) to 41.88 50% net tex py po and 41.91 to 41.92 (at 85°) 45% net po-py; 41.93 (4mm bed with 40% po-py at 070°), 41.95 - 41.96 (at 070°) 'A' laminae with 50% po py net tex; at 41.97 - 41.975 at 75° 'A' with 50% net tex po-py;		Sample PN-02-99-016 MS readings: 41.34 (0.38), 41.46 (0.3#)
			420 - 430 ditto 36.6 but host has more of a light jade-green colour; 'A' laminae as follows: 42.03 - 42.035 (at 70°) 50% net tex py-po; 42.06 - 42.07 (at 70°) 50% net tex py-po ('B' laminae with coarser lineated py (po) up to 8% - MS reading at 1.36), 'A' lamina at 42.14, 42.15, 42.16 with dissem grains of magnetite adjacent to net textured py-po; MS reading 15.2.		Sample PN-02-99-017 MS readings 42.06 (1.36) 42.15 (15.2#, with oxide), 42.26 (1.9), 42.76 (0.7), 42.85 (0.5)
			42.19 - 42.25 significant granular con of magnetite (MS 9.4)	42.4 - 42.69 gentle crenu-lated laminations with fold closures; laminations at 40° at 42.5 and 20° at 42.6	
			'A' lamination at 42.45 to 42.47 45% net textured sphalerite with po-py.		
			43.0 to 43.5 Massive pyrrhotite from 43.59 to 43.92, 43.98 to 44.07 tuff with 30% net py-po (MS reading at 8.4) Sharp contact at 44.07 at 20°	laminations crenulated and slumped at 430-43.17 at 0° to 45°	Sample PN-02-99-018 MS readings 2.2 (430), 2.0 (43.15) 0.14 (43.24) 180 ox band 0.5 cm wide at 43.53

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 10
From	To	Lithology	Description	Structure	Comments
				Oxide band in sharp contact with massive po-py with deformed sulphide-ed beds to 43.68 (sharp ~~gradational~~ contact at 85°-90°	at 080°. Sulphidization of the tuff (recall skeletal appearance of some crystals) would support thermal mobilization.
			44.07 to 44.15 massive po with inclusions of tuff up to 2cm. (MS reading at 11.2 - 9.4)		SAMPLE PN-02-99-019
			44.15 to 45.0 from 44.15 to 44.28 a continuation of 'inclusion-bearing' (tuff) massive sulphides (po-py) MS reading at 42.35 at 0.6. Note presence of amythy-st qtz 'eyes'		Sample PN-02-99-020
				attitude of sulphides at 44.2 at 30°	Sulphides are decreasing and or inclusions of tuff are getting larger. Are sulphides deposited into a breccia zone or impregnated into a zone being fragmented (question)
				Crenulated fabric from 44.15 to 45.0 with general dip with fold closures sub-parallel to core axis	
				Py vein at 45 at 15°.	
			45.0 - 46.0 recrystallized and relatively weakly mineralized; at 45.2 to 45.3 2% py minor po; MS reading at 45.9 at 0.1.	Py vein at 45.2 at 25°	Sample PN-02-99-021.
			46.0 - 48.0 d.ito 45.0; at 46.6 'A' lamina with 15% net py (po); @ te vein with globby spy at 47.29 - 47.3 at 090	py veins (2) at 46.72 - 46.75 at 090°; @ vein (4mm) at 47.42 at 30°	Sample PN-02-99-022 MS reading at 47.6 at 0.37
			48.0 - 49.0 d.ito 45.0 recrystallized with husky sillimanite, 3-5% 'depleted' net-tex py (po)		Sample PN-02-99-023 MS readings: 48.3 (0.3) 48.6 (0.3) 48.8 (0.13) 48.9 (0.08)
			49.0 - 51.0 d.ito 45.0; MS at 49.9 (0.1). ribbon fabric at 85.	MS readings 0.6, 1.95 (49.2) 1.20 (3-5 net po py at 49.3)	Sample PN-02-99-024

