# NI 43-101
# Technical Report
# on the
# North Island Copper Property

*Location:*
**Northern Vancouver Island,**
**Nanaimo Mining Division**

**NTS 92 L/11, 12**
**Latitude: 50° 38' 18" N, Longitude: 127° 28' 51" W**
**607423 E, 5610722 N**
**UTM Zone 9, NAD 83**

*Owner and Operator:*
**Questcorp Mining Inc.**
**#510 – 580 Hornby St. Vancouver, BC, V6C 3B6**

*Author:*
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**Campbell River, BC**

***Effective Date***
**July 27, 2022**

**Frontispiece**

*Hiking in to the Rainbow showing area across a deactivated stream crossing along the Doreen Lake Road, November 2021.*

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# 1. Summary

The North Island Copper Property is located south of Port Hardy on northern Vancouver Island. It is adjacent to exploration areas around the past producing Island Copper Mine, which is located on the north shore of Rupert Inlet. The Island Copper Mine was discovered in the early 1960s, initially by a regional airborne magnetometer survey, and subsequently by soil geochemistry and ultimately by extensive diamond drilling. The North Island Copper Property was explored concurrently with the Island Copper Mine development and production phases using soil geochemistry, ground and airborne magnetometer surveys, prospecting and geological mapping and limited diamond drilling and trenching.

The Property is owned by Craig Alvin Lynes and is under option to Questcorp Mining Inc. of Vancouver who have retained the author to write a NI 43-101 Technical Report to support their application for listing on securities exchanges. The Property is located on Northern Vancouver Island in the Nanaimo Mining Division and appears on topographic map sheets NTS 92 L/11, 12 at latitude 50° 38' 18"N, by longitude 127° 28' 51"W in the NAD 83 datum or in UTM Zone 9 coordinates at 607423 E by 5610722 N and covers an area of 1168.09 hectares. The Property is in an actively logged area of low relief and altitude and is accessible by a network of well maintained roads west of Highway 19 and from the Coal Harbour Highway.

The geology of the Property lies within the upper stratigraphic section of the 7 km thick Triassic Karmutsen Formation, a series of tholeiitic marine flood basalts, where intervals of limestone increase in frequency culminating in the Quatsino Formation limestone capping the final flows of the Karmutsen. A calc-alkaline magmatic arc was initiated in the Jurassic resulting in extensive volcanic and sedimentary strata deposited over the Quatsino Fm and voluminous plutonic complexes intruding the strata including the Karmutsen Fm. Porphyry copper deposits were formed in a belt now preserved along the north side of Holberg Inlet as the Island Copper - Hushamu Belt. Associated with the porphyry copper deposits around plutons are skarns developed in limey sediments as well as epithermal vein deposits. In the eastern part of the North Island Copper Property copper-iron skarns are commonly developed at the interface between the interflow limestone beds and the adjacent basalts as well as in limestones proximal to plutonic contacts. The western part of the Property encompasses part of the Quatse Lake Pluton, one of the Jurassic intrusions of the Bonanza Arc, in which previous exploration work has identified porphyry copper -molybdenum type mineralization of undetermined extent.

The present work reexamined examined showings known as the Rainbow, Cranberry, South, and Skid, which display extensive garnet skarns in marbleized limestone. Chalcopyrite, magnetite and minor sphalerite are found in the skarns varying in style from fine fracture fillings and disseminations to laminated garnet-sulphide bodies and massive sulphide-magnetite zones. Most skarns occur as replacive bodies in the limestone at the basalt contact, but some are discordant crosscutting the marble. Dykes, satellitic to dioritic and granodioritic plutons are evident, but poorly exposed around most showings. Previous exploration data, including geological maps were used to guide the current work, which involved mapping, though inhibited relative to the original exploration work by dense second growth Coastal Hemlock and Cedar, and undergrowth filling old trenches and previous stripped areas.

Forty six mineralized rocks sampled and were assayed along with an additional eight unmineralized magmatic rocks, which were analysed by whole rock methods to determine magmatic affiliations of dykes around the skarns and granitoid phases of the Quatse Lake Pluton. Of the mineralized rocks assayed, 29 reported overlimit variously for copper, silver or zinc and were reanalyzed by ore grade methods. The mineralized rocks were all classified as grab samples, which are not considered to be representative of the bulk composition of the

several skarn showings. Mineralized skarn showings in the Karmutsen section are characterized by massive magnetite - chalcopyrite lenses associated with garnet – pyroxene skarns classified as copper skarns. The Rainbow showing is the most extensive skarn deposit and extends as lenses and pods of garnetite with disseminated chalcopyrite associated with massive magnetite and chalcopyrite lenses from over 500 meters along a marbleized limestone beds bordered by massive basalt flows within about 800 meters of the contact with the Quatse Lake Pluton. Seventeen samples from the Rainbow showing range from 75 ppm to 17.1 % copper with a mean value of 5.2 %. Copper grades above 10% represent massive lenses of chalcopyrite, while the samples with grades between 1 and 6% mainly represent more homogenous disseminated chalcopyrite in garnetite. At the Cranberry showing six samples range in copper concentration from 3910 ppm for interstitial chalcopyrite in massive magnetite skarn to 7.88% for chalcopyrite banded garnetite. Of nine samples from the South showing, 3 are from chalcopyrite filled amygdules in basalt ranging from 568 ppm to 2.28% copper. Six samples of South showing garnetites displaying disseminated or banded chalcopyrite ranged from 1.6 to 3.2% copper. In the Quatse Lake Pluton, the sampled mineralization consists chalcopyrite veinlets in altered biotite granodiorite and range in grade in 5 samples from 203 ppm to 3910 ppm Cu. One granodiorite sample displaying molybdenite rosettes on fractures graded 1280 ppm Mo.

As part of the mapping program a UAV magnetometer survey of parts of the Property was and completed in March 2022 by Pioneer Exploration Consultants to resolve structural features including limestone interbeds in the Upper Karmutsen Formation and areas of magnetite destructive alteration in the Quatse Lake Pluton. The surveys were flown ar 35 meter line spacing over the Karmutsen - limestone section and at 50 meters in the Quatse pluton and the eastern, volcanic dominated part of the Property.

In Area 1, which is around a series of skarn showings, classified in Minfiles as the Rainbow, Cranberry, South, and Frances, the TMI and 1stVD maps reflect the ENE south dipping stratigraphic structure of the upper Karmutsen Formation, which is characterized by an increasing frequency of interflow sediments, particularly limestone near its conformable contact with the Quatsino Limestone. A lack of exposure in the district generally prevents tracing flow structures in the Karmutsen. The pattern of magnetic structures shows a series of parallel highs and lows striking about 070, which coincide with a trellis pattern of streams. The streams likely follow less resistant layers in the Karmutsen, probably limestones, which show the effects of karst formation where they are exposed. The streams are coincident with the south side of high gradient features on the 1stVD. Probably, the high gradient lines represent the contact between south dipping limestones on the south and basalt flow to the north. However, not all of the mapped limestone lenses found within the area correspond to magnetic lows or the the south side of high gradient anomalies.

On the basis of confirmed mineralization in several copper skarn showings in the Karmutsen interflow limestones, and historical mineralization of a porphyry type in the Quatse Lake Pluton, the North Island Copper Property is a property of merit in the author's opinion. A program of detailed delineation of the limestone lenses and skarns is recommended in the central part of the Property, where proximity to the eastern contact of the Quatse Lake pluton occurs. The TMI of the Karmutsen is higher near the contact, which may be indicative of contact metamorphism as well as formation of magnetite-bearing skarns. Detailed ground magnetic surveys and soil geochemistry should be focused in the immediate vicinity of predicted contacts. Orientation surveys of both magnetic and geochemical surveys should be conducted to determine optimum intervals between reading and sample sites. In the Quatse Lake pluton exploration should focus on the magnetic low. Previous work, including diamond drilling and surface mapping has discovered porphyry style mineralization in that area, but access is difficult and exposure minimal and will require considerable logistical efforts. Coordination with logging activities may mitigate costs. The recommended budget for the program is $119.434.50.

# 2. Introduction

The North Island Copper Property holds the mineral rights in an area within 5 to 10 km north of the past producing Island Copper mine, a porphyry copper deposit that operated from 1967 to 1993. The geology of the claims is within the upper stratigraphic interval of the Triassic Karmutsen Formation where increasingly frequent hiatuses in submarine plateau basalt volcanism are occupied by limestone beds. Skarn mineralization in the limestones is associated with local dioritic intrusions possibly connected to the same magmas responsible for the Island Copper porphyry deposits on the shore of Rupert Inlet and the several other known porphyry copper deposits in the Hushamu - Red Dog belt to the west northwest.

The North Island Copper Property is subject to the Property Option Agreement, dated October 4th, 2021, between Questcorp Mining Inc. ("Questcorp" or the "Optionee") and Craig Alvin Lynes (the "Vendor") whereby Questcorp can acquire 100% of the interest in and to certain mineral claims comprising the Property. The author was retained by Questcorp to prepare a National Instrument 43-101 *Standards of Disclosure for Mineral Projects* and National Instrument Form 43-101 F1 Technical Report ("NI 43-101" and "Form NI 43-101 F1", respectively) compliant Technical Report on the North Island Copper Property (the "Technical Report" or the "Report"). The author is an independent qualified person as defined in Section 1.5 of NI 43-101. This Report has been prepared in the form and content specified in Form NI 43-101 F1.

Regional geological information was sourced from British Columbia Geological Survey reports and maps available from government websites (Mapplace.ca), as well as papers published in refereed international journals. Information was also obtained from the web-based British Columbia government website "Mineral Titles Online" for claim information. Historical information was gathered from the assessment reports on file in the British Columbia Assessment Report Information System (ARIS) describing exploration on the Property and on adjacent properties since about 1968.

The author has referred to the work of various geological experts in the preparation of this Technical Report who are authors of geological papers and maps on the region where the Property is situated. While it is not always easy to verify early results or to make representations regarding their accuracy or applicability, based on a review of the data presented in the previous work, involving reprocessing and critical reevaluation, the author is confident that this earlier work was carried out to high industry standards of the time. The author believes the information in this Technical Report remains accurate and is unaware of any material change in the scientific and technical information prior to the filing date. The author reserves the right to review public releases by Questcorp that quote this Technical Report and the work of the author.

In the matter of Property ownership, the author is not relying on a report or opinion of any experts. The ownership of the Property claims has been taken from the British Columbia Mineral Titles Online database. The data on this site is updated daily and therefore assumed to be correct. The mapped tenures presented in this Technical Report are taken from a GIS data file downloaded by the author on March 17, 2022 from the website for Mineral Titles Online

**Table 1:** Abbreviations
Measurement Units, Element Abbreviations and Acronyms used in this report.:

**Measurement Units:**

| | |
|---|---|
| C | Celsius |
| cm | centimeter |
| g/t | g/t |
| ha | hectares |
| Hz | Hertz |
| km | kilometer |
| kg | kilogram |
| m | meter |
| mm | millimeter |
| Ma | Million years ago |
| Mt | Million tonnes |
| ppb | parts per billion |
| ppm | parts per million |
| t | tonnes |
| wt% | weight percent |

**Element Abbreviations:**

| | |
|---|---|
| Ag | Silver |
| As | Arsenic |
| Au | Gold |
| Cd | Cadmium |
| Ce | Cerium |
| Cu | Copper |
| Eu | Europium |
| La | Lanthanum |
| Mo | Molybdenum |
| Mn | Manganese |
| Pb | Lead |
| Sb | Antimony |
| Yb | Ytterbium |
| Zn | Zinc |

**Minerals:**

| | |
|---|---|
| bn | bornite $Cu_5FeS_4$ |
| cc | chalcocite $CuS_2$ |
| cpy | chalcopyrite $CuFeS_2$ |
| po | pyrrhotite $Fe_{1-x}S$ |
| py | pyrite $FeS_2$ |
| sp | sphalerite ZnS |
| gn | garnet $Ca_3Fe_2Si_3O_{12}$ |
| magn | magnetite $Fe_3O_4$ |

**Geological Terms**

| | |
|---|---|
| Fm | Formation |
| Gp | Group |
| SW | southwest |
| NW | northwest |

**Acronyms:**

| | |
|---|---|
| AAS | Atomic Absorption Spectroscopy |
| ARIS | British Columbia Assessment Report Index System |
| BCGSB | B.C. Geological Survey Branch |
| EM | Electromagnetic |
| MEMPR | Ministry of Energy Mines and Petroleum Resources |
| GIS | Geographic Information System |
| GPS | Geographic Positioning System |
| Mag | Magnetometer |
| NTS | National Topographic Series |
| QA | Quality Assurance |
| QC | Quality Control |
| REE | Rare Earth Element |
| RGS | Regional Geochemical Survey |
| RMI | Residual Magnetic Intensity |
| TMI | Total Magnetic Intensity |
| 1VD | First Vertical Derivative |
| UTM | Universal Transverse Mercator |

# 3. Reliance on other Experts

In the matter of Property ownership, the author is relying on a legal opinion from the lawyers for the issuer and Schedule A of the Property Option Agreement. This opinion applies in Item 4.

# 4. Property Description and Location

The North Island Copper Property is located on northern Vancouver Island (Fig. 1) between the coastal town of Port Hardy and Rupert Inlet at the eastern end of Quatsino Sound. The property is centred at Latitude: 50° 28' 15" N, Longitude: 127° 38' 51" W, NAD 83 datum, UTE Zone 9, 607423 E, 5610722 N, in the NTS map sheets 92 L/11 and 12 , BCGS Map 092L.065 in the Nanaimo Mining Division (Fig. 2). It consists of 4 variously named cell claims listed in Table 1, issued between September 2019 and November 2021 and currently with Good To Dates of September 30, 2028. The total area of the tenures is 1168.09 hectares. The ground to the south and west remains solidly claimed in Mineral Tenures currently and principally by North Isle Copper and Gold Inc. (Fig. 3) , as much of it has been since the early days of the Island Copper Mine.

The claims establish subsurface rights to the owner for minerals (base and precious metals) as outlined in the *Mineral Tenure Act* of British Columbia (the "*Mineral Tenure Act*").

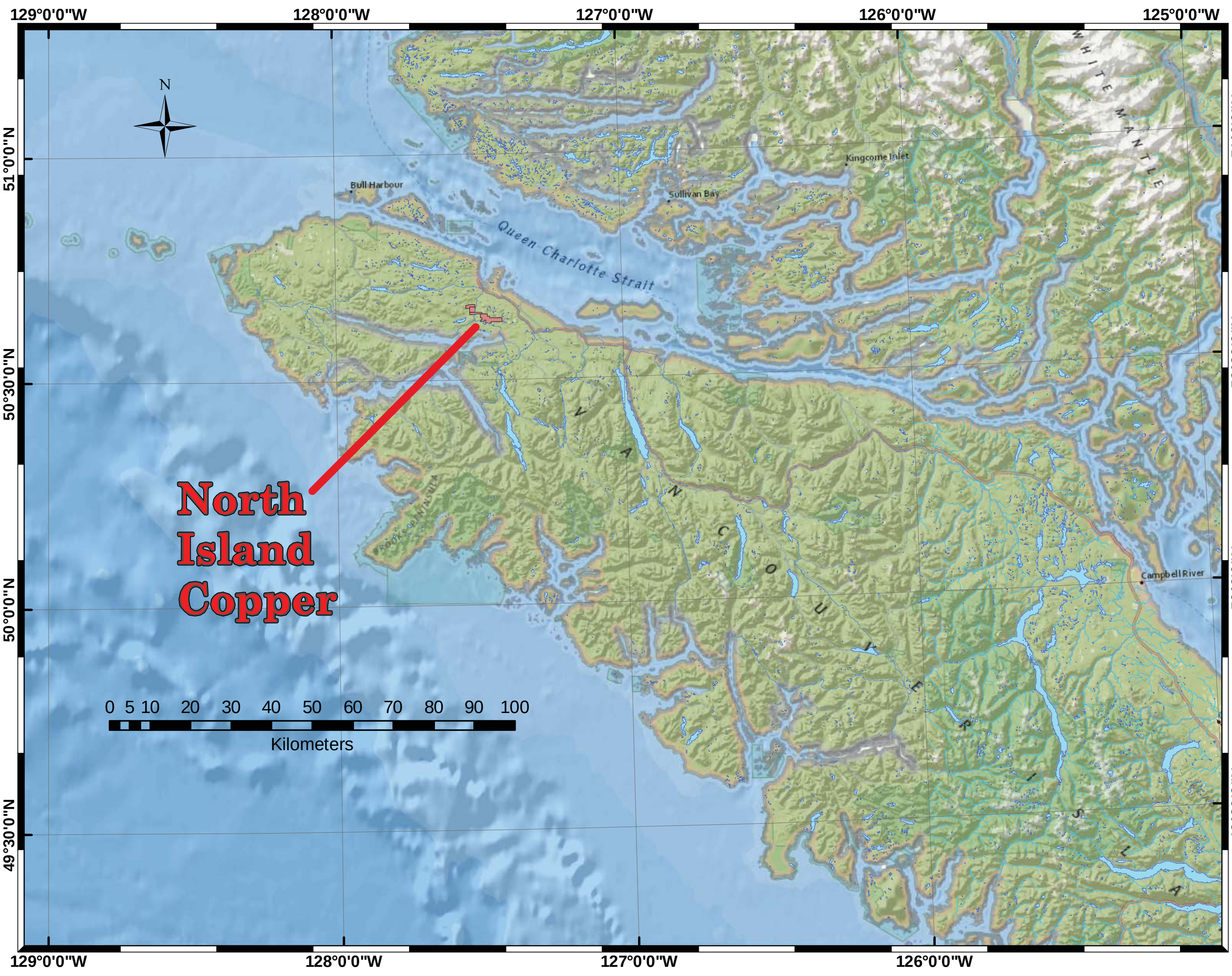



**Figure 1: The North Island Copper claim group on northern Vancouver Island.**
The claims are between Port Hardy and Coal Harbour, and about 10 km north of Rupert Inlet, which branches from Quatsino Sound.

The North Island Copper Property claims are listed in the British Columbia Mineral Titles On-line system (http://www.mtonline.gov.bc.ca/), the boundaries of which are predetermined by geographically defined cells conforming to a provincial mineral titles grid system. Neither the claims nor the Property boundary have been surveyed or marked on the ground, nor is this required for resolution of Property issues. The individual claims and the outside Property boundary are shown on a physiographic map in Figure 3. All UTM coordinates referred to in the Report are in the North American Datum of 1983 ("NAD 83") and in UTM Zone 9.

Retention of the Property requires filing Statements of Work with the British Columbia Mineral Titles System reflecting expenditures on qualifying exploration and development work. On the basis of the *Mineral Tenure Act* the required work must amount to a minimum of $5/ha/year for the first 2 years the claims are held, and then $10/ha/year for the next 2 years, $15/ha/year for the next 2 years and finally $20/ha/year for each subsequent year. Technical reports (assessment reports) must be filed and accepted after review by the British Columbia Ministry of Mines describing the applicable work with cost statements justifying the exploration expenditures.

For advanced exploration work, Notice of Work (NOWs) applications will be necessary to permit future mechanically assisted exploration (diamond drilling, trenching, etc.) and certain types of geophysical surveys (IP). The Property is underlain by Crown land with no known adverse claims to mineral rights, including by aboriginal groups. However, aboriginal rights and land title are complex and evolving areas of liability for resource projects throughout British Columbia and proponents of projects are advised to consult with and maintain relations with local indigenous groups.

The current and previous mineral tenures were all staked after the expiry of previous claims, and, thus, there are no inherited royalty or Net Smelter Returns attached to the Property except as provided in the Property Option Agreement between Questcorp and the Vendors, which is further discussed below. There are no known environmental liabilities, significant factors or risks that affect access, title, or the right or ability to perform work on the Property.

## 4.1 Property Option Agreement

**4. Grant of Option and Consideration**

4.1 Upon the execution of and pursuant to this Agreement, the Optionors shall grant the right and option to earn a 100% undivided interest in the Property (the "Option") to the Optionee, subject only to a 3 % NSR Royalty (as defined below) on all base, rare earth elements and all precious metals, and gems as follows:

(a) to acquire a 51% interest in the Property (the "Stage 1 Interest"), the Optionee shall pay $10,000 to Rich River Exploration Ltd. upon the execution and delivery of this Agreement by the parties (the "Stage 1 Option Consideration"); and

(b) to acquire an additional 49% interest in the Property, the Optionee shall: (i) pay a total of $85,000 to Rich River ; (ii) issue a total of 2,200,000 common shares in the capital of the Optionee and (iii) complete $500,000 worth of exploration expenditures on the Property (collectively, the "Stage 2 Option Consideration"; together with the Stage 1 Option Consideration, the "Option Consideration"), as set out below: (i) the Optionee shall issue the common share portion of the Stage 2 Option Consideration as follows:

(A) 2,000,000 (Two Million Shares) upon the listing of the Optionee's common shares on the Exchange;

(B) 100,000 common shares on or before the first anniversary of the listing of the Optionee's common shares on the Canadian Securities Exchange (the "Exchange");

(C) 50,000 common shares on or before the second anniversary of the listing of the Optionee's common shares on the Exchange; and

(D) 50,000 common shares on or before the third anniversary of the listing of the Optionee's common shares on the Exchange;

(ii) the Optionee shall pay the cash portion of the Stage 2 Option Consideration as follows:

(A) $10,000 upon the listing of the Optionee's common shares on the Exchange;

(B) $10,000 on or before the first anniversary of the listing of the Optionee's common shares on the Exchange;

(C) $5,000 on or before the second anniversary of the listing of the Optionee's common shares on the Exchange; and

(D) $60,000 on or before the third anniversary of the listing of the Optionee's common shares on the Exchange; and

(iii) the Optionee shall make the required Stage 2 Option Consideration exploration expenditures on the Property according to the following schedule:

(A) $80,000 on or before the first anniversary of the listing of the Optionee's common shares on the Exchange;

(B) $100,000 on or before the second anniversary of the listing of the Optionee's common shares on the Exchange; and

(C) $320,000 on or before the third anniversary of the listing of the Optionee's common shares on the Exchange.

2.2 This Agreement confers an option only. Once the Optionee has paid the Option Consideration in full, then it shall be deemed to have earned a 100% undivided interest in the Property, subject to a 3% NSR Royalty on all base, rare earth elements and precious metals.

**3. Net Smelter Royalty**

3.1 A Net Smelter Returns Royalty in the aggregate amount of 3% (the “NSR Royalty”) is payable to the Optionors on all base, rare earth elements and precious metals, as more particularly described in Schedule B to this Agreement.

3.2 The Optionee may purchase the first 1% of the NSR Royalty for $750,000. The Optionee may purchase the remaining 2% of the NSR Royalty for an additional $1,000,000.

**4. Operator**

4.1 The Optionee, or its designate, shall be the operator of the Property during the term of the Agreement. Monkey Dragon Metals Corp. shall be the primary exploration contractor, when possible.

**4. Assessment Work**

4.1 In order to keep the claims comprising the Property in good standing, the Optionee shall pay or cause to be paid any rates, taxes, duties, royalties, assessments or fees levied with respect to the Property or the Optionee’s operations thereon. Without limiting the generality of the foregoing, during the duration of the Option and after the earn-in of the Stage 1 Interest by the Optionee, the Optionors shall have a free-carried interest equal to 51% in the Property. The Optionee shall apply and pay for assessment credits for the mineral claims comprising the Property for all work and expenditures conducted on all or any part of the Property.

# 5. Access, Climate, Local Resources, and Physiography

## 5.1 Accessibility

The main access to the North Island Copper property is via the Vancouver Island Highway 19 to a series of branch highways and logging roads west of Port Hardy that lead to


**Figure 2: North Island Copper Claim Group Map**
NIC claims and tenure numbers are show in red. Crown Grants, and Minfile showings indicated by symbols in legend. Map base is Canvec contours in meters on shaded relief. The now-flooded open pit of the past-producing Island Copper is shown on the north shore of Rupert Inlet.

| TNRNMBRD | CLAIM_NAME # | ISSUE_DATE | GDTDT | RNHCTRS | CLIENTNUM | OWNER_NAME |
|---|---|---|---|---|---|---|
| 1071041 | NORTH ISLAND COPPER | 20190913191434 | 20280930 | 696.8694 | 116233 | LYNES, CRAIG ALVIN |
| 1079574 | COPPER DRAGON | 20201112191743 | 20280930 | 184.3888 | 116233 | LYNES, CRAIG ALVIN |
| 1079575 | COPPER DRAGON II | 20201112192506 | 20280930 | 143.4371 | 116233 | LYNES, CRAIG ALVIN |
| 1085503 | COPPER DRAGON II | 20211116184920 | 20280930 | 143.3922 | 116233 | LYNES, CRAIG ALVIN |

**Table 2:** Mineral Cell Claims in the North Island Copper Claim Group
Four cell claims constitute the North Island Copper claim group owned by Craig Lynes and under option to Questcorp Mining Inc. Total Property area is 1168.09 hectares. The data table is directly from a file issued on March 22, 2022 by BC Mineral Titles that is updated daily.

Coal Harbour on Rupert Inlet. The southern access is via R400 from its intersection with the Island Highway about 15 kilometers south of Port Hardy. R400 leads to R440 at about 2 km west of the highway, from which some current logging roads lead north into the eastern claims. R440 terminates at Port Hardy Main, at a point a few kilometers south of the claims, and leads to a deactivated logging road that runs north into the center of the eastern block. R400 itself is inactive but leads to a point on the north side of the eastern claims where a footbridge connects with deactivated sections of the Doreen Lake road running along the north side of the claims and connecting with older roads that run south through the Rainbow showing area.

From the north near Port Hardy the Coal Harbour Road runs south between the eastern

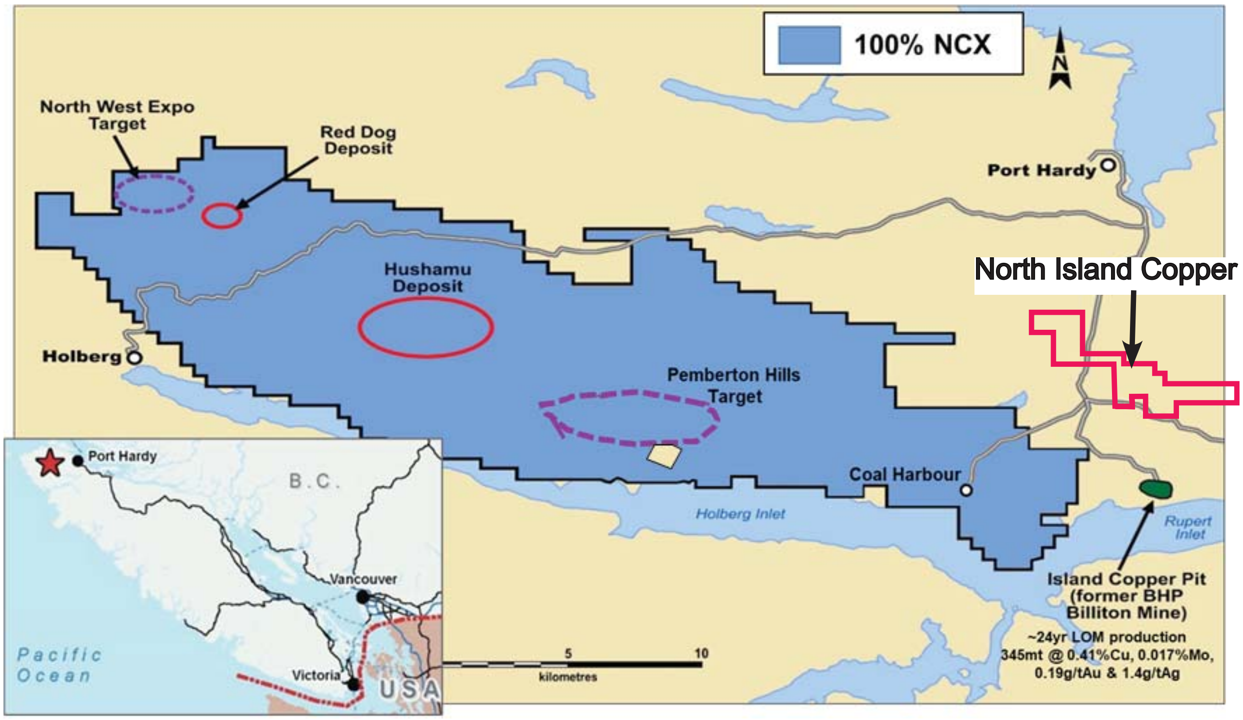



**Figure 3: Current principal mineral tenure in the Hushamu Porphyry District**
To the west of the North Island Copper Property indicated by a red outline on the east side of the map, the blue area is ground held in mineral tenures by Northisle Copper and Gold Inc covering the Hushamu, and Red Dog advanced-stage porphyry copper prospects as well as high-level epithermal prospects and porphyries in the Pemberton Hills. Map from the website Northisle.ca Other claims occupying the ground south of the Property are not shown.

and western blocks of the claims and connects with Port Hardy Main for access to the roads described above, as well as Quatse Main on the west, which accesses the western block of claims.

## 5.2 Climate and Vegetation

The climate of the region is classified as very wet maritime coastal with high amounts of rain and minimal snow. Exploration and development activity can readily be carried on throughout the year, with minimal disruption during snowfall periods in December through March, when most of the annual precipitation occurs as rain, reaching 1700 mm/year. Daily average temperatures range from 2.4 C in January to 13.8 C in August, with a mean annual temperature of 7.9 C.

The area is classified as the very wet maritime subzone of the Coastal Western Hemlock biogeoclimatic zone (CWH). Original forests observed by the author in the southern area east of the Coal Harbour Road were primarily old growth cedar that were harvested in the 1950s and 60s (Fig. 4). Subsequently, shake blocks were extracted from naturally fallen old growth cedars (Fig. 5) that had been left behind. These areas are now in a roughly sixty year semi-mature stage of natural regrowth as forests of mixed Western Hemlock and Amabalis Fir or Pacific Silver Fir with a significant Western Red Cedar shrub understory. Undergrowth in the more mature sections is relatively sparse and allows reasonable access on foot. However, some intervals around streams, swamps, and recent openings are virtually impenetrable in tangled salal and alder. Recent logging blocks in the southeastern area have harvested second growth fir and hemlock.

In the section of the Property north of Quatse Lake, the primary forests are dated at about 210 years and consist of a mix of Western Red Cedar, Yellow Cedar ( Nootka false cypress) and Western Hemlock. Extensive areas of the Western Red Cedar in this area display spires indicating natural die-back of the tops of the trees and generally common in mature cedar forest.

**Figure 4: Old growth cedar stump in the southern area**
This Western Red Cedar stump is about 3 meters in diameter.

**Figure 5: Remnants of shake-block harvesting**
Many shake-block testing and extraction sites were observed throughout the southern area. Naturally fallen Western Red Cedars, some buried in undergrowth were “mined” by “shake-blockers” decades ago. Shake blocks appear to have been packed out to nearby roads. The remnants were from logs too rotten for shakes or forgotten loads.

The area has been subject to some recent clear cut logging, but does not appear to have remnants of old growth cedar forest like in the southern area. Undergrowth in these more open canopy forests can support a vigorous shrub layer dominated by frequently dense thickets of salal.

Historically the area has been subjected to powerful hurricanes, such as the 1906 hurricane which flattened significant areas of forest and can affect forest succession. Generally, mature forests in the area are classified as Hemlock- Amabalis Fir, but with disruption by blow downs, transition to a Cedar - Hemlock succession may occur (Blanco et al, 2021).

## 5.3 Physiography and Surficial Geology

The Property lies within the physiographic region of the Nahwitti Lowlands and area of relatively low relief from intensive glaciation forming part of the Coastal Trough along the Queen Charlotte Straight and covering the northern tip of Vancouver Island.

Within south eastern claims low rolling east-west trending ridges are cut by a few streams and interspersed by swamps.  Elevations range from 100 to 300 meters with mean elevation of 185 meters.  Doreen Lake lies to the north of the claims and appears to be a local fishing destination. In the west of the Property near Quatse Lake, the average elevation is slightly higher, but relief remains low and there are many swampy areas characterized by cedar forest.

## 5.4 Local Resources

The Property lies within 10 kilometers of the coastal town of Port Hardy to the north and 5 kilometers from tidewater at Rupert Inlet to the south. Rupert Inlet is the site of the former Island Copper Mine, which has now been reclaimed by flooding of the open pit.  See below under Item 5.6 Suitability for Mining.  Highway 19 connects Port Hardy to the south island and nearby Port McNeill.

Both Port Hardy and Port McNeill are sources of supplies for the logging industry and support flight bases for helicopters and fixed wing aircraft,   Port Hardy is the site of the terminal for the BC Ferries northern route, which runs through a protected inner passage to Prince Rupert.

## 5.5 Infrastructure

There is no established infrastructure on the Property other than a series of active and deactivated logging roads and overgrown exploration trails.

## 5.6 Suitability for Mining

The Property is suitable for mining by virtue of its low relief, general lack of sensitive habitat, recent logging activity, and proximity to tide water, highways, hydro power, and communities formerly involved in the Island Copper Mine operations.

The Property lies with 5 to 10 kilometers of a past-producing 50,000 tpd open pit porphyry copper mine located on the north shore of Rupert Inlet.  Mining at the Island Copper Mine ceased in 1993 and the main pit and marine waste rock dumps were notably reclaimed in the next few years by a passive treatment system described in Wilton and Lawrence (1998).  The main pit was connected to Rupert Inlet by a cut channel on June 15, 1996 allowing sea water to enter until it reached near sea level in 1998.  The ultimate water level is expected to be 2.4 m above sea level which will allow internal mixing of ARD from surrounding rock outcrops and diffusion of the outflow through the marine waste rock dumps in a controlled way into the marine environment.

# 6. North Island Copper Property History

## 6.1 Introduction

Mineral exploration on Vancouver Island dates back to the late 1800s, but in the Rupert Inlet district around the North Island Copper Property it accelerated in the early 1960s after the discovery of the Island Copper porphyry copper-gold deposit. The North Island Copper Property, lies immediately north of the Island Copper Mine area. Parts of the Property were variously included in exploration efforts peripheral to the mine and the showings on the Property were discovered as a result of the activity on the Island Copper mine, and in some cases developed because of proximity to the mines operations.

Numerous showings and small mineable deposits, had previously been found in the region, but typically in higher relief areas with shallow glacial overburden. In 1962, a publicly released airborne magnetometer survey by the BC Geological Survey prompted staking of a magnetic anomaly in the vicinity of the Island Copper deposit, which was subsequently found to have a spatially-associated soil geochemical anomaly. Small diameter diamond drilling was used to explore the bedrock and eventually discover a significant enough body of mineralization to warrant a larger exploration and development program. After about 80 drill holes a significantly mineralized intersection was recovered which led to the development of the Island Copper porphyry copper ore body. Concurrent and ongoing exploration to the west, north of Holberg Inlet also led to the discover of other porphyry copper and epithermal type deposits in the Pemberton Hills west of Island Copper at Hushamu and Red Dog. The Island Copper Mine operated until closure in 1993.

## 6.2 Historical Exploration in the Eastern Sector of the Property

### 6.2.1 Early Days

Records of the earliest work in the area are summarized in the BC Ministry of Mines Annual Reports (BCMMAR) including those for 1959, 1963, 1968 and 1970.

The Frances showing, south of the Property, was trenched in 1959 by Cominco who extracted 13 cubic yards of rock as reported in the BCMMAR for that year. John McAndrew, who later staked claims in the area and wrote several reports (McAndrew, 1989) was apparently involved in some of the early

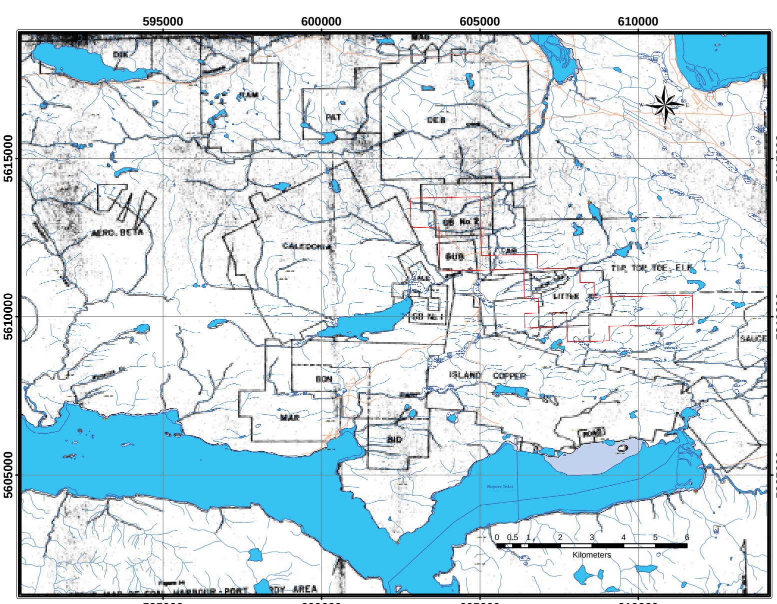



**Figure 6: Summary claim map from BCMMAR for 1968**
Map shows the location of the Little Joe; Tip, Top etc, and Island Copper claims mentioned in the text.
The current NIC Property is superimposed in red.

**Figure 7: Second Growth Forest in the Area of the Skarn Showings**
The forest floor is a deep network of moss buried Western Red Cedar logs between logging stumps. Current new growth is about 60 years old in most of the south-eastern area. Outcrops were typically restricted to ridge tops

exploration work including trenching work by Anaconda Brass (AR 964) on the Cranberry showing which exposed copper mineralization for 120 ft along strike with sampled grades of 5%.

In the 1963 BCMMAR it is reported that Port Hardy Copper Mines stripped a 10 acre area around the Rainbow Zone (then called the Little Joe claims and showing; Fig. 6 ) and drilled 3000 feet of core in 17 holes. There is no report of results from the drilling. The present area is in a state of regrowth (Fig. 7) that obscures many of the old showings although it is apparent where exploration trails were located as well as some small exploration pits and stockpiles.

### 6.2.2 Silver City Petroleum 1968

In 1968 Silver City Petroleum (BCMMAR, 1968) spent 3 months surveying parts of the Property around the Rainbow showing and along Branch Road 6. They completed magnetometer and soil geochemical surveys through the area, but no report was found of results.

### 6.2.3 Humphrey 1966

Publicly available information on the North Island Copper property in the form of geological assessment reports was not available until the advent of the Assessment Report Information System (ARIS) in the mid 1960s and the earliest of these specifically overlapping part of the Property is by Humphrey (1966) in Assessment Report number 894 in the BCGS ARIS system. The work consisted of a soil geochemical survey south of Port Hardy on the REEF 17-31 claims and 4, 5, 6 fractional claims underlain by Vancouver Group pyroclastics, flows, argillites and limestones, and granodioritic intrusion. Contact on the south side of the Reef property with Quatsino Limestone places the property near the southern limit of the current

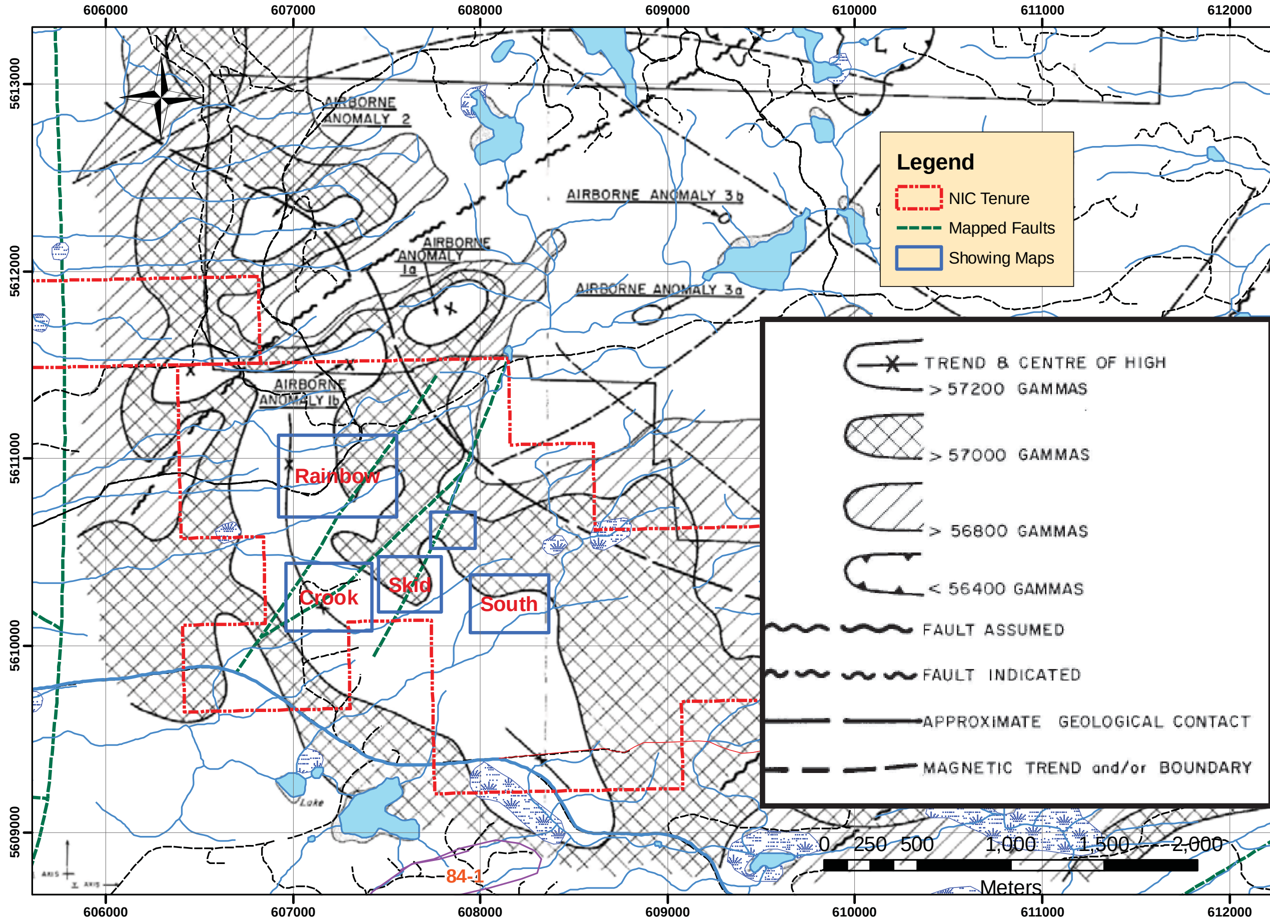



**Figure 8: Airborne Magnetometer Survey Interpretation Map, 1970**
A broad magnetic structure extends south through the area of the Rainbow and other showings, indicated by map areas in blue rectangles, on the Property, outlined in red Magnetic anomalies marked on the map are picked within the claim group to the north. The interpretation legend from the map is inset on the right of the figure. Map is from Cerne and Cochrane (1968) and georeferenced and modified by the author

North Island Copper Property. Mineralization described in the report was noted to be north of the Reef claims and consisted of chalcopyrite-magnetite skarn. The survey occurred on the east side of the road to Port Alice and included 388 samples analyzed for copper generating a calculated background of 30 ppm and a maximum value of 130 ppm in one anomalous zone in the claims.