COPPER HILL RESOURCES INC.			Hole # PN-99-02	Date:	Page # 11
From	To	Lithology	Description	Structure	Comments
			51.0 - 52.6 Confederate grey whispy laminated / bedded (question mark) tuff with amythystene elliptical quartz 'eyes' (no definite band or bed development recognized). The tuff is coarser grained - particularly the 'B' laminae and an amorphous (baritic ?) phase is present as conformable laminae to give the tuff a ribbony appearance. Weak sulphide presence in the range of 3-5% with thin sulphide plating of net tex. pyrite (referred to as sulphide depleted net tex)	Attitude of relict bedding (ribbony modification) is 70° to 60°	Sample 025 MS readings are all very low from .03 - .05 .06 .07 .06 .08 .08 .09 .09 to 0.1 0.1.
52.53	52.6	Porphyry	An intrusive tongue or wedge of pinkish plagioclase porphyry trachyte. Sharp but curved basal contact from 65° to 30° with depth. Porphyry tongue is 7cm at its widest.	Sharp basal contact with chilled plag porphyry at 52.53 at 65°	Part of previous sample 025 Ribbony fabric of tuff is markedly discordant and nearly at right angles at 65° to core axis. Few qtz eyes
52.6	52.67	Tuff	Recrystallized tuff 13 cm at widest ½% dissem py, few qtz 'eyes'	Basal contact is sharp and curves from 0° (parallel to core axis) to 60°-50°	If this represents an inclusion then porphyry is marginally inclusion-bearing.
52.67	58.52	Porphyry	plagioclase-set in cryptocrystalline matrix (K spar stained). Colour changes are sharp between mouse grey and pink and present an attitude of 35° at 53.5 to 53.7 From 57.4 - 58.52 mixture of pink and confederate grey. MS readings of latter are higher (.07, 1.2, 0.4, 0.8, 0.25, 0.19)		Sample Rubble to form composite sample. MS readings at 52.72 (0.01) 53.57 (0.06), 54.55 (0.05) 55.9 (0.02) 56.9 (0.04)
	58.52	E.O.H.			

Appendix VII: Synopsis of Puskas' drill logs

December 29, 1999

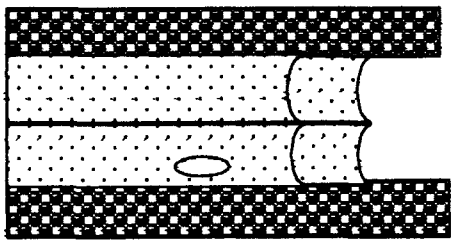
Powderhorn Zn-rich polymetallic prospect (refer to Copper Hill Corporation press releases 99-07 and 99-08)

The following intends to summarize the results obtained from a brief property visit and the detail logging of 3 boreholes, namely PN-99-01 and PN-99-02 drilled by Copper Hill Corp. and PH-97-04 drilled by property vendors.

Detail logging was carried out over a period of 3 and ¼ days and involved core orientation, magnetic susceptibility readings, specimen etch-staining and binocular examination.

Results in tabulated format:

(1) Dominant host rocks are laminated on a mm to cm scale – Laminae can appear regularly banded, and/or gently crenulated suggestive of penecontemp-oraneous (slump induced) folding. Laminae have been subdivided into type "A" and "B" (see figure below). These two types of laminae exhibit :
   1. Compositional differences involving silicate mineralogy and sulphide mineralogy,
   2. Textural differences and
   3. Structural differences.



'A' Lamina

'B' Lamina (Lamina on mm to cm scale)

'A' Lamina

Description of Lamina differences

'A' Lamina	'B' Lamina
Silicates • Quartz (o) appears granular, sized, transparent (unglazed), equant (not elliptical to bipolar and /or deformed). • Coarser Grained • Granular quartz is matrixed by silicates (actinolite, phyllosilicates) no potash feldspar, and minor to rare anthophyllite/sillimanite) Sulphides • Quartz is matrixed by sulphides (pyrite-, pyrochotic-red (low iron) spalerite). The presence of chalcophcite is very rare. • Sulphides can exhibit a zonation with pyrite margined by pyrrhotite, or pyrrhotite margined by sphalerite. • Sulphides exhibit net textured inclusion of quartz. Structure	Silicates • Quartz (.) is very fine grained, poorly sorted, nontransparent (glazed), "eyes" are bipolar. (○) • Very fine-grained. Sulphides • Quartz is rarely matrixed. Sulphides occur as lineated 'blade-like' grains. The presence of chalcapyrite is common. • Sulphides are not zoned. • Sulphides occur as dust (pinpoint) inclusions and/or lineated 'blade-like grains. Structure • 'B' Laminae exhibit features typical of imposed ductile shearing which includes grain elongation, elongation parallel to anthophyllite/sillimanite lineation, development of augen textures, and boudinage.

• 'A' laminae are surprisingly devoid of any obvious structural overprint. Quartz grains are not fractured or distended and are matrixed by megacrysts of pyrite-pyrrhotic-sphalerite. Divergent crystallographic orientations of megacrysts do not support crystallization during deformation/shearing.	

In many respects the host rocks and mineralization is similar to that discovered and reported by Nainsco Resources in Richardson Township, Ontario. The auriferous Zn-rich base metal mineralization was found to be hosted by crystal (amythystone quartz) tuffs in a volcanic cauldera setting.

The following table compares rock types and their respective magnetic susceptibility readings t the suggested precursor lithology.

Table 1 Rock Type – Magnetic Susceptibilities

Rock Type in borehole	Magnetic Susceptibility	Suggested Precursor
• Weathered tuffs	0.01 – 0.07	Tuff-ash mixture
• Unweathered tuffs	0.2 - 17	Tuff-ash mixture
• Tuffs, laminae 'A' tuff	1.96 – 20 (lower readings can have more sphalerite, absence of pyrrhotite)	Quartz crystal tuff w/wout sulphides
• Tuffs, laminae 'B' type	1.5 – 7.3	Argillaceous arkosic ash w/wout sulphides
• Tuffs (predominately 'B' type) with dusty (pin-point) sulphides	0.1 – 0.38	Tuffaceous ash
• Zoned epidote- pyroxene-garnet-quartz ± pyrite skarn	0.6 – 5.8	Marl
• Oxide-biotitite w/wout solitary garnets	6.6 – 108	Lean oxide-bearing mudstone or ironstone
• Plagioclase prophyry 'trachytic' dyke (borehole PN-99-01)	15-40	Intermediate to felsic emplacement
• Zoned, amygdular plagioclase porphyry dyke (borehole PN-99-02)	Uphole section: 6.3 – 10.5 (av 8-9) Downhole section: 9.9 – 15.5	Intermediate to felsic emplacement
• Glomeraporphyritic plagioclase porphyry dyke (borehole PN 99-02)	0.01 – 0.06	Intermediate to felsic emplacement
• Massive remobilized pyrrhotite (borehole PN-99-02)	0.14 - 22	Massive pyrrhotite
• Massive remobilized 'inclusion-bearing' pyrrhotite	9.4 – 11.2	Massive pyrrhotite
• Massive spinel (borehole PN-99-02)	180	Massive spinel

The preservation of lamina specifics on such a fine scale and persisting where folded (soft sediment slumpage) rules out pyrometasomatic replacement. Instead a syngenetic origin is favoured.