The mineralization referred to by Humphrey (1966) was probably some of the many skarn showings on the current Property, which appear to have been discovered and trenched in the mid- 1960s, but without any publicly available reports.

### 6.2.4 Emperor Mines Ltd. 1968

An airborne magnetometer survey (Fig. 8) centred on Lat 50 39' Long 127 35' on 93L/12 covered an area of claims owned by Emperor Mines Ltd. called the Toe, Elk, Top, and Tip of about 5.5 by 4 miles (Cerne and Cochrane, 1968: AR1709). The claim area in the survey is adjacent to the north side of the NIC claims, but the survey overlap extended south onto the Property . Several anomalous zones were interpreted from the survey within Emperor's claims. Northeast-trending faults and broad curvilinear northwest-trending magnetic structures were interpreted traversing both the Emperor claims and the Property.

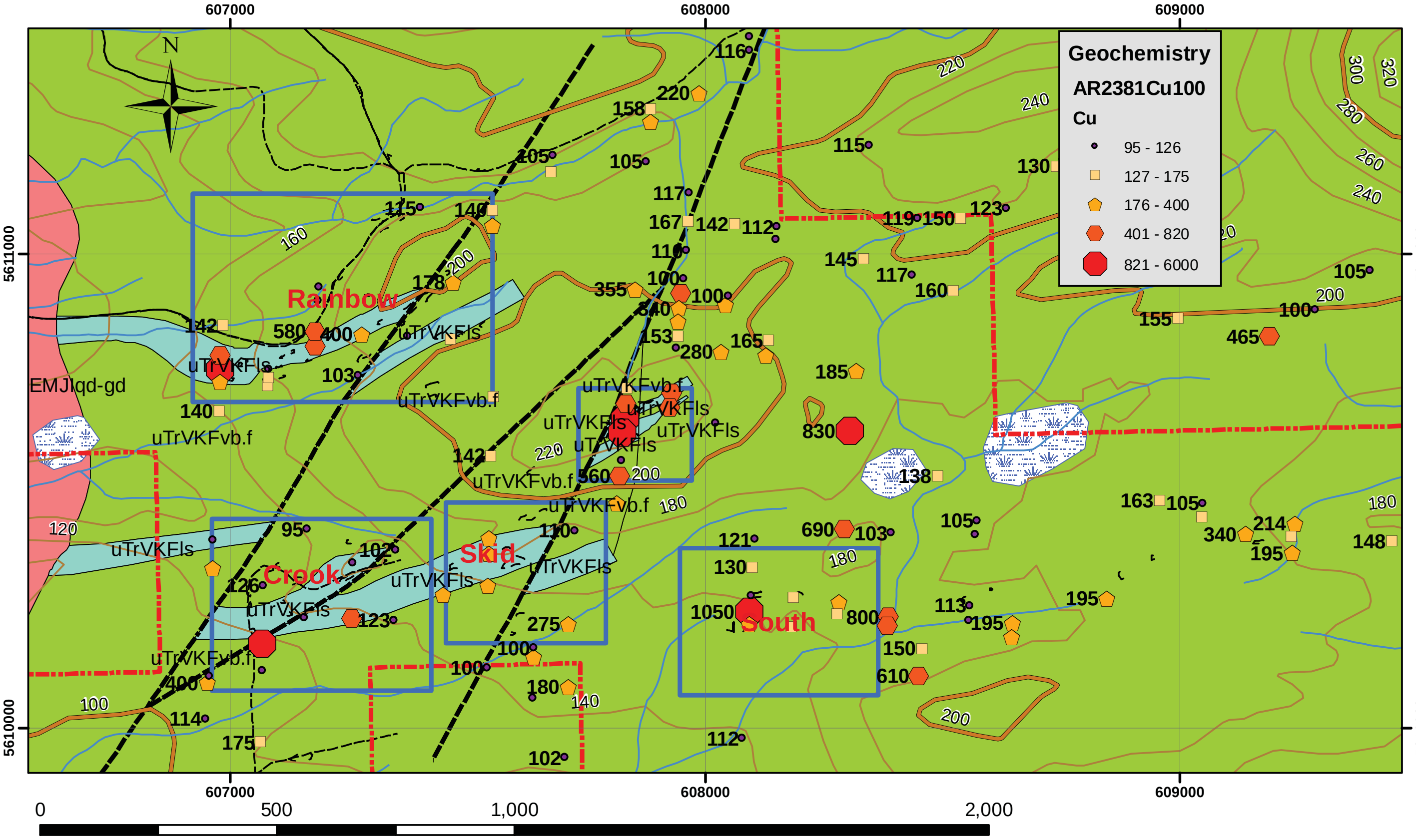



**Figure 9: Cu Soil Geochemical Survey 1970**
The map shows values of copper from Phelan (1970) above 100 ppm as labels (left of the points) digitized from a georeferenced map plot of copper values from 1681 samples. Background values below 100 ppm are not shown. Geology is current BCGS mapping. Claim lines shown in red and reference boxes for mapping of showings in this report shown in blue. Labels in red name the showing or map areas used in Item 7 of the Technical Report,

### 6.2.5 Yellowknife Bear Mines Ltd, 1970

A ground magnetometer and a soil geochemical survey for Cu and Zn (Fig. 9) were conducted by Yellowknife Bear Mines in 1969 and 1970 (Phelan, 1970: AR2381). Several skarn mineralized zones were located coinciding with both the magnetic highs and the copper anomalies. The old property corresponds to the central area of the NIC claims in the Rainbow showings area. Maps of the Cu in soils and magnetometer readings have been georeferenced approximately by the author (very few reference points exist on the old maps). Many of the known showings are identified by highly anomalous copper-in-soil samples from the survey. A few anomalous clusters of samples and a few individual high samples are not associated with showings and may be worthy of further exploration. The anomalous samples, above 100 ppm Cu, have been digitized by the author and displayed in Figure 9 overlaid on the currently interpreted extent of limestone lenses within the upper Karmutsen Formation, and the eastern intrusive contact of the Quatse Lake Pluton. Contacts of the limestone lenses were originally shown in assessment reports by McAndrew (discussed below) and incorporated into the provincial geological maps base. These have been modified by the author in Figure 9 using new map data from the Property visit in November 2021.

The ground magnetometer survey recorded points at 100 foot spacings along lines 300 feet apart through the area, with 50 foot spacings near known showings. At the Rainbow showing, the eastern area of magnetite-rich skarn is highlighted by a few very high magnetometer readings while the more westerly skarns fall in a broad magnetic high. Interestingly, the band of marble-limestone that is mapped between the Crook and Skid areas in the present work, registers as a broad magnetic high distinct from the surrounding Karmutsen basalts suggesting possibility of buried magnetite skarns. Historical showings within the Crook area were not located during the Property visit.

### 6.2.6 Cliff Claims, McAndrew, 1980

In 1980 John McAndrew (McAndrew, 1980: AR08284) acquired the Cliff claims and reported on the previous history of mineral occurrences, much of which had gone unreported, except in BC Minister of Mines Annual reports for various years, during exploration work by Utah Mines on the Island Copper Mine. The Cliff claims cover the area of the Frances and Rainbow showings north of Utah Mines Island Copper mining area and the central claims in the Property. McAndrew (1980) found that many of the showings had been blasted or trenched during the period from 1963 to 1964, which may explain their present state.

McAndrew (1980) completed field mapping at a scale of 1:1000 areas around the current Rainbow, Frances and South showings. He utilized existing geochemical and magnetometer maps and suggested there were geochemical and geophysical anomalies between Cranberry and the West showing worthy of investigation. His mapping shows Karmutsen Formation flows, fragmentals and poorly developed pillow lavas, and tuffs interbedded with flow and pillow breccias. Flows typically display amygdules with quartz, epidote, chlorite, and lesser calcite, pumpellyite and zeolites. Quartz diorite was mapped in vicinity of Rainbow showing 1 and along west side of Branch roads 6 and 7.

McAndrew (1980) noted that the rocks generally strike NE and dip SE and are broken by NE-striking NW-dipping faults, and subject to rotational block faulting. Alteration minerals around the skarns include epidote, garnet yellow-brown and red, amphiboles in the tremolite-actinolite series, hornblende, and pyroxenes in the diopside-ilvaite series and hedenbergite. The mineralization observed was found as skarns along limestone-intrusive and limestone- basalt contacts and consisted of disseminated bornite and chalcopyrite. He subdivided the sulphide mineralization into “Brown ore” consisting of yellow garnet with disseminated chalcopyrite and minor magnetite and calcite, and “Black ore” having darker red garnet and being more sphalerite rich with massive magnetite zones and chalcopyrite occurring as disseminations and seams. Ten zones of mineralization were mapped including four along Branch road 7: The Rainbow showings 1-4 (formerly the Little Joe showing) were measured along a strike of 500 meters and widths of 18 m, while the Cranberry (formerly T and B showing) were mapped along 100 m of strike with widths to 5 m. Other showings were less well-exposed. The mineralized skarns all strike NE and dip 35 degrees to the SE and range from 1.4 to 3 m thick.

The geological map included in McAndrew (1980) was georeferenced and digitized by the author to produce a field map for future exploration in overgrown zones around skarn showings and is presented in Item 7.

### 6.2.7 Amazon Claims 1981

In the eastern part of the Property, a VLF and EM survey were conducted on the Amazon claims by Englund in 1981 (Englund 1981: AR9811). In addition a small prospecting program found a showing, now called Amazon, located along a linear structure from which 5 rock samples were collected, two of which returned 3 and 4 % copper. This showing was examined in the present work.

### 6.2.8 Energex Minerals 1981

In 1981 an airborne magnetometer and EM helicopter survey was flown for Energex Minerals on the Pick and Cliff claims on the east side of the Property in the area of the Rainbow and Cranberry showings, and the Pick claims near Quatse Lake overlapping some of the present NIC western area, which is largely in the Quatse Lake pluton (Sheldrake 1981: AR9853).

The results of the survey showed numerous anomalous conductive zones, but according to Sheldrake (1981), none could be interpreted as indicative of a significant massive sulphide body. All of the anomalous EM responses were considered indicative of low conductivity contrasts within the range of geological noise in the 918 Hz system frequency, although some could be inferred to be caused by disseminated mineralization. Major lithological contacts and intrusive bodies were inferred from the magnetic data. In the area north of Quatse Lake, Sheldrake (1981) recommended one conductive anomaly be explored for disseminated mineralization because of a coincident disturbance in the magnetic contours, but that zone is south of the present Property boundary. Conductivity anomalies were also interpreted in the vicinity of the Rainbow and Cranberry showings, but were considered as ambiguous indicators of mineralization.

### 6.2.9 Energex Minerals; Swamp Showing 1982

In 1982 a small diamond drilling program was completed at the Swamp showing on the western end of the Cliff 78 claim (Fig. 7) (Darney et al., 1983: AR11407). The Swamp showing is located outside of the present Property in a single cell claim owned by Razzle Resources and enclosed by the Property on three sides, but its geology is similar to that of other showings to the east on the Property within the same stratigraphic level of the Karmutsen Formation that hosts marble and skarned limestone intervals.

Surface mapping by Energex identified marbled limestone, skarns, hornblende granodiorite and andesite dykes (Fig. 9). Limestone forms an east-west trending ridge at the Swamp showing. The intrusive is medium-grained equigranular hornblende granodiorite that shows alteration along its border phases.

The diamond drilling program drilled 236 meters of core in 8 holes at the Swamp showing. One of the more successful drill sections is shown in Figure 10, where all three drill holes intersected mineralization which was interpreted as a folded structure. However, the holes were all relatively short and the section produced was only 20 meters deep. The three holes were collared in marbleized limestone (Fig. 11) and penetrated skarn mineralization with grades varying between 0.62 and 5.1% copper, and 0.6 to 11.3 % zinc. The lower contact of the skarn was with a 2 meter wide zone of altered granodiorite before ending in unaltered granodiorite. The other two drill sections were not as well mineralized.

### 6.2.10 McAndrew; Pick and Cliff Claims 1988

The Pick and Cliff claim block (Fig. 12) was located north of the Utah Mines Island Copper property roughly in the position of the eastern block of the present Property and east of the present Coal Harbour highway, and was modified from earlier claims described in the Energex report of 1981 (McAndrew, 1988). The work reported in McAndrew (1988: AR17029.) is in the western part of the area described in McAndrew (1980); Sheldrake (1981), and Darney et al. (1983) and is mainly west of the southern, and south of the northern blocks of NIC claims.

The survey work included geological mapping, 170 soil samples, and ground magnetometer readings. Soil samples and ground magnetometer readings were collected at intervals along roads and a loose grid of north-south oriented cut lines. Several soil geochemical anomalies were

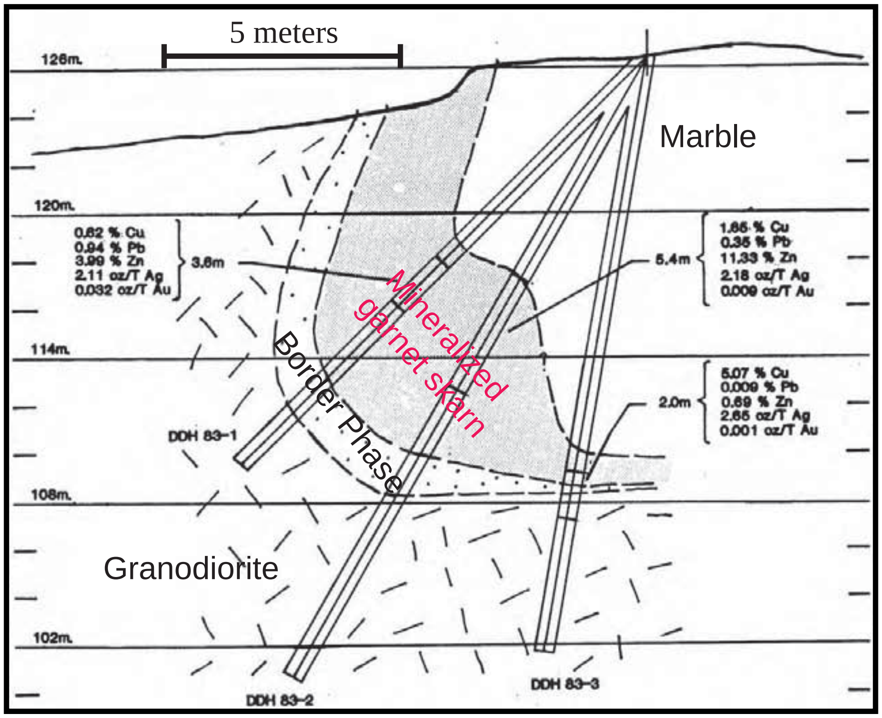



**Figure 10: Cross Section A-A': Swamp Showing**
Location of cross section is shown in Figure 11. Scale intervals of 2 meters are indicated by hash marks on margins of section. Modified by the author from Darney et al. (1983)

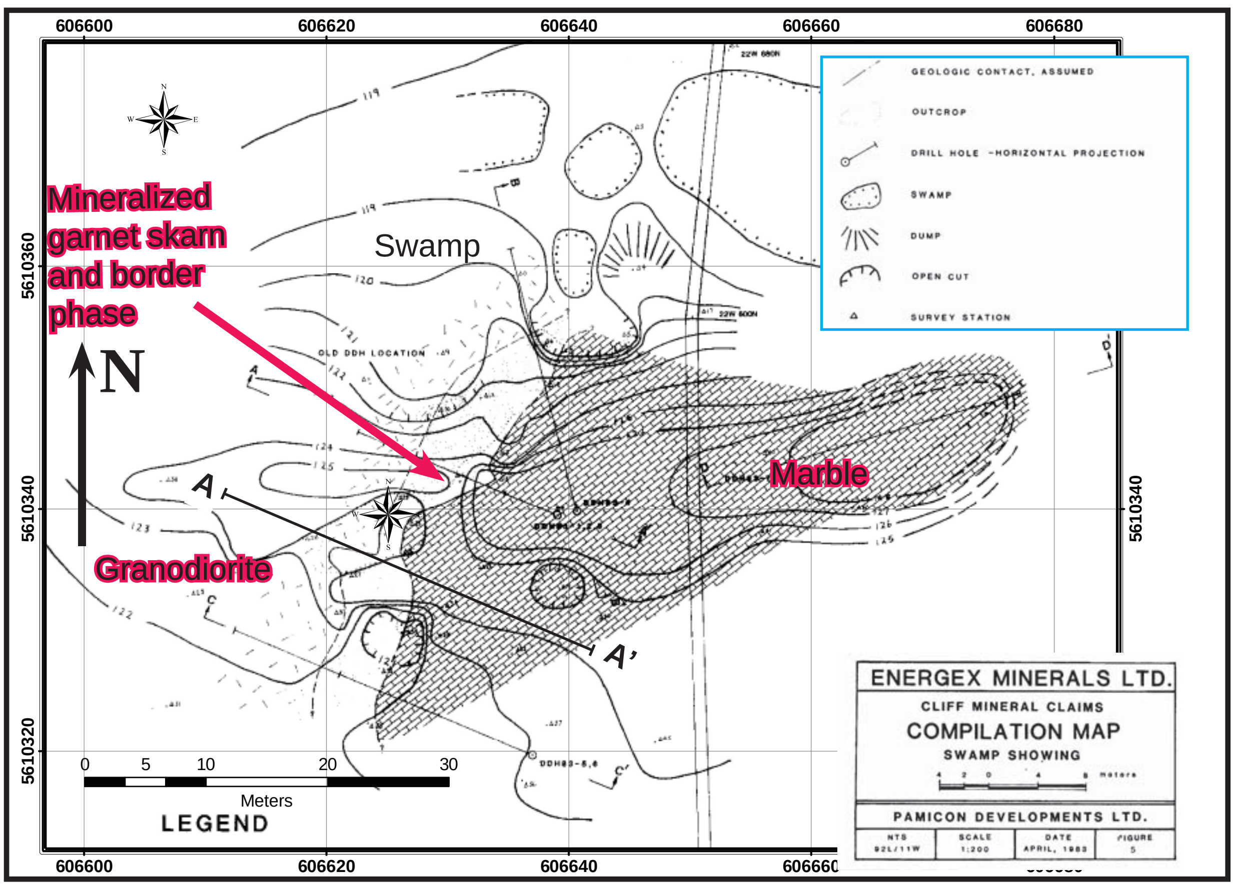



**Figure 11: Swamp Showing Geological Map**
Map from Energex report (Darney et al. 1983) on eight drill holes and cross sections at the Swamp Showing. Section A-A' is highlighted and shown below in Figure 10. Modified by the author after Darney et al. (1983).

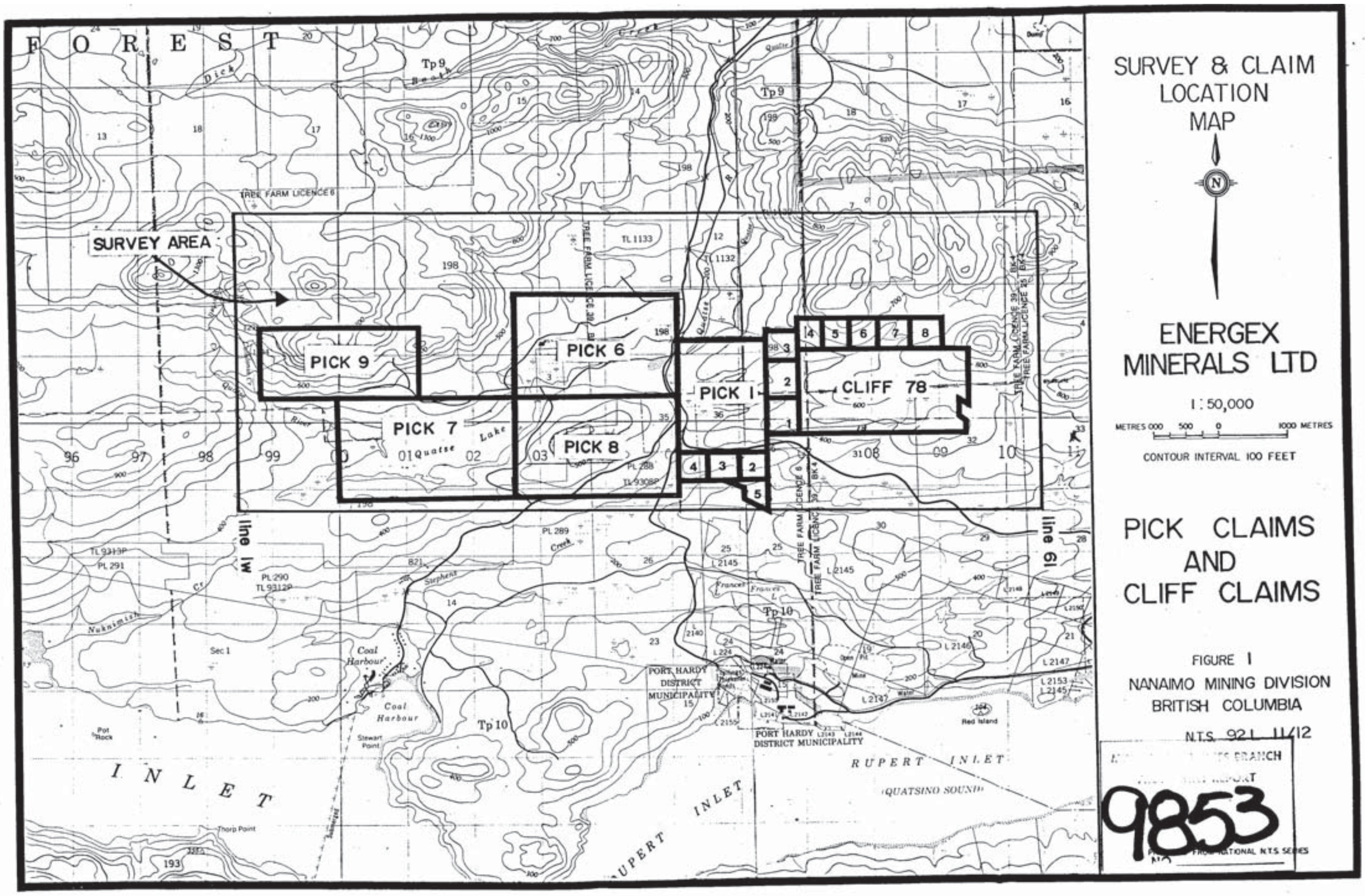



**Figure 12: Energex Survey Area and Claim Map**
Map is from Sheldrake 1981. The area of the survey covers much of the current Property. The Cliff claims (Cliff 78) approximates the area of the eastern Property claims which are largely underlain by Karmutsen Formation basalt with intervals of limestone on the east side of the Coal Harbour road. The Pick claims covered ground around, and NE of Quatse Lake. Pick 6 is approximately in the position of the NW claims in the Property. .The claims are the subject of many exploration reports by McAndrew from 1980 to 1989.

delineated in various part of the survey area. Magnetic anomalies were generally classified by high readings alone and ascribed to potential for magnetite in skarns. Coincident geochemical and magnetic anomalies were considered to be high priority, but no confirmation was completed during the survey.

Upper Triassic Karmutsen Formation basalt and andesite flows, massive Quatsino Formation limestone, Parsons Bay Formation argillaceous and carbonaceous sedimentary rocks, and Lower Jurassic Bonanza Group andesitic flows and breccias are intruded by Jurassic-Tertiary granodiorite, diorite and andesite. Skarn mineralization, containing chalcopyrite, bornite, sphalerite, galena, pyrite, magnetite and specularite, was observed along limestone contacts for over 2 kilometres. The mineralization strikes northeasterly, usually has a shallow dip to the southeast and has been block faulted. Some faults may have served as channelways for mineralizing solutions.

The work was continued in 1989 as described in McAndrew (1989)

## 6.2.11 McAndrew: Pick and Cliff Claims 1989

The main work reported by McAndrew (1989a: AR18238) consisted of soil sampling, ground magnetometer readings and descriptions and sampling of about 50 test pits many of which did not reach bedrock (Figure 13). In total 98 soil samples, 5200 meters of mag lines, and mapping of 9 claim units using 4 km of control lines were reported. The work consisted of test pits from 1988, half of which were dug in the area north of Branch Road 7 on the current Property and the other half to the west off the Property adjacent to the Coal Harbour Road. From this McAndrew inferred evidence of skarn mineralization near four of the test pits (88-4, 5, 6 and CF-101). Andesite dykes were inferred to be related to the skarn. The hornblende diorite at the Swamp showing was concluded to have caused the skarn in contact with limestone.

McAndrew's report contained considerable speculation about grades and tonnages and feasibility of providing mill feed to Island Copper as well as contemplating possible occurrences indirectly inferred from geochemistry and geophysics.

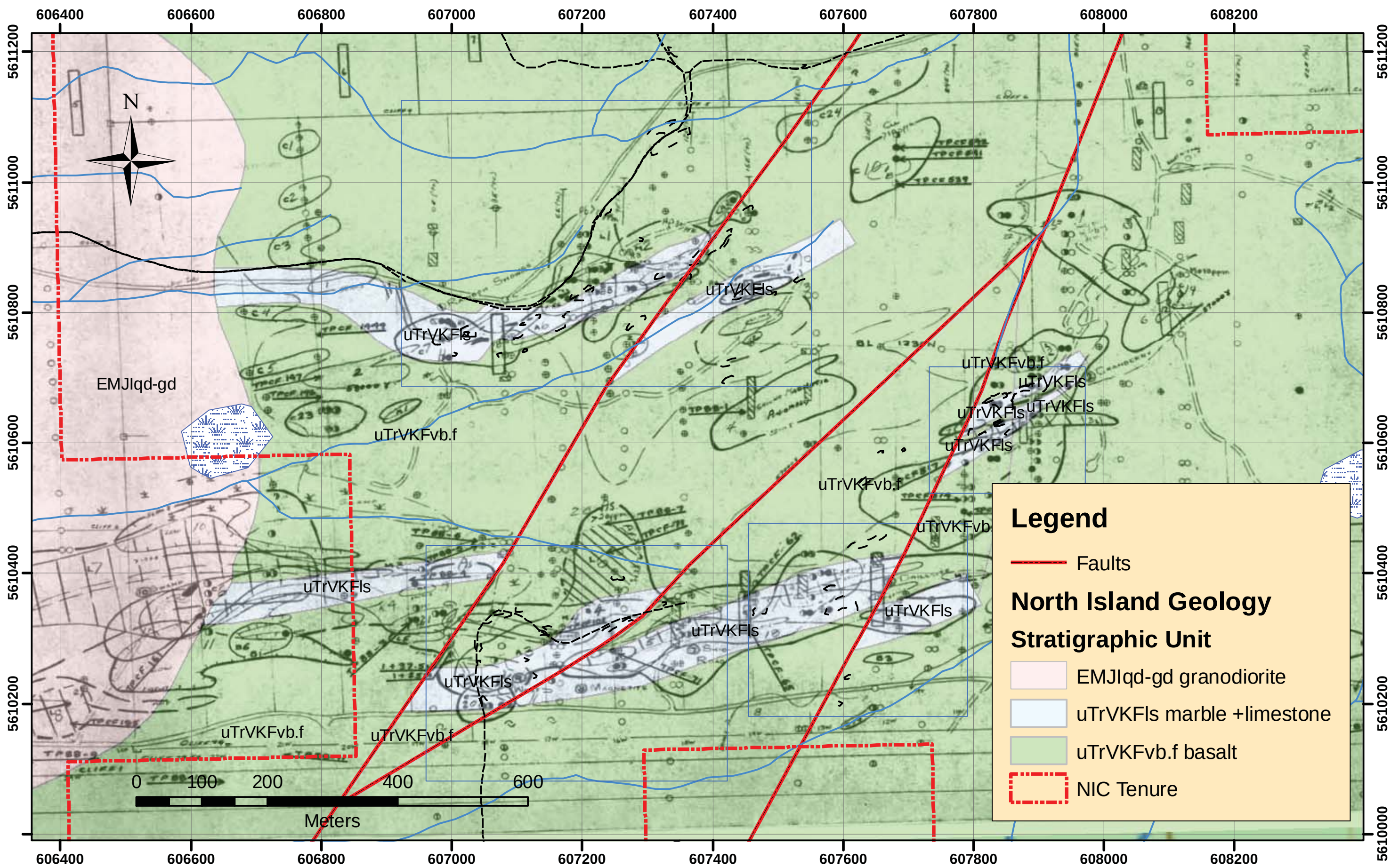



**Figure 13: Compilation Map of Geochem and Mag work in the claims by 1988**
The map from McAndrew (1989a) is a compilation of soil geochemical and magnetic anomalies discerned in his work between 1980 and 1988. The McAndrew's map, overlain by recent known BCGS geology, appears to have been derived from data in test pits shown on the map within the area of the granodiorite. .

## 6.10 McAndrew: Pick and Cliff Claims

The field work reported in AR18238 was continued between October 3 and November 1, 1989. No new significant findings were presented in McAndrew (1989b: AR19423.)

## 6.3 Exploration Associated with the Island Copper Mine.

### 6.3.1 Agilis Exploration Services, 1968

In an area north of Rupert Inlet and 8 miles south of Port Hardy, Agilis Exploration conducted a geochemical survey on the Kol 1-47 and the Northeast Group consisting of the Bim, Tar, Ken, Bee, Car, and Expo claims (Philp, 1968: AR1693). Northwest trending volcanics and sediments of Triassic age overlain by Cretaceous sediments, were observed in an area south of the Property. A 4000 ft baseline with cross lines at 100 ft intervals was cut in the Kol and a 6000 ft baseline and cross-lines on the NE group at various intervals and sample spacings. Soils were analyzed by AAS for copper lead and zinc. Several anomalous areas were revealed, but no follow-up work was reported.

### 6.3.2 Utah Mines Ltd; Central Group of Claims 1984

The Central Group of claims owned by Utah Mines were located directly north of the main Island Copper Mine and were explored during the mine development and mining era. The periphery of the Central Group overlapped with or was proximal to the present North Island Copper Property. In 1984 a series of reconnaissance IP surveys were conducted on 20 miles of logging roads using a dipole-dipole array with 200 ft dipole separation and measuring 4 separations from the current electrode (Clarke, 1984: AR13009). Results were considered approximate as lines were not straight, but were sufficient to identify anomalies worthy of more precise work. Five anomalous zones, which lie to the south of the Property, were identified by the survey in the Central Group and are shown in Figure 14.

In addition a few lines, such as BR8 and MB in the north part of the Utah Mines Survey overlapping the Property had smaller anomalies such as Line BR8, which has a “pant leg” shaped resistivity anomaly at survey point 30W, and minor corresponding metal factor and chargeability. The line and anomaly are near the top of the Karmutsen Formation and contact with the Quatsino Limestone according to the existing regional geology maps. The area lacks outcrop and was not examined in any detail in the current work.

### 6.3.3 Utah Mines; Central Group of Claims soil survey 1984

Using the same series of roads as the IP survey reported by Clarke (1984) a soil geochemical survey along them was conducted by Fleming (1984: AR13716), which reported several anomalous copper and molybdenum zones (2 high priority and 8 low). The overlap area of the survey is shown in Figure 15. A copper-zinc geochemical anomaly classified as high priority was identified along the eastern section of the road. It was interpreted as related to the contact between Karmutsen basalts and overlying Quatsino Limestone and a probable indicator of skarn mineralization. The anomaly was considered important because it involved several samples with concentrations of copper and or zinc variably above threshold. The area of the anomaly was visited by the author and found to lie within a heavily forested area with no outcrop that has been interpreted as within the upper Karmutsen Formation near the contact with the overlying Quatsino limestone. The anomalous area lies about 1 kilometer southeast of the South Showing which was located.

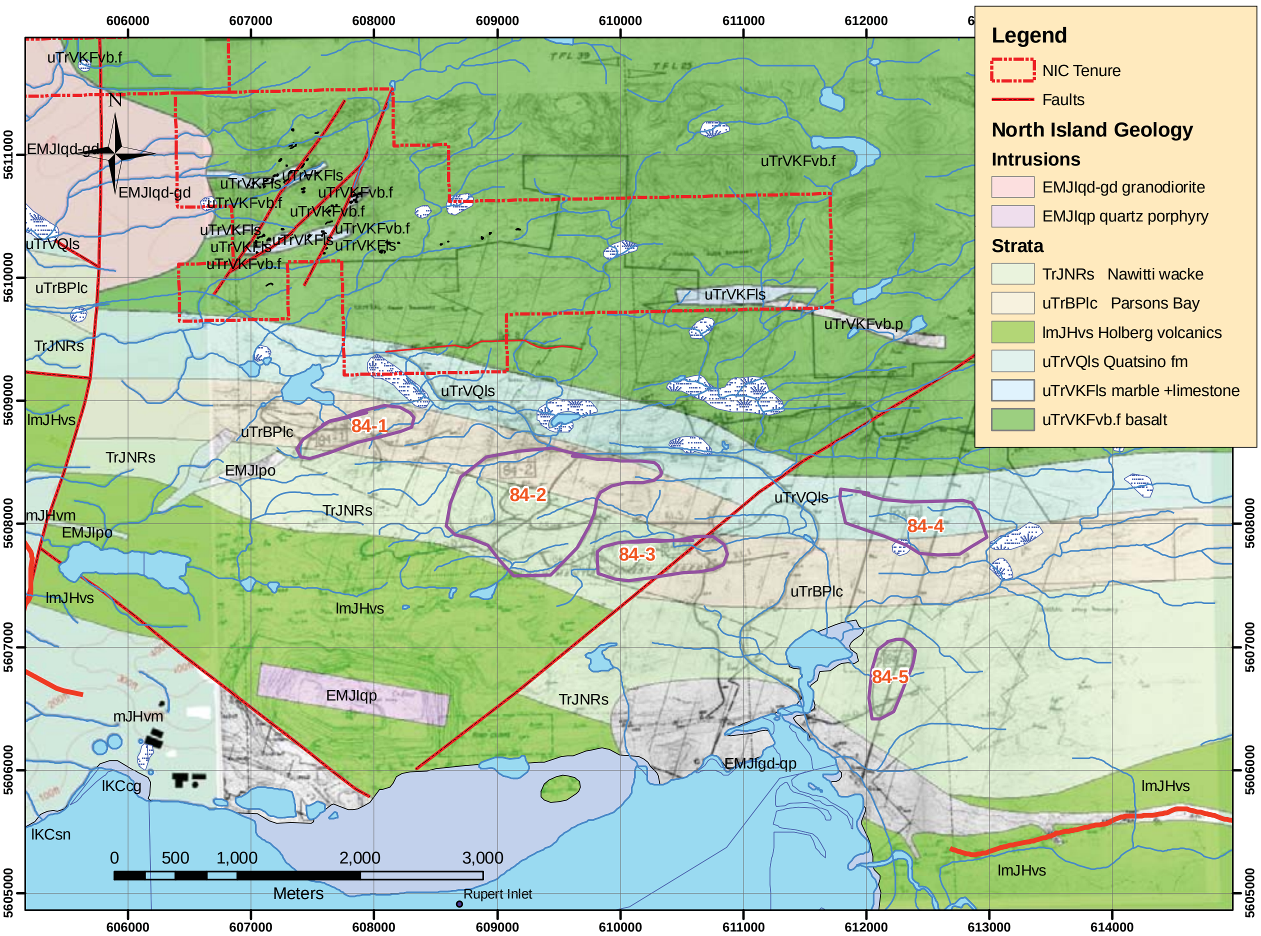



**Figure 14: IP survey anomalies north of Island Copper Mine in the Central Gp of claims**
Five anomalous IP areas are all south of the Property and are highlighted in purple and labelled 84-1 to 84-5 and described in Clarke (1984). The south-eastern sector of the North Island Copper Property is to the north, but overlapped the ca. 1960s Central claims. The IP survey was conducted in a reconnaissance mode along roads with slight compensation for curvature. Anomalous areas are mainly within the Parson Bay Formation sediments and the Bonanza Gp Nahwitti wacke. Tight contours of the Island Copper open pit are located in the bottom left on the north shore of Holberg Inlet. Coloured geology overlay is current BCGS interpretation available as a GIS file and viewable on Mapplace.

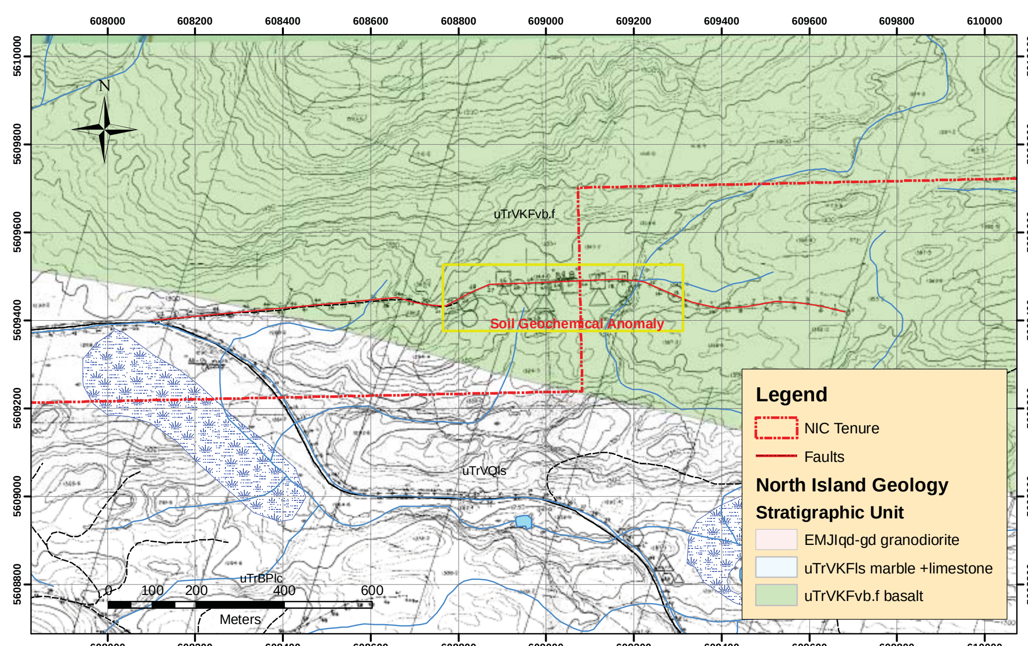



**Figure 15: Soil Geochemical Survey on Roads.**
The anomaly 84-11 is indicated by a yellow rectangle along a branch road at the north end of the road based survey in Fleming (1984).The old map is overlain by current geological survey geology. The NIC Property is north of the red claim line.

## 6.4 Quatse Lake Area

### 6.4.1 Prospecting on the Marisa Mineral claims.

In 1991, the Marisa group of claims shown in Figure 16 relative to the Property, was explored by Bilquist and Dasler (1991: AR21581). The claims were in 4 main perimeter-staked blocks on overlapping the north side of the NIC Property (Fig. 16). Marisa 1 and 2 overlap the western block of claims and Marisa 4 the east end of the eastern block. In the northwest the Marisa 1 claim corresponds to the area of the western Property north of Quatse Lake in the Quatse Lake pluton, and in the east the Marisa 3 includes the north part of the central area of the Property in Karmutsen Formation flows and interflow limestones, while Marisa 4 covers

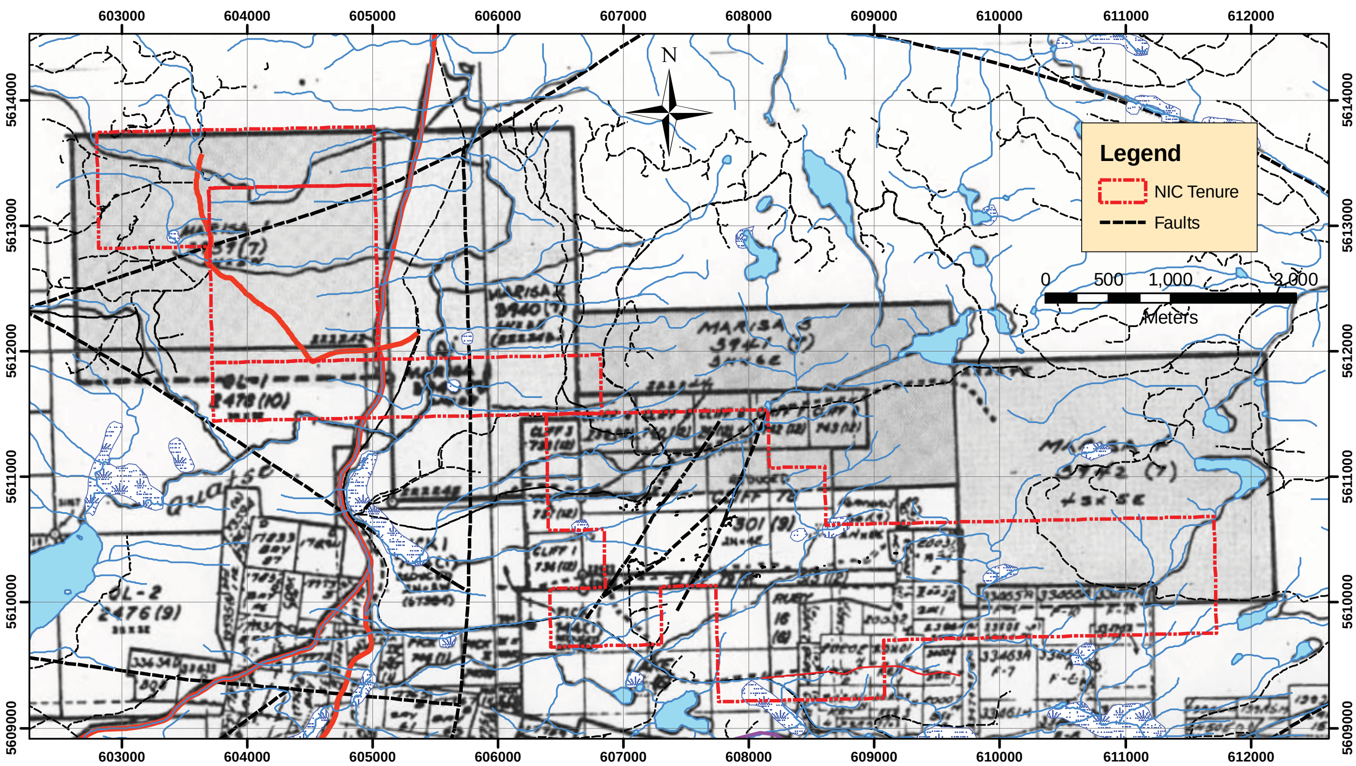



**Figure 16: The Marisa group of claims in 1991**
The Marisa group, large blocks with grey fill, corresponds to the northern side of the Property in the east and most of the Quatse Lake part in the west.

much of the eastern extent of the Property, also in Karmutsen Fm. The prospectors collected rock samples and soil samples between July 3 and 14, 1991. Terrain in the Quatse Lake area is moderate, but brush along creeks and log jams makes current traverses challenging (Fig. 16)

In the Marisa 1 claims they discovered chalcopyrite and traces of molybdenite in the Quatse Lake diorite for 450 meters along the main stream. Pinkish felsic alteration was noted in places and interpreted either as an indicator of potassic alteration or a zeolite. Geochemical soil profiles in the area did not reflect the mineralization noted in the creek. In the Marisa 2 and 3 claims Bilquist and Dasler (1991) found chalcopyrite in amygdules in basalt near the contact of the Quatse Lake diorite along with increased quartz, K-spar, and zeolite alteration,

Prospecting by Bilquist and Dasler also looked at the Little Joe showing (referred to as the Rainbow Showings by McAndrew (1989) and herein). Disseminated chalcopyrite was noted in the Karmutsen north of the Little Joe skarn occurrence along the southern boundary of Marisa 3.

**Figure 17: Log jams in a creek within the Quatse Pluton**
Downstream of a north trending road through the Quatse Pluton, large log jams of logging debris inhibited progress. Steep banks with thick alder and willow hemmed-in traverses to the creek bed. Chalcopyrite mineralization was discovered in the granodiorite downstream of the logging road.

This mineralization observed consisted of disseminated pyrite and chalcopyrite in quartz-epidote filled amygdules. In the eastern most area of the Marisa 4 claims, corresponding to the eastern extent of the Property, minor chalcopyrite and malachite mineralization was found in and near epidote-quartz veins within shear zones.

### 6.4.2 Geophysics and Drilling on the Marisa Property 1991

Following the prospecting work of Bilquist and Dasler (1991), the Marisa 1 claim, which corresponds to the NW part of the North Island Copper Property (Fig. 16), was explored for porphyry copper mineralization in the Quatse Lake Pluton. An IP survey and 5 drill holes were completed on the Marisa 1 claim within the Quatse Lake diorite located on Figure 18. Mineralization reported in the drill holes was generally low grade, but significant in a few holes, and the IP survey did not reveal any significant anomalous areas untested by drilling, but the full extent of the anomalous IP zone was not determined (Allen and Dasler, 1992: AR 22243). The geophysical survey was recommended to be extended to northeast and southeast to find the limits of the anomalous zone.

Details from the report by Allen and Dasler (1992) are of interest for further research and are summarized below: The survey included induced polarization and resistivity as well as a total field magnetometer survey. The aim of the geophysical surveys was to investigate chalcopyrite mineralization discovered in fine-grained diorite along a stream bed that cuts across the geophysical grid. Somewhat higher than background IP effects are detected underlying the entire southeastern half of the survey area, with the creek that exposes the copper mineralization striking across the northern region of the anomalous IP zone. This anomalous response is currently undefined in three directions. The southern portion of the IP zone correlates well with a distinctive magnetic anomaly attributable to widespread magnetite in the diorite and roughly coincident with higher than normal resistivity.

Five diamond drill holes, amounting to 376 meters of core, were completed in various

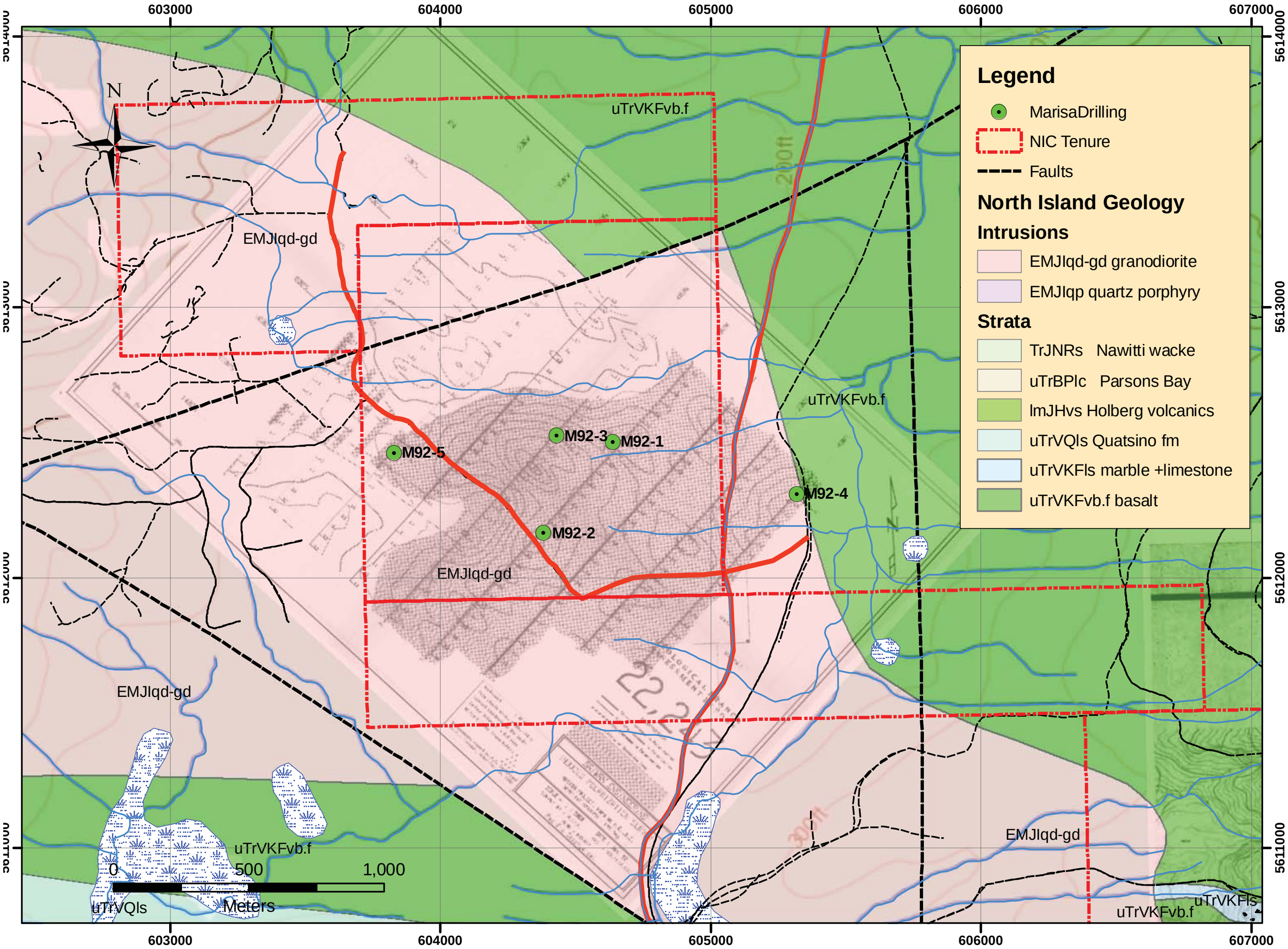



**Figure 18: IP Anomaly in the Quatse Lake Pluton; Marisa Property**
The anomalous area of the grid is shown in dark tone on the underlying georeferenced map from report by Allen And Dasler (1992). Symbols for drill holes for the Marisa Drilling are indicated in the Legend and labelled M92-1 to M92-5. The best mineralization was reported in drill hole M92-1.

parts of an induced polarization anomaly in the Quatse Lake pluton (Figure 18). All of the drill holes were reported by Allen and Dasler (1992) to have intersected at least traces of chalcopyrite mineralization, but diamond drill hole M92-1 intersected 16.2 meters grading 0.17% copper with significant copper values over its entire length. Diamond drill hole M92-2 was collared well within the area of anomalous IP effects (Fig. 16), on the northeastern flank of the coincident magnetic anomaly, and encountered magnetite rich diorite. Some chalcopyrite mineralization was reported associated with felsic dykes intersected near the bottom of this hole. A good correlation between the magnitude of the observed IP effects, the concentration of sulphide and/or magnetite was shown by hole M92-5, which tested the least anomalous IP effects of any of the five diamond drill holes and coincidentally had the lowest grade of polarizable mineralization.

### 6.4.3 Tec-X Resources

An assessment report by Clarke and Mostaghimi (2016: AR37001) on prospecting and geologic modelling in the “Port Hardy claims” for Tech-X Resources is mostly a compilation of previous work and an attempt to classify alteration types through the area to indicate exploration targets.

# 7. Geological Setting and Mineralization

## 7.1 Vancouver Island

Vancouver Island is a significant transect across the southern part of the Mid-Paleozoic to Early Mesozoic Wrangellian tectonostratigraphic terrane (Fig. 19) that extends northward though the Queen Charlotte Island into southern Alaska. On Vancouver Island Wrangellia is intruded to the east by rocks of the Coast Plutonic Complex and tectonically sliced to the west by the Pacific Rim Terrane and the Westcoast Crystalline Complex (Wheeler and McFeely, 1991). The Wrangellian terrane on Vancouver Island is essentially composed of two oceanic volcanic arcs separated by voluminous flood basalts that formed an oceanic plateau. The earliest arc, forming the basement of the island geology, is exposed in several fault-bounded tectonic uplifts in the central part of the island (Fig. 20), most notably around Buttle Lake where the prolific massive sulphide deposits of Myra Falls are located in felsic volcanics of the Devonian to Early Permian Sicker and Buttle Lake Groups. The basement uplifts were deformed and then

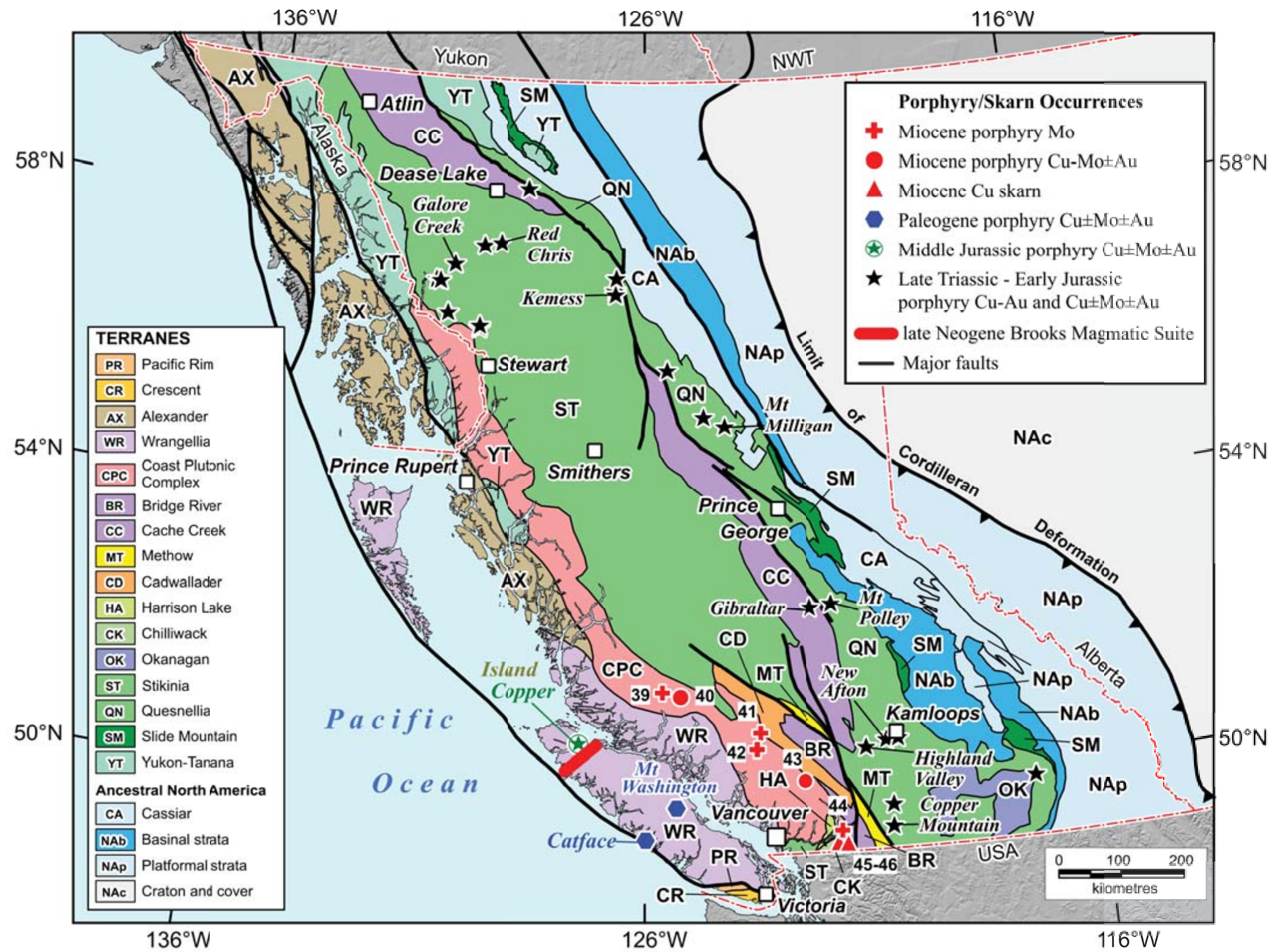



**Figure 19: Terrane Affiliation of Copper Porphyries and Skarns in British Columbia**
Map from Nixon et al. (2020). The Island Copper Mine is located north of a thick red line indicating the Brooks Peninsula magmatic suite. Other porphyry copper and skarn deposits of various ages are indicated. Several numbered Miocene porphyry occurrences are numbered for reference in Nixon et al (2020).

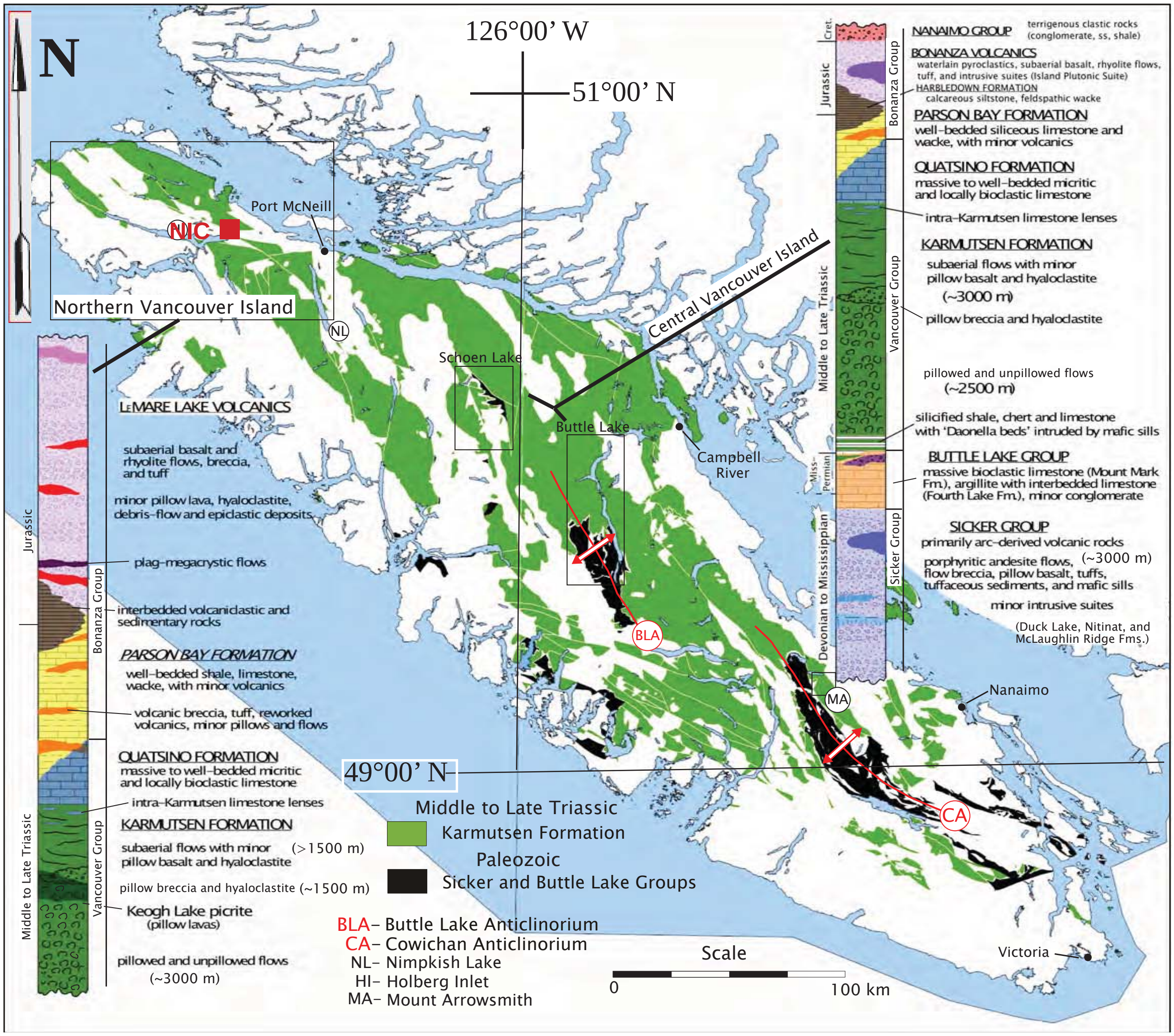



**Figure 20: Paleozoic and Triassic Volcanics of Vancouver Island.**
The project area, indicated by a red square labelled "NIC", is within the Northern Vancouver Island area for which a stratigraphic column is shown on the left indicating a significantly greater thickness of Jurassic volcanics in the Bonanza Group than in the Central Vancouver Island section on the right. The Bonanza group volcanics are known as the LeMare Lake Volcanic south of the Holberg Fault that runs along Holberg Inlet, and the Holberg Volcanic Unit to the north around the past-producing Island Copper Mine and the NIC project area. Map from Green et al. (2008).

engulfed by the voluminous flood basalts of the Karmutsen Formation (Fig. 20), the lower part of the Vancouver Group, that dominates the alpine skyline of much of the central Vancouver Island (Fig. 21). A stratigraphic section for the island is shown in Figure 22. A return to volcanic arc magmatism came in the late Triassic with the onset of the Bonanza Group that deposited a series of increasingly volcanic-dominated strata on the Quatsino Formation limestones that capped the Karmutsen Formation flood basalt plateau. The Bonanza Group is mainly composed of the Parson Bay Formation and the Bonanza Volcanics. The Parson Bay Formation is a mixed carbonate-clastic-volcanic succession with a significant island-arc volcanic and volcaniclastic affinity that separates it conformably from the earlier limestone strata of the Quatsino Formation and is premonitory to Bonanza Group volcanic arc volcanism culminating in the volcanic-dominated LeMare Lake Volcanics south of the Holberg fault and the Holberg volcanics

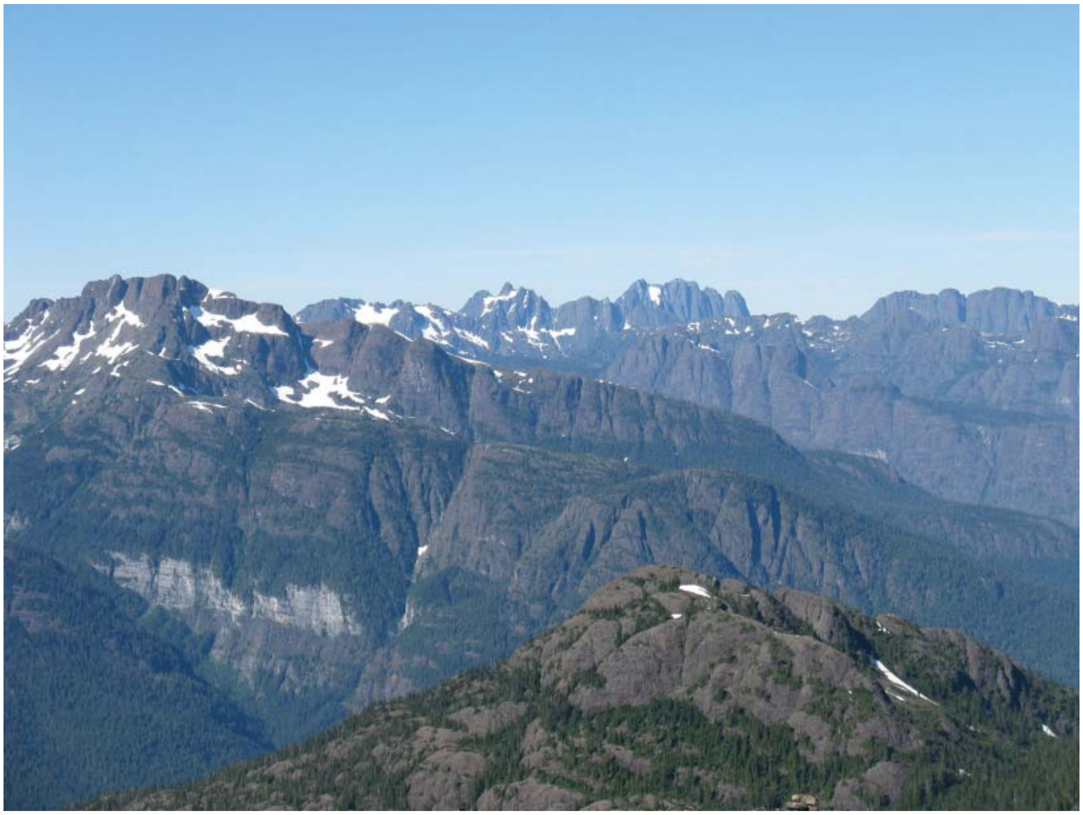


**Figure 21:  Basal Karmutsen Formation contact above the Buttle Lake Group**
In central Vancouver Island the Karmutsen Formation overlies the Paleozoic Sicker Group, which is not exposed in the north island around Quatsino Sound and Holberg Inlet.   View looking west across Buttle Lake from Mt Alexandra towards Mt McBride, left skyline, and Mt Colonel Foster on skyline at right of center.  Grey-weathering limestones at the top of the Permian Buttle Lake Group, exposed in cliff faces at left, overlie Sicker Group volcanic rocks that host the Myra Falls massive sulphide deposits.  The Karmutsen Formation dips shallowly northwest and occupies the entire field of view except for the Sicker and Buttle Lake Groups, and exposing almost the full 6 kilometers of stratigraphic section.  Hidden in valleys beyond Mt McBride, block faults of Sicker and Buttle Lake Groups occur below the Karmutsen Fm contact. The east (front) face of Colonel Foster is in Karmutsen basalts in close intrusive contact with granodioritic Jurassic Island Intrusive Suite plutons to the west.  Photo by the author July 2015 from Jacks Fell on the east side of Buttle Lake..

to the north.  Coeval granitoid intrusions of the Island Plutonic Suite cut volcanic strata of the Karmutsen Formation as well as those of the Bonanza Group and resulted in both porphyry copper deposits and, where intruding limestones, significant skarn deposits of magnetite and copper sulphides.  The Bonanza Arc rocks were eroded following a major Jurassic contractional event and covered unconformably by clastic sedimentary rocks of the terrigenous Nanaimo Group that include coal-bearing conglomerates in fault-bounded troughs along the eastern side of Vancouver Island.

The history of faulting on northern Vancouver Island is complex and dominated by Cretaceous transpression and Tertiary extension. The present crustal architecture exhibits a dominant northwesterly-trending structural grain manifested by the distribution of major lithostratigraphic units and granitoid plutons (Fig. 23).  Numerous fault-bounded blocks of homoclinal, Early Mesozoic strata generally dip to the south-west and west whereas Jura-Cre-

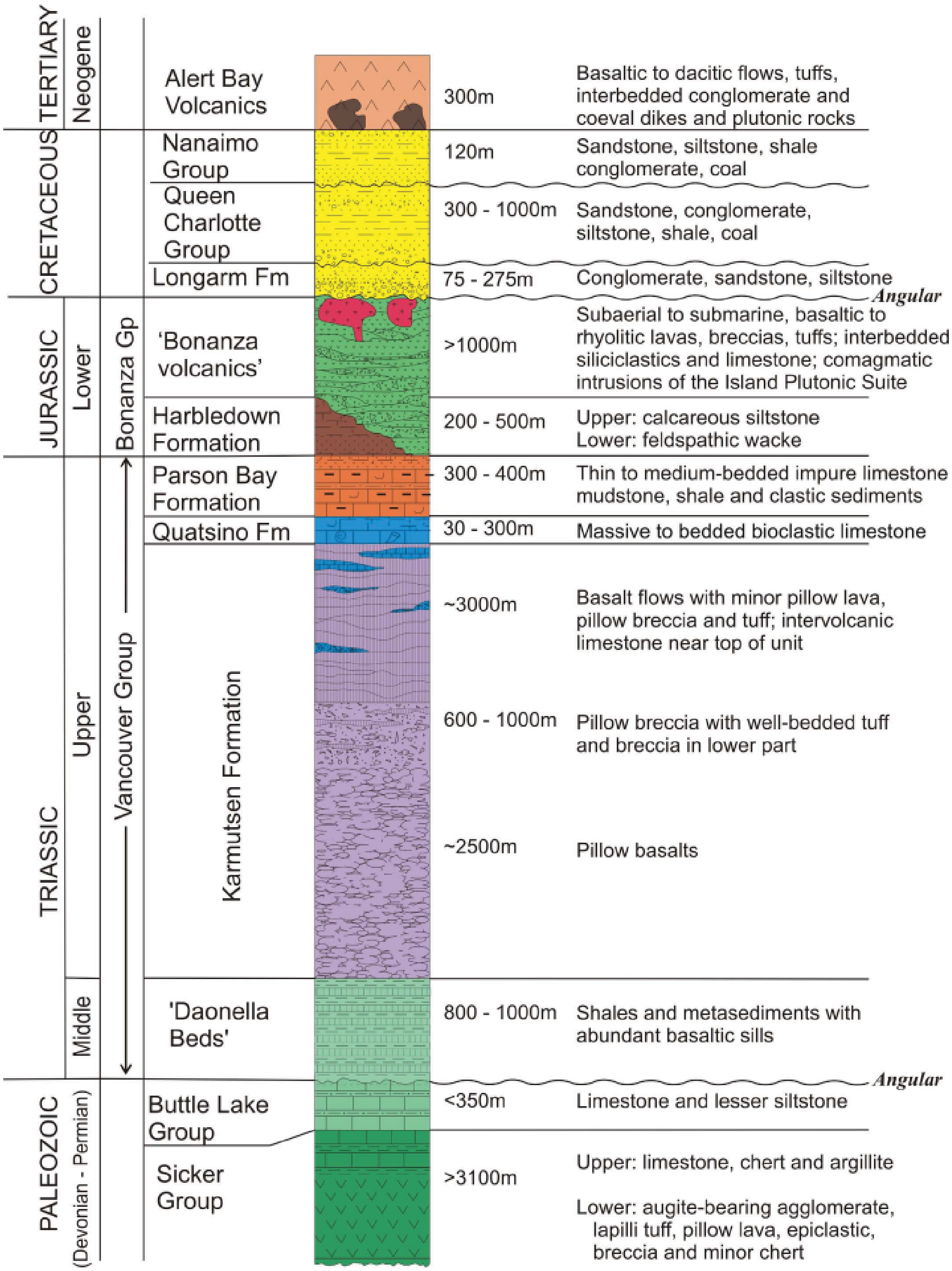



**Figure 22: Stratigraphic Nomenclature for Northern Vancouver Island.**
Stratigraphy of northern Vancouver Island. Notably, the upper Karmutsen Fm includes intervals of limestone such as those observed on the North Island Copper Property. The group subdivisions shown here have been revised recently by Nixon & Orr (2007) to include the Parson Bay Formation as the lowest formation in the Bonanza Group indicative of the onset of a new volcanic arc.

taceous clastic strata are preserved as disparate fault-bounded remnants of formerly more extensive Cretaceous basins on the north side of Quatsino Sound (Nixon and Orr, 2007).

Holberg Inlet is the locus of the Holberg Fault across which the Triassic to Jurassic stratigraphic units are repeated, but with significant changes in facies in the Bonanza Group. On the north side of the Holberg Fault the Jurassic volcanic arc rocks are named the Holberg Volcanic Unit, while to the south the equivalent stratigraphic interval is called the LeMare

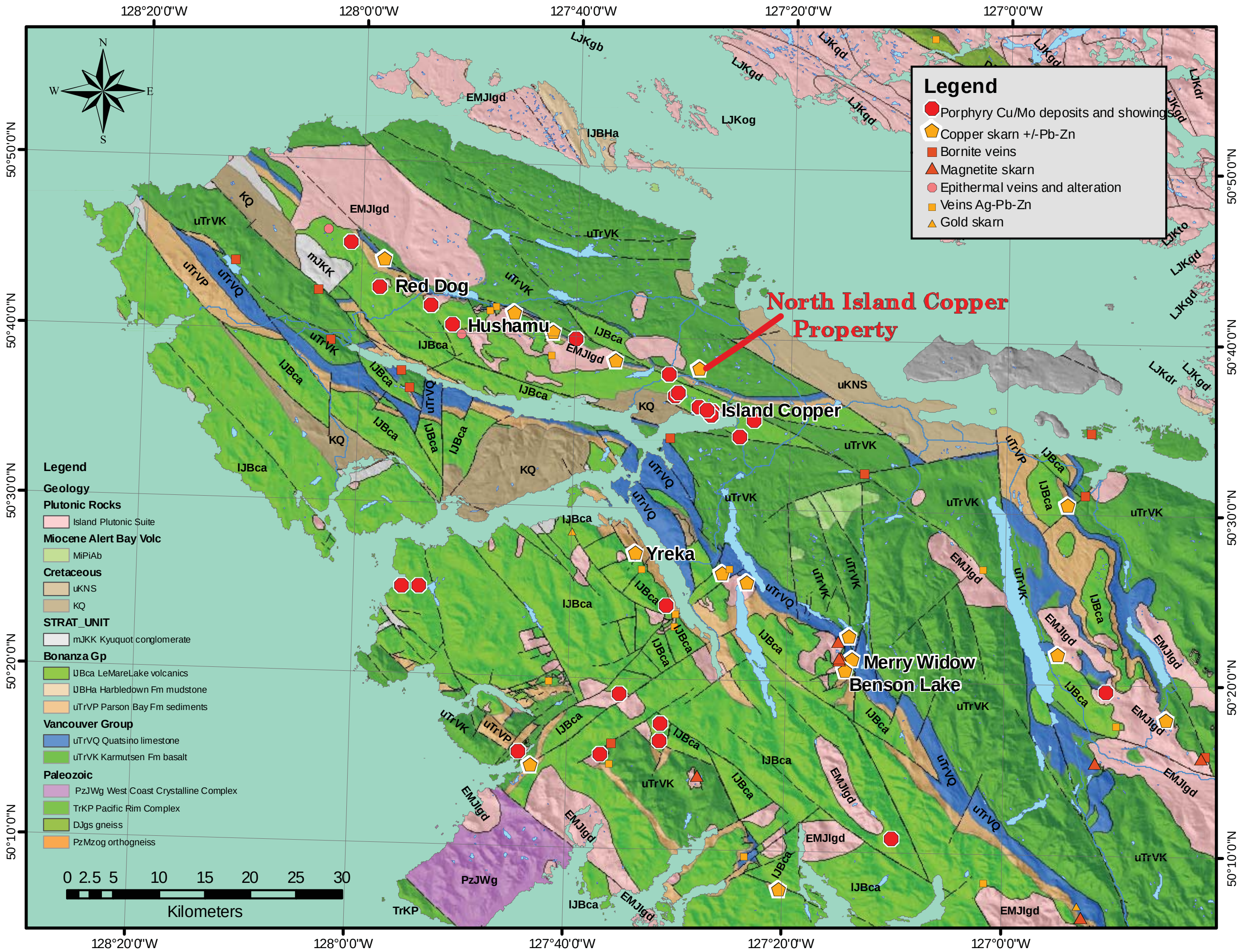



**Figure 23: Regional Geology and Ore Deposits of the North Island.** Island Copper, Hushamu and Red Dog are all porphyry copper deposits associated with the Jurassic Island Intrusive Suite. Merry Widow, Benson Lake and Yreka are skarns also associated with the Island Intrusives. Bornite veins are metamorphogenic and found in the upper Karmutsen basalt. Base map from BC Geological Survey GIS files on the Mapplace website, drawn by the author in ArcGIS 9.3, March 2022.

Lake volcanics. The LeMare Lake volcanics are considered lower-middle Jurassic while the Holberg volcanics are younger in the middle Jurassic stratigraphy and represent a shift from more proximal volcanic facies in the south to distal volcaniclastic facies in the north. The Holberg Fault is also parallel to the chain of Island Intrusions in the Island Copper to Hushamu belt, which host several porphyry copper deposits (Fig, 23) and its role in the localization of the porphyry belt is unknown as it is a younger tectonic feature. However, speculatively, it may be a reactivated Jurassic crustal feature. Another belt of recognized porphyry deposits in the Miocene Brooks magmatic suite composed of the Alert Bay volcanics and the Klaskish Plutonic Suite, which form a chain of intrusions and volcanic deposits that runs transverse to all the Mesozoic structures in the region (Fig. 24). This Miocene belt has been attributed to magmatism localized at a subducted plate edge (Nixon et al., 2020) shown in Figure 25.

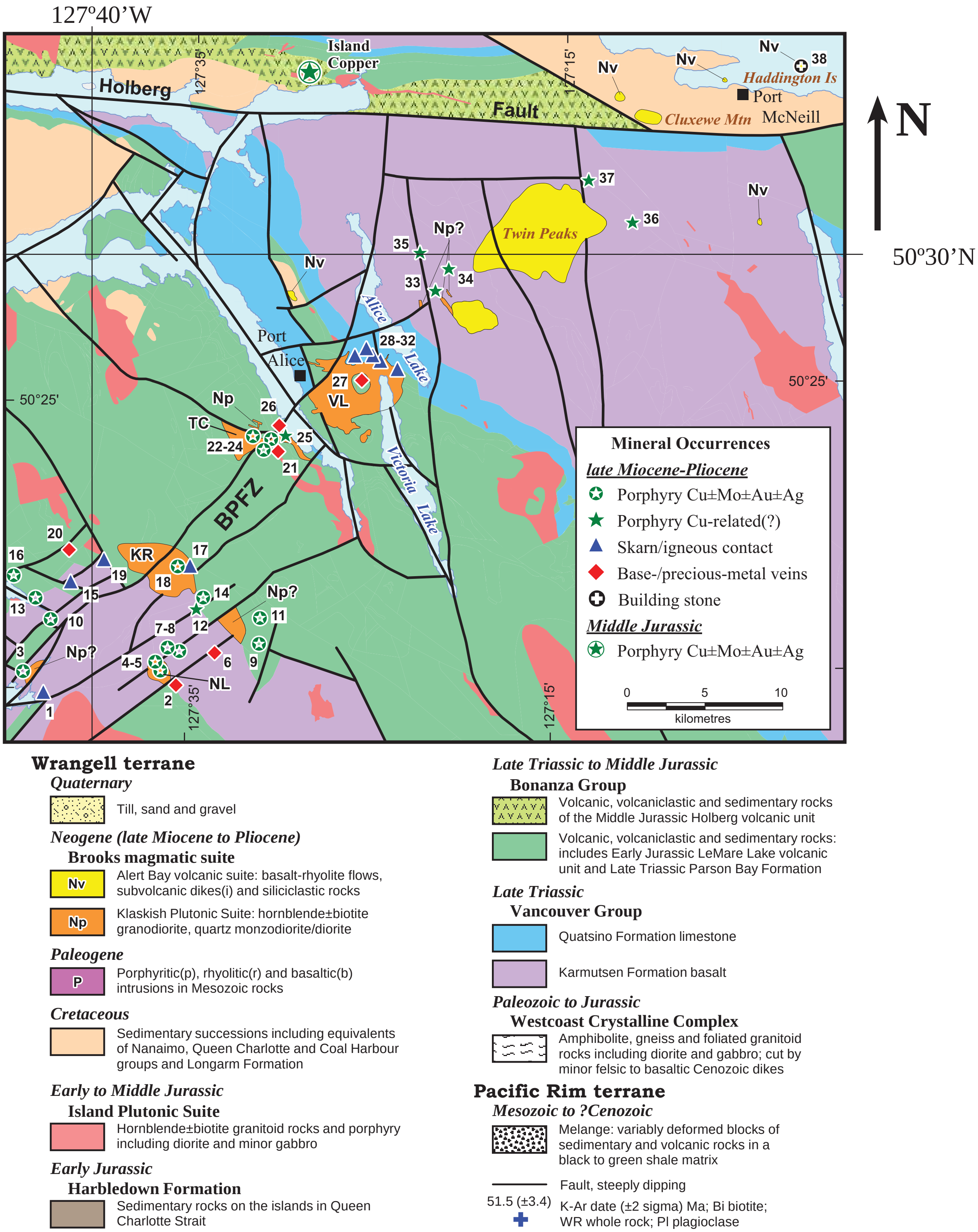



**Figure 24: Brooks Magmatic Suite Porphyry Copper Association**

Porphyry copper, skarn and vein mineral occurrences spatially associated with the Brooks magmatic suite: Mineral occurrences are taken from the MINFILE database and classified in the map legend. Geological units and other symbols as the legend. The Middle Jurassic Cu-Mo-Au porphyry deposit (green stars) at the former Island Copper mine (1971-1995) and the Holberg fault are shown for reference to Figure 23 at the upper edge of the figure. The NIC Property is located north of Island Copper. BPFZ: Brooks Peninsula Fault Zone. Map is a detailed inset from a larger generalized geology map of the north island in Nixon et al. 2020.

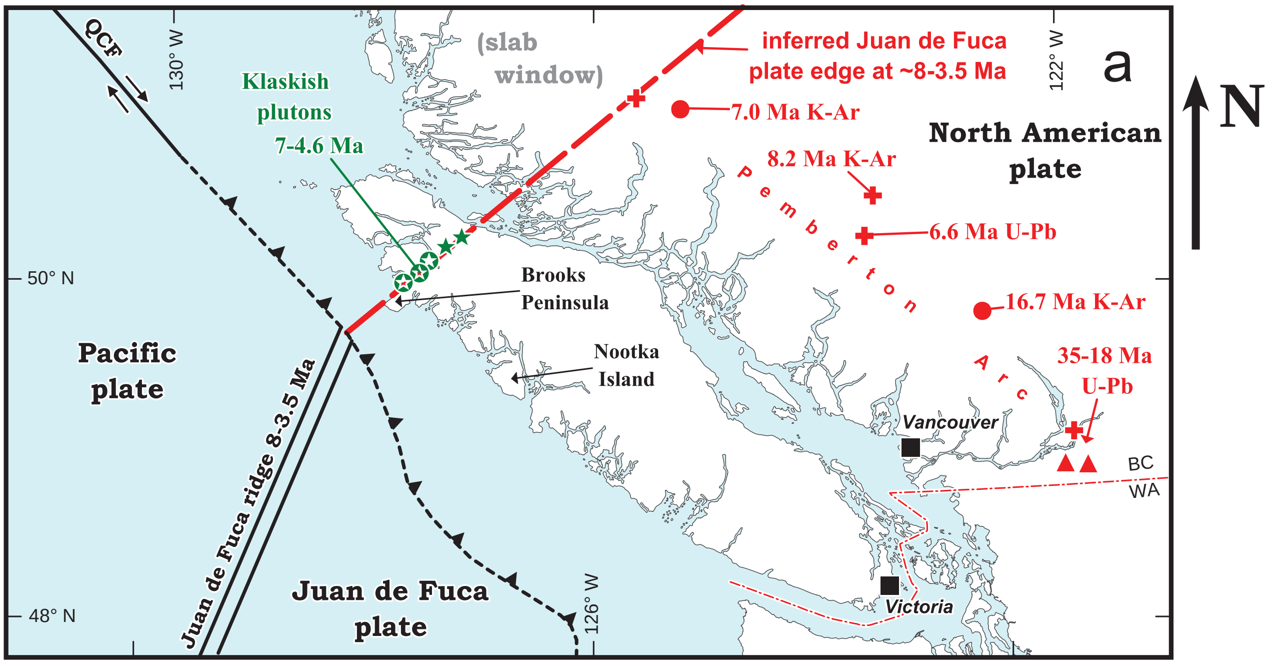



**Figure 25: Tectonic Configuration off the Coast of Vancouver Island in the Miocene.**
The Brooks magmatic belt is indicated by the green symbols for plutons and volcanics, Plate reconstructions show the position of the Juan de Fuca - Pacific - North America plate triple junction offshore of Brooks Peninsula at that time and it is inferred that a plate edge effect resulted in the Brooks magmatism and its alignment across the arc . Map is part of a more detailed diagram showing current plate configurations in Nixon et al. 2020. Ages indicated for volcanics in the Pemberton Arc show a younging-to-the-NW possibly controlled by migration of the triple junction.

## 7. 2 Mineral Deposits

Regionally, Northern Vancouver island is home to a number of significant mineral occurrences including Cu-Mo-Au porphyries and high sulphidation epithermal occurrences in the Port Hardy porphyry copper area, and a number of skarn Cu-(Fe) occurrences at Yreka, Nimpkish Lake, and Benson Lake (Merry Widow camp) (Fig. 23). The most significant deposit is the Island Copper mine (Minfile 092L 158) that was mined between 1971 and 1995 and produced over 1.2 billion kilograms copper, 31.4 million kilograms of molybdenum, 33,591 kilograms of gold, 345,535 kilograms of silver and 27,000 kilograms of rhenium from about 361 million tonnes of ore. Other porphyry copper deposits in the Port Hardy area include advanced-stage exploration projects such as Hushamu (092L 240) and Red Dog (092L 200) porphyry copper deposits for which North Island Copper and Gold Inc. has published current low-grade resource estimates. These porphyry deposits are associated with granodiorite and quartz diorite of the Island Plutonic Suite, which has intruded volcanics of the Bonanza Group.

Magnetite skarn and copper skarn occur at the contact between Quatsino limestone and Jurassic granodiorite. The Merry Widow (092L 044), and associated deposits produced over 1.7 billion kilograms of iron in the 1950s and 1960s. The nearby Old Sport (092L 035) mine produced 488 million kilograms of iron, 41 million kilograms of copper and almost 4 million grams of gold and 12 million grams of silver. The Iron Crown iron skarn deposit (092l 034) near Nimpkish Lake produced almost 1.3 billion kilograms of iron in the late 1950s and early 1960s.