1. Without question, the sulphides have undergone variable textural modification and remobilization. (veining and sulphide plating at high angles to lamination). Such remobilizations may occur preferentially and marginal to the various emplacements of what appears to by a coeval assemblage of porphyritic dykes. The variety and intensity increase in dyking to the west (borehole PN-99-02) may be indicative of proximity to a locus of magmatic activity and mineralization.
2. Plagioclase porphyritic intermediate dykes. At present the porhyritic textured dykes do not appear to be sourced from the non-porphyritic, hypidiomorphic textured, Dawes Pond Granite located to the west.
   It should be noted that the dykes need not transect the entire lithologic column. Any one dyke could serve as a feeder to a lava/edifice temporally located within the detailed column.
3. Paleoreconstruction. In numerous paleoreconstructions, and Powderhorn may ultimately be included, the lateral transition into higher energy lithic lapilli tuffs / aggloverated (ie. So-called mill rock) was found to occur over a limited distance.
4. Marker horizon. The suggested ironstone-marl succession may represent a bonafide "marker horizon". Would support the conclusion that the Zn enriched section from BH# PN-99-01 was dyked out in Borehole PN-99-02.
5. Mineralization.
   - Grade – The intensity and/or grade of mineralization found on surface has yet to be intersected in core. This clearly suggests economically favourable features are yet to be encountered.
   - Massive pyrrhotite-spinel – Massive pyrrhotite intersected in borehole PN-99-02 (samples 018, 019, and 020) exhibits a unilateral zonation involving a hanging wall (uphole) spinel (hercynitic?) zone and a footwall (downhole) inclusion breccia. The intensity in sulphidation of the tuff septae bears witness to the high levels of thermal metamorphism imposed on the pre-existing mineralization. Similar oxide-sulphide (pyrrhotite) assemblages have been identified in numerous deposits of VMS.
   - Sampling – Without question the sampling carried out to date, except in the case of one sample, has resulted in serious dilution of assays, particularly w.r.t. Zn.
6. Geophysics – The variation in magnetic susceptibilities sheds light on the geophysical (mag, TEM, VLF) results obtained in the Powderhorn Pond Grid to the south. Several boreholes in the grid should encounter extensions of the discovered Zn mineralization and these results should enable further targets to be identified.

Appendix VIII: Geochemical data for samples from drill holes PN99-01 and PN99-02

Au Fire Assay/ICP Geochemistry Certificate

Client: Pearl Resources Inc.
Geologist: P. Georghiou
Project:
Sample: Rocks

DskFile: 373-9896

DateIn: November 06, 1999
DateOut: November 12, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale, NF
A0J 1T0

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: G. Smith

(Concentrations in assay range may cause interferences in associated elements.)