## 7.3 Stratigraphic Units

### 7.3.1 Karmutsen Formation

The major stratified unit of Vancouver Island including the North Island is the Triassic Karmutsen Formation (Figs. 20, 21, 22), with a cumulative thickness of about 7 kilometers. The Karmutsen Formation is a series of tholeiitic flood basalts that formed an oceanic plateau beginning with pillowed flows and transitioning to a mix of hyaloclastitic pillow breccias and tuffs, and finally becoming intermittently subaerial with thick amygdaloidal flows, and flow breccias, interspersed with limestone and siltstone intervals capped by thin pillowed basalt sequences. The upper subaerial basalts of the Karmutsen Formation are common hosts of bornite veins resulting from metamorphogenic remobilization of copper during low grade prehnite-pumpellyite facies metamorphism of the lower less oxidized submarine flows, and redeposition in the more oxidized flows at the top of the pile. Limestone intervals in the Karmutsen also served as hosts for skarn deposits in proximity to Jurassic intrusions of the Island Plutonic Suite.

Many of the less resistant rock units are discontinuously or poorly exposed in the Nawhitti Lowlands around the North Island Copper claims. Subdued topography and thick glacial till deposits obscure the geological expression of stratigraphy. Relatively good exposures of many units are found 15 km to the south-southwest of Rupert Inlet near the Yreka skarn deposit (Fig. 23) on the west side of NNW trending Neroutsos Inlet where the physiographic trends are parallel to the main stratigraphic contacts. The eastern slope of the ridge on the west side of the inlet is underlain by a west-dipping homoclinal sequence consisting in ascending order of the Quatsino Limestone, Parson Bay Formation and LeMare Lake volcanics. The base of the sequence in the Quatsino Fm is conformably laid on Karmutsen Formation that is not exposed within the inlet, but forms much of the outcrop on Vancouver Island. Unconformably overlying the Vancouver Group, the Bonanza Group consists in the Parson Bay Formation sedimentary rocks, the Volcaniclastic-Sedimentary Unit and the LeMare Lake Formation volcanics. The Parson Bay Formation occupies about half of the slope up to the ridge crest. It is subdivided into volcanic- and limestone-dominant units. The Volcaniclastic-Sedimentary Unit and LeMare Lake Formation volcanics complete the section to the crest of the ridge and hosts the skarn deposits at Yreka. The LeMare Lake volcanics range in composition from felsic to mafic with pyroclastic and coherent flow-dominated units.

### 7.3.2 Quatsino Formation (uTrQ)

Quatsino Formation is the upper-most formation in the Vancouver Group (Fig. 22), which largely consists of the voluminous basalt flows and volcaniclastics of the Upper Triassic Karmutsen Formation. The Quatsino caps the flood basalts of the Karmutsen oceanic flood basalt plateau that itself is built on island arc volcanics of the Permian Sicker Group, now exposed mainly in structural uplifts at the south end of Buttle Lake and near Port Alberni (Fig. 20). The Quatsino is described by Nixon et al., (2007) as a medium to pale grey, thinly bedded to massive micritic and locally bioclastic limestone with minor silica replacement and chert nodules. It has rare laminated interbeds, oolitic layers and algal structures and is locally fossiliferous. Its restricted occurrence in the area corresponds to its lack of thickness declining to less than 40 meters on the west coast of northern Vancouver Island.

### 7.3.3 Bonanza Group: Parson Bay Formation (uTrP)

The main Parson Bay Formation described by Nixon et al. (2011) consists of medium grey to black, thinly-laminated to medium-bedded, impure limestone, calcareous to non-calcareous

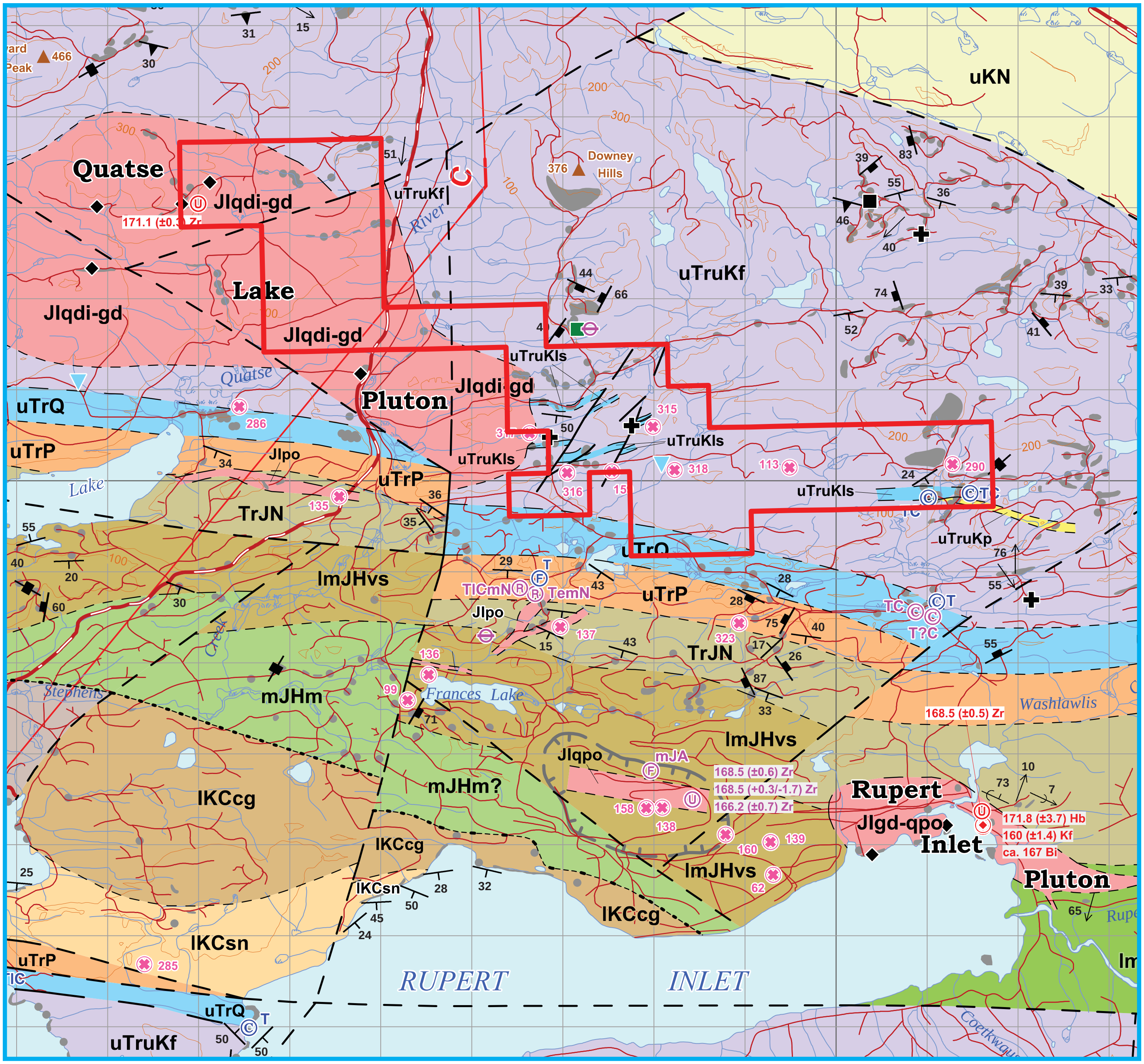



**Figure 26: Geology of the Quatsino-Port McNeill Area, Northern Vancouver Island**

Part of Map 2011-2 by G.T. Nixon, et al. 2011. Selected parts of the Legend published with the map are shown in Figure 22, below. Locations and designations of mineralized showings known as Minfiles in the BCGS system are represented by pink "X"s. Labels are the last digits of the Minfile number usually prefixed by the NTS designation for the 1:250,000 scale map sheet in which the Minfile occurs as shown below.


Minfile localities on the Property have the prefix 092L, and include 315, 316, 317, 318, 113, 159, and 290. Descriptions and identities of the Minfiles are found online at HTTPS://MINFILE.GOV.BC.CA/SEARCHBASIC.ASPX . The Property outline in red is approximate.

*UPPER CRETACEOUS*

**NANAIMO GROUP EQUIVALENTS (IN PART)**

*Campanian to ?Maastrichtian*

| | |
|---|---|
| uKN | Grey to greenish grey and brown, medium to coarse-grained, arkosic to lithic wacke, pebble to cobble conglomerate, siltstone and minor coal; locally fossiliferous |

*LOWER CRETACEOUS*

**COAL HARBOUR GROUP**

*?Albian*

| | |
|---|---|
| lKCsn | Upper sandstone unit: trough cross-laminated lithic wacke intercalated with siltstone, minor pebble conglomerate and rare coal |
| lKCcg | Lower conglomerate unit: massive conglomerate with minor lenses of coarse-grained lithic wacke |

*UPPER TRIASSIC TO MIDDLE JURASSIC*

**BONANZA GROUP - NORTH OF HOLBERG FAULT**

*Lower (?Hettangian) to Middle (Bajocian) Jurassic*

HOLBERG VOLCANIC UNIT

| | |
|---|---|
| lmJH | Poorly exposed, undivided basaltic to rhyolitic flows, volcaniclastic and sedimentary rocks east of Rupert Inlet |
| mJHm | Mainly dark grey-green to medium grey, basaltic to andesitic flows and volcaniclastic rocks including plagioclase-hornblende-phyric andesite, plagioclase-clinopyroxene-phyric basalt-andesite with sparse hornblende megacrysts (~1cm), tuff-breccia, lapilli tuff and reworked equivalents; minor sedimentary rocks including volcanic breccia, wacke, siltstone, mudstone and shale; locally may include minor rhyolitic flows and tuffs |
| mJHf | Medium grey to grey-green, aphanitic to feldspar-phyric, rhyolitic to dacitic flows, flow domes and/or pyroclastic rocks including flow and pyroclastic breccia, welded to non-welded crystal-lithic lapilli tuff with carbonized wood fragments; may locally include thin interbedded volcanic breccia and wacke, and minor basaltic to andesitic flows |
| lmJHvs | Dark grey-green volcaniclastic and sedimentary rocks including basaltic to andesitic, plagioclase-clinopyroxene and plagioclase-hornblende-phyric lapilli tuff and tuff breccia, volcanic breccia, wacke and minor siltstone and mudstone; locally includes basaltic to andesitic flows |

*Upper Triassic (Norian) to Lower Jurassic (Sinemurian or younger)*

NAHWITTI RIVER SILTSTONE-WACKE

| | |
|---|---|
| TrJN | Dark grey to grey-green, medium bedded to thinly laminated, siliceous siltstone, mudstone and feldspathic lithic wacke; locally contains massive beds of basaltic to andesitic volcaniclastic breccia and thin, rhyolitic tuff beds |

*Upper Triassic (Carnian to Rhaetian)*

PARSON BAY FORMATION

| | |
|---|---|
| uTrP | Similar lithologies to those found south of the Holberg Fault; coarser sedimentary and volcaniclastic deposits appear to be less common and Sutton limestone equivalent has not been observed |

*UPPER TRIASSIC*

**VANCOUVER GROUP**

*Upper Triassic (Carnian to Lower Norian)*

QUATSINO FORMATION

| | |
|---|---|
| uTrQ | Medium to pale grey, thinly bedded to massive micritic limestone and locally bioclastic limestone; minor silica replacement and chert nodules; rare laminated interbeds, oolitic layers and algal structures; locally fossiliferous |

*Upper Triassic (Carnian; possibly Middle Triassic (Ladinian) at the base)*

KARMUTSEN FORMATION

Upper Karmutsen Formation: Flow Member

| | |
|---|---|
| uTruKf | Dark grey-green, aphanitic to plagioclase-phyric basalt flows, commonly amygdaloidal and locally exhibiting laminar flow features (vesicle trains) and pipe vesicles; may include minor pillow lava and hyaloclastite |
| + | Small outcrop of plagioclase-megacrystic (1-2cm) basalt flow; commonly amygdaloidal and locally exhibiting trachytoid texture; intercalated with aphanitic or plagioclase-phyric basalt near the top of the succession |
| uTruKp | Dark grey-green, closely packed, pillowed basalt flows; aphanitic and variably amygdaloidal |
| uTruKpx | Plagioclase-megacrystic (<2cm) pillowed basalt flows |
| uTruKls | Pale to medium grey, micritic to rarely bioclastic or oolitic limestone intercalated with basalt near the top of the flow succession |

## INTRUSIVE ROCKS

*MIDDLE JURASSIC (ca. 174.7 to 166.2 Ma)*

**ISLAND PLUTONIC SUITE**

| | |
|---|---|
| Jl | Dark grey-green to pale pinkish grey, medium to coarse-grained, equigranular granitoid rocks and porphyry; includes hornblende±biotite-bearing quartz diorite (qdi), granodiorite (gd), plagioclase±hornblende porphyry (po) and quartz-plagioclase±biotite porphyry (qpo); combined codes indicate a range of common rock types (qdi-gd, quartz diorite - granodiorite) |

## MAP SYMBOLS

- Geological contact, defined
- Geological contact, approximate
- Geological contact, inferred
- Steeply dipping fault, defined
- Steeply dipping fault, approximate
- Steeply dipping fault, inferred
- Unconformity, approximate
- Unconformity, inferred
- A — C Line of vertical cross-section
- Outcrop examined
- Outcrop too small to show at map scale

**Structure**

- 30 Bedding, inclined
- 14 Volcanic flow lamination, inclined
- 30 Eutaxitic foliation/welding, inclined
- 64 Dike, inclined, vertical
- 64 Tertiary dike, inclined, vertical, attitude unknown
- 27 Axis of minor fold, inclined
- 17 Axial plane of minor fold, inclined
- 17 Lineation, inclined (slickenfibres on steeply dipping fault)
- Lineation, horizontal (slickenfibres on steeply dipping fault)

**Metamorphism**

- Ⓗ Hornblende hornfels facies: hornblende+plagioclase±epidote±quartz
- Upper greenschist facies: actinolite+chlorite+albite±epidote±quartz ±calcite
- Ⓟ Prehnite-pumpellyite facies mainly: pumpellyite±prehnite+chlorite+albite ±epidote±quartz±calcite
- ⊗ Lm Retrograde zeolite mineral assemblages: Lm, laumontite (X-ray diffraction determination by M. Chaudry)

**Figure 27: Geological Units on BCGS Map 2011-2**

Unit descriptions are from GM2011-2, Map by Nixon et al. (2011)

mudstone, siltstone and shale intercalated with variable proportions of grey-green lithic feldspathic/tuffaceous wacke, minor crystal-lithic tuff and reworked equivalents, volcaniclastic breccia and debris-flow deposits, and rare vitric tuff, pebbly sandstone and conglomerate. Shale units locally yield abundant thin-shelled bivalves (Halobia sp., Monotis sp.), and limestone locally contains rare algal structures; may include coraline limestone described as the Sutton limestone equivalent, near the top of the succession.

Work by the author in 2016 along the south shore of Quatsino Sound north of Yreka (Fig. 23) showed the Parson Bay Fm to be a mix of grey massive limestone and gritty limestone with zones of dark green calcareous crystal tuffs that weather brick red commonly cut by E–W calcite veins. To the east, the formation consists of non-calcareous sediments with rusty tuffaceous zones, dark grey, finely fractured massive limestone interbedded with calcareous volcanic grit and limestone conglomerate. White weathering hornblende-feldspar porphyritic felsic dykes cut the limestone steeply at 160 degree strike locally.

An adjacent fault block of the upper Parson Bay Formation is dominated by calcareous tuffs, commonly massive bedded, with some beds up to 10 m thick and grading upward to agglomerates with rounded porphyritic clasts (Wasteneys, 2017). In places limestone occurs as a host to dark grey calcareous crystal tuffs and crystal-lithic breccias with vesicular lapilli, but the units surveyed are predominantly of volcanic origin within a 20 hectare area traversed by new logging roads. Felsic dykes, up to several meters wide sporadically cut the sediments and tuffs in a N-S strike. Pyrite alteration of hornblende is notable along with thin veins of pyrite observed in the vicinity of the dykes cutting the tuffs.

The Parson Bay Formation uTrP was subdivided locally into two volcanic dominated units by Nixon et al. (2011); uTrPvfmc and uTrPvmc (not exposed in the Property area) form a series of fault delimited blocks within the main formation from Quatsino Sound south along the coast of Neroutsos Inlet. Units uTrPvfmc and uTrPvmc are described by Nixon et al. (2011) as follows: uTrPvfmc includes dark grey-green tuff-breccia, crystal-lithic lapilli tuff and lesser basaltic flows that are aphanitic to coarsely clinopyroxene-plagioclase ± olivine-phyric. The unit may include minor limestone, wacke, siltstone and mudstone. The unit uTrPvmc consists of dark grey-green, basaltic tuff-breccia, lapilli tuff and reworked equivalents that are aphanitic to coarsely clinopyroxene-plagioclase ± olivine-phyric and may include minor limestone, wacke, siltstone and mudstone.

### 7.3.4 Bonanza Group: Nahwitti River siltstone (TrJN) and Volcaniclastic-Sedimentary Unit (TrJBvs)

The Holberg fault (Fig. 26), colinear with Holberg Inlet marks a facies change in the Bonanza Group rocks from more proximal sources in the south to more distal in the north (Fig. 27). North of the fault the unit overlying the Parson Bay Formation is named the Nahwitti River siltstone, while to the south Harbledown Formation and a Volcaniclastic-sedimentary unit of the Parson Bay formation is recognized. The Nahwitti Fm is described as a dark grey to grey-green, medium bedded to thinly laminated, siliceous siltstone, mudstone and feldspathic lithic wacke locally containing massive beds of basaltic to andesitic volcaniclastic breccia and thin, rhyolitic tuff beds

South of the Holberg Fault the Parson Bay Formation is stratigraphically overlain by the Volcaniclastic-Sedimentary Unit of the Bonanza Group, The main unit is described by Nixon et al. (2011) as "Interbedded volcaniclastic and sedimentary strata (predominantly submarine): buff to grey-green, thin to very thickly bedded, calcareous to non-calcareous, volcanic breccia, lithic and feldspathic wacke, siltstone and limestone, locally coralline; lithic-crystal tuff, lapilli tuff and reworked equivalents; and minor vitric tuff, pebbly sandstone, siltstone, and volcaniclastic debris-flow deposits.

### 7.3.5 Bonanza Group: Holberg (mJHm) and LeMare Lake Volcanic Units (lJLm)

The facies change at the Holberg Fault from proximal, flow-dominated - on the south side, to distal - volcaniclastic stratigraphy on the north side, is more observable in the volcanic dominated units of the lower and middle Jurassic Bonanza Group. South of the fault the main Bonanza volcanic arc unit is the Le Mare Lake Volcanics. In the North Island Copper Property and Island Copper mine area (Fig. 26), the LeMare Lake is represented by the Holberg volcanic unit (mJHm). The LeMare Lake volcanics are described by Nixon et al. (2011) as dark grey-green, basaltic to andesitic flows with minor intercalated volcaniclastic and sedimentary lithotypes and locally includes minor pillow lava/breccia, minor rhyolitic flows and pyroclastic rocks. West of Neroutsos Inlet the author has mapped LeMare Lake volcanics on both sides of a prominent ridge line including feldspar porphyritic volcanic flows and volcaniclastics cut by phyllosilicate-altered quartz-feldspar porphyritic felsic dykes in which hornblende mafic phenocrysts are replaced by epidote and pyrite and the feldspars are altered.

The Holberg volcanic unit, poorly exposed north of Rupert Inlet, is regionally described by Nixon et al. (2011) (Fig. 27) as composed of mainly dark grey-green to medium grey, basaltic to andesitic flows and volcaniclastic rocks including plagioclase-hornblende-phyric andesite, plagioclase-clinopyroxene-phyric basalt-andesite with sparse hornblende megacrysts (~1cm), tuff-breccia, lapilli tuff and reworked equivalents; minor sedimentary rocks including volcanic breccia, wacke, siltstone, mudstone and shale; locally may include minor rhyolitic flows and tuffs. Other subunits, mapped to the west-northwest include medium grey to grey-green, aphanitic to feldspar-phyric, rhyolitic to dacitic flows, flow domes and/or pyroclastic rocks including flow and pyroclastic breccia, welded to non-welded crystal-lithic lapilli tuff with carbonized wood fragments, and may locally include thin interbedded volcanic breccia and wacke, and minor basaltic to andesitic flows. Dark grey-green volcaniclastic and sedimentary rock strata are observed to include basaltic to andesitic, plagioclase-clinopyroxene and plagioclase-hornblende-phyric lapilli tuff and tuff breccia, volcanic breccia, wacke and minor siltstone and mudstone, with local intercalations of basaltic to andesitic flows.

### 7.3.6 Island Plutonic Suite

Large plutonic bodies are aligned in a west-northwest belt away form the Island Copper Mine on the north side of the Holberg Fault (Fig. 23, and 26) in a series of named plutons including the Rupert Inlet, Quatse Lake, Wanokana Creek, Hushamu Creek, and Goodspeed River Plutons with the large Nahwitti Batholith lying to the north. Mineralization of a porphyry affinity including porphyry copper molybdenum, copper skarns and epithermal vein system is commonly associated with the plutons and at least two deposits in the Pemberton Hills area, the Red Dog and the Hushamu have geological resources of copper (Figs. 3 and 23). The plutons are calc-alkaline in geochemistry and include a variety of compositions from dioritic to quartz dioritic to granodioritic. The rocks are dominantly hornblende and biotite-bearing coarse-grained, equigranular granitoids and porphyry and range in age from 197.5 to 169.9 Ma based on a variety of geochronological measurement systems with the most reliable U-Pb zircon ages lying the range from 172 to 167 Ma (Fig. 26)

The Quatse Lake Pluton underlies the western part of the Property and its eastern margin is proximal to skarn mineralized, marbled limestone interbedded within Karmutsen Fm basalts in the central part of the Property.

## 7.4 Property Geology and Mineralization

A geological map of the entire Property at the scale of the district north of the historic Island Copper Mine is shown in Figure 26, above. Maps of the individual prospects are shown in Item 9: Exploration in Figures 31, for the skarn showings with individual maps for each of the skarn showings in Figures 36, and 38 to 40, and the Quatse pluton in Figure 44.

The Property covers two distinct but probably related geological environments: An eastern block of claims covers a 5 kilometer strike length of the upper Karmutsen Formation tholeiitic basalt flows adjacent to the overlying Quatsino Formation limestone which lies to the south (Fig. 26) and the Quatse pluton on the west. The western lobe of the Property is a block of claims covering a 450 hectare area of the eastern end of the Quatse Lake Pluton where previous work identified potential porphyry copper mineralization.

At the western end of the eastern block of claims (Fig, 26), numerous copper skarn showings, the discovery of which was described in Item 6 (above), is represented by a ca. 230 hectare area shown in Figure 31. The copper skarns, named the Rainbow, Cranberry, South, and Skid, occur within marbleized limestone beds that are interspersed within basalt flows and disrupted by NNE-trending faults. The limestone beds represent pauses in submarine volcanism in the final stages of eruption of the tholeiitic, submarine flood basalts of Karmutsen Formation which culminated with deposition of the Quatsino Limestone. The skarns are stratiformly controlled by the limestone beds, but may be spatially arrayed in proximity to the eastern contact of the Quatse Lake Pluton.

The most extensively displayed skarn mineralization is in the Rainbow Zone (Fig. 36) , comprising a series of garnetite skarns, and lobate magnetite-chalcopyrite bodies arrayed along a 500 meter strike of marbleized limestone. The original limestone section is roughly 40 meters thick and moderately south dipping. Garnetite skarn horizons within the marble vary from lenticular layers up to 5 meters thick at the contact of the marble with Karmutsen basalt to lobate masses cutting across strike. Mineralization consists mainly of massive garnetite with disseminated or irregular fracture-controlled chalcopyrite, and larger massive lobes of magnetite interspersed with lenses and disseminated chalcopyrite. Grades of 17 mineralized samples are tabulated in Table 3 and range from 74 ppm in some barren garnetite to 17 percent in chalcopyrite lenses in black amphibolitic skarn. Diorite dykes are present in the vicinity of the mineralization, and assumed to be related to the genesis of the skarns, but no exposures could be found to prove this.

South of the Rainbow Zone, at least one other limestone horizon is present in the Karmutsen Formation, but poorly exposed fault offsets obscure continuity and the appearance of multiple beds may be fault repetitions. Skarn showings in these limestone horizons are not as well exposed, or apparently extensive as the Rainbow zone, but show similar styles of garnetite-chalcopyrite-magnetite mineralization. The Cranberry showing (map in Figure 38), was previously, partially excavated exposing two narrow garnetite bands extending over a few hundred meters of strike length of two relatively thin limestone beds. The garnetite-magnetite-chalcopyrite mineralization is localized at the northern or basal contact of the limestone. Other showing at South (Fig. 39), and Skid (Fig. 40) are less well exposed. South is located on a knoll in low ground adjacent to marshes and Skid on a steep south-facing hillside.

The porphyry copper component of the Property is encompassed by the western block of claims in the Quatse Lake Pluton west of the Port Hardy to Coal Harbour Highway. The geology of the Quatse pluton part of the Property is shown in Figures 18 in Item 6, and in Figure 44 below in Item 9. Figure 18 shows five previous drilling sites, and the area of an IP chargeability anomaly. Chalcopyrite mineralization was commonly encountered in the drill core, and significantly drill hole M92-1 intersected 16.2 meters near its collar grading 0.17% copper in a non-magnetic zone of granodiorite reflecting granitoid alteration. Similar mineralization was encountered throughout drill hole M92-3, except in a late-stage quartz-feldspar phyric felsic dyke. Within the quartz diorite between 24.4 meters and the EOH at 76.8 m copper assays ranged between 260 and 792 ppm averaging about 500 ppm. The mineralization consisted of in hairline fracture-filling and disseminated pyrite (1%), variable chalcopyrite from trace to 0.5% and traces of molybdenite.

In general, mineralization in the Quatse Lake Pluton may be related to skarn mineralization in the marbles within the Karmutsen Formation. The most prolific skarn mineralization appears to be within 500 meters of the contact of the pluton with limestone horizons in the Rainbow Zone and declining to possibly smaller skarn lobes by 1 kilometer at the South and Cranberry showings.

# 8. Deposit Types

The mineralizing environment of the Property is mainly influenced by the Quatse Lake pluton, which has both internal porphyry copper potential, as well as external skarn mineralizing potential in limestone beds in the upper Karmutsen Formation, into which it intrudes. Showings in the Quatse Lake pluton include significant drill intersections of copper mineralization. In the Karmutsen Formation, garnet - chalcopyrite - magnetite skarns are documented in limestone - marble beds at several showings within a kilometer to the east of the Quatse intrusive contact. The two main deposit types being explored on the Property are described below. Regionally, the Karmutsen Formation is known for hosting small bornite, chalcopyrite and native copper veins and breccias associated with low grade metamorphic remobilization of copper into upper subaerially deposited sections of nearly 7 kilometer thick the tholeiitic basalt pile, but these are not a significant target in the immediate area.

## 8.1 Skarns

Mineralized skarns are present in several showings on the North Island Copper Property, but their precise classification amongst a range of types including copper, gold, and iron skarns has not been firmly established. Copper is the main element of economic interest in the skarns and veins discovered so far. Numerous different classes of mineralized skarn have been documented, including gold, copper, tungsten, lead-zinc and iron, and in each class there are distinctive subtypes worthy of considering in designing an exploration plan. Copper skarns also have associated gold, high sulphide content of chalcopyrite, pyrite and magnetite or pyrrhotite in inner garnet-pyroxene skarn facies. Establishing a classification may guide exploration to find overlooked geological features of the skarns that are of economic importance. The established characteristics of the North Island Copper skarns are an association between dioritic intrusions and metasomatic replacement of marble by garnet and pyroxene skarns, with magnetite associated with chalcopyrite lenses. Two of the most relevant types of copper and gold skarns are summarized below.

### 8.1.1 Copper Skarns

Copper dominant skarns of the calcic type have high garnet to pyroxene ratios with high Fe andraditic garnet and diopsidic clinopyroxene replacing marble near intrusive stock, to wollastonite and tremolite with lesser garnet and diopside farther away (Ray, 1998). Mineralization is of high sulphide content with chalcopyrite, pyrite and magnetite in the inner zone and bornite, sphalerite and tennantite possible in the outer zone. The oxidation state of the intrusion and host rocks determines the predominance of iron species including magnetite, hematite, and pyrrhotite. Traces of scheelite, Co-Ni arsenides, and Cu- Sb-As sulphosalts may be present.

The geochemical signature of Cu-skarns includes Co, As, Sb, Bi, Mo, and W anomalies in soils, silts, and rocks with zoning from Cu-Ag-Au in the inner zones through Au-Ag to Pb-Zn-Ag distal from the intrusions. Copper skarns may be associated with copper porphyry deposits. Grades in Cu-skarns range from 1 to 2% and sizes from 1 to 300 Mt.

### 8.1.2 Gold Skarns

The majority of gold-dominant skarn mineralization occurs in calcareous rocks that have been metasomatically replaced by fluids exsolving from crystallizing dioritic intrusive bodies. The resulting calc-silicate skarns consist of Ca, Fe and Mg silicate minerals, mainly clinopyroxene, garnet, and epidote, the proportions of which determines the three types of calcic skarns formed under different geochemical conditions and reflecting original host-rocks.

Pyroxene-rich skarns have high pyroxene to garnet ratios and mineralization characterized by native gold, pyrrhotite, arsenopyrite, chalcopyrite and a variety of significant bismuth tellurides, such as hedleyite ($Bi_7Te_3$), tetradymite ($Bi_2Te_2S$), altaite (PbTe) and hessite ($Ag_2Te$), as well as bismuthinite ($Bi_2S_3$) cobaltite (CoAsS) native bismuth (Bi) pyrite $FeS_2$ sphalerite ZnS and maldonite $Au_2Bi$. Gold occurs as microscopic blebs at sulphide grain boundaries and is strongly associated with the Bi-tellurides resulting in a significant Bi-Te-As geochemical signature in rocks and soils (Ray, 1998). The sulphide content is generally high with high ratios of pyrrhotite to pyrite.

Garnet-rich skarns have higher garnet-pyroxene ratios, and prograde calc-silicates including low-Mn grandite garnet, K-feldspar, wollastonite, diopsidic clinopyroxene, epidote, vesuvianite, sphene and apatite. Mineralization is similar to the pyroxene skarns with native gold, chalcopyrite, pyrite, arsenopyrite, sphalerite, magnetite, hematite, pyrrhotite, galena and the geochemically distinctive tellurides and bismuthinite. However, they lower sulphide content with less pyrrhotite than the pyroxenes skarns.

The exploration geochemical signature of gold-rich skarns includes anomalous Au, As, Bi, Te, Co, Cu, Zn or Ni in soils, stream sediments, and mineralized rocks and relatively high ratios of gold to copper, silver and zinc. Related intrusions may be anomalously enriched in the compatible elements Cr, Sc and V, and depleted in lithophile incompatible elements (Rb, Zr, Ce, Nb and La), compared to intrusions associated with most other skarn types.

The target size for gold skarn deposits ranges from 0.4 to 13 Mt and from 2 to 15 g/t Au. The Nickel Plate mine in the Quesnel Terrane near Penticton produced over 71 tonnes of Au from 13.4 Mt of ore (grading 5.3 g/t Au).

### 8.1.3 Iron Skarns

Many examples of magnetite skarns are present in the Wrangellian Terrane of Vancouver Island associated with relatively mafic Jurassic intrusions of the Island Plutonic Suite into Upper Triassic Quatsino Formation limestone (see Fig. 23 above). The Merry Widow, Old Sport, and Iron Crown magnetite skarns collectively produced over 3 million tonnes of iron in the 1950s and 60s (Ray, 1995). In addition the Old Sport mine produced 41,000 tonnes of copper, 4,000 kg of gold and 12,000 kg of silver.

Iron skarns typically are zoned outwards from gabbroic to dioritic intrusions into limestone and calcareous volcanic tuffs in the order of massive magnetite, andraditic garnet skarn and finally pyroxene skarn. Small blebs of copper and iron sulphides are present in the skarn. Fluids exsolving from the crystallizing pluton progressively react with the calcareous rocks first developing pale green pyroxene skarn, which is replaced by garnet and in turn garnet is replaced by magnetite. Metallic mineral assemblages in the skarn typically include magnetite, with lesser chalcopyrite, pyrite, pyrrhotite, cobaltite, arsenopyrite, sphalerite, galena, molybdenite, bornite, hematite, and martite.

## 8.2 Calc-alkalic copper-molybdenum porphyry deposits

The Island Copper porphyry copper-molybdenum deposit is located just a few kilometers south of the Property on the shores of Holberg Inlet.

Generally, porphyry Cu-Mo deposits form as veinlets, stockworks and disseminations of quartz and sulphides within broadly mineralized potassic and phyllic alteration zones surrounded by barren zones of propylitic alteration. The principal minerals of economic interest minerals include chalcopyrite, molybdenite, lesser bornite and trace gold or electrum. Pyrite is an important constituent, particularly in the phyllic and propylitic alteration zones. The deposits are formed by fluids released during the crystallization of hydrous calc-alkaline magmas typically around small plutons or stocks that have differentiated from larger plutonic bodies. They can be associated with igneous intrusions that vary from coarse-grained phaneritic to porphyritic, forming batholiths and dyke swarms, and with compositions that range from quartz diorite to granodiorite and quartz monzonite. Multiple intrusive episodes are commonly involved, some with explosive release of fluids resulting in phreato-magmatic breccias intruding surrounding rocks.

Alteration facies are typically concentrically zoned around a central stock as described in classical models of porphyry deposits such as Gustafson and Hunt (1975) and Lowell and Guilbert (1970). Potassic alteration, usually in or proximal to the central stock, is characterized by the presence of shreddy-textured secondary biotite, the alteration of feldspars by orthoclase overgrowths and replacement, and by hornfelsing of country rocks. Outwards and upwards from the potassic zone, phyllic alteration is characterized by quartz and sericite replacement of feldspars, and pyrite replacement of mafic minerals such as hornblende and pyroxene. On the periphery of the zoning, broad outer halos of propylitic alteration are recognized by assemblages of chlorite, epidote and calcite replacing feldspars and mafic minerals. Such concentric zoning may extend over kilometers.

Mineralization consists mainly of chalcopyrite; molybdenite, lesser bornite and rare (primary) chalcocite. At extremes of high sulphidation, acidic hydrothermal alteration, advanced argillic alteration may occur in the upper part of deposits and characterized by assemblages of sulphosalts, bornite, pyrite and enargite forming large veins systems and replacement deposits. Veins of galena and sphalerite with silver may form in a distant halo around large porphyry systems.

Porphyry copper deposits are classified as low grade high tonnage deposits usually amenable to open pit mining. In British Columbia mined deposits range in size from 50 Mt to a billion tonnes at grades from 0.2 to 0.5% copper, nil to 0.04% Mo, and sporadically 0.1 to 1.5 g/t Au and 1 to 3 g/t Ag (Panteleyev, 1995).

# 9. Exploration

## 9.1 Introduction

In November of 2021 the author examined the North Island Copper Property assisted by Craig Lynes, Roger Kennedy and Marcel Bedard. The author's objective was to evaluate the known showings, and confirm or update the existing geological mapping to determine the merit of the Property. Craig Lynes and Roger Kennedy provided assistance to the author as needed to locate showings and aid with field logistics, as well as prospect adjacent areas. A soil geochemical study was contemplated in light of past exploration experience in the area that showed it to be an effective tool. However, current post-logging ground conditions throughout much of the area indicated that it would be inefficient and labour intensive to obtain samples through the deep organic debris accumulations observed, and potentially ambiguous where soil had been disturbed by logging and past exploration trenching as well as from a lack of information on depth and type of glacial overburden. Finally, to augment the geological field work, the author recommended a precision airborne magnetometer survey by Pioneer Exploration Consultants using a UAV suspended magnetometer over parts of the Property, which was completed in March 2022.

## 9.2 Geological Mapping

The current conditions of secondary regrowth and even recent logging of second growth throughout the Property were not conducive to efficient or precise geological mapping. Many old roads (Fig. 28) that served as exploration trails in the early days were not accessible by vehicles and some could no longer be recognized. However, the Property has been previously mapped at times when exploration roads that appear on old maps were accessible, and when mapping could be conducted in old growth forest around current logging and saliently in freshly cleared areas around showings and trenches. The earliest work took place under the auspices of Utah Mining in relation to development of the Island Copper Mine and mapping was apparently not filed for assessment. Many of the original showings were remapped by John McAndrew (1980; 1988; 1989) and the maps included in assessment reports. The existing map of McAndrew (1989) was georeferenced and consulted in the field both to find showings and geological contacts and to check the georeferencing of the map itself against GPS points at specific geological features. The latter was done by the author using a combination of viewing the map on a GPS enabled tablet in the field as well as plotting points taken with a separate Garmin 62s GPS unit for comparison in ArcGIS 9.3. Generally, there was good correspondence, which allowed the original map to be digitized with only slight adjustments to compensate for presumed base map distortion, and to reproduce some finer details that were presumably exposed when the original

**Figure 28: Rainbow Zone Access Road.** An old exploration trail through the north side of the Rainbow Zone connects to deactivated Doreen Lake road. The roadbed exposes white weathering diorite that is probably in place, but does not outcrop. The diorite is likely a dyke, possibly from the Quatse Lake Pluton and causative of skarn mineralization.

**Figure 29: Blocks of Mineralized Skarn from a Pit in the Rainbow Zone**
The blocks appear to have been excavated from a debris filled hole nearby in the central parts of the Rainbow Zone. The pit may have been blasted in the early 1960s and the area restripped within the last 30 years judging by the second growth. Samples of this skarn contained lenses of massive chalcopyrite in massive magnetite and garnetite. Photo by the author, November 2021.

mapping was done, but now covered by vegetation and logging debris.

Many of the old showings, which are recorded as Minfile occurrences were difficult to recognize in the field even in reference to McAndrew's map. These included some at the Rainbow showing where in many cases evidence of showings consisted of large blocks of mineralized rock, such as in Figure 29, inferred to have been displaced from the original pit either by large machinery or by blasting. The original pits were commonly sloughed-in and overgrown burying the skarn - host rocks contacts and in some cases took quite a bit of hunting around through dense undergrowth to recognize. However, in some situations, especially in higher relief area, contacts and mineralization were found in place, such as at the Cranberry showing where a large trenched area had left some vertical faces in mineralization although the original stripped areas were fully covered in dense alder.

In the southern area, east of the Coal Harbour road, the principal rock types recognized in the field are Karmutsen basalt and limestone. The basalts are not generally well enough exposed even in steep outcrops to consistently discern flow structures. A few quarries used for road building show generally shallow southerly dips of moderately thick flows. Pillows were not observed. Limestone was mainly exposed in quarries, recent roadcuts, and some old stripped areas that had not completely revegetated. Some original outcrops showed the effects of mild karsting such as dissolution grooves and cavities, and in places forming noticeable surface depressions.

The northwest sector of the claims is within the Quatse Lake Pluton, a Jurassic age granodiorite of the Island Intrusive Suite. Most of the area within the claims was in an intermediate stage of second growth. Forested areas were passable, but devoid of obvious outcrops. Most outcrop of the Quatse Lake granodiorite occurs presently along stream beds and in some road cuts, but streams were difficult to traverse because of logging debris and dense salal and alder thickets along streambanks. The best exposure of the pluton and was in a series of quarries on the west side of the claim block. Known showings however, are within the claims area and outcrops examined and mapped consist mainly of one creek canyon which traversed for a few hundred meters downstream of an active logging road.

**Figure 30: Rainbow Zone Showing**
A partially excavated magnetite-garnetite skarn mineralized with chalcopyrite and black sphalerite. The whale-back form of the outcrop is likely a roche moutonee, a glacial erosion landform. Plastic sample bags for scale (12 by 20 inch).

## 9.3 Mineralized Rock Sampling

During the 2 week program 46 rocks were collected from mineralized outcrops by the author and assistants in the immediate vicinity of the Property. Most of the evaluation was around the main series of showings known as the Rainbow Showing with several traverses from 3 different access routes over 4 days. Smaller showings including the Cranberry, South, and Skid involved single traverses by the author and at least one or two of the prospectors, Roger Kennedy, and Craig Lynes.

All of the rock samples were categorized as grab samples. Most were taken from in-place outcrops or the edges of old exploration pits and trenches (Figure 30), but several were from blocks of rock that had been excavated from nearby, sloughed-in exploration pits (Fig. 29). The mineralized rocks were analyzed by ALS method ME-MS61 which involves a strong 4 acid digestion using HF-HNO3-HClO4, with an HCl leach of the dried-down residue, and Induction Coupled Plasma - Mass Spectrometry and Emission Spectrometry as appropriate for 48 analytes. Analytical ranges for common analytes include copper 0.2 to 10,000 ppm, silver 0.01 to 100 ppm, sulphur 0.01 to 10%, iron 0.01 to 50%, and zinc 2 to 10,000 ppm.

Maps showing the geology, field and sample stations are shown below for each area mapped. The map areas are shown as reference blocks on and index map in Figure 31 and named Rainbow, Cranberry, South, Skid, and Crook Road (no assays were obtained from Crook Road). Assays for selected elements of samples are tabulated for each area including capsule descriptions and GPS coordinates. Prior to samples shipment to the ALS Geochemistry Laboratory in North Vancouver, the author described all of the samples and conducted spot analyses with a Niton XL3t handheld XRF analyzer as backup and to verify identity of analytical results. The results of the XRF analysis were used by the author to verify the analytical results and characterize sample heterogeneity and mineralogy.

The showings examined were all classified as chalcopyrite-magnetite garnetite exoskarns. Most of the mineralization occurs within limestones that have been marbleized and locally metasomatized to garnetite, or to lesser degrees of pyroxenite and calc-silicate rocks. Lower grade occurrences of chalcopyrite in metasomatized basalt appear to be proximal to marble

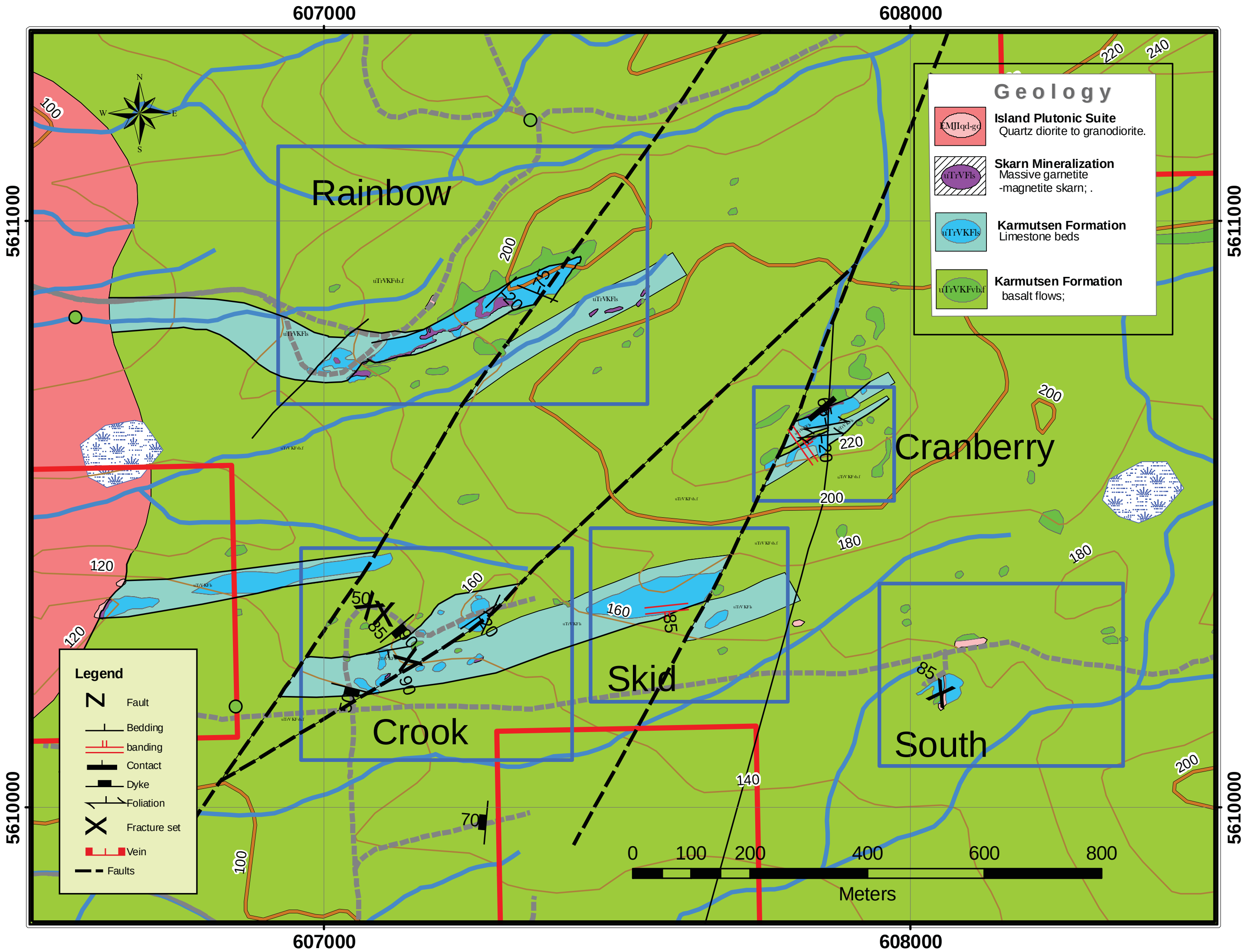



**Figure 31: Location Map of Reference Blocks and Field Stations in the Southeastern Sector**
Maps shows reference areas for detailed sample and station maps of the Rainbow, Cranberry, Skid, South and Crook Road areas. Stations are shown for areas not shown in detailed maps. Segments of south claim boundary appear on the lower left, and north boundary top right.

hosted skarns. All appear to occur at the contact of the marble with basalt or near the contact of the marble with some intrusive phase that was inferred to occur as a dyke from a local pluton. Mineralization textures varied from coarse garnetite with disseminated chalcopyrite to more massive zones of magnetite and chalcopyrite with minor sphalerite. Laminated textures were observed at some of the Rainbow Showing occurrences consisting of finely intergrown magnetite and yellow garnet. Zoning of laminated textures proximal to mineralized skarn, consisted of layers of fine garnet crystals 1 to 5 mm apart within marble near more massively replaced laminated garnet and magnetite. No sulphides other than chalcopyrite and sphalerite were recognized in the field in the skarns and the assays confirm mainly copper, silver and sporadic high zinc-bearing mineralogy. Associated calc-silcate minerals observed in outcrop were mainly amphiboles including coarse actinolite and unclassified hornblende forming radiating clusters of large crystals. Some of the mineralization was nearly massive magnetite with wavy lenses of chalcopyrite up to several centimetres in width, which undoubtedly biased some samples towards high copper assays.

## 9.4 Geochemistry of the Mineralized samples

Statistical analysis of the assays from the 38 skarn mineralized rocks characterizes the mineralization and shows variations that may be indicative of mineralogical spatial zoning of the skarn deposits relative to the Quatse Lake Pluton. The Rainbow showings are within 800 meters of the western edge of the Quatse pluton and the Skid, Cranberry, and South showings at increasing distance to about 1.5 kilometers. The boxplots summarize some basic statistics of nine selected elements from the assays in Figure 32. The Rainbow assays show higher Ag, S, Pb, and W and lower Ni than the others, which may be an indication of its proximity to the Quatse Lake Pluton. Nickel is distinctly higher in the farthest showings, South and Cranberry, than in Skid and Rainbow, while antimony (Sb), and tungsten (W) are the reverse, higher in the closer showings.

Correlations of the elements in the samples is useful for classifying the skarns. Copper is strongly correlated with silver, although this is a common correlation in many deposit types resulting from the ready substitution of silver for copper in crystal lattices of many sulphide and sulphosalt minerals. Figure 34 plots all the assayed samples from the skarns and the Quatse pluton and shows a linear relationship between copper and silver with most of the high Cu-Ag samples from Rainbow. It can also be deduced from the logarithmic graph in Figure 34, that the Rainbow showing has a higher Ag-Cu ratio of about 1:1000 than those from Cranberry which are less than 1:5000. Samples of veins and stockworks from the Quatse pluton plot on the line with the Rainbow samples supporting a connection between porphyry copper fluids in the Quatse and proximal skarns at Rainbow, with Ag declining away from the pluton contact more rapidly than Cu.

Copper is more weakly correlated with Bi, W, and Te, which are present in moderate concentrations especially in the Rainbow samples, and are typical indicators of magmatic fluid sources. Tellurium (Te) ranges from nil to 13.9 ppm (mean 2.3 ppm), Bi from 0.05 to 44.6 ppm (mean 5.0 ppm), and W from 0.1 to 195.5 ppm (mean of 19 ppm), in the 38 skarn samples. Correlations coefficients for Te are 0.33 with Cu and 0.41 with Ag. In gold-skarns Bi, and Te form Bi-tellurides associated with gold mineralization (Ray, 1998), but gold has historically been reported as low in the north island skarns and was not analyzed. Lead is also strongly correlated with silver (0.65) and copper (0.54) (Fig. 32) and shows potential spatial zoning with higher concentrations in the Rainbow showing (Fig. 33). Tungsten shows a similar spatial distribution of concentrations with the highest in Rainbow followed by Skid and then South, and Cranberry. A binary logarithmic plot of Pb vs. W in Figure 35 illustrates the higher concentrations of these two elements in the Rainbow showing despite a relatively poor correlation between them.

In general it can be hypothesized that the spatial geochemical variations of the skarns were influenced by proximity to the Quatse Lake pluton possibly by differential fluid migration along bedding planes in limestone intervals in the Karmutsen Formation. A thermal gradient around the pluton may also have influenced mineral stability with distance from the pluton. Sills and dykes are evident at many of the showings and assumed to be related to skarn formation. These would be structurally limited by the radial stress field of the pluton, limiting the distance of skarn formation from the pluton, but it is not clear how this would influence geochemistry. The apparent geochemical variations may be somewhat biased by the large number of samples from the Rainbow showing compared to Skid and Cranberry.

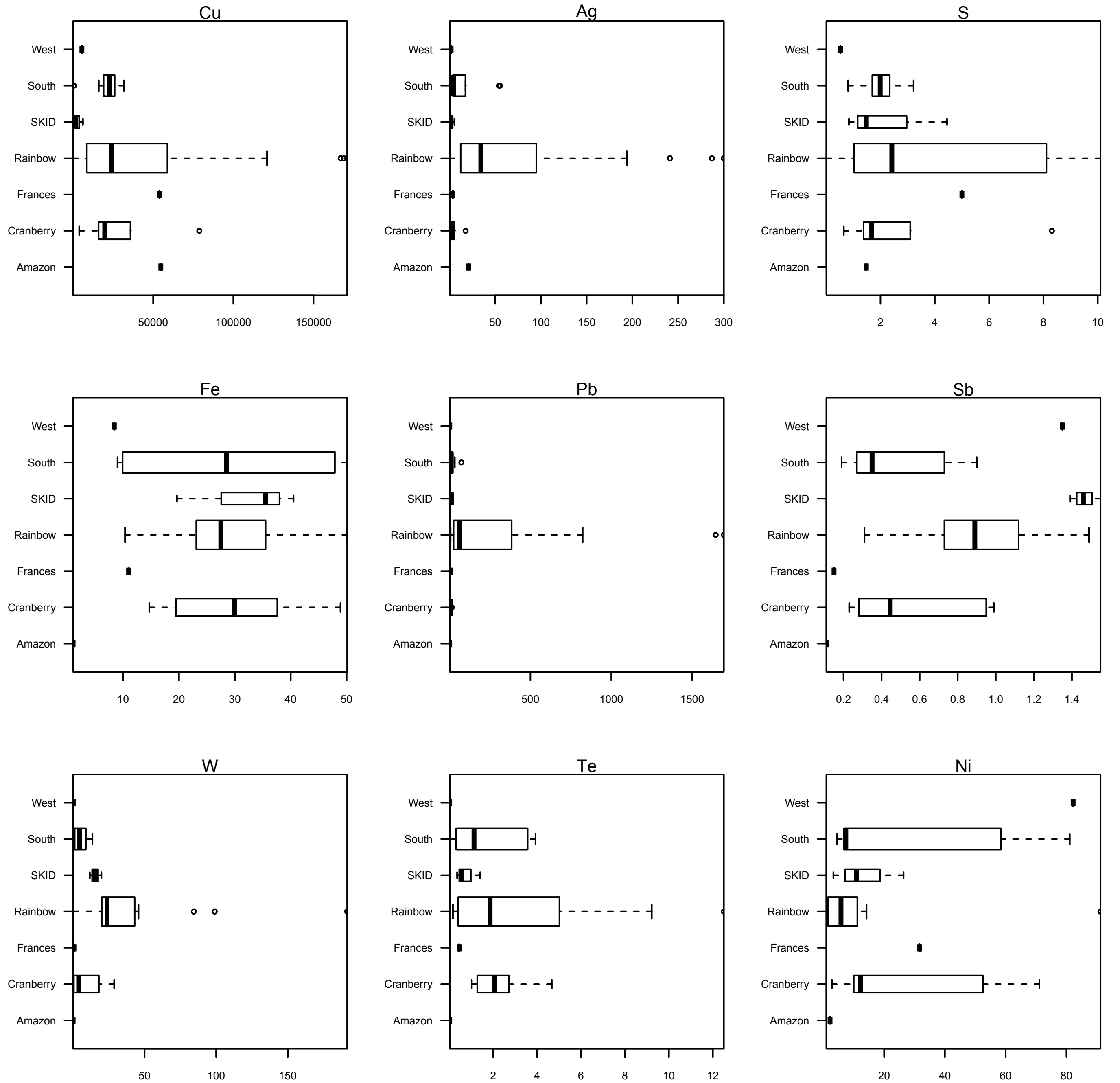



**Figure 32: Boxplots of Nine Selected Elements in the Skarn Assays**
The 38 assays are classified in this chart into 7 groups arbitrarily representing the main mineralized skarn showings: Most of the samples are from the Rainbow (17), South (9), Cranberry (6), and Skid (3) showing with only single samples representing West, Amazon, and Frances. Each of the nine small charts represents an element with the groups arrayed vertically and the assay concentration scaled across the bottom axis.

Statistics for each element in a group are graphically represented by the small rectangles (boxes) ranging across the two middle quartiles of concentrations with a dark line inside the box representing the median value. The vertical width of the box is proportional to the groups number of samples in each group. The T-shaped whiskers connected by a dashed line to the box represent 1.5 times the interquartile range above and below the box. Statistical outliers are the small circles to the right or left of the whiskers.

Chart produced by the author in GCDkit 4.1 June, 2022.

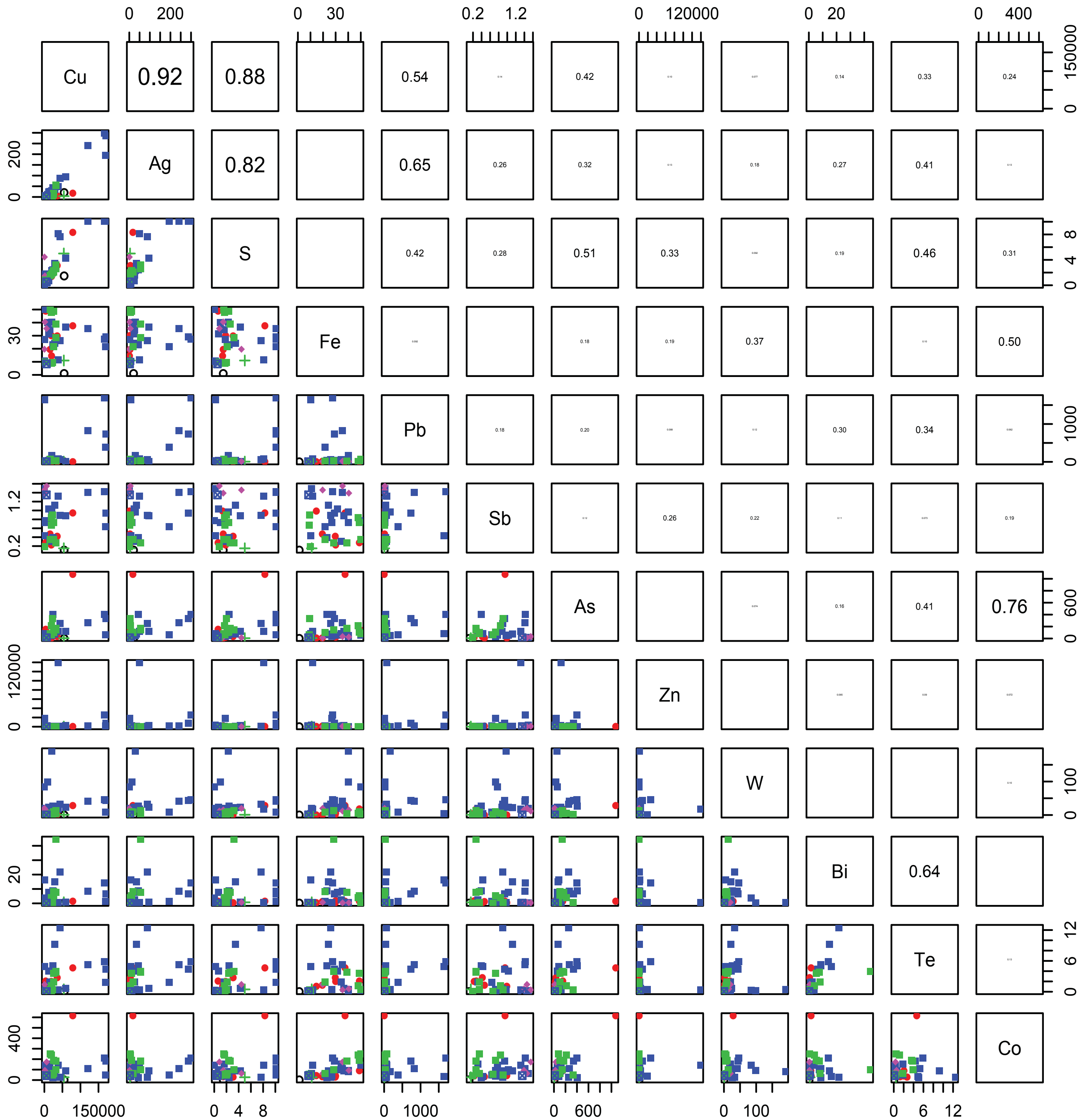



**Figure 33: Correlations of Selected Elements in the Skarn Samples**

Correlation coefficients were calculated by the author for the skarn samples to evaluate potential mineral assemblages in the rocks. The chart shows binary graphs of elements paired by column and row on the lower left of the chart, and on the opposite side of the diagonal, a correlation coefficient ranging from nil to 1 with the size of the font enlarged in proportion to the degree of correlation. Scales for the axes for each graph are labeled in ppm (except % for S) to the right or left and top or bottom of the chart.

A high degree of correlation is shown between Cu-Ag (0.92) and Cu-S (0.88), and moderate correlations of Bi and Te with Ag, S, and Pb. Drawn by the author in GCDkit 4.1 June, 2022 from a data set of 38 samples.

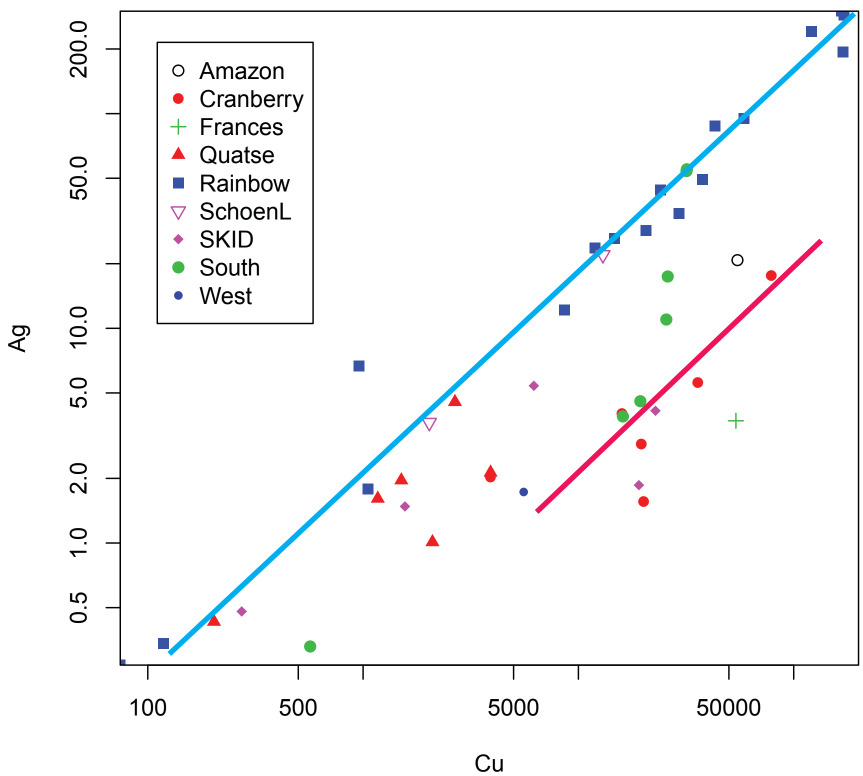



**Figure 34: Copper vs Silver: Logarithmic Binary Variations in NIC Mineralization**
Samples are symbolized by showings identified in the legend. The blue line shows a linear relation of copper and silver on the logarithmic plot (exponent of zero; slope = 1 Cu/Ag =1000) for samples from Rainbow. Samples from Cranberry permissively plot along a lower ratio line Cu/Ag = 5000. Three samples from Quatse are aligned with the Rainbow samples.
Graph drawn by the author in GCDkit4.1, June 2022.

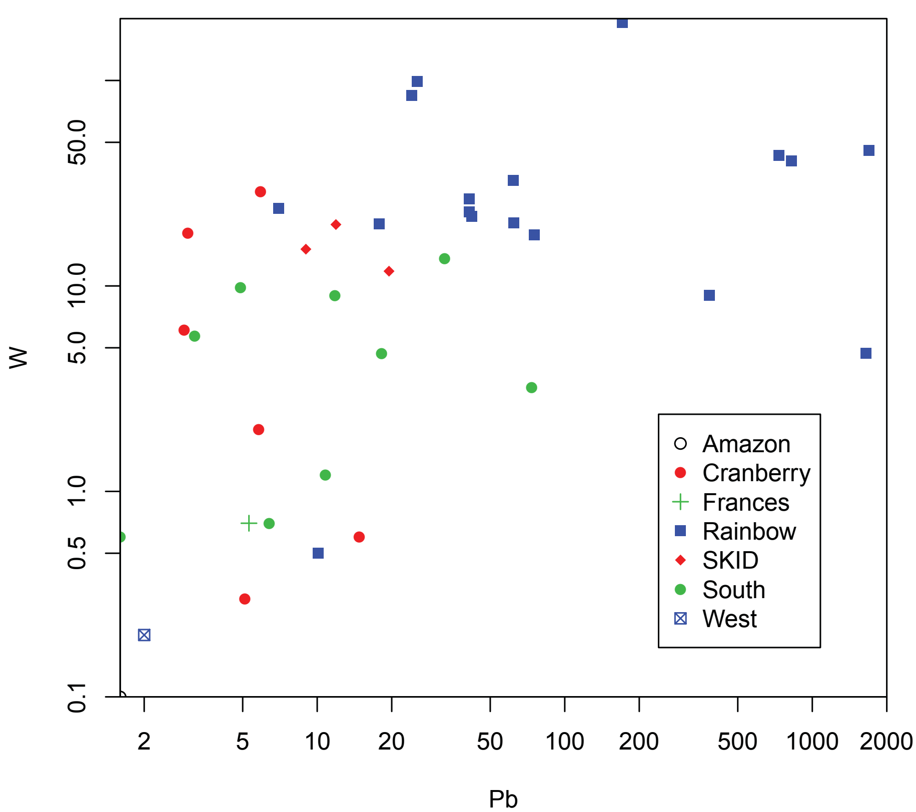



**Figure 35: Lead vs Tungsten Logarithmic Binary Variations in Skarn Samples**
Pb and W in samples from Rainbow generally plot in a cluster of higher combined W-Ag concentrations than other samples from showings at greater distance from the Quatse pluton contact. The Skid showing is the next closest and Cranberry, South and Frances farther away.

Drawn by the author in GCDkit 4.1, June 2022.

### 9.3.1 Rainbow Showing

The Rainbow zone or series of showings following the nomenclature of McAndrew (1989) is located centrally in the claims and is traversed by a now inaccessible system of deactivated logging and possibly exploration roads (Fig. 36). The area was accessed by hiking from the Crook road area through north through the bush, from the west by hiking from a new logging road to a deactivated section of the Doreen Lake Road near km 32, or along the Doreen Lake road (aka R440) past a footbridge crossing of a creek formerly crossed by a road bridge. One moderately open old road passes along the northern edge of the showings, while old exploration trails within the explored showing on the map of McAndrew (e.g. 1980) are thoroughly ingrown with alder and cedar.

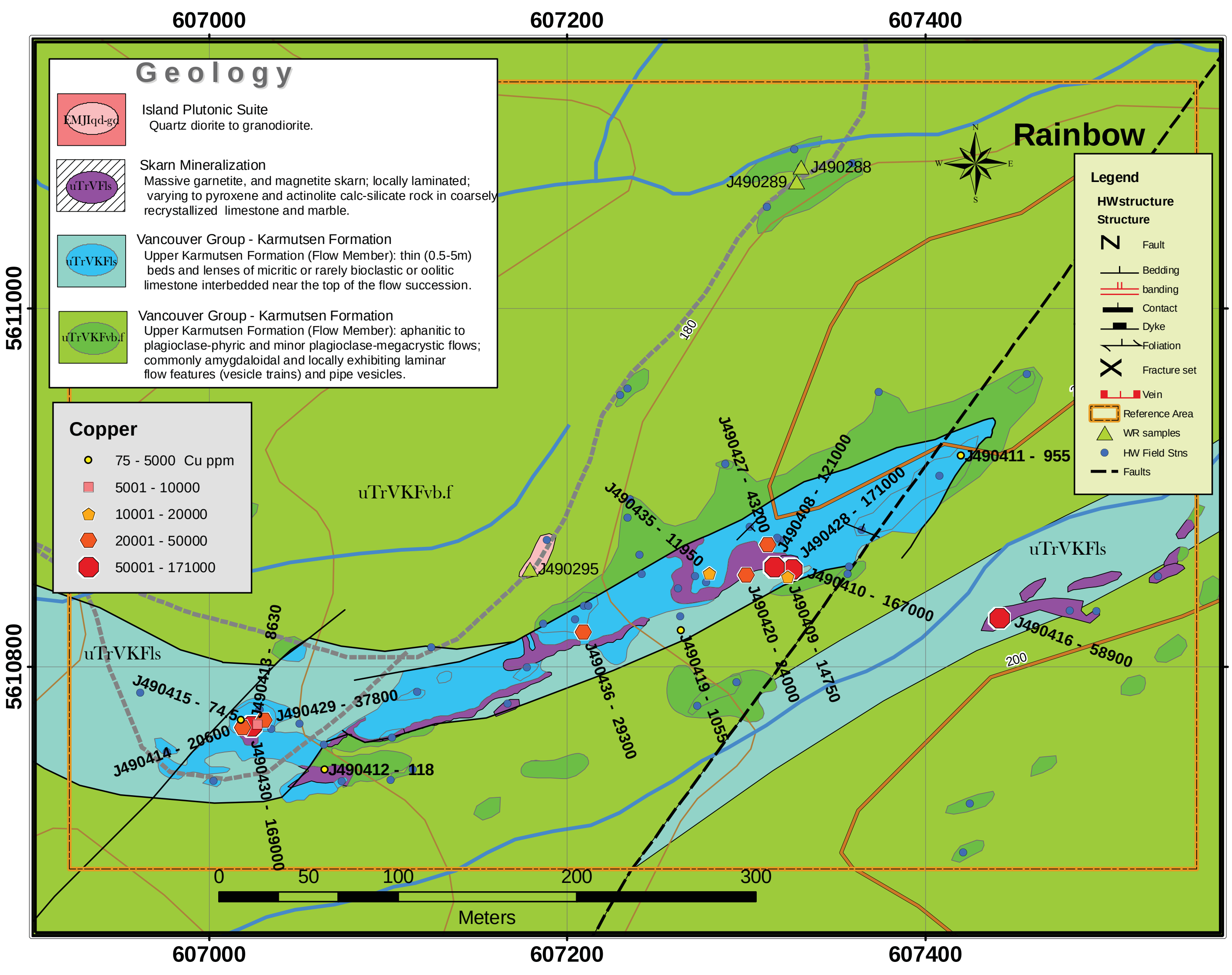



**Figure 36: Geological Map of the Rainbow Showing area**
The map legend shows for each unit different colour shades for regional interpretation and mapped outcrops either from this work or historical maps. Placement of the map can be referenced by the orange box shown at Property scale in Figure 31. Skarn bands are shown in mapped extent from McAndrew (1980). Labels show sample numbers, keyed to Table 3, and copper in ppm.
Drawn by the author in ArcGIS 9.3, June 2022.

Mineralized skarn showings at Rainbow occur in a limestone band over a distance of about 500 meters and a width of 50 to 75 meters. McAndrew mapped several lenses of mineralized skarn interpreted as narrow lenses at the contact with basalt or crosscutting the limestone/ marble lens in bulbous lobes.

| Tag | Capsule Description | Cu | Ag | S % | Fe % | Zn | Pb | As |
|---|---|---|---|---|---|---|---|---|
| J490428 | black amph skarn; lens cpy | 171000 | 287 | >10.1 | 29.0 | 7200 | 734 | 337.0 |
| J490430 | garnet calcite cpy skarn | 169000 | 194 | >10.1 | 21.7 | 1490 | 384 | 62.0 |
| J490410 | coarse cpy w garnet and sphal. | 167000 | 300 | >10.1 | 27.5 | 25900 | 1695 | 402.0 |
| J490408 | msv cpy lens in garnetite | 121000 | 241 | >10.1 | 35.5 | 1520 | 823 | 268.0 |
| J490416 | magn-cpy garnet | 58900 | 95 | 4.3 | 36.6 | 2870 | 7 | 119.5 |
| J490427 | actinolite garnet skarn diss cpy | 43200 | 88 | 7.7 | 26.2 | 678 | 62 | 252.0 |
| J490429 | coarse cpy in marble | 37800 | 49 | 8.1 | 11.7 | 139500 | 75 | 122.0 |
| J490436 | garnetite w coarse cpy and magn lenses | 29300 | 34 | 3.5 | 24.3 | 976 | 42 | 74.3 |
| J490420 | garnetite coarse cpy in bands | 24000 | 44 | 2.4 | 23.1 | 163 | 41 | 403.0 |
| J490414 | magn w lenses of garnet | 20600 | 29 | 2.3 | 40.2 | 381 | 171 | 52.7 |
| J490409 | amphibole skarn, minor magn | 14750 | 26 | 1.6 | 34.5 | 552 | 62 | 81.3 |
| J490435 | garnet magn skarn | 11950 | 24 | 0.7 | 31.5 | 509 | 41 | 59.1 |
| J490413 | garnet layers in marble | 8630 | 12 | 1.0 | 40.1 | 279 | 25 | 33.5 |
| J490419 | hornblendite minor cpy veins | 1055 | 2 | 1.8 | 27.0 | 18250 | 10 | 35.7 |
| J490411 | calc-silicate w trace sulphides | 955 | 7 | 0.2 | 10.4 | 1140 | 1645 | 81.3 |
| J490412 | garnet - magn skarn | 118 | 0.3 | 0.0 | 50.1 | 135 | 24 | 56.9 |
| J490415 | tremolite garnet in marble | 74.5 | 0.3 | 0.1 | 10.8 | 3300 | 18 | 21.3 |

**Table 3:** Rainbow Showing Assays
Sample locations are tabulated Table 10 and plotted on map figure 28. All assays in ppm unless indicated as percent (%)

Seventeen samples were collected from three main showings at the Rainbow Showing zone as shown on map in Figure 36 and in Table 3. Copper ranges from 75 ppm to 17.1 percent with a mean value of 5.2 %. Four samples have over 10% copper, but the high grades may be attributed to near massive lenses of chalcopyrite mainly in garnetite, but associated with massive magnetite. Eight of the samples range from 1 to 6% Cu and are generally described as garnetites with disseminated and laminated chalcopyrite. Silver in these 12 samples is roughly proportionate to copper content ranging from 12 to 300 ppm. Zinc is sporadically high with 3 samples showing 2 to 14% Zn, but the rest below 7200 ppm and averaging 1500 ppm Zn. Other elements are more sporadic in distribution and not clearly correlated with copper or other the mineralogy of the rock. Iron ranges from 10 to 50% (the analytical range limit) with a mean of 38%, and represents both magnetite and garnet, with samples over 30% Fe having modal magnetite and those with less being mainly andraditic garnet. Calcium assays vary according to calcite content, but also to andraditic garnet.

The size of the skarn lenses can only be estimated with reference to previous descriptions made when the showings and trenches were stripped bare. Presently the many small pits are filled in with debris and vegetation and mineralized rock was found as small stockpiles adjacent to the pits. Where appropriate, samples were collected either from outcrop or adjacent stockpiles.

### 9.3.2 Cranberry Showing.

The Cranberry showing was originally accessed in the early 1960s by exploration trails coming in from what is now the Doreen Lake road and some large areas were stripped and pits or trenches dug. The exploration trails are no longer evident and the stripped areas at the showings covered in an impenetrable mat of alder and young cedars. Presently it is on a broad high ridge and was accessed from a partially open old E-W road originally called Branch Road No. 7 by walking north for about 450 meters through generally open second growth Western Hemlock and Amabalis Fir. Pits in the center of the area remain open, however, and some vertical faces were sampled. Flat lying surfaces were heavily overgrown. Other smaller showings in the area also appear to have been blasted and are now mainly evident by large blocks of mineralized skarn loosely piled nearby.

Six samples were collected from the Cranberry Showing area from two main showings. The principal showing is reported to be a WSW- ENE striking lens some 75 m long and a few meters wide at the contact between limestones to the south and basalt to the north shown in Figure 37 and mapped in Figure 38. Assays of selected elements are shown in Table 4. Two more samples are from a different lens lying to the south at a possibly fault offset marble-basalt contact. This second lens is mapped by McAndrew at 30 meters long and a meter wide. The lenses and basalt-limestone/marble contacts dip moderately to the SSE as shown in a geology map digitized from one produced by McAndrew (1989).

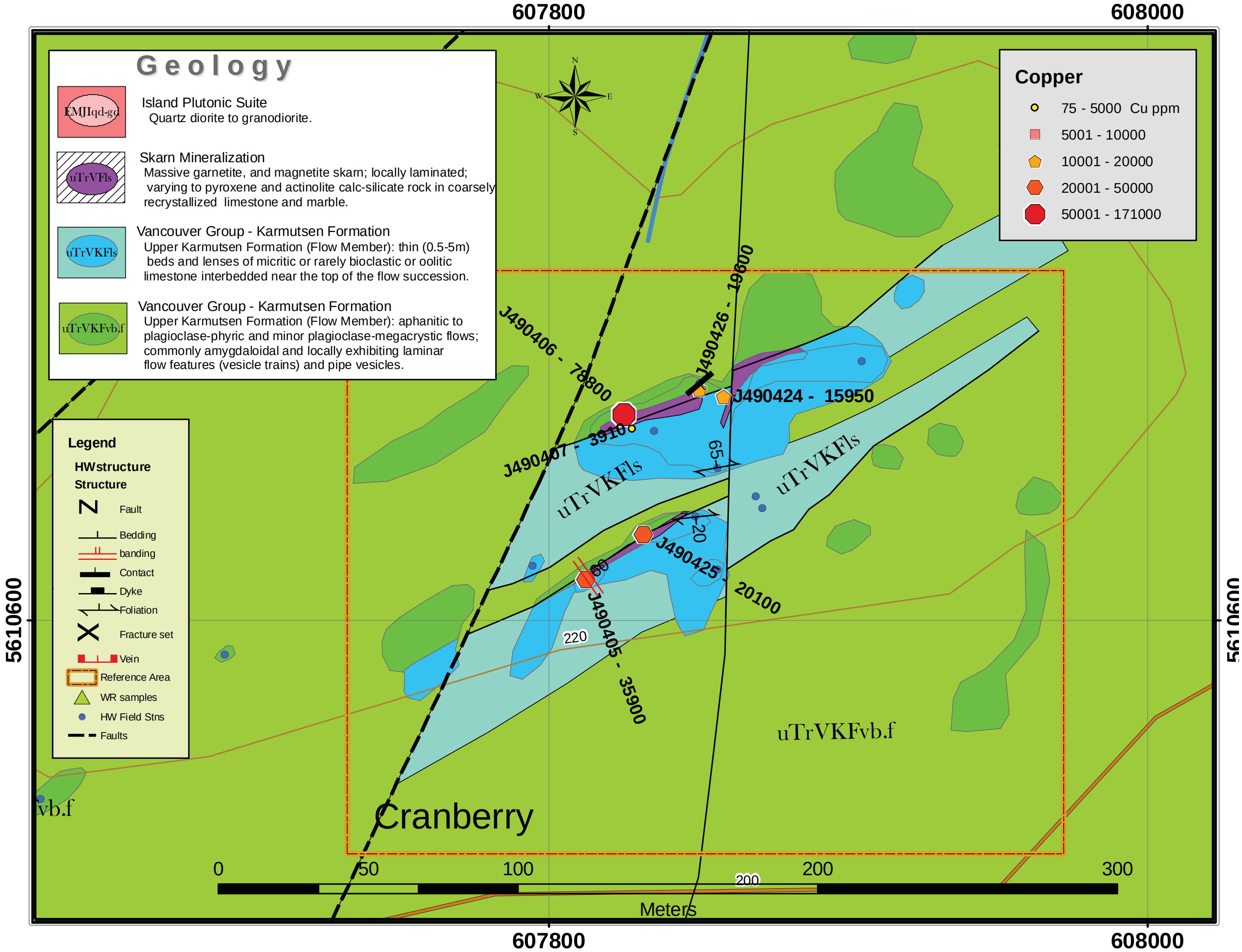
| Tag | Capsule Description | Cu | Ag | S % | Fe % | As | Ca |
|---|---|---|---|---|---|---|---|
| J490406 | magn-cpy banded garnetite | 78800 | 17.6 | 8.31 | 37.6 | 1075.0 | 8.0 |
| J490405 | msv garnetite; diss cpy and mag. | 35900 | 5.59 | 3.1 | 29.8 | 34.7 | 15.6 |
| J490425 | basalt; amygdules w cpy-mag | 20100 | 1.56 | 1.38 | 14.7 | 10.2 | 12.0 |
| J490426 | actinolite diss magn, cpy | 19600 | 2.9 | 1.88 | 30.1 | 24.1 | 14.7 |
| J490424 | basalt skarn; diss cpy | 15950 | 4.02 | 1.48 | 19.45 | 12.4 | 11.0 |
| J490407 | msv magn interstitial cpy | 3910 | 2.03 | 0.65 | 48.9 | 154.0 | 5.6 |

**Table 4:** Cranberry Showing Assays
Assay in ppm except S and Fe in percent (%)

The highest grade sample is described as finely intergrown magnetite, chalcopyrite and yellow garnet laminated in places with a fine granular texture. Significant element assays in the sample are 7.9% Cu, 17.6 ppm Ag, 37.6% Fe and 1075 ppm As. Other samples are mainly garnetites averaging 3% Cu. Two samples with moderate copper contents of ca. 1.5 % are skarns developed in basalt with chalcopyrite in amygdules or intergrown in a pyroxene-epidote matrix, which may also be a skarn facies in marble.

### 9.3.3 South Showing

The South Showing occurs adjacent to Branch Road 7 about 1000 meters east of a current logging road that leads into the Crook Road area (Fig 39). The main showings are around the periphery of the dome-shaped outcrop that is elevated above swamp and valley-filling overburden. A second minor showing occurs on the north side of Branch Road 7 about 50 meters east of the small access trail leading to South. Eight samples were collected for analysis at the two showings. The samples are all magnetite rich and fairly consistent in copper content varying only from 1.6 to 3.2% Cu. Iron ranges from 9 to over the 50% analytical limit and averages 32% indicative of the magnetite and high iron andraditic garnet. Several of the skarns have coarsely banded structures with layers of calcite, magnetite, garnet, and chalcopyrite.



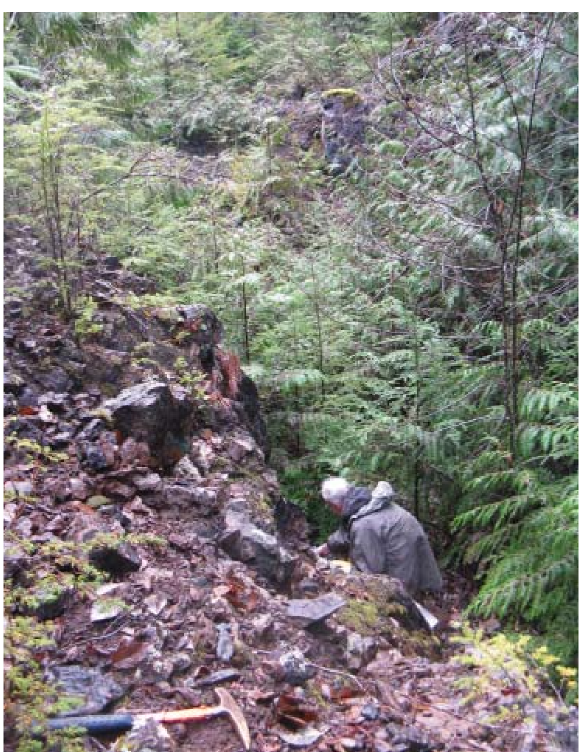



**Figure 38: Geological Map of the Cranberry Showing**
Map is at the same scale as Rainbow Showing map in Figure 26. The map legend shows for each unit different colour shades for regional interpretation and mapped outcrops either from this work or historical maps. Skarn bands are only shown in mapped extent. Labels show sample number and copper concentration in ppm.
Drawn by the author in ArcGIS 9.3, June 2022.

**Figure 37: Cranberry Showing**
View looking west over the fault gap in the middle of the 75 m lens. Roger Kennedy sampling at the base of a rock face that was probably excavated in the early 1960s. Rock hammer for scale in the foreground.