Sample Number	Au ppb	Ce ppm	Sr ppm	Ba ppm	Fe %	P %	Hg ppm	Mg %	As ppm	V ppm	Na %	Mo ppm	Al %	Be ppm	Ca %	Zn ppm	Cu ppm	Sb ppm	Ag ppm	Pb ppm	Bi ppm	Ti %	Cd ppm	Co ppm	Ni ppm	W ppm	La ppm	K %	Mn ppm	Rb ppm	Cr ppm
PN-01-99-001	5	10	7	25	0.57	0.01	1	0.44	5	1	0.15	2	0.81	0.5	0.36	136	32	5	0.3	9	2	0.01	0.5	1	3	10	10	0.19	61	20	70
PN-01-99-002	5	10	14	25	0.58	0.01	1	0.36	5	1	0.16	4	1.16	0.5	0.59	277	38	5	0.5	25	6	0.01	1.3	1	3	10	10	0.13	74	20	66
PN-01-99-003	5	10	4	28	0.91	0.01	1	0.55	5	1	0.14	7	0.65	0.5	0.09	408	63	5	0.3	13	4	0.01	1.0	1	2	10	10	0.23	91	20	65
PN-01-99-004	5	10	7	42	0.94	0.01	1	0.89	5	5	0.15	10	0.97	0.5	0.11	280	57	5	0.4	24	5	0.01	0.5	1	3	10	10	0.38	165	20	68
PN-01-99-005	7	10	9	45	1.60	0.02	1	1.72	5	4	0.15	4	1.68	0.5	0.14	428	251	5	0.6	13	7	0.01	0.5	1	2	10	10	0.51	307	20	55
PN-01-99-006	8	10	7	34	1.17	0.01	1	1.03	5	1	0.14	1	1.04	0.5	0.12	298	178	5	0.4	6	2	0.01	0.5	1	1	10	10	0.19	155	20	77
PN-01-99-007	7	10	10	54	1.54	0.01	1	1.13	5	2	0.15	1	1.24	0.5	0.12	134	61	5	0.4	5	4	0.01	0.5	1	2	10	10	0.22	166	20	80
PN-01-99-008	13	10	22	75	3.85	0.15	1	1.33	5	4	0.20	2	2.16	0.5	0.98	104	396	5	0.8	6	5	0.01	0.5	1	1	10	10	0.35	276	20	54
PN-01-99-009	19	10	20	57	3.32	0.01	1	1.49	5	57	0.18	10	2.30	0.5	0.68	1091	620	5	1.3	292	3	0.02	1.4	5	4	10	10	0.46	357	20	59
PN-01-99-010	9	10	4	17	0.72	0.01	1	0.55	5	1	0.18	7	0.71	0.5	0.05	2175	150	5	>6.0	1264	2	0.01	6.7	1	4	10	10	0.15	111	20	126
PN-01-99-011	93	10	10	49	1.84	0.01	1	0.90	5	40	0.18	6	1.27	0.5	0.31	1916	375	5	>6.0	664	4	0.02	5.9	4	4	10	10	0.38	275	20	85
PN-01-99-012	111	10	25	37	2.86	0.02	1	0.49	6	12	0.18	10	0.94	0.5	0.29	>2200	1189	5	>6.0	1503	11	0.01	27.1	5	7	10	10	0.22	326	20	120
PN-01-99-013	12	10	4	23	1.17	0.01	1	0.41	5	3	0.11	11	0.54	0.5	0.08	>2200	374	6	1.9	383	4	0.01	25.2	1	6	10	10	0.17	176	20	111
PN-01-99-014	59	10	3	26	2.75	0.01	1	0.44	5	3	0.15	23	0.59	0.5	0.08	>2200	1254	10	5.2	1147	9	0.01	49.8	2	6	10	10	0.21	194	20	139
PN-01-99-015	70	10	3	18	1.39	0.01	1	0.49	5	3	0.14	9	0.61	0.5	0.05	>2200	1151	8	2.6	376	7	0.01	33.8	1	6	10	10	0.18	206	20	145
PN-01-99-016	58	10	3	14	2.63	0.01	1	0.29	5	2	0.14	13	0.45	0.5	0.07	>2200	1593	27	4.6	155	12	0.01	>110.0	1	4	10	10	0.14	211	20	136
PN-01-99-017	182	10	3	13	3.89	0.01	3	0.34	5	4	0.35	17	0.57	0.5	0.06	>2200	1933	46	4.1	110	27	0.01	>110.0	1	6	10	10	0.18	379	20	182
PN-01-99-018	88	10	2	13	2.72	0.01	2	0.26	5	2	0.13	7	0.44	0.5	0.04	>2200	2053	30	4.2	47	12	0.01	>110.0	2	5	10	10	0.17	195	20	153
PN-01-99-019	64	10	3	11	4.56	0.01	1	0.23	5	4	0.13	6	0.41	0.5	0.04	>2200	2623	5	4.1	28	7	0.01	11.4	2	3	10	10	0.15	131	20	124
PN-01-99-020	5	10	16	57	1.82	0.03	1	0.56	5	5	0.22	2	1.56	0.5	0.50	671	192	5	0.2	5	3	0.04	10.6	1	2	10	10	0.43	451	20	116
PN-01-99-021	5	10	9	77	2.28	0.05	1	0.72	5	35	0.20	1	1.75	0.5	0.58	225	69	5	0.3	2	2	0.10	0.5	5	2	10	10	0.71	577	20	72
PN-01-99-022	40	10	26	128	5.13	0.03	1	1.15	5	148	0.26	1	3.49	0.5	1.53	316	264	5	0.5	19	2	0.08	0.5	30	2	10	10	0.49	934	20	35
PN-01-99-023	14	10	8	63	3.93	0.01	1	0.50	5	3	0.16	1	1.07	0.5	0.14	435	371	5	0.8	14	4	0.01	0.5	1	3	10	10	0.21	507	20	108
PN-01-99-024	11	10	5	71	3.31	0.01	1	0.30	5	6	0.13	1	0.74	0.5	0.07	93	244	5	0.4	8	3	0.01	0.5	2	3	10	10	0.15	373	20	102