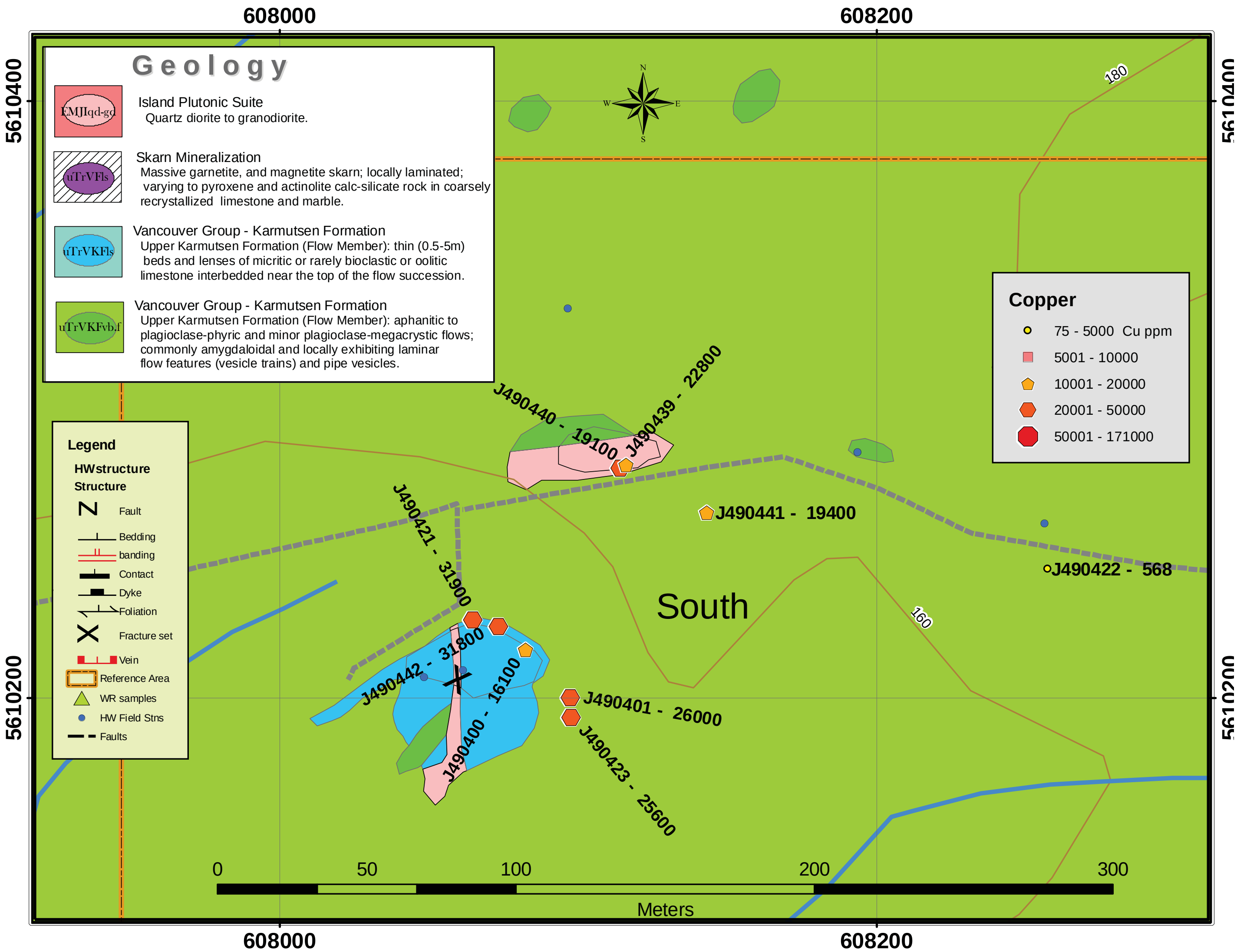



**Figure 39: Geological Map of the South Showing area**

The South Showing is connected to Branch Road 7 by a short spur road. The showing occurs on the flanks of a round knob about 5 meters high shown in the main outcrop area of marble. Continuity of the marble-limestone unit under cover is unknown. Labels show sample number and copper concentration in ppm.

| Tag | Capsule Description | Cu | Ag | S % | Fe % | As | Zn | Mo |
|---|---|---|---|---|---|---|---|---|
| J490421 | garnetite w sporadic magn bands of marble w diss cpy | 31900 | 55.1 | 3.22 | 28.5 | 143.0 | 103 | 15.5 |
| J490442 | magn breccia in garnetite w diss cpy | 31800 | 54.1 | 2.63 | 39 | 171.0 | 106 | 27.5 |
| J490401 | garnetite w veins cpy | 26000 | 17.45 | 2.1 | 21.5 | 103.5 | 32 | 30.1 |
| J490423 | magn interlayered w garnetite; cpy layered | 25600 | 11 | 2.34 | 48.7 | 105.0 | 218 | 36.4 |
| J490441 | msv magn bands in garnetite w cpy | 19400 | 4.58 | 1.7 | 47.9 | 215.0 | 137 | 20.2 |
| J490400 | msv magn lenses of garnet vnlts cpy | 16100 | 3.89 | 1.55 | 50.1 | 79.7 | 139 | 4.8 |
| J490422 | amygdaloidal basalt cpy-py fills | 568 | 0.33 | 0.81 | 9.92 | 14.5 | 937 | 1.1 |
| J490439 | amyg basalt, diss cpy and py | 22800 | 41.3 | 1.99 | 9.38 | 334.0 | 111 | 2.8 |
| J490440 | amyg basalt, chloritic diss cpy | 19100 | 1.86 | 1.73 | 9.01 | 60.0 | 90 | 2.1 |

**Table 5:** South Showing Assays

## 9.3.4 Skid

The Skid showing is located on the steep southern aspect of a high East-West ridge as a series of thin lenses from which 3 samples were collected (Fig. 40). Samples were collected from trenches crossing the skarn layers. The area was traversed twice, once in a general reconnaissance and once on the way into the Cranberry Showing, which is a few hundred meters to the NE. Skarn bands are narrow at this showing and are only shown by location of field stations and samples. None of the assays are significantly high reflecting the general field observations of deeply weathered friable magnetite-rich garnet skarn with minor disseminated chalcopyrite and pyrite. Copper in the 3 samples ranged from 273 to 6200 ppm and is inversely correlated with sulphur in the samples indicating high pyrite contents or copper remobilized and deposited as malachite. Iron ranges from 20 to 40 % indicative mainly of the magnetite lenses observed in the trench outcrops.

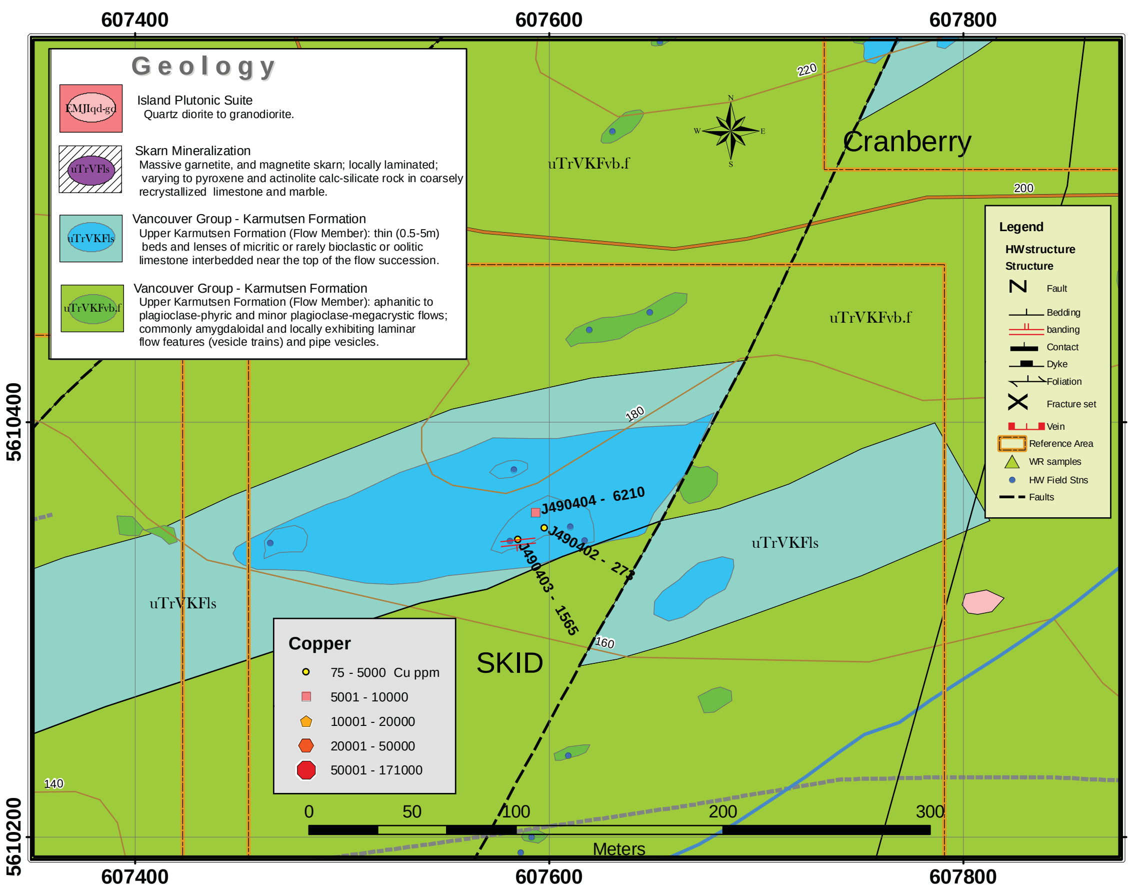



**Figure 40: Geological Map of the Skid Showing area**
The map shows symbolized copper concentrations for 3 samples from several small crosscut trenches in the steep south aspect of a ridge. Sample numbers and copper are labelled.

| **Table 6:** Skid Showing Assays | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Tag** | **Capsule Description** | **Cu** | **Ag** | **S %** | **Fe%** | **As** | **Zn** | **Mo** |
| J490404 | malachite stained bands of magn | 6210 | 5.4 | 0.84 | 35.5 | 33.4 | 923 | 25.9 |
| J490403 | magn lens in skarn w lobes of py | 1565 | 1.48 | 1.48 | 40.5 | 25.6 | 401 | 52.3 |
| J490402 | epid, magn, cpy garnet in marble | 273 | 0.48 | 4.45 | 19.65 | 13.5 | 219 | 3.5 |

### 9.3.5 Crook Road

No samples were analysed from the Crook Road area (Fig. 41). A showing was originally located within the zone, but recent difficult logging slash obscured the showing despite several traverses.

Extensive marble outcrops are located along the Crook part of the road forming southeast dipping lenses within Karmutsen basalt flows.

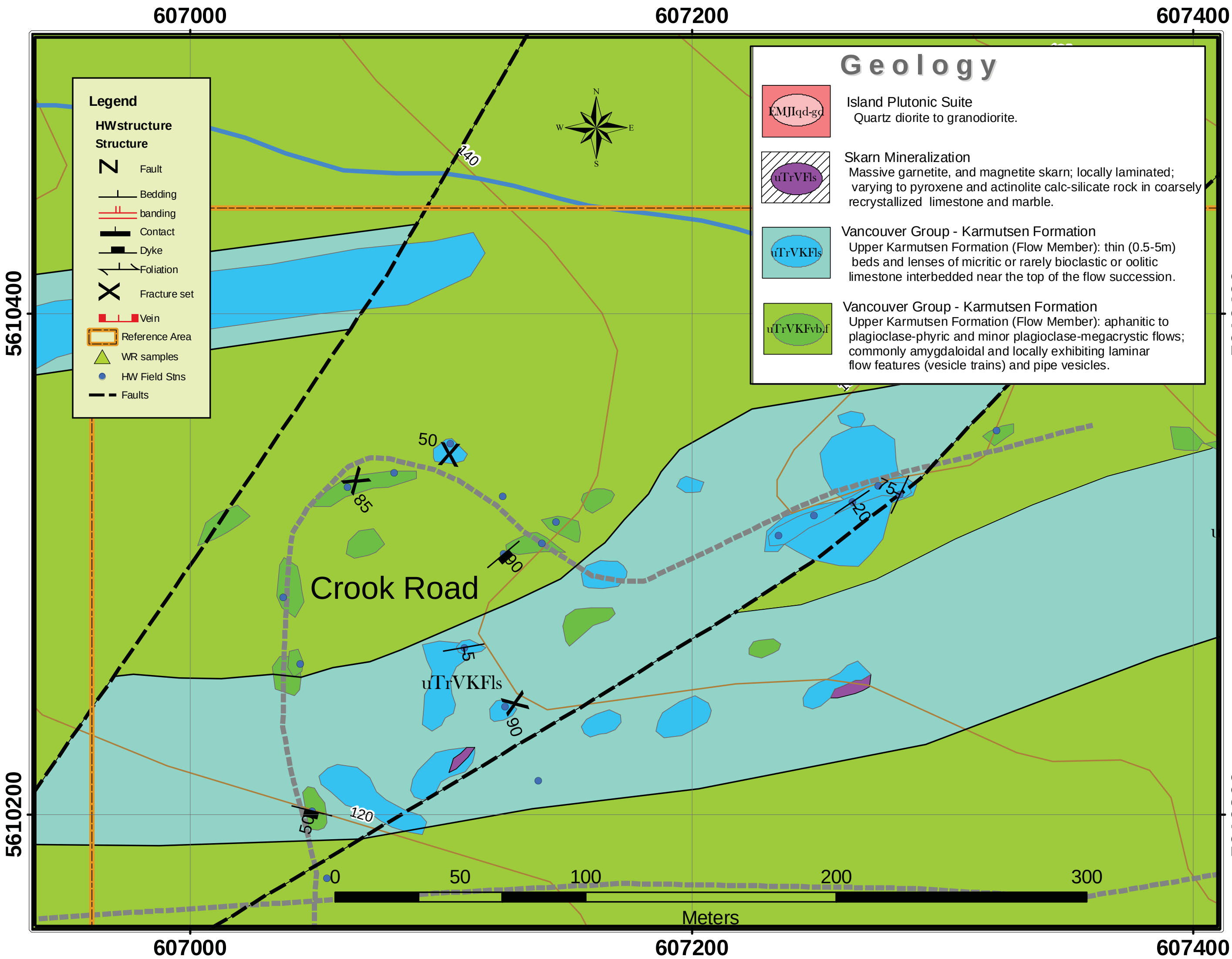



**Figure 41: Geological Map of the Crook Road Area**
This map area was a central staging point from new logging operations for traverses north into the Rainbow Showing and along Branch road 7, which is off the map in the south. Extensive areas of limestone, partly recrystallized to marble, are exposed in new road cuts and outcrops in the logging slash, Old skarn showing are marked here, but were not found in the field.
The map legend shows for each unit different colour shades for regional interpretation and mapped outcrops either from this work or historical maps. Skarn bands are only shown in mapped extent.
Drawn by the author in ArcGIS 9.3, June 2022.

### 9.3.6 Quatse Lake Pluton

The Quatse Lake Pluton underlies most of the NW sector of the North Island Copper claim group where it is in intrusive contact with basalt flows of the Karmutsen Formation (Fig. 44). Five samples of granodiorite and one aplite dyke were sampled to investigate the lithogeochemistry of the pluton and alteration effects discussed below. Six mineralized samples were analyzed by ME-MS61 selected analytes from which are shown in Table 7. Five were from granitoid outcrops, and one from a fractured basalt.

Copper in the 6 samples ranges from 203 to 3910 ppm with an average of 1926 ppm. However the low copper sample was analysed not for copper potential, but because of molybdenite rosettes on fracture surfaces, and it assayed 1280 ppm Mo. The most prospective traverse was along a creek bed in the northern part of the claims where 5 samples of altered and mineralized granodiorite were collected. Four were assayed (Table 6) and are Cu-D01 and 02, and RK58 and 59. Copper contents ranged from 1170 to 3910 in these 4 samples and all have low concentrations of Mo (2 to 3 ppm) and Ag ( 1 to 2 ppm). One sample from station RK058 had anomalous Zn at 2920 ppm. Arsenic was sporadic ranging from 4 to 244 ppm.

**Figure 43: Prospecting Streambed Outcrops along a Creek in the Quatse Pluton**
Five samples were collected from outcrops downstream of this location including one whole rock analysis and 4 assays. In Table 6 these are CU-D01 and 02, and RK58 and 59.

**Figure 42: Quatse Pluton fracturing and alteration**
Photo in a quarry used for road material shows multiple disorganized fracture sets likely Cretaceous in age and unrelated to Jurassic Island Plutonic Suite intrusion. Shear zones are shown on the map and are similar to the vertical one in the centre of the photo.
Photo by the author November, 2021.

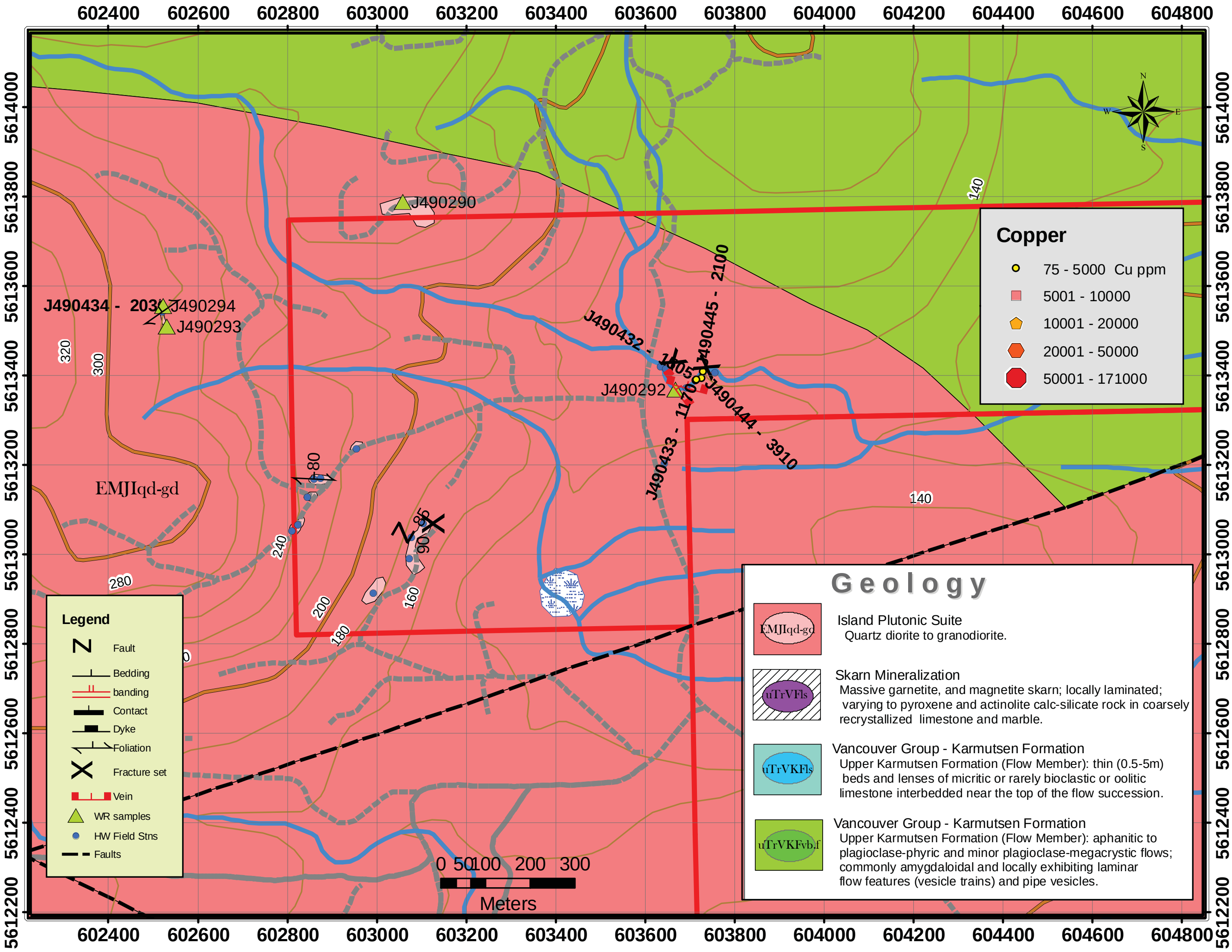



**Figure 44: Geological Map of the Quatse Pluton Area**
Samples labelled by sample number and copper concentration in ppm
Drawn by the author in ArcGIS 9.3, June 2022.

| Station | Sample Description | Cu | Ag | S % | Fe % | Mo | Sb | As | Zn |
|---|---|---|---|---|---|---|---|---|---|
| Cu-D 01 | granodiorite w calcite veins | 3910 | 2.13 | 0.6 | 1.9 | 3.5 | 5.14 | 53.2 | 121 |
| Cu-D 02 | granodiorite w qtz-calcite veins | 2100 | 1.01 | 0.16 | 2.66 | 2.7 | 0.49 | 5.9 | 80 |
| RK057 | basalt fine filamentous fxs | 2670 | 4.54 | 4.7 | 13.1 | 2.2 | 0.7 | 244.0 | 194 |
| RK058 | biotite granodiorite cpy veinlets | 1505 | 1.96 | 0.24 | 2.96 | 2.9 | 0.09 | 5.8 | 2920 |
| RK059 | biotite-hb granodiorite | 1170 | 1.61 | 0.11 | 2.83 | 2.5 | 0.07 | 4.2 | 80 |
| RK060 | biotite granodiorite w moly rosettes | 203 | 0.43 | 0.17 | 3.22 | 1280 | 0.07 | 8.0 | 66 |

**Table 7:** Quatse Lake Pluton Mineralized Sample Assays
Selected analytes are shown in ppm or where indicated, wt%.

Alteration of the 4 mineralized rocks could not be thoroughly assessed with the lack of complete fusion digestion and appropriate analysis, but Na and K from the 4 acid digestion all appear to be unaffected exhibiting a narrow range of variation of 1.95 to 2.5 wt% Na and 1.23 to 2.03 wt% K. Alteration in the pluton includes an orange zeolite shown in Figure 46, which may be mistaken for potassic alteration, which is more apparent in veins (Fig. 45).

The fifth sample served as a whole rock analysis of the Quatse granodiorite and was found to have 1090 ppm Cu. It contained quartz carbonate veins along which chalcopyrite was disseminated. Alteration of the rock consisted of pink potassium feldspar replacing mafic clusters proximal to the veins and biotite altered to chlorite more distally. However, its alkali elements Na and K were not noticeably different than those from less altered samples. Its whole rock composition is discussed below in "Lithogeochemistry" and found in Table 8. where $Na_2O$ was 3.24 wt% and $K_2O$ 2.63 wt% which are comparable to the non-oxide values from the ME-MS61. Only one whole rock sample displayed significant depletion of alkalis principally Na from the Quatse Pluton whole rock dataset.

**Figure 45: Quatse Pluton veining**
Salmon coloured alteration between fine quartz veins may be potassic alteration.

**Figure 46: Alteration in the Quatse Pluton**
Salmon red coloured patches may be a mix of zeolite and carbonate alteration rather than potassic alteration.

## 9.4 Lithogeochemistry of the basalts and intrusives

Eight rocks were selected for whole rock complete characterization analysis by ALS Geochemistry labs in North Vancouver using a suite of methods appropriate for accurate results for major, trace, and REEs as well as carbon and sulphur. The analyses are recorded in Table 8.

The eight analysed rocks from can be readily subdivided lithologically and lithogeochemically into two groups. The main group of 5 rocks is from the Quatse Lake pluton, which are granodiorites and granites on the TAS diagram in Figure 47, while the remaining three are from two basalts and dioritic dykes cutting them. The basalts have $SiO_2$ concentrations below 50% whereas all the Quatse rocks are above 68% and the one diorite at about 61%. The Quatse Lake pluton rocks were collected from extensive exposures in recent quarries near the NW corner of the Property.

Of the five, one is an obvious aplitic dyke cutting Karmutsen volcanics on the north side of the Quatse Pluton. It has a fine graphic texture of intergrown quartz and orthoclase and very low mafic content. Its composition is well into the granite field of the TAS diagram (Fig. 47). Three rocks from widely separated sites are almost compositionally identical in the granodiorite field with similar alkalis CaO (3.32 to 3.78)%, $Na_2O$ (3.24 to 3.3%) and $K_2O$ (2.37 to 2.63%) as well as $TiO_2$ (ca. 0.37%). This set includes a mineralized rock from a creek occurrence of fine chalcopyrite veinlets in the claims. In contrast, at one of the sites to the west of the claims, an argillically-altered rock shows substantial differences in alkali depletion ($Na_2O$ of 0.08%, and $K_2O$ 1.52%) and very similar immobile elements such as $TiO_2$ at 0.31% and CaO (7.2%) and LOI (12.5%) enrichment. The aplitic dyke is higher in $K_2O$ (4.9%), lower in CaO (0.9%), and similar in $Na_2O$ (3.5%) compared to the unaltered granodiorites.

The three other whole rock analyses from the project were collected in the vicinity of the Rainbow Showing where three dykes were sampled (Fig. 36). Two presumed dykes were mafic

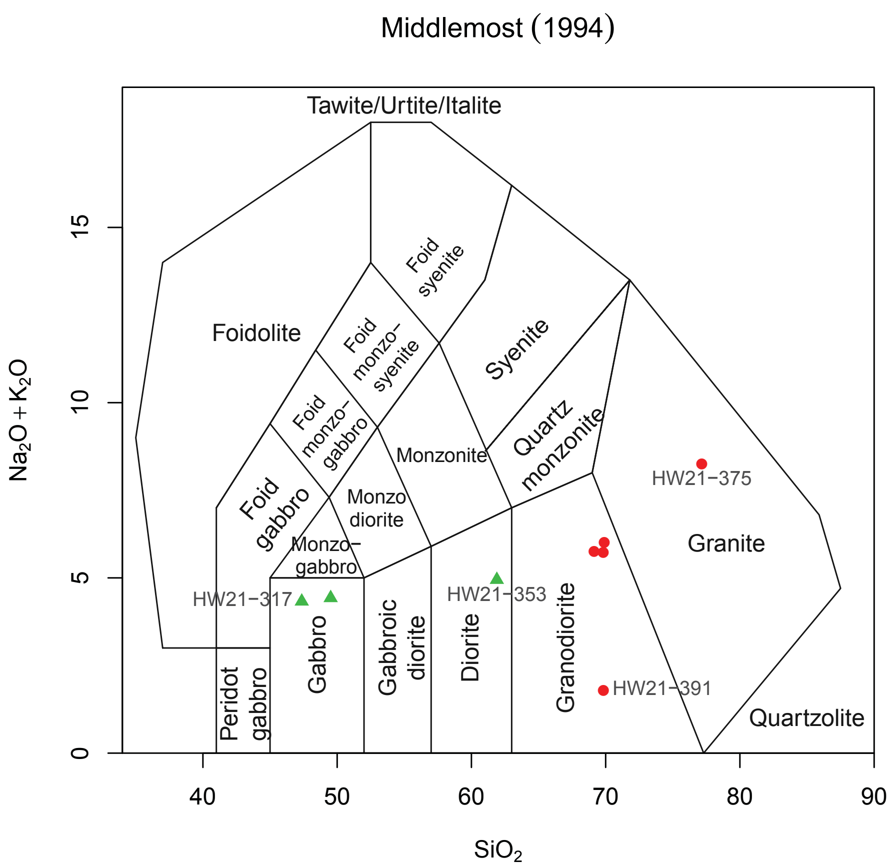



**Figure 47: Total Alkali Silica Diagram for Igneous Rocks** Granodiorites from the Quatse pluton are shown in red circles. Rainbow showing dykes are show in green triangles. Field station labels are keyed to whole rock analyses in Table 8 HW21-375 is an aplite dyke.

**Table 8:** Whole Rock Analyses
Rocks from the Quatse Pluton and Dykes Cutting the Karmutsen Formation at the Rainbow Showing

| Station | | HW21-242 | HW21-317 | HW21-353 | HW21-374 | HW21-375 | HW21-379 | HW21-389 | HW21-391 |
|---|---|---|---|---|---|---|---|---|---|
| Sample | | J490288 | J490289 | J490295 | J490290 | J490291 | J490292 | J490293 | J490294 |
| Showing | | Rainbow | Rainbow | Rainbow | QuatsePluton | QuatsePluton | QuatsePluton | QuatsePluton | QuatsePluton |
| Northing | | 5611079 | 5611070 | 5610854 | 5613788 | 5614607 | 5613368 | 5613509 | 5613556 |
| Easting | | 607331 | 607328 | 607179 | 603057 | 603214 | 603668 | 602530 | 602521 |
| Alt | | 192 | 189 | 177 | 220 | 245 | 143 | 275 | 272 |
| Sample Class | | hb por basalt | hb por dyke | leucocratic hb diorite | bi-hb diorite | pink aplite dyke | bi-hb granodiorite | bi-hb granodiorite | Altered diorite |
| SiO2 | % | 49.1 | 46.5 | 61.3 | 69.1 | 78.2 | 68.3 | 68 | 62.3 |
| Al2O3 | % | 15.85 | 18.7 | 16.6 | 14.75 | 13 | 14.95 | 14.85 | 11.8 |
| Fe2O3 | % | 13.1 | 12.15 | 6.85 | 3.84 | 0.71 | 3.78 | 4.06 | 3.4 |
| CaO | % | 8.29 | 9.52 | 5.56 | 3.74 | 0.91 | 3.32 | 3.78 | 7.19 |
| MgO | % | 6.07 | 5.55 | 2.96 | 1.34 | 0.09 | 0.96 | 1.45 | 2.44 |
| Na2O | % | 3.67 | 3.13 | 3.2 | 3.3 | 3.48 | 3.24 | 3.29 | 0.08 |
| K2O | % | 0.72 | 1.12 | 1.7 | 2.37 | 4.88 | 2.63 | 2.37 | 1.52 |
| Cr2O3 | % | 0.013 | 0.002 | 0.002 | 0.004 | 0.003 | 0.003 | 0.004 | 0.003 |
| TiO2 | % | 1.86 | 0.96 | 0.66 | 0.37 | 0.06 | 0.39 | 0.38 | 0.31 |
| MnO | % | 0.22 | 0.16 | 0.13 | 0.09 | 0.01 | 0.07 | 0.09 | 0.11 |
| P2O5 | % | 0.28 | 0.39 | 0.08 | 0.07 | 0.005 | 0.07 | 0.08 | 0.06 |
| SrO | % | 0.07 | 0.1 | 0.04 | 0.03 | 0.005 | 0.02 | 0.03 | 0.02 |
| BaO | % | 0.05 | 0.05 | 0.07 | 0.1 | 0.18 | 0.1 | 0.1 | 0.02 |
| LOI | % | 2.42 | 2.35 | 1.63 | 0.53 | 0.43 | 3.24 | 0.79 | 12.45 |
| Total | % | 101.71 | 100.68 | 100.78 | 99.63 | 101.95 | 101.07 | 99.27 | 101.7 |
| C | % | 0.04 | 0.04 | 0.04 | 0.02 | 0.02 | 0.37 | 0.02 | 2.62 |
| S | % | 0.04 | 0.01 | 0.005 | 0.005 | 0.02 | 0.13 | 0.005 | 0.04 |
| Ba | ppm | 419 | 452 | 601 | 903 | 1545 | 884 | 898 | 155 |
| Ce | ppm | 26.8 | 28.1 | 24.1 | 48.3 | 29 | 28.4 | 29.2 | 27.4 |
| Cr | ppm | 100 | 20 | 20 | 30 | 20 | 20 | 20 | 10 |
| Cs | ppm | 1.05 | 1.04 | 1.19 | 1.31 | 1.67 | 1.88 | 1.2 | 0.63 |
| Dy | ppm | 5.21 | 3.53 | 3.15 | 2.52 | 1.39 | 2.28 | 2.68 | 2.35 |
| Er | ppm | 2.86 | 2 | 1.95 | 1.6 | 0.9 | 1.54 | 1.74 | 1.46 |
| Eu | ppm | 1.58 | 1.28 | 0.81 | 0.67 | 0.05 | 0.58 | 0.69 | 0.6 |
| Ga | ppm | 20.6 | 20.2 | 16.2 | 13.8 | 11 | 14 | 13.5 | 10 |
| Gd | ppm | 5.28 | 3.81 | 3.02 | 2.73 | 1.31 | 2.23 | 2.65 | 2.55 |
| Hf | ppm | 3.1 | 1.4 | 2.5 | 3.4 | 3 | 3.3 | 3.4 | 2.7 |
| Ho | ppm | 1.01 | 0.64 | 0.65 | 0.57 | 0.3 | 0.51 | 0.58 | 0.5 |
| La | ppm | 11.3 | 11.8 | 12.9 | 28.8 | 17 | 15.7 | 16.8 | 14.6 |
| Lu | ppm | 0.38 | 0.29 | 0.32 | 0.28 | 0.19 | 0.28 | 0.3 | 0.24 |
| Nb | ppm | 9.7 | 3.8 | 5.3 | 5.8 | 10.2 | 6 | 5.5 | 5.3 |
| Nd | ppm | 18.4 | 18.4 | 11.4 | 15.8 | 8.4 | 11.6 | 12.1 | 12.9 |
| Pr | ppm | 4.03 | 4.15 | 3.16 | 5.16 | 2.97 | 3.31 | 3.51 | 3.14 |
| Rb | ppm | 15 | 26.6 | 36.1 | 51.7 | 108.5 | 63.3 | 51.4 | 41.3 |
| Sm | ppm | 5.53 | 4.45 | 3.18 | 3.28 | 1.85 | 2.66 | 3.15 | 2.62 |
| Sn | ppm | 1 | 1 | 1 | 0.5 | 0.5 | 1 | 1 | 1 |
| Sr | ppm | 629 | 909 | 376 | 271 | 65.2 | 224 | 264 | 155 |
| Ta | ppm | 0.6 | 0.2 | 0.4 | 0.5 | 1.6 | 0.6 | 0.5 | 0.4 |
| Tb | ppm | 0.86 | 0.56 | 0.52 | 0.46 | 0.22 | 0.36 | 0.42 | 0.39 |
| Th | ppm | 1.43 | 2.19 | 3.3 | 5.8 | 9.21 | 5.08 | 5.01 | 4.3 |
| Tm | ppm | 0.41 | 0.3 | 0.29 | 0.26 | 0.16 | 0.25 | 0.28 | 0.21 |
| U | ppm | 0.57 | 1.01 | 1.2 | 1.81 | 2.19 | 2.59 | 1.79 | 1.48 |
| V | ppm | 388 | 297 | 178 | 78 | 7 | 85 | 85 | 53 |
| W | ppm | 1 | 1 | 1 | 0.5 | 1 | 0.5 | 0.5 | 2 |
| Y | ppm | 26.5 | 18.1 | 18.5 | 15.2 | 9.8 | 14.5 | 16.2 | 14.1 |
| Yb | ppm | 2.69 | 1.88 | 2.08 | 1.81 | 1.19 | 1.7 | 1.93 | 1.54 |
| Zr | ppm | 119 | 50 | 94 | 131 | 69 | 128 | 132 | 93 |
| As_ | ppm | 5.8 | 8.3 | 0.5 | 1.1 | 38.3 | 9 | 1 | 2.5 |
| Bi | ppm | 0.02 | 0.03 | 0.04 | 0.02 | 0.04 | 0.16 | 0.02 | 0.62 |
| Hg | ppm | 0.013 | 0.011 | 0.0025 | 0.0025 | 0.061 | 0.397 | 0.0025 | 0.062 |
| In | ppm | 0.022 | 0.02 | 0.016 | 0.016 | 0.008 | 0.054 | 0.019 | 0.024 |
| Re | ppm | 0.001 | 0.001 | 0.001 | 0.0005 | 0.001 | 0.0005 | 0.001 | 0.08 |
| Sb | ppm | 0.24 | 0.17 | 0.05 | 0.025 | 0.08 | 0.22 | 0.025 | 0.025 |
| Se | ppm | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.5 |
| Te | ppm | 0.03 | 0.01 | 0.005 | 0.005 | 0.01 | 0.03 | 0.005 | 0.04 |
| Tl | ppm | 0.04 | 0.1 | 0.02 | 0.11 | 0.03 | 0.05 | 0.08 | 0.04 |
| Ag | ppm | 0.25 | 0.25 | 0.25 | 0.25 | 0.6 | 0.6 | 0.25 | 0.25 |
| Cd | ppm | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Co | ppm | 39 | 34 | 17 | 9 | 2 | 8 | 8 | 9 |
| Cu | ppm | 421 | 62 | 34 | 5 | 129 | 1090 | 12 | 35 |
| Li | ppm | 10 | 10 | 10 | 20 | 5 | 10 | 10 | 30 |
| Mo | ppm | 1 | 0.5 | 2 | 2 | 5 | 2 | 2 | 457 |
| Ni | ppm | 62 | 12 | 4 | 3 | 2 | 0.5 | 2 | 2 |
| Pb | ppm | 2 | 3 | 4 | 3 | 10 | 5 | 3 | 13 |
| Sc | ppm | 28 | 19 | 17 | 11 | 1 | 9 | 10 | 8 |
| Zn | ppm | 107 | 91 | 66 | 39 | 12 | 60 | 42 | 84 |

rocks cutting Karmutsen basalt flows and were analysed to determine if they were feeder dykes or possibly a phase of the Island Plutonic Suite potentially related to mineralization. The third is from an obviously discordant intrusive phase of white weathering diorite. These three plot predictably on the TAS diagram (Fig. 47), two in the gabbro/basalt field and one in the diorite field. It is difficult to relate the origin of the diorite to the Quatse Plutonic rocks although it would be predicted to be a dyke from the pluton.

Broader petrogenetic analysis is provided by REE spider plots of the 8 rocks in Figures 48 and 51. A significant contrast is shown on a REE spider plot (Fig. 48) normalized against primitive mantle compositions of McDonough and Sun (1995) where the Quatse Lake Pluton granodiorites and aplite show strong LREE enrichment typical of island arc calc-alkaline plutonic rocks, compared to a shallower to flat LREE and HREE pattern for the tholeiitic Karmutsen basalts. Interestingly the diorite dyke from the Rainbow Showing also shares the flat REE trend of the basalts. In the Quatse rocks the aplitic dyke stands out with a very strong Eu depletion anomaly typical of separation of plagioclase from the parental melt. The highly altered granodiorite has a REE pattern indistinguishable from the other granodiorites showing the immobility of REE in alteration and weathering systems.

For comparison data sets obtained by the author from north island locations in the Karmutsen Group and Island Plutonic Suite are shown in Figures 49 and 50. Figure 49 shows a set of Karmutsen basalts from properties near Stewart Lake and the Adam River (with a few skarn rocks for contrast). The basaltic rocks show remarkably parallel trends on the REE plot with the same typical tholeiitic lack of LREE enrichment monotonously characteristic of the Karmutsen plateau flood basalts. The diagram uses averaged REE concentrations in primitive mantle rocks determined by McDonough and Sun (1995) to normalize the compositions of the same elements in the samples. The range of REE concentrations amongst the basalts is the result of either varying degrees of partial melting of the mantle peridotites that formed the source of the Karmutsen Formation oceanic plateau basalts, or, indistinguishably, by crystal fractionation. The increase in absolute REE contents in the melts at constant ratios of LREE to HREE (commonly the Ce/Yb ratios) is because of the incompatible element behaviour of REEs, which concentrate in residual melts as compatible minerals are fractionated away by crystal settling. Skarns and plagioclase cumulates show positive Eu anomalies in Figure 49. The Quatse rocks are comparable in REE profiles to Island Intrusive Suite dykes from the Stewart Lake and Adam River areas shown in Figure 50 where a consistently parallel pattern is shown with a steep LREE enrichment. A leucocratic granite dyke cutting Karmutsen basalt near Stewart Lake, like the aplite north of the Quatse Pluton, also shows a strong Eu depletion anomaly.

An extended REE spider plot of the eight rocks in Figure 51 adds to the analysis of the petrogenesis and differentiation between the rocks. Large Ion Lithophile Element ("LILE") enrichment is greater in the granodiorites than the basalts. Further differentiation of tholeiitic origin of the basalts and calc-alkaline origin of the granodiorites is emphasized by significant High Field Strength Element ("HFSE") depletion anomalies relative to the basalt, which is a typical signature of island arc magmatic rocks. The hornblende diorite shows its calc-alkaline affinity in comparison to the granodiorites with strong HFSE depletion including stronger Zr, and Nb-Ta depletion than shown by the granodiorites. In the REE diagram the diorite has a nearly parallel trend to the basalts suggesting a similar origin, but the extended REE diagram confirms a calc-alkaline petrogenesis with possible assimilation of basalt to explain the lower degree of LREE enrichment relative to the Quatse granodiorites.

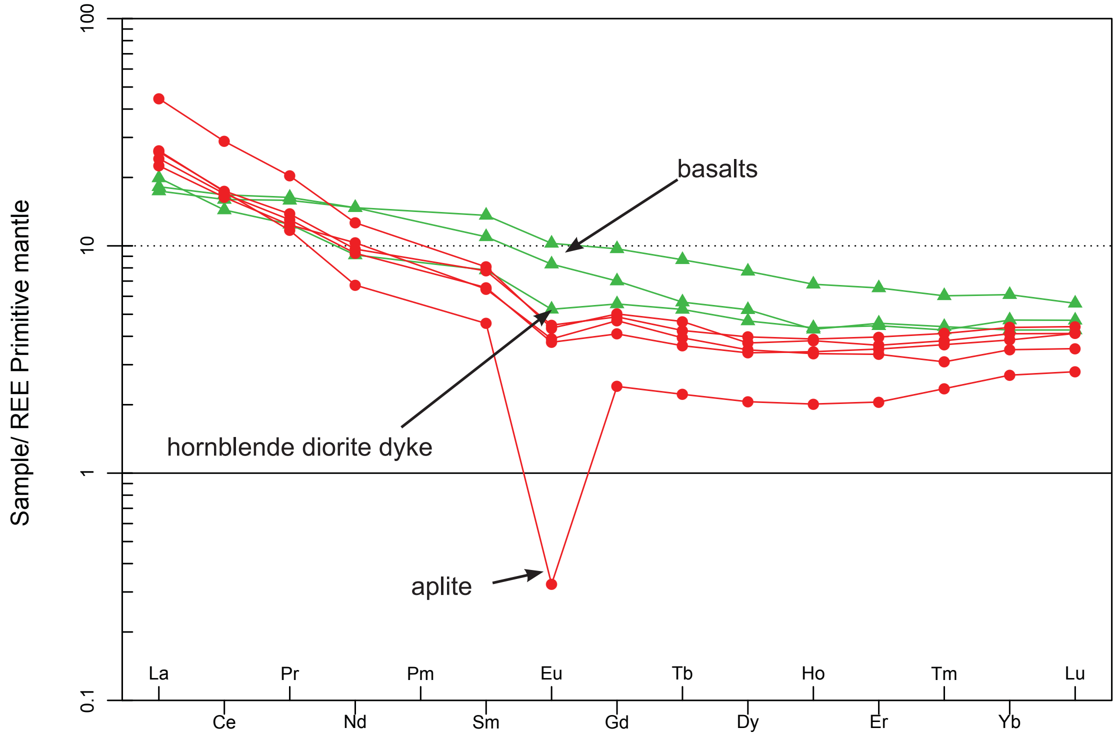



**Figure 48: REE Spider Diagram for Rocks from the Quatse Pluton and Dykes at Rainbow**
Red circles are granodiorites and an aplite from the Quatse Pluton. Green triangles are mafic rocks from the Rainbow showing including a hornblende diorite and two feldspar porphyritic basalt dykes. The aplite shows the extreme Eu depletion anomaly. The Quatse pluton granitoids show stringer LREE enrichment and although more felsic are generally less enriched in REEs Drawn by the author in GCDkit 4.1 February 2022.

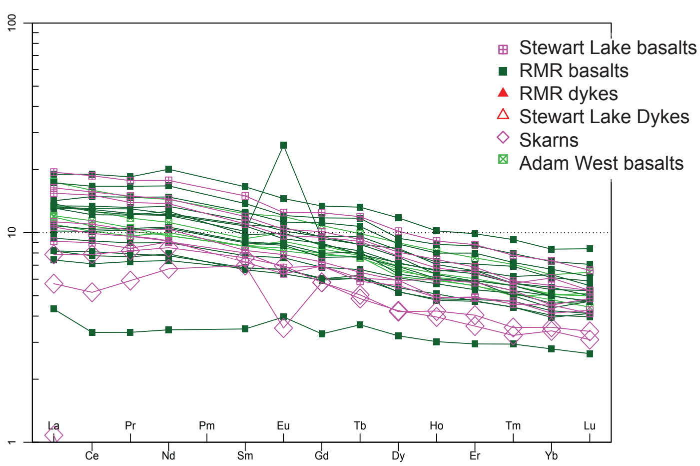



**Figure 49: REE Spider Plot for Upper Karmutsen Basalts: Northern Vancouver Island**
The diagram plots REE concentrations measured in the rocks normalized by REE concentrations defined by McDonough and Sun (1995) from primitive mantle rocks. Near parallel trends are displayed for the middle and upper Karmutsen Fm basalts from Stewart Lake and Adam River areas (symbols in legend). Plotted by the author in GCDkit4.1 (Janousek et al., 2006).