Assay Certificate

Client: Pearl Resources Inc.
Geologist: P. Georghiou
Project:
Sample: Rocks

DskFile: 373-9902

DateIn: November 06, 1999
DateOut: November 12, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale, Nfld
A0J 1T0

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: Graham Smith

SAMPLE NUMBER	Zn %	Ag oz/ton
PN-01-99-010	-------	0.18
PN-01-99-011	-------	0.21
PN-01-99-012	0.58	0.29
PN-01-99-013	0.52	-------
PN-01-99-014	1.10	-------
PN-01-99-015	0.68	-------
PN-01-99-016	2.11	-------
PN-01-99-017	7.40	-------
PN-01-99-018	2.63	-------
PN-01-99-019	0.34	-------

Au Fire Assay/ICP Geochemistry Certificate

Client: Pearl Resources Inc.
Geologist: P. Georghiou
Project:
Sample: Rocks

DskFile: 373-9897

DateIn: November 06, 1999
DateOut: November 12, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale, NF
A0J 1T0

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: G. Smith

(Concentrations in assay range may cause interferences in associated elements.)

Sample Number	Au ppb	Ce ppm	Sr ppm	Ba ppm	Fe %	P %	Hg ppm	Mg %	As ppm	V ppm	Na %	Mo ppm	Al %	Be ppm	Ca %	Zn ppm	Cu ppm	Sb ppm	Ag ppm	Pb ppm	Bi ppm	Ti %	Cd ppm	Co ppm	Ni ppm	W ppm	La ppm	K %	Mn ppm	Rb ppm	Cr ppm
PN-02-99-001	40	10	5	17	1.07	0.01	1	0.96	5	3	0.13	5	0.94	0.5	0.17	>2200	582	5	0.8	59	5	0.01	13.3	1	2	10	10	0.11	276	20	70
PN-02-99-002	20	10	14	10	1.90	0.04	1	0.43	5	10	0.50	3	0.82	0.5	0.41	40	264	5	0.5	10	3	0.01	0.5	6	10	10	10	0.10	318	20	375
PN-02-99-003	13	10	24	149	3.74	0.04	1	1.12	5	106	0.24	2	2.71	0.5	1.10	201	169	5	0.3	6	2	0.04	0.5	17	5	10	10	0.35	412	20	58
PN-02-99-004	5	10	20	108	3.27	0.01	1	0.70	5	35	0.20	9	1.69	0.5	0.78	588	205	5	0.5	9	3	0.01	0.5	5	4	60	10	0.20	448	20	87
PN-02-99-005	5	10	6	50	3.23	0.01	1	0.42	5	22	0.16	2	0.83	0.5	0.18	346	137	5	0.5	11	5	0.01	0.5	7	3	10	10	0.13	284	20	98
PN-02-99-006	5	10	3	34	2.08	0.01	1	0.33	5	2	0.16	2	0.63	0.5	0.10	361	243	5	0.4	8	4	0.01	0.5	2	2	10	10	0.08	281	20	112
PN-02-99-007	36	10	6	32	5.52	0.01	1	0.61	5	4	0.14	20	0.81	0.5	0.08	>2200	722	5	0.8	25	8	0.01	10.5	1	2	10	10	0.09	328	20	76