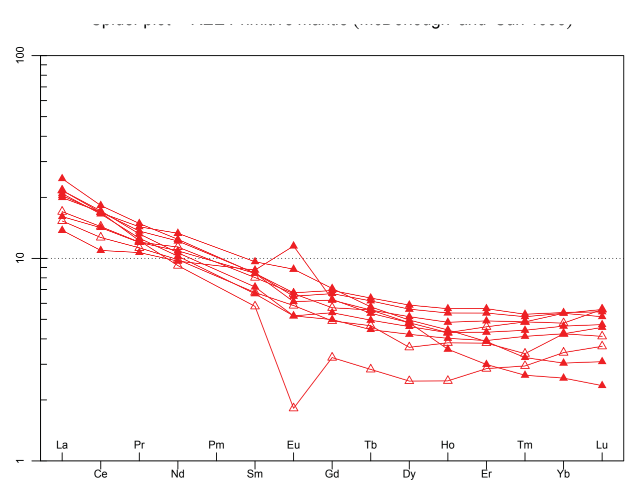


**Figure 50: Spider Plot Normalized by REE Primitive Mantle Concentrations in the Island Intrusive Suite Dykes: Northern Vancouver Island.**
The diagram plots REE concentrations measured in the rocks normalized by REE concentrations defined by McDonough and Sun (1995) from primitive mantle rocks. Near parallel trends are displayed for the dioritic dykes cutting the Karmutsen basalts in different areas. Plotted by the author in GCDkit4.1 (Janousek et al., 2006).

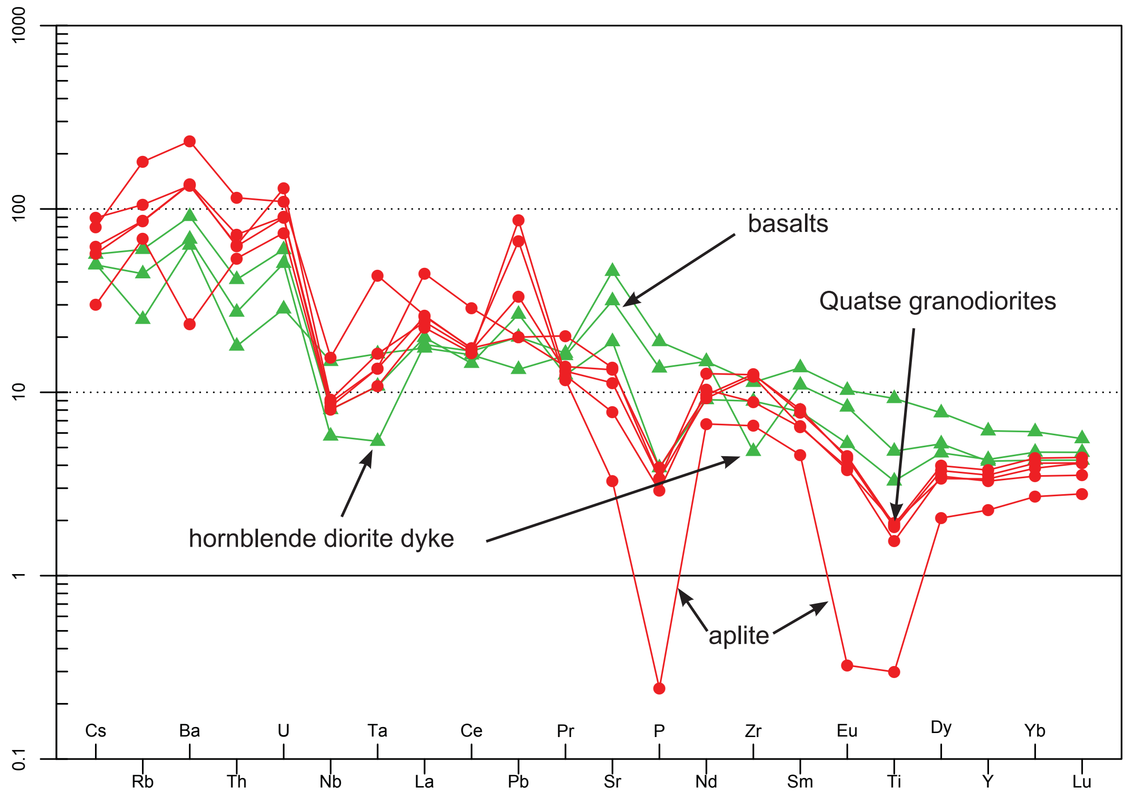



**Figure 51: Extended REE Spider Diagram for Rocks from the Quatse Pluton and Dykes at Rainbow**

Quatse granodiorites and aplite dyke are symbolized by red circles; Karmutsen basalt dykes and diorite dyke from the Rainbow Showing are green triangles. The Quatse rocks and the hornblende diorite show significant depletion in HFSEs (Nb, Ta, P, and Ti) typical of calc-alkaline arc rocks, but the hornblende diorite also shows stronger Zr and Nb-Ta depletion than the granodiorites. Plotted by the author in GCDkit4.1 (Janousek et al., 2006).

## 9.5 Airborne Magnetometer Survey of the Property

An aeromagnetic survey of the North Island Copper Property was conducted under contract from Questcorp Mining to Pioneer Exploration Consultants Ltd ("Pioneer") using an Unmanned Aerial Vehicle ("UAV" or drone) - mounted magnetometer. The survey was completed between March 4th and 8th, 2022 after delays from heavy snowfall in December

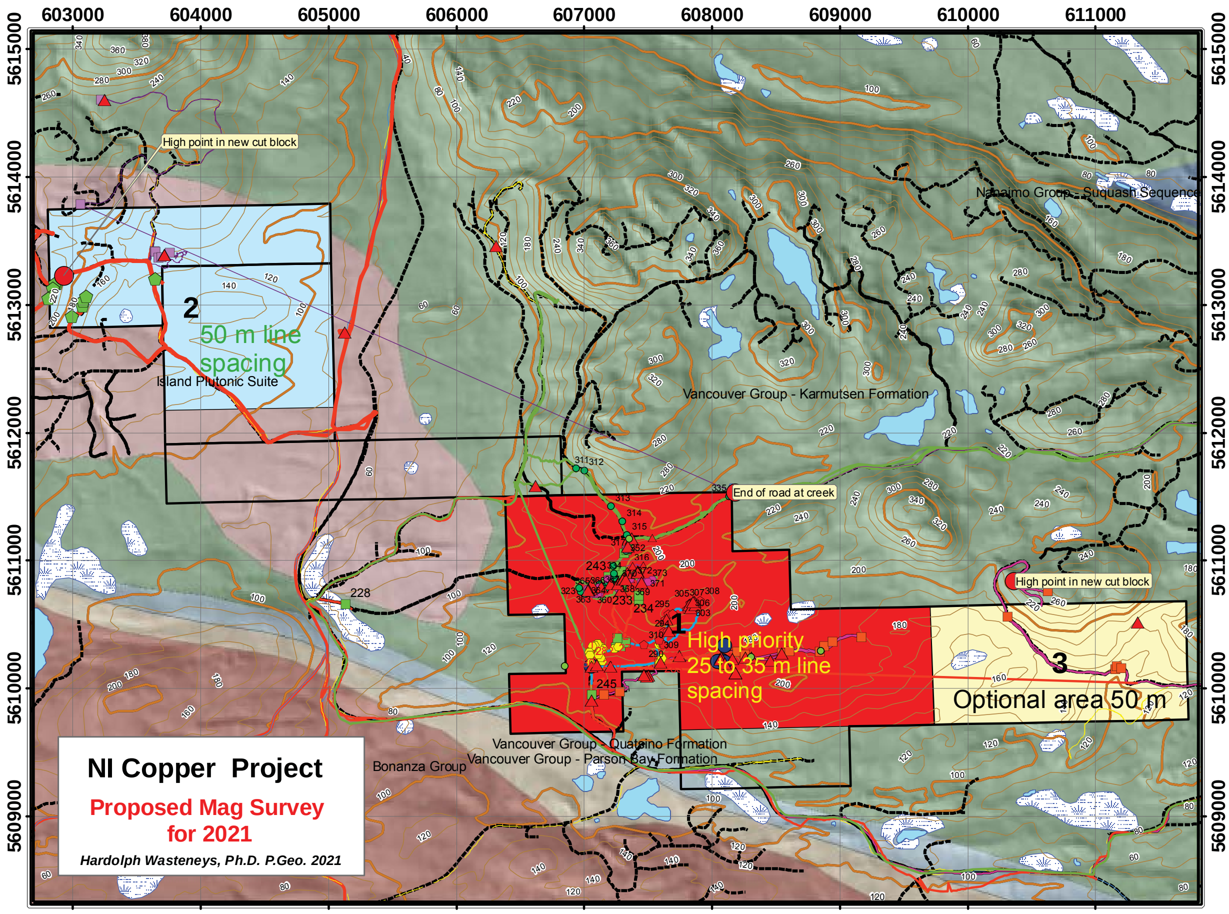



**Figure 52: Survey blocks for the North Island Copper UAV survey**
The central area in red ("Area 1") was specified at a 35 m line spacing, tighter than Area 2 (blue) and Area 3 (yellow) to resolve contacts between numerous marble lenses and basalts. Standard spacing of 50 meters was used in Areas 2 and 3. Area 2 is mainly within the Quatse Pluton was surveyed to find areas of magnetite destructive alteration or internal intrusive contacts. Field examination of Area 3 found it to be entirely underlain by unaltered Karmutsen basalt and was considered optional.

2021. The survey was conducted on three blocks within the Property (Fig. 52), prioritized on the basis of geological characteristics to provide higher resolution than the available regional aeromagnetic maps (Fig. 53) produced by Geoscience BC in 2013.

The rationale was that a UAV survey could achieve higher resolution by lower ground clearance and tighter line spacings than a helicopter-borne survey. The objective was to delineate limestone lenses intercalated in the Karmutsen basalt, and potentially detect magnetite skarn bodies. The survey was designed to prioritize three areas of the Property shown in Figure 52. The highest priority was for the central section of the Property around the Rainbow and Cranberry skarn showings, which are hosted by marbleized limestone lenses and skarn. This area was flown at a line spacing of 35 meters. Second priority was over the NW

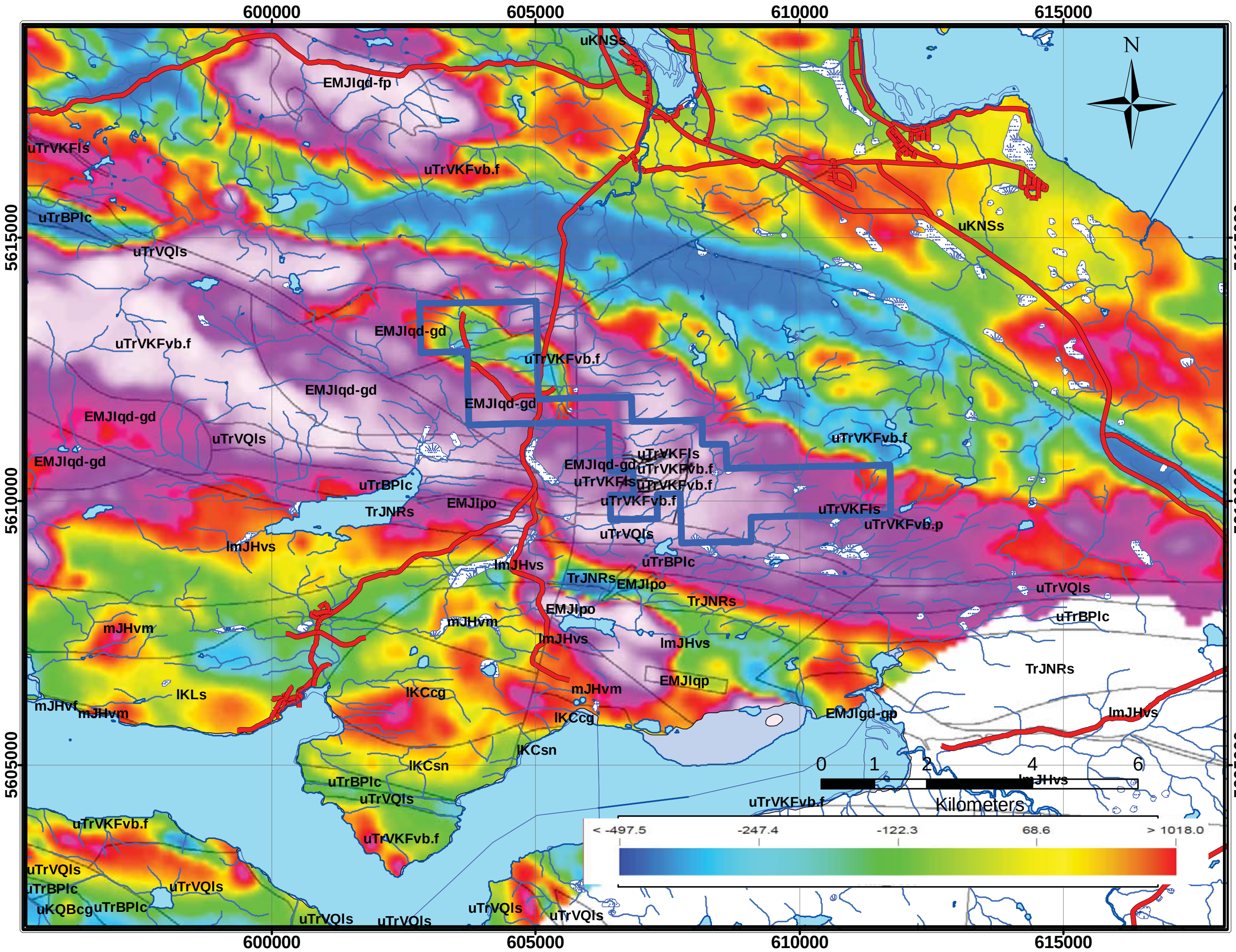



**Figure 53: Regional Aeromagnetic Survey Map 2013**

The North Island Copper Property is outlined in blue on the regional Residual Magnetic Intensity ("RMI") map from the 2013 Geoscience BC airborne magnetometer survey of parts of the North Island. Regional geological contacts and unit labels are superimposed. The magnetic high continues to the west northwest along the Hushamu Porphyry copper belt and a series of Jurassic Island Plutonic Suite dioritic to grano-dioritic intrusions. Scale in nanoTeslas. The RMI is calculated from the aircraft-measured Total Magnetic Intensity ("TMI"), the ground station measured diurnal, and the regional magnetic field calculated from the International Geomagnetic Reference Field (IGRF). The low frequency component of the diurnal is extracted from the filtered ground station data and removed from the TMI. The average of the diurnal is then added back in to obtain the resultant TMI. The regional magnetic field, calculated for the specific survey location and the time of the survey, is removed from the resultant TMI to obtain the RMI. The final step is to Tie-line level and microlevel the RMI data. Map drawn by the author in ArcGIS 9.3 using tiff file for Geoscience BC project 2013-02.

section of the Property in the Quatse Lake pluton, part of which is regionally anomalous on the Geoscience BC airborne magnetometer survey in Figure 53 and was flown at standard 50 meter line spacing. The third area covered the eastern section of the Property where no skarn mineralization has been previously found, and only one lens of the limestone has been delineated in the upper Karmutsen Formation.

The survey area was within a Class "E" restricted flight zone for seaplane airport at Port Hardy within which the drone was limited to visual range of the drone pilot. In the central area in particular tall second growth trees and a blocked access road into the north side of the Property required using several launch sites within the block to respect the Transport Canada flight restrictions. Deliverables from the survey included a satellite-derived DEM, and maps of Total Magnetic Intensity (TMI), First Vertical Derivative (1VD), and Analytical Signal.

### 9.5.1 Airborne Magnetic Survey Specifications

Flight lines for the UAV survey (Fig. 52) were oriented north-south with east-west tie lines. Line spacing was at 35 meters for "Area 1", and 50 meters for each of Areas 2 and 3, with tie lines at 350 and 500 meters in all three areas for a total of 258.3 line kilometers. The nominal magnetic sensor altitude above ground level (AGL) was set to 45 m for the duration of the survey and was controlled by an onboard laser range altimeter. A satellite-based digital terrain model (DTM) was used in order to aid the terrain following procedure and to minimize topographic effects on the magnetic data. The nominal production groundspeed of the UAV mounted magnetometer was 8 m/s over flat ground with no wind. Upon landing, the flight batteries are exchanged and the sensor is downloaded for QAQC checks. The average distance covered by each data acquisition flight was approximately 6-10-line kms.

### 9.5.2 Instrumentation and Software

The principal airborne sensor used was a GEM Systems Canada GSMP-35U potassium vapor sensor mounted on a UAV platform. Ancillary equipment included a laser altimeter with a 130m range, Global Positioning Satellite (GPS) system antenna and Inertial Measurement Unit (IMU). A stationary GSM-19 Overhauser magnetometer was used as a base station. Raw aerial magnetometer data was collected at a rate of 10 Hz while base station data was collected at a rate of 0.16 Hz. Total field and GPS UTC time were recorded with each data point, enabling diurnal correction to be applied during final data processing.

The GSM-19 Overhauser Magnetometer base station was placed in a location of low magnetic gradient, away from electrical transmission lines and moving metallic objects, such as motor vehicles and aircraft. The data collected from this base station was used to diurnally correct the aeromagnetic data. The GSM-19 Overhauser Magnetometer is supplied by GEM Systems of Markham, Ontario.

Pioneer used the Matrice M600 Pro UAV (Unmanned Aerial Vehicle) to complete this survey towing a lightweight GEM System's UAV GSMP-35U potassium magnetometer at a distance of 3 to 5 meters from the UAV. The Matrice 600 (M600) is DJI's platform designed for professional aerial photography and industrial applications. The UAV Aeromagnetic Configuration of the UAV GSMP-35U potassium magnetometer provided high sensitivity of 0.0002 nT , 0.0001 nT resolution, with +/- 0.1 nT absolute accuracy over its dynamic range of 15,000 to 120,000 nT. and low heading error of + / – 0.05 nT. An onboard laser altimeter measured distance above ground and controlled the flight altitude to remain at 45 m above ground.

### 9.5.3 Data Processing and Maps

All post-field data processing was carried out using Geosoft Oasis Montaj, Python and Microsoft Excel software/ programming languages. Presentation of final maps used ESRI ArcMap and/or Geosoft Oasis Montaj. Results were gridded using minimum curvature method and a grid cell size of approximately 1/3 of flight line spacing. The geophysical images are positioned using the WGS 1984 datum. The survey geodetic GPS positions have been map-projected using the Universal Transverse Mercator (UTM) projection into UTM Zone 9 in common with the coordinates used in the rest of the Technical Report.

Deliverables from the survey include the primary maps of the Total Magnetic Field based on the flight lines covered by the drone, and interpolating the filtered magnetic data. The first order vertical derivative maps quantifies the rate of change of the magnetic field as a function of ground clearance. It is an approximation of the vertical magnetic gradient, which could be directly measured with separate magnetometers vertically spaced apart. The purpose of this type of filter is to eliminate the long wavelength signatures and make sharp features more detectable, such as the edges of magnetic bodies. The vertical derivative is used to delineate the contacts between large-scale magnetic domains because its value is zero over vertical contacts. The 3D Analytic Signal ("AS") map is the square root of the sum of the squares of the derivatives in the x, y, and z directions. The AS, is useful in locating the edges of magnetic source bodies, particularly where remnant magnetic signals and/or low magnetic latitude complicates interpretation.

In general TMI images are negatively affected by increases in clearance height of the sensor above the ground as well as by the depth of overburden. Within the Property, most trees are second growth and in some areas over 30 meters in height. Local surficial geology generally consists of till veneers less than a few meters thick in upland areas. The first derivative image compensates for variations in height above ground and local relief by calculating a pseudo gradient measured in nT/m.

### 9.6.4 Interpretation

Maps of TMI and 1VD for each of the 3 areas are shown in Figures 54 to 59, with reference to regional structures, local mapped geology and topography. Maps of the Analytical Signal show similar features as 1VD maps and are not considered further here. Area 1 was considered the highest priority for the magnetometer survey: Karmutsen basalt flows are interspersed with interflow limestone formations that have been metasomatically altered by fluids from dioritic dykes, possibly from the Quatse Lake pluton, which intrudes the western border, producing calcic garnet-pyroxene skarns with bodies of magnetite mineralized with chalcopyrite. Area 1 has a complex magnetometer pattern in both the TMI (Fig. 54) and the 1VD (Fig. 55) indicating structural breaks and possible intrusions as well as the limestone interflow beds. Area 2, is within the Quatse Lake diorite pluton that has been partially explored for porphyry copper deposits and intrudes Karmutsen Formation basalt. A large east west magnetic low was detected previously by Allen and Dasler (1992) on the Marisa property coincident with IP anomalies and some mineralization on drill holes, as well as on the Geoscience BC regional aeromagnetic survey of 2013, and was confirmed by the UAV survey. Area 3 is in a weakly deformed sequence of Karmutsen Formation basalt flows, possibly at a lower stratigraphic level than Area 1 and only has one known interflow sediment band. It has a generally flatter and lower magnetic susceptibility than the adjacent Area 1.

On a regional scale map in Figure 53 the Property is within a broad west northwest trending magnetic high that corresponds to the upper stratigraphic levels of the tholeiitic Karmutsen Formation basalts (unit uTrVKFvb.f). The northwest part of the Property, Area 2, is marked by a deep, west-northwest trending magnetic low coincident with the northeast margin of the Quatse Lake pluton (unit EMJqg-gd). The area of the Quatse Lake pluton is slightly lower in intensity than the surrounding Karmutsen basalts. The southeast section of the Property, is in a very high magnetic zone in the west of Area 1 and tapering off to a lower magnetic intensity in the east in Area 3.

In Area 1, the TMI map (Fig. 54) shows a relatively strong, but variable magnetic intensity with a moderately defined east-northeast fabric. The western edge of the map is a magnetic low that corresponds to the mapped eastern margin of the Quatse Lake pluton. East

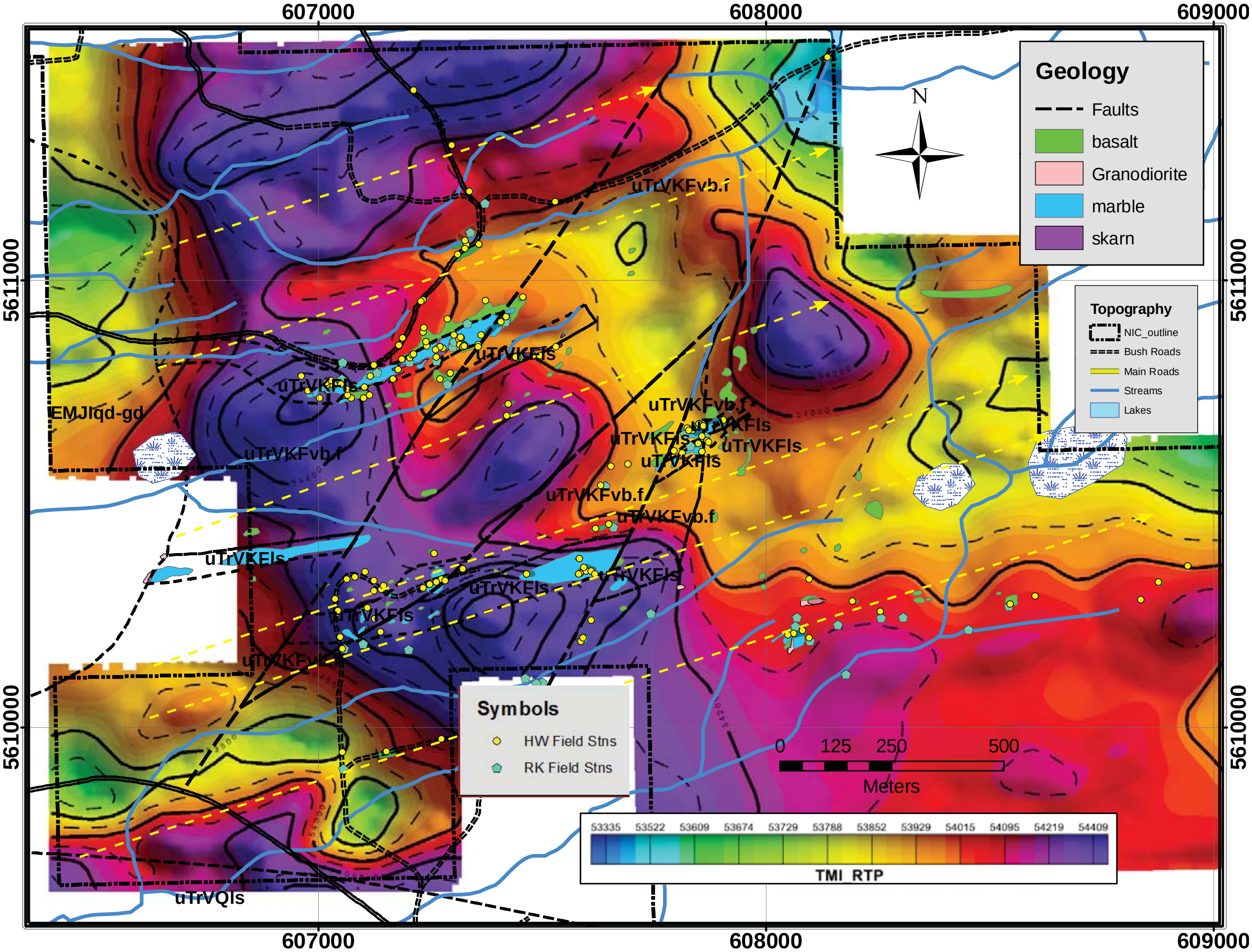



**Figure 54: Area 1: Total Magnetic Intensity**
The contoured Total Magnetic Intensity (TMI) for this area was derived from the UAV survey on north-south lines at 35 m intervals and 45 meters above ground level. Yellow dashed lines are interpreted contacts defined by the alignment of zero gradient contours on the 1VD map in Figure 55.
The TMI map is overlain by geological units in the main mapped area, and known regional-scale faults and contacts indicated in the geology legend (Fig. 36). The area is within Karmutsen Formation basalts with intercalated limestones-marbles lenses mapped in blue and hosting the skarn showings. The eastern contact of the Quatse Lake dioritic to granodioritic pluton is marked on the left and the pluton labelled “EMJlqd-gd”. Yellow dots are field stations (Symbols Legend). Topographic contour lines have been omitted, but streams, swamps and roads are shown. Regional scale formations are labelled, and contacts outlined, but without fill to avoid conflict with the magnetic map colours. The Magnetic scale is in nanoTeslas (nT). Coordinates are in NAD 83, UTM Zone 9.

of the intrusive contact the Karmutsen Formation is magnetically high, but declines rapidly 1.4 kilometers to the east. The ENE structure is most evident north of the Rainbow showing area, but does not appear to resolve the approximately 50 meter wide limestone/marble lens in which the Rainbow skarns were formed. The ENE fabric is more strongly resolved in the 1VD map (Fig. 55), as several approximately 100 meter wide linear magnetic low and high gradients ranging from -2.7 to 3.5 nT/meter. Notably, the fabric is parallel to the layering in the Karmutsen and to the trellis pattern of streams, which appear to follow TMI lows (Fig. 54) and on the

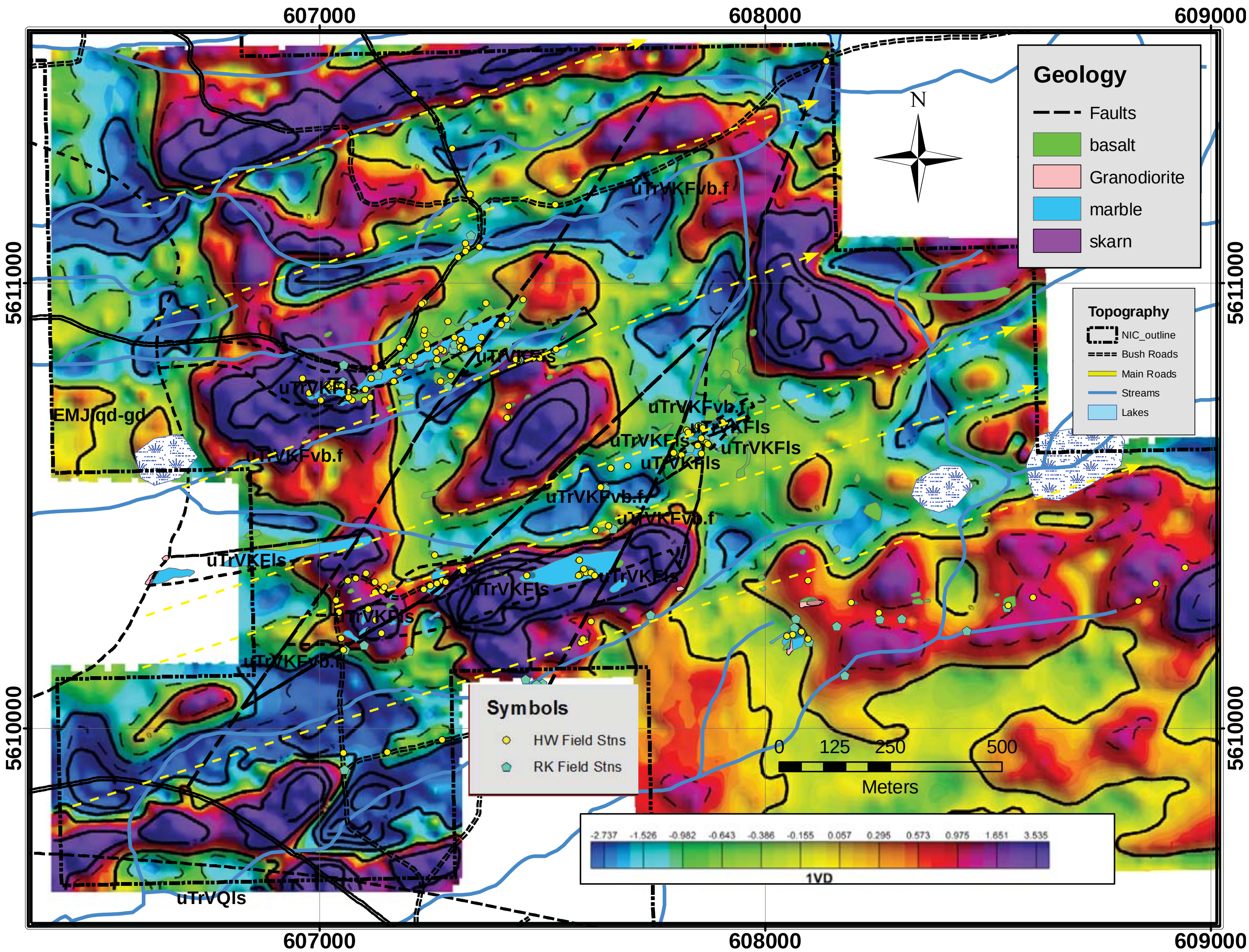



**Figure 55: Area 1: First Vertical Derivative of the Magnetic Field**
The contoured 1st Vertical Derivative (1VD) of this area was derived from the UAV survey on north-south lines at 35 m intervals and 45 meters above ground level. The contoured 1VD map is overlain by colour filled polygons for selected geological units in the detail mapped areas around skarns showings. Known regional-scale faults and contacts are marked, but no fill is applied to units to avoid conflict with the 1VD colour contouring. The area is within the upper Karmutsen Formation basalts, in which limestone lenses are intercalated. The contact of the eastern end of the Quatse Lake dioritic to granodioritic pluton is at left. Yellow dots are field stations. Topographic contour lines have been omitted, but streams, swamps and roads are shown. The Magnetic scale is in nT/m.
Yellow dashed lines are interpreted contacts defined by the alignment of zero gradient contours.

generally lies on the south side of high gradient bands at the zero gradient line. Bedding in the Karmutsen dips to the south at about 30 degrees and is expressed by basalt flows and interflow sediment bands, principally the limestone units hosting the skarns. However, it is not clear what stratigraphic layers other than limestone bands are responsible for the magnetic structure. Mapped limestone bands lie with highs and lows in the TMI, and are not always present in the known stream valleys. Dykes and sills from the Quatse pluton are associated with the skarns, but are not well enough exposed to determine if they are the cause of the magnetic structure. Potentially, sills intrude along interflow layers such as the limestone bands, or perhaps between massive flows and volcaniclastic layers. Diorite sills may account for TMI lows, but may also metamorphose the basalts as well as generate skarns in the limestone that have accentuate the magnetic structure of the Karmutsen.

In the Quatse Lake area the magnetic low (Fig. 56) is an east-west "trough" at 53300 nT contrasting with a magnetic high in the Karmutsen basalt at 54400 nT in the NE corner of the map. Along the south edge of the magnetic low, drill holes on the Marisa property encountered significant porphyry style mineralization in 1991 (Allen and Dasler, 1992) (see Fig. 16 above). The 1st-VD map (Fig. 57) resolves some of the same ENE fabric observed in Area 1, in the Karmutsen block on the NE corner of the map. An ENE regional fault that offsets the Quatse Lake diorite through its centre is parallel to the fabric.

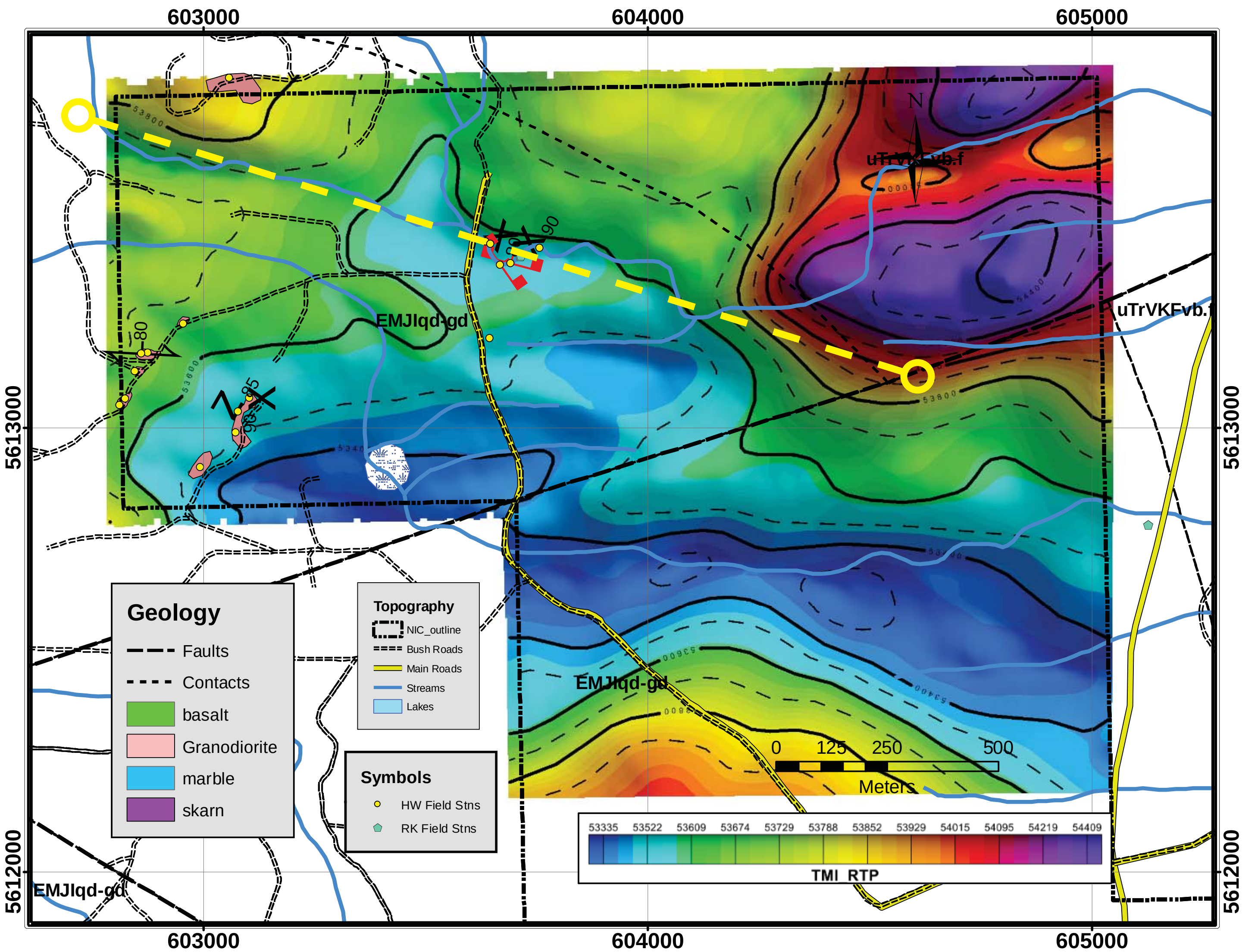



**Figure 56: Area 2, Quatse Lake Pluton: Total Magnetic Intensity Map**
The contoured Total Magnetic Intensity (TMI) for this area was derived from the UAV survey on north-south lines at 50 m intervals and 45 meters above ground level. Dashed yellow line is interpreted as a fault in the 1VD map in Figure 54 and from some shears and veins structures mapped by the author in a creek bed (top center). The deep mag low may be related to alteration in the pluton based on historical work and a few outcrops of altered and faulted diorite in pits on the west side of the map. The contoured TMI map is overlain by geological outcrop areas of geological units in legend, known regional-scale faults and contacts. Most of the area is within the Quatse Lake Pluton. The area in the northeast corner is Karmutsen Formation basalts. Yellow dots are field stations. Topographic contour lines have been omitted, but streams, swamps and roads are shown. The Magnetic scale is in nT.

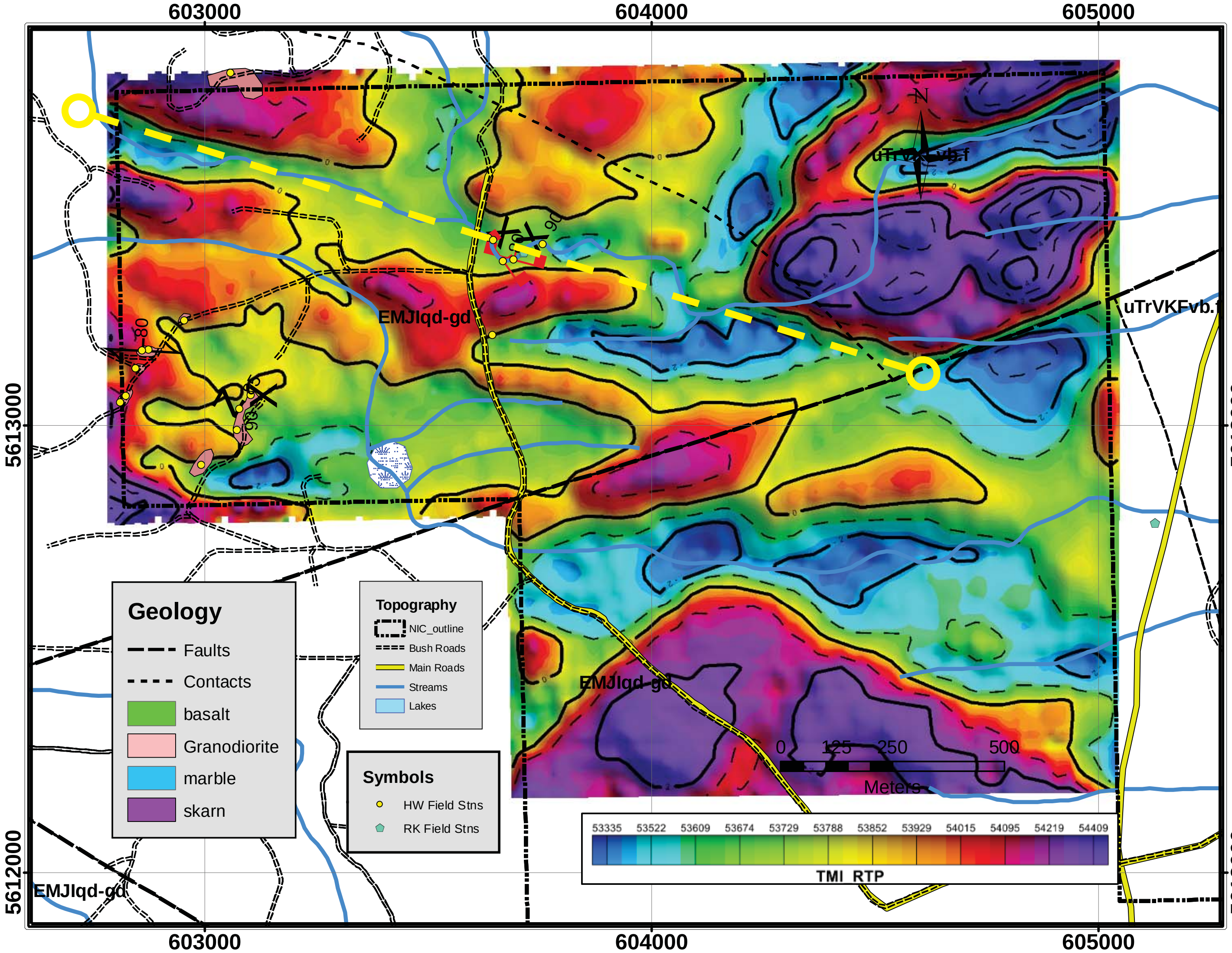



**Figure 57: Area 2, Quatse Lake Pluton: First Vertical Derivative of the Magnetic Field**
The contoured 1st Vertical Derivative (1VD) of this area was derived from the UAV survey on north-south lines at 50 m intervals and 45 meters above ground level. The contoured 1VD map is overlain by geological units in the main mapped area, and known regional-scale faults and contacts indicated in the geology legend. Most of the area is within the Quatse Lake Pluton. The area in the northeast corner is Karmutsen Formation basalts. Yellow dots are field stations. Topographic contour lines have been omitted, but streams, swamps and roads are shown. Regional scale formations are labelled, and contacts outlined, but without fill to avoid conflict with the magnetic map colours. The 1VD Magnetic scale is in nT/m.

The magnetic fabric of Area 1 diminishes to the east into Area 3 along with the generally higher magnetic intensity (Fig. 58). Weak ENE features can be interpreted from the 1VD map in Figure 59, but reconnaissance exploration along logging roads revealed some narrow shear zones, but no major intrusions, or stratigraphic variations.