PN-02-99-008	14	10	5	26	3.18	0.01	1	0.54	5	3	0.13	17	0.70	0.5	0.12	231	349	5	0.4	10	3	0.01	0.5	1	1	10	10	0.09	326	20	91
PN-02-99-009	12	10	5	25	1.76	0.01	1	0.81	5	3	0.15	9	0.94	0.5	0.13	466	431	5	0.3	7	5	0.01	0.5	1	3	10	10	0.10	478	20	82
PN-02-99-010	5	10	5	20	1.94	0.01	1	0.78	5	3	0.15	4	1.08	0.5	0.37	200	576	5	0.4	4	2	0.01	0.5	1	3	10	10	0.07	592	20	97
PN-02-99-011	12	10	3	11	2.30	0.01	1	0.52	5	3	0.14	8	0.86	0.5	0.31	121	924	5	0.8	5	2	0.01	0.5	1	4	10	10	0.08	453	20	105
PN-02-99-012	5	10	3	13	2.46	0.01	1	0.56	5	2	0.13	21	0.85	0.5	0.19	69	213	5	0.3	7	4	0.01	0.5	1	2	10	10	0.09	466	20	91
PN-02-99-013	31	10	6	12	3.53	0.01	1	0.79	311	4	0.12	2	1.15	0.5	0.75	121	222	5	0.2	6	4	0.01	0.5	1	3	10	10	0.09	827	20	78
PN-02-99-014	13	10	4	23	2.50	0.01	1	1.35	25	9	0.13	7	1.52	0.5	0.41	514	109	5	0.2	2	3	0.01	0.5	2	2	10	10	0.20	1000	20	89
PN-02-99-015	12	10	6	34	2.06	0.01	1	1.03	5	8	0.14	1	1.23	0.5	0.26	563	31	5	0.2	4	4	0.01	1.1	2	4	10	10	0.16	975	20	87
PN-02-99-016	23	10	6	13	3.75	0.01	1	0.73	11	5	0.14	3	0.97	0.5	0.60	1312	161	5	0.4	6	4	0.01	8.4	2	2	10	10	0.10	874	20	90
PN-02-99-017	28	10	5	23	4.41	0.01	1	0.43	5	5	0.15	7	0.78	0.5	0.31	699	265	5	0.7	11	4	0.01	6.0	1	3	10	10	0.10	599	20	97
PN-02-99-018	46	10	4	23	5.79	0.01	1	0.41	5	5	0.19	6	0.74	0.5	0.13	199	428	5	1.3	21	5	0.01	0.5	2	2	10	10	0.08	571	20	112
PN-02-99-019	128	10	1	10	>10.00	0.01	1	0.01	5	20	0.20	1	0.40	0.5	0.10	60	1100	5	1.9	40	40	0.01	0.5	1	1	10	10	0.01	560	20	60
PN-02-99-020	14	10	7	15	3.89	0.01	1	0.58	5	4	0.16	2	0.75	0.5	0.36	73	433	5	0.5	8	3	0.01	0.5	2	1	10	10	0.06	682	20	75
PN-02-99-021	5	10	6	10	2.61	0.01	1	0.54	5	3	0.11	1	0.75	0.5	0.46	114	249	5	0.2	5	3	0.01	0.5	1	2	10	10	0.07	699	20	78
PN-02-99-022	22	10	6	19	3.44	0.01	1	0.39	8	3	0.13	3	0.43	0.5	0.22	129	1488	5	1.7	4	6	0.01	0.5	1	2	10	10	0.09	509	20	82
PN-02-99-023	13	10	6	68	1.85	0.01	1	0.37	5	2	0.13	7	0.48	0.5	0.14	935	465	5	0.5	6	3	0.01	3.6	1	2	10	10	0.07	424	20	78
PN-02-99-024	17	10	10	49	3.67	0.01	1	1.05	5	3	0.19	4	1.07	0.7	0.48	79	65	5	0.4	9	4	0.01	0.5	1	1	10	10	0.12	818	20	67
PN-02-99-025	5	10	26	39	2.23	0.01	1	0.46	5	2	0.12	14	0.67	1.6	0.97	37	32	5	0.2	3	4	0.01	0.5	1	3	10	10	0.09	990	20	79

Assay Certificate

Client: Pearl Resources Inc.
Geologist: P. Georghiou
Project:
Sample: Rocks

DskFile: 373-9901

DateIn: November 06, 1999
DateOut: November 12, 1999

Eastern Analytical Limited
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Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: Graham Smith

SAMPLE NUMBER	Zn %
PN-02-99-001	0.27
PN-02-99-007	0.41

Au Fire Assay Certificate

Client: CopperHill Resources
Geologist: Ross Burton
Project:
Sample: Rocks

DskFile: 384-9727

DateIn: October 22, 1999
DateOut: October 26, 1999

Eastern Analytical Limited
P.O. Box 187,
Little Bay Road,
Springdale, Nfld
A0J 1T0

Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: Graham Smith

SAMPLE NUMBER	Au ppb
PNR-99-01	5
PNR-99-02	5

ICP Geochemistry Certificate

Client: CopperHill Resources
Geologist: Ross Burton
Project:
Sample: Rocks

DskFile: 384-9733

DateIn: October 22, 1999
DateOut: October 26, 1999

Eastern Analytical Limited
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Little Bay Road,
Springdale, NF
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Phone: 709-673-3909
Fax: 709-673-3408
Email: eanalytical@thezone.net

Signed by: G. Smith

(Concentrations in assay range may cause interferences in associated elements.)

Sample Number	Ce ppm	Sr ppm	Ba ppm	Fe %	P %	Hg ppm	Mg %	As ppm	V ppm	Na %	Mo ppm	Al %	Be ppm	Ca %	Zn ppm	Cu ppm	Sb ppm	Ag ppm	Pb ppm	Bi ppm	Ti %	Cd ppm	Co ppm	Ni ppm	W ppm	La ppm	K %	Mn ppm	Rb ppm	Cr ppm
PNR-99-01	10	3	30	2.38	0.01	1	0.53	5	6	0.14	4	0.69	0.5	0.01	399	207	5	0.7	77	2	0.01	1.5	3	4	10	10	0.23	168	20	110
PNR-99-02	10	4	27	1.05	0.01	1	0.81	5	11	0.16	6	0.89	0.5	0.01	276	92	5	0.3	4	3	0.01	0.6	2	5	10	10	0.28	237	20	121

STATEMENT OF QUALIFICATIONS

I, Derek H.C. Wilton, of 7 Yellowknife Street, St. John's, Newfoundland, A1A 2Z7, hereby certify that:

1. I am a graduate of the Memorial University of Newfoundland and the University of British Columbia, and hold a Ph.D. degree in Earth Sciences (1984-MUN), an M.Sc. degree in Geological Sciences (1978-UBC) and a B.Sc. degree in Geology (1976-MUN).

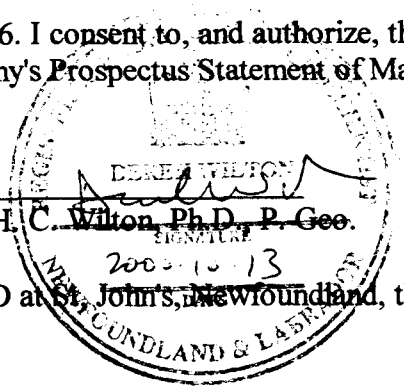
2. I am a professor in the Department of Earth Sciences, Memorial University of Newfoundland and have been retained by Copper Hill Resources Inc. to prepare this report.

3. I am a registered P. Geo. with the Association of Professional Engineers and Geoscientists of Newfoundland and Labrador.

4. This report is based on two one-day visits to the claim blocks, brief examinations of drill holes PH-98-01, PN99-01, and PN99-02 and a review of the bibliography as cited herein.

5. I do not nor do I expect to receive, directly or indirectly, any interest in the subject properties or in the securities of Copper Hill Resources Inc..

6. I consent to, and authorize, the use of the attached report and my name in the Company's Prospectus Statement of Material Facts or other public document.



Derek H. C. Wilton, Ph.D., P. Geo.

DATED at St. John's, Newfoundland, this 13th day of October, 1999.