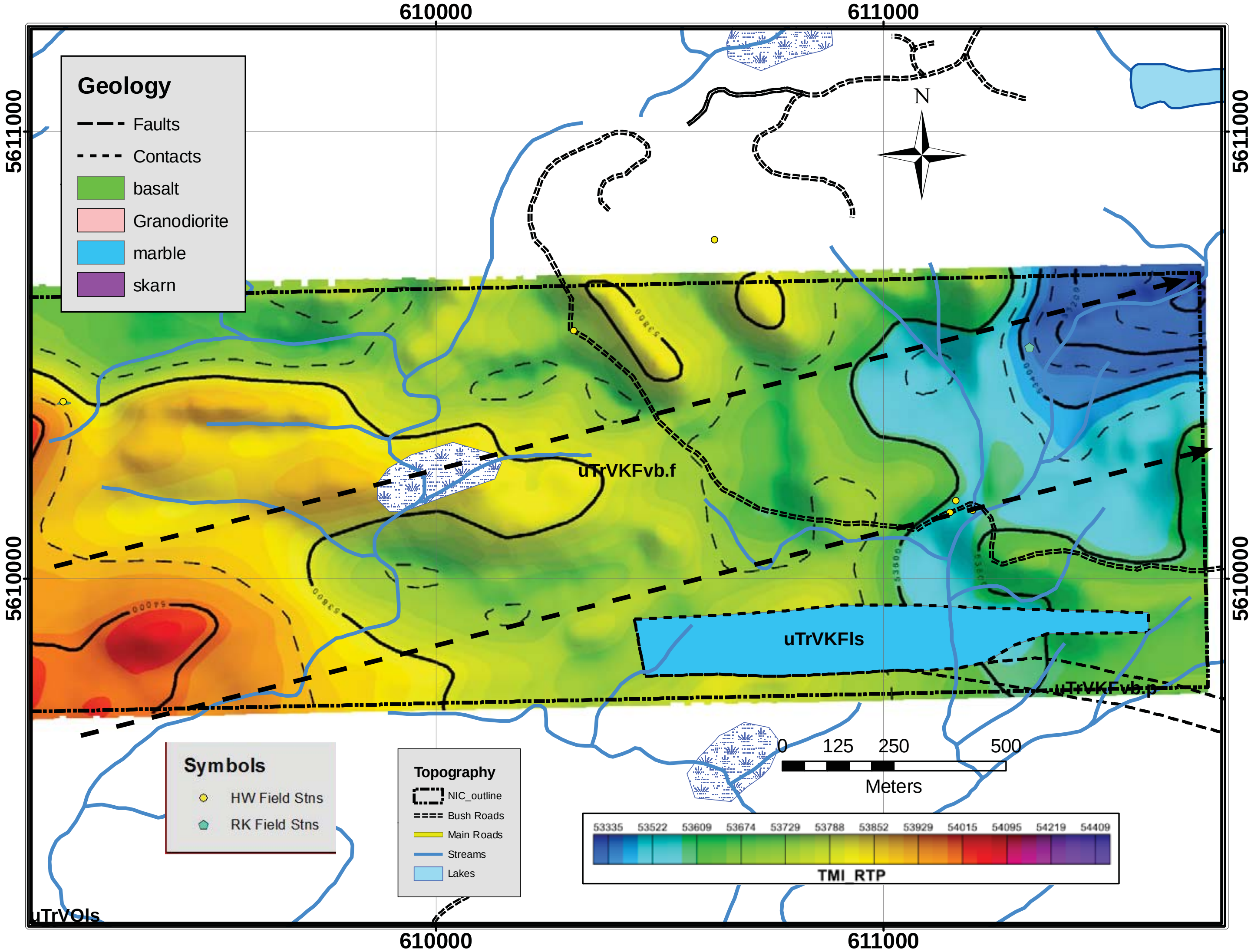



**Figure 58: Area 3: Total Magnetic Intensity**

The contoured Total Magnetic Intensity (TMI) for the eastern part of the Property in Area 3, was derived from the UAV survey on north-south lines at 50 m intervals and 45 meters above ground level. Dashed black lines are interpreted from the 1VD map (Fig.56) and may be faults or contacts between contrasting flow units. The contoured TMI map is overlain by geological units in the main mapped area, and known regional-scale faults and contacts indicated in the geology legend. All of the area is within Karmutsen Formation basalts and volcaniclastic except one lens of interflow limestone. Yellow dots are field stations. Topographic contour lines have been omitted, but streams, swamps and roads are shown. The Magnetic scale is in nT.

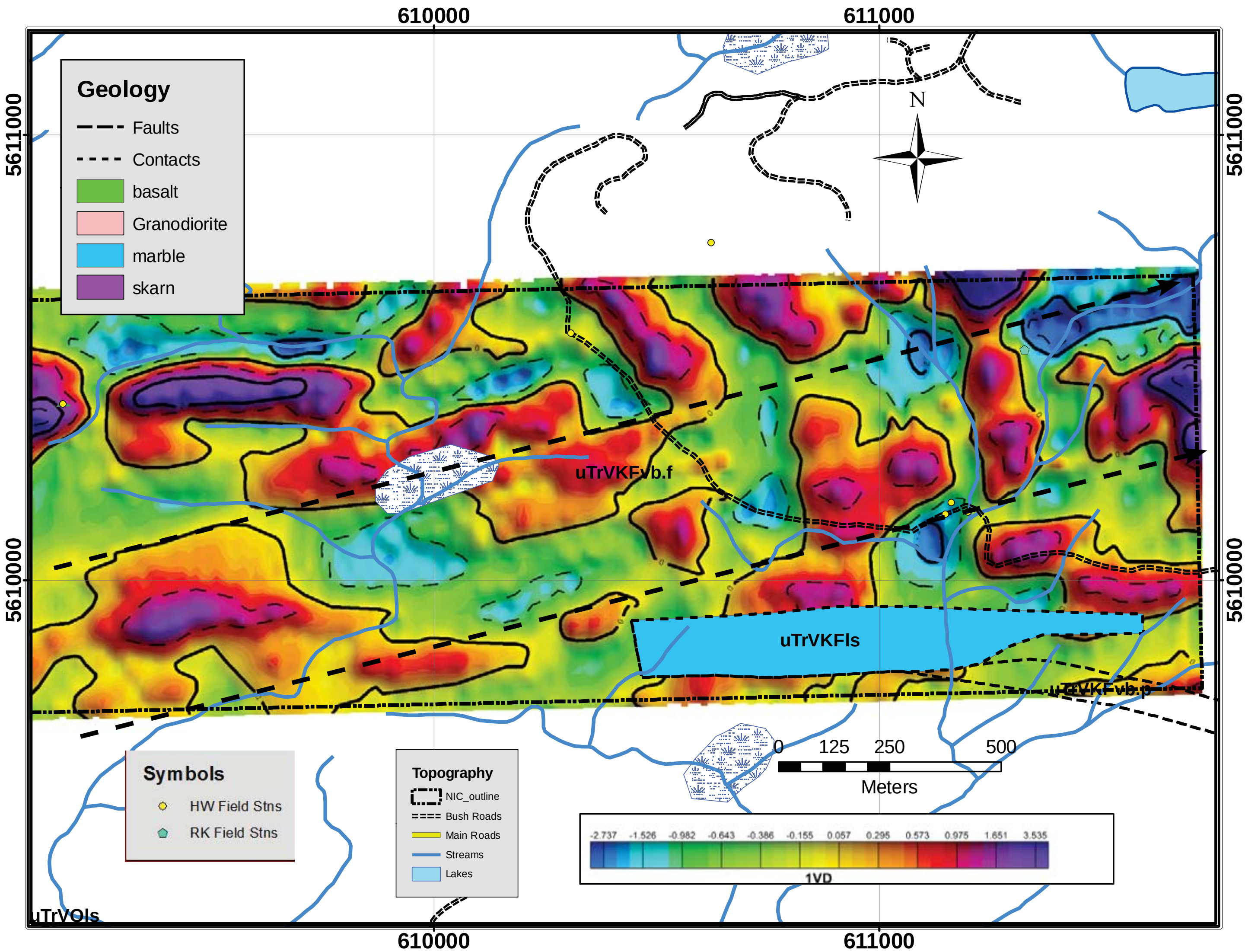



**Figure 59: Area 3: First Vertical Derivative of the Magnetic Field**
The contoured 1st Vertical Derivative (1VD) of this area was derived from the UAV survey on north-south lines at 50 m intervals and 45 meters above ground level. Dashed black lines are interpreted from the 1VD map (Fig.54) and may be faults or contacts between contrasting flow units. All of the area is within upper Karmutsen Formation basalts and volcaniclastics except one lens of interflow limestone in the southeast.
Topographic contour lines have been omitted, but streams, swamps and roads are shown.
The Magnetic scale is in nT/m.
Map and interpretation by the author, June 2022.

# 10. Drilling

Historical exploration diamond drilling has been undertaken at the North Island Coppere Property mainly during the 1960 through the 1990s. All of the results of the drilling that are available are disclosed in Item 6 History, above.

# 11. Sample Preparation, Analyses and Security

## 11.1 Sample Collection and Preparation

The author collected or supervised the collection of 54 rock samples and lithologically interesting specimens from several showings and rock units on Property. Sampling was commonly from outcrops and old exploration pits that had become overgrown by vegetation which inhibited measured chip sample sections. Accordingly, all samples were regarded as grab samples and not necessarily representative of bulk mineralization. All collection sites were clearly marked with labelled flagging tape and recorded by GPS coordinates and field notes were compiled in a spreadsheet. GPS coordinates were established by the author using a Garmin Model 62s unit and by assistant Roger Kennedy using a Garmin 64 handheld unit. Coordinates were transferred into a GIS by the author using gpx files stored in the devices. Rock samples were collected in labelled 6 ml plastic sample bags.

Subsequent to the field collection, the author reexamined all of the rocks at his place of business, redescribed them, analyzed spots of interest using a Niton XL3t portable XRF unit, and reserved a small piece of each sample for reconciliation with the laboratory analysis. The rock bags were then identified with sequential Tyvek numbered tags and sealed by the author. The rocks were shipped by the author from Campbell River via Comox Pacific Express in sealed bags to the ALS Canada Ltd ("ALS") laboratory in North Vancouver.

During the exploration program the rock samples were always under the supervision of the author and were stored in locked vehicles or cabins to prevent public tampering until shipped.

## 11.2 Sample Laboratory Procedures and Analysis

At the ALS laboratory, the rock samples were catalogued, dried, crushed, split and pulverized using standard rock and soil preparation procedures. All of the rock samples were prepared for assay by fine crushing method CRU-31 which requires 70% passing through a 2 mm screen. The passing crushed material was then riffle split and a proportional split of 1000 grams pulverized to 85% passing through a 75 micrometer screen from which the sample for analytical digestion was taken. All of the 54 rocks were reported in ALS Canada Ltd file VA21326842 as secure pdf certificates of analysis and csv files sent to the author by e-mail. Whole rock samples were analyzed by whole rock method CCP-Pkg01 in the sample series J490288 to J490295, and mineralized samples by MEMS61 in the series J490400 to J490445.

The 46 mineralized rocks were analysed for 48 elements by ALS protocol ME-MS61 (Inductively coupled plasma - mass spectroscopy "MS"). ME-MS61 involves a 4 acid dissolution in $H_3ClO_4$ -$HNO_3$ - HCl; followed by the evaporation to dryness of the digest solution and then an

HCl leach of the residue to create the analytical solution. Analytes reported above the dynamic range of the ICP-MS instrument for ME-MS61 in 29 samples and were reanalyzed using ME-OG62 4 acid dissolution and ICP-AES analysis for Ag, Cu and Zn. Four samples above 100 ppm Ag were reassayed by Ag-OG62, 28 samples above 1% Cu by Cu-OG62 and 3 samples above 1% Zn by Zn-OG62.

Whole rock analysis of 8 samples collected by the author utilized ALS method CCP-Pkg01 which involves selected procedures for each type of element to ensure complete dissolution of particular elements from the refractory minerals, and the measurement of each element by methods appropriate to avoid analytical overlaps. Major elements were measured by fusing a portion of the rock powder with lithium metaborate prior to dissolution and ICP analysis. Trace elements, and REEs were analyzed by 2 ICP MS methods involving either direct dissolution of an aliquot of the rock powder or of the lithium metaborate fused powder. Carbon and Sulphur were analyzed by Leco furnace and IR spectroscopy.

For the rock samples, quality control was ensured by XRF spot analyses, and representative pieces of each sample. No other QA/QC procedures were deemed to be necessary prior to submission of either the 46 mineralized rocks or the 8 whole rocks samples considering the diversity of sample types and small size of the datasets.

The analytical laboratory QA/QC procedures included inserting into the laboratory sample stream a series of appropriate certified rock standards that allow a statistical assessment of accuracy relative to established concentrations of various elements. Precision is assessed by the degree of variation of concentrations reported for an element in successive analyses of the same standard and by reanalysis of a small number of randomly selected field samples. The monitor contamination, ALS inserts a series of blanks in the laboratory analytical stream which are analyzed for all elements. Elements that returned concentrations above the analytical limit for ME-ICP61 or ME-MS61 were reanalyzed using a sequence of quantitative methods for higher concentrations of base and precious metals as required.

ALS is a certified commercial lab with ISO 9001:2000 certification and no connection to Questcorp or the author other than a regular service provider - client relationship. The laboratories in North Vancouver has also been accredited to ISO 17025 standards for specific laboratory procedures by the Standards Council of Canada (SCC). ALS is a subsidiary of ALS Global, which is a leading testing, inspection, certification and verification company head-quartered in Brisbane, Australia that services multiple industries globally and employs over 13,000 staff in over 65 countries.

# 12. Data Verification

The Technical Report includes data from the following categories:

- Historical exploration data including field geological descriptions, geochemical data for rocks and soils, geophysical data from Induced Polarization surveys and airborne magnetometer surveys, and diamond drilling.
- Current exploration data including 54 rock samples from the Property.
- Current exploration data from a Property-wide airborne magnetometer survey.

Historical data was generally in the form of maps and tables filed as assessment reports available in the public domain on the British Columbia Assessment Report Information System. Typically, no QA/QC data was presented with the geochemical data and the main presentation was as labelled points on grid maps in many cases with very imprecise reference points. Where possible these maps were georeferenced so that the data could be reviewed spatially with respect ot known geology of mineralization. Some larger datasets had been statistically analyzed by the authors to determine geochemical threshold and anomalous levels appropriate to the dynamic range and sensitivity of the analytical methods employed, which were different than those in current use.

For current geochemical data, the author compared the ALS Geochemistry analyses to spot analyses conducted by the author using a Niton ZL3t Model handheld XRF and found them to be consistent given the grade variations between the spots selected by the author for the XRF analyses and their proportion in relation to the heterogeneity of the much larger sample.

The geochemical data was examined by the author in statistical plots (box plots and correlation diagrams) and variation diagrams for trends and patterns that might highlight both natural variations and unusual inconsistencies in the individual data points.

The author's QA/QC review initially involved scanning the laboratory analytical data in tabular form for unusual trends indicative of laboratory cross contamination such as observing high concentrations of an element at the beginning of an analytical series (assuming that samples were run in order) that declined exponentially in successive samples. No unusual trends were observed, which was further confirmed by a lack of significant departure from normal values in the laboratory and marble field blanks. From reviewing the QA/QC data the author concluded that the analyses were statistically accurate and precise, and without external contamination as indicated by laboratory blanks. The author then reconciled the laboratory assays with the spot XRF analyses taking into account the small volumes represented by the XRF measurements and compared these to the small hand specimens. From this assessment the author concluded that the data set was representative of natural element concentrations in rocks.

The author compiled the analytical and sample coordinate data into ArcGIS and checked coordinates for plotting irregularities related to poor signals by variations in coordinates for fixed sites either over time or between GPS units. Generally, it was acknowledged that under adverse conditions the Garmin 64 coordinates were more precise. For the actual assay data, the author replaced element concentrations that were reported as below detection limit (e.g. <10 ppm) with a numerical value of half the detection limit (e.g. 5 ppm) to allow numerical processing of the data. The data were then statistically and graphically analyzed for significant variations and plotted on geological maps of the showings.

The geophysical data was verified by examining the internal consistency of the maps compared to known geology and expected responses, and evaluating the logistics and methodology reports accompanying the data. The author also directly communicated with the geophysicists who conducted the UAV Magnetometer surveys to inquire about conditions on the surveys, equipment issues, and characteristics such as sensor height. As well, the new magnetometer survey data were compared with data from older surveys and found to be consistent, but at much higher resolutions.

In the author's opinion the quality of the data collected is wholly adequate for verifying and augmenting previous geological mapping and assessing the grades of mineralization in known showings. The work is appropriate for the purposes of early stage exploration of the North Island Copper Property as laid out in this Technical Report (pursuant to item 12 (c) of Form NI 43-101 (F1)) within the limitations described by the author regarding analytical methods used.

## 13. Mineral Processing and Metallurgical Testing

There has been no recent extraction of rock for the purposes of mineral processing or metallurgical testing undertaken on the North Island Copper Property.

## 14. Mineral Resource Estimates

No mineral resource estimates have been calculated in the current work on the Property.

## 15.

**This section is not relevant to this Report.**

## 16.

**This section is not relevant to this Report.**

## 17.

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## 22.

**This section is not relevant to this Report.**

# 23. Adjacent Properties

## 23.1 Introduction

Information on adjacent and regional mineral tenures has been taken from the *Mineral Titles Online* website, and downloaded GIS files of current tenures provided by the BC government. Additional information is taken from Minfile records available in the *Mapplace* website (https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/british-columbia-geological-survey/mapplace) and individual mineral exploration company websites.

The region has been actively explored for over a century and the district was the site of a significant mining operation from 1970 to 1994 at Island Copper. Currently, mineral tenures form a continuous block almost 80 kilometers long and 10 to 15 kilometers wide along the entire north side, and some of the south, of Holberg Inlet to the west-northwest (Fig. 3). Most of the claims, 210 out of 283, are in one 33,560 hectare property owned by North Island Mining aka North Isle Copper and Gold Inc which encompasses the significant Hushamu and Red Dog porphyry copper deposits. The continuously claimed area in the Hushamu - Red Dog belt is

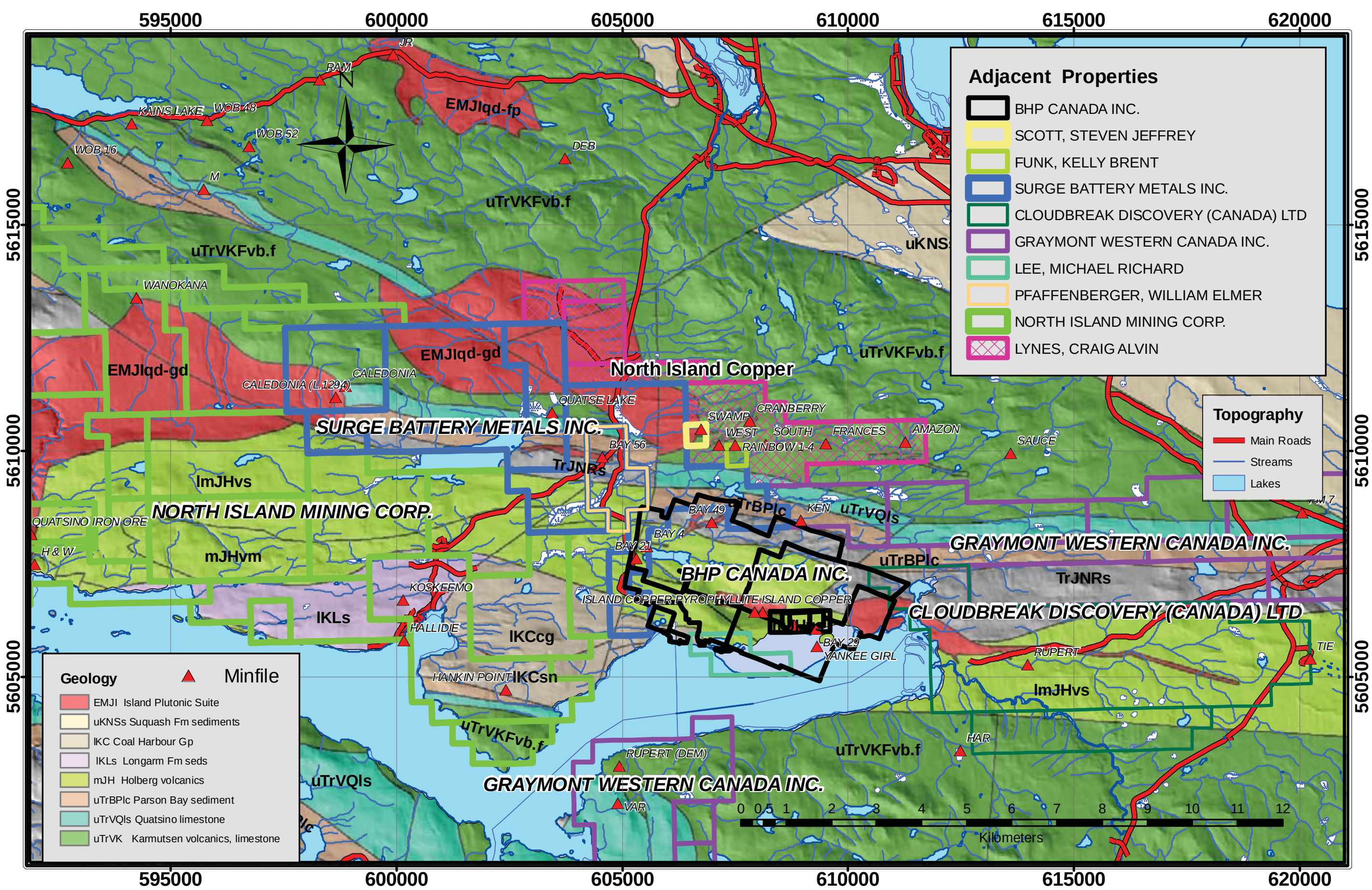


**Figure 60: Adjacent Properties to North Island Copper Property**
The map shows the mineral tenure situation as of June 14, 2022 in the North Island Copper district. Tenures are outlined in colours shown in Adjacent Properties legend. Legend descriptions are the owner names. Major properties are labelled on the map. Minfile mineral showings, occurrences and prospects are indicated with red triangles and labelled with the Minfile name. Simplified geological units are shown in the legend, labels show unit designations. The BHP Canada Inc. property is the former Island Copper mining leases.
Drawn by the author in ArcGIS 9.3 using current BCGS and Mineral Titles GIS files..

76,670 hectares. BHP Canada owns the mining leases on the closed Island Copper Mine.

Within 10 kilometers of the center of the Property (Fig. 60) smaller claim groups are owned by Surge Battery Metals Inc., Graymont Western Canada Inc., and a handful of single claim holders. Two single cell claims on the border of the Property are owned by S,J, Scott and K.B. Funk. The Scott claim is on the Swamp showing, the history of which was reviewed in Item 6.2.9, and is inset into the western border of the Property. Funk owns a cell claim inset into the southern border of the Property, which covers ground east of the Crook Road map area explored on the Property in 2021. On the shore of Rupert Inlet, M.R. Lee owns a claim that appears to only cover some of the waste rock from the Island Copper Mine. Surge Battery Metals Inc is a junior exploration company who has optioned the claims shown in Figure 60 from Jonathan Shearer, prospector. The property encloses an inlier claim owned by W.E. Pfaffenberger. Minor work has been completed on the Caledonia skarn showings and percussion drilling is planned. Graymont Western Canada Inc. is a limestone products company interested in quarrying potential in the belts of Quatsino Formation limestone southeast of the Property and south of Rupert Inlet. Cloudbreak Discovery is a project-generating junior exploration company that owns claims east of the old Island Copper Mine. Several Minfile occurrences are located within the claims, but no recent work has been accomplished and the claims are potentially being optioned as a listing property by Buscando Resources (news release on www.cloudbreak-discovery.com).

## 23.2 Island Copper

The most geologically significant property in the immediate vicinity is the BHP-owned Island Copper Mine. It was discovered in the 1960s, and operated between 1971 and closure in 1993. The copper-molybdenum porphyry system is characterized by early stage, pervasive magnetite-rich alteration and veinlets over a 700 m wide by 450 m high space centered in a large dacitic dyke of the Island Plutonic Suite and extending into surrounding volcanic strata of the Bonanza group, Holberg volcanics (Fig. 61: Arancibia and Clark, 1996). Later, main stage potassic alteration formed an annular zone of about 150 meter width, associated with the economic chalcopyrite-pyrite stockwork veinlet mineralization. The author has not been able to verify the Island Copper information and this information is not necessarily indicative of the mineralization on the Property.

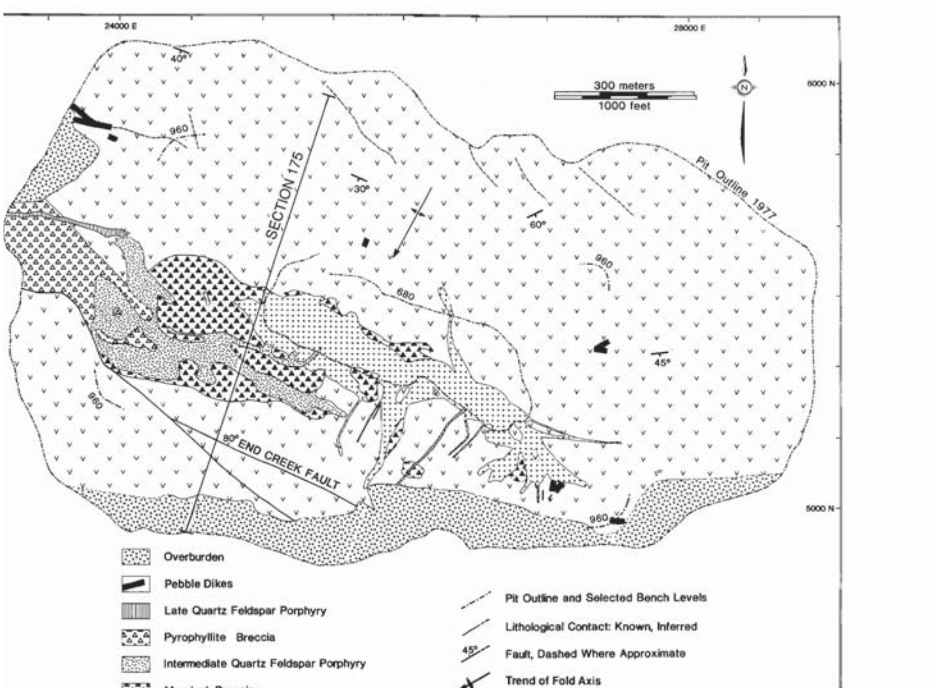


**Figure 61: Geological Map of the Upper Levels of the Island Copper Mine Open Pit**
Map from Fig. 3 of Arancibia and Clark (1995) shows the elongate complex of intrusive igneous rocks and breccias cutting the Holberg volcanics of the Bonanza Group, which are consanguinous with the Island Plutonic Suite.

## 23.3 Surge Battery Metals Inc.

The Surge property lies adjacent to the south and west border of the North Island Copper Property covering rocks within the Quatsino Formation, Nahwitti wackes, Holberg volcanic unit as well as parts of the Quatse Pluton and Karmutsen Formation. The property was actively explored during the period of the Island Copper Mine operations. The Quatse Lake and Caledonia showings are located within the Property. Quatse Lake (Minfile 092L 173) is south of the main body of the Quatse Lake pluton in Quatsino formation limestone and is prospective for its industrial mineral potential. The Caledonia showing (092L061) is classified variously a Cu skarn, a Pb-Zn, or a replacement type Pb-Zn-Ag manto deposit. A percussion drill hole in 2010 recovered a 3 meter interval that graded 2.35 % Cu, 200 g/t Ag, 0.76% Pb and 2.3 % Zn. Historically, dating back to the 1920s when at least two exploration adits were driven, surface samples have reported significant copper and silver grades. The skarn is characterized by a retrograde assemblage of epidote-chlorite-garnet-actinolite skarn hosting sphalerite, chalcopyrite, magnetite, specularite, bornite, galena, tennantite and pyrite mineralization at a contact between Quatsino limestone, Karmutsen volcanics and granodiorite of the Island Plutonic Suite (Flower, 2019). The author has not been able to verify the Surge Battery Metals information and this information is not necessarily indicative of the mineralization on the Property.

## 23.4 North Isle; Pemberton Hills

The North Isle property extends WNW from nearby the Island Copper mine site for about 40 kilometers. The Hushamu porphyry copper deposit is about 25 kilometers west of the Property (Fig. 23), and Red Dog about 35 km west. The deposits are described in Minfile reports and on the NorthIsle Copper and Gold Inc, website (*Northisle.ca*)as occurring in a high level porphyry system, meaning that the deposits were both formed at high levels in the crust and that the present level of exposure is near the top of the mineralizing environment. Hushamu is classified as a copper-gold-molybdenum porphyry, and described as centred on a breccia complex related to the Island Plutonic Suite intrusions. Alteration facies recognized at Hushamu vary

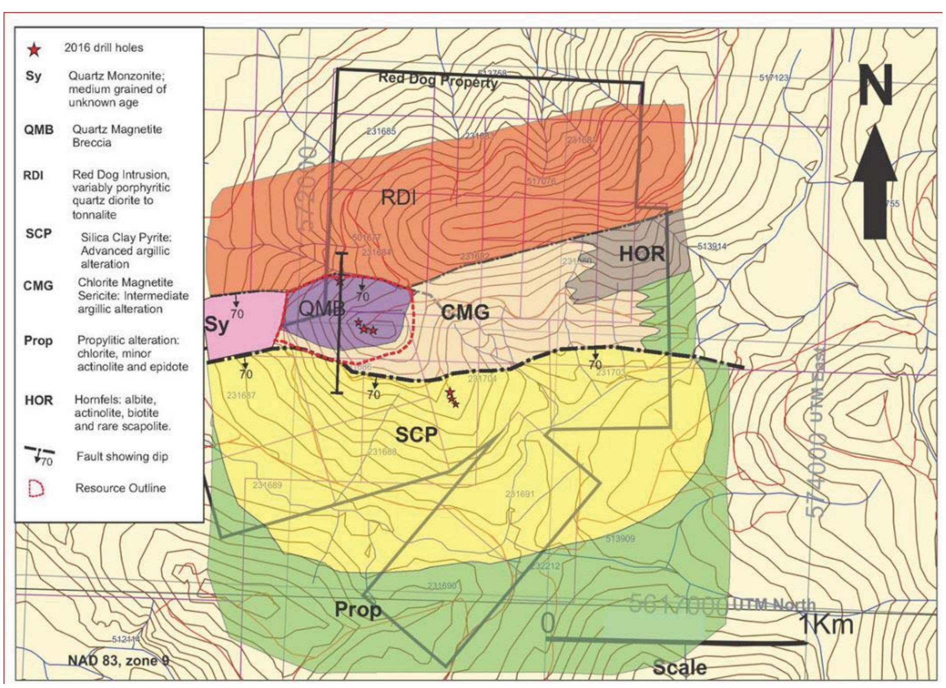


**Figure 62: Red Dog alteration Zones**
Map from the NorthIsle website (*Northisle.ca*) showing a quartz magnetite breccia body (QMB) adjacent to the Red Dog intrusion, and zones of argillic (CMG) and advanced argillic (SCP) alteration.

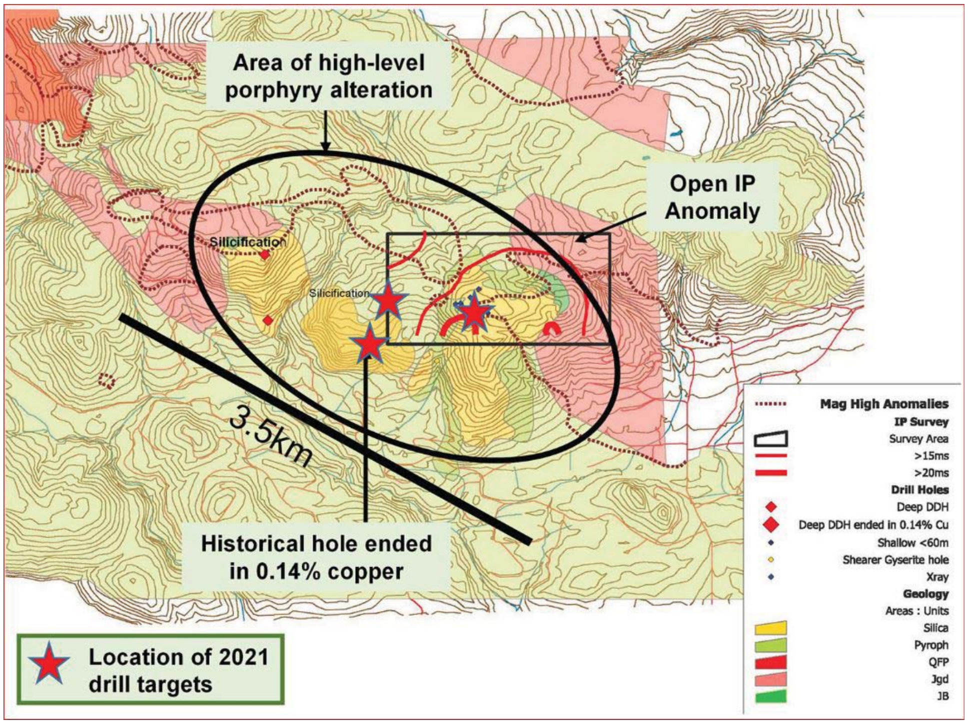


**Figure 63: Pemberton Hills alteration zones**
Map is from the NorthIsle website *Northisle.ca* showing an area of advanced argillic alteration characterized by silicification and pyrophyllite alteration

from early potassic alteration characterized by biotite- K-spar and magnetite to later chlorite-sercite alteration and finally, advanced argillic, characterized by pyrophyllite. high in the system and above the known mineralization. Advanced argillic alteration is commonly associated with high level epithermal mineralization, which has been discovered in the Pemberton Hills about 5 km east of Hushamu. The advanced argillic alteration in the Pemberton Hills extends over a 3.5 by 1.5 km area, altering Triassic Holberg Group volcanics, and is hypothesized to overlie porphyry style mineralization. The Red Dog deposit also has advanced argillic alteration nearby a mineralized quartz-magnetite breccia body adjacent to a quartz feldspar porphyry intrusion. Resource estimates have been established for Hushamu and Red Dog, but they are not currently economic. The author has not been able to verify the North Isle information and this information is not necessarily indicative of the mineralization on the Property.

# 24. Other Relevant Data and Information

There is no additional relevant data or information known to the author that is not disclosed in this technical report on the North Island Copper Property.

# 25. Interpretation and Conclusions

## 25.1 Property of Merit

The North Island Copper Property is located at the eastern end of a west-northwest trending belt of Jurassic porphyry copper, skarn and epithermal deposits that includes the past producing Island Copper porphyry copper-molybdenum deposit, and the Hushamu and Red Dog porphyry copper prospects. The North Island Copper Property is a property of merit on account of two types of mineralization which occur on the Property:

1. The Quatse Lake diorite to granodiorite pluton at the west end of the Property hosts chalcopyrite and molybdenite mineralization in porphyry style veinlets; and in the central part of the Property chalcopyrite occurs in massive to disseminated form associated with magnetite and sphalerite in garnet-pyroxene skarns at marble – basalt and marble – granodiorite contacts. The porphyry mineralization was drilled in a single program in the 1990s and produced grades of xx over yy meters in a part of the pluton associated with a significant IP anomaly. The mineralization was not fully delineated and warrants further exploration.

2. Copper skarn mineralization consists of pods and lenses of chalcopyrite associated with massive magnetite in garnetites replacing marble in zones possibly proximal to dioritic dykes and within 800 meters of the Quatse Lake pluton intrusive contact. Significant high grades of copper ranging from a few percent to 17 percent in massive lens in magnetite, and sporadic lead and zinc associated with the chalcopyrite are common in the many skarn bodies. The skarns are in marbleized limestone within a kilometer of the Quatse Lake Pluton, and form interflow sediment layers in the upper Karmutsen Formation.

## 25.2 Conclusions

Several copper skarn showings were examined and mapped in the current and previous work including the previously named Rainbow, Cranberry, South, and Skid although contact details of the skarn bodies were obscured by dense second growth forest and undergrowth. The Rainbow showing is the most extensive and well exposed skarn mineralized limestone horizon, with mineralization in numerous lobes found over a strike length of 500 meters within the 25 to 40 meter thick limestone lens. The Cranberry showing includes 2 limestone beds that may be fault repetitions of a single bed, and extends for about 200 meters also in a 20 to 25 meter thick limestone bed. Other showings are less exposed in low lying areas including the South which is bordered by creeks and swamps. Grades in the copper skarns where chalcopyrite is observable range from about 2 percent, where disseminated in garnetite, to 17 percent in massive sulphide - magnetite lenses within the skarn bodies. Sporadic zinc and lead grades were also observed in some samples, but no distinct zoning or contact relations could be observed. Magnetite is a common skarn mineral occurring as a replacement of garnetite which is generally composed of calcium-iron bearing andradite garnet. .

The drone / UAV magnetometer survey of three selected areas of the Property was completed in March 2022 and significantly enhanced resolution of magnetic features within two of the areas, while confirming a relatively “flat” structure in the third. In Area 1 which encompasses the Rainbow and other skarn showings, the combined data from the TMI and 1VD images revealed a strong ENE fabric at intervals of 100 to 200 meters. The fabric appears to correspond to a trellis pattern of streams in the area and the approximate contact of limestone lenses against basalt. The streams likely follow less resistant layers in the Karmutsen, probably limestones, which are generally 50 meters in thickness, which show the effects of karst formation where they are exposed. The streams are coincident with the south side of high gradient features on the 1stVD. Probably, the high gradient lines represent the contact between south dipping limestones on the south and basalt flow to the north. However, not all of the mapped limestone lenses found within the area correspond to magnetic lows or the south side of high gradient anomalies. Individual skarn bodies are not detected and inferred to be below the resolution of the survey.

The magnetic fabric may also reflect dykes from the Quatse Lake Pluton, the most easterly contact of which lies just inside the western border of the Property and the survey limits of Area 1. The Quatse Lake Pluton has generally relatively low magnetic susceptibility compared to Karmutsen basalt in the Area 1 survey block where the Rainbow and Cranberry showings are located, which suggests that some linear lows may be dykes. The generally higher TMI of the Karmutsen in Area 1 also contrasts with lower TMI in Karmutsen to the east in Area 3, which suggests that Area 1 has been affected by contact metamorphism, perhaps hornfelsing the volcanics and also reacting with calcareous sediments to produce skarns.

## 25.3 Risks and Uncertainties in the Interpretation of the Exploration Results

The current exploration information has confirmed previous sample grade data and geology obtained for the copper skarn showings. Grades of mineralized samples, and observed textures and mineralogy of both mineralized and alteration facies have been shown to be consistent with previous interpretation of the showings as copper skarns. The main risk for ongoing exploration is in over-extrapolation of the grades of the Historic and current Exploration samples to larger bodies of the skarn. The next stage of exploration should attempt to determine the representivity of the samples by more detailed geological mapping of skarn facies. For the skarn prospects, the project viability does not hinge on uncertainties or risks in the integrity of the current exploration information.

In the area of the Quatse Pluton, previous diamond drilling intersections and geophysical exploration data showed potential for low to modest grade copper porphyry mineralization that merits further evaluation. The current drone magnetometer survey shows a strong magnetic low on the area of the potential porphyry mineralization. Surface geology and rock sample geochemistry are consistent with interpretation of the pluton as a calc-alkaline dioritic body with variable hydrothermal alteration. The rock sample geochemistry from both current surface sampling and historic exploration drilling have a low degree of analytical uncertainty and there is little risk in this data that affects any degree of confidence in the exploration model. The new drone magnetic data is consistent with previous property data and recent regional airborne magnetometer surveys, suggesting that there is little uncertainty in the interpretation of a magnetic low in the core of the pluton.

The viability of the project is not subject to uncertainties in any of the current or previous exploration information.

# 26. Recommendations

## 26.1 Exploration Priorities and Methods

Continuing exploration in the eastern part of the Property should focus on determining the extent of the limestone lenses and their relation to the lineaments interpreted from the UAV magnetometer survey. The degree of marbling and concentration of calc-silicate mineral assemblages, which may be an indicator of proximity to the Quatse Lake pluton or dykes and smalls plugs from the pluton that may be associated with skarn mineralization. The TMI of the Karmutsen is higher near the contact, which may be indicative of contact metamorphism as well as formation of magnetite-bearing copper skarns. The skarns appear to be geochemically zoned and limited to within a zone less than 1 kilometer from the Quatse Lake pluton, although dykes and other apophyses of the pluton may extend the distance.

Detailed geophysical and soil geochemistry surveys should be focused in the immediate vicinity of contacts predicted by the drone survey. Initially, orientation surveys of both magnetic and geochemical surveys should be conducted around known showings and contacts to determine optimum intervals between reading and sample sites. The contacts between the basalt and the marble should then be explored by densely-spaced ground magnetometer surveys, soil geochemistry, or possibly using Induced Polarization – Resistivity (IP) surveys. Magnetometer readings should differentiate between limestone and basalt across contacts, and sporadically detect magnetite skarn bodies. IP surveys may directly detect sulphide or magnetite bodies and disseminated sulphide mineralization in fractured garnetite, but should use a short array with an "a" spacing of 20 meters or possibly less and measure at 1 to 6 intervals. Soil surveys have been shown to be effective in the area, but the deep organic overburden prohibits efficient widespread use. Sampling should be minimized to contact zones defined by the magnetometer surveys with orientation style sampling around showings.

In the Quatse Lake pluton itself previous exploration work included diamond drilling and IP surveys both of which supported an interpretation of porphyry style mineralization. The main area of interest is in relatively dense bush traversed by a creek and will require considerable logistical efforts. The previously discovered mineralization should be validated by traversing the creek prospecting and mapping surface mineralization and by defining alteration related to mineralization using lithogeochemistry and petrography. IP survey lines across the strike of the magnetic low work should be the primary tool for targeting porphyry type mineralization in the pluton.

## 26.2 Recommended Program and Budget

The program will require coordination between a geologist and an IP geophysical contractor. The most efficient place to start would be on the Rainbow showing via the Doreen Lake road, which entails a 1 kilometer hike from the former bridge to the showing along good open road. The geologist could start by mapping the area and working out sensible lines across the Rainbow zone for a couple of IP orientation lines perhaps 600 to 800 meters in length. IP lines could also be tested parallel to the strike of the zone to assess detection of sulphide and magnetite bodies. Soil sampling should be focused along the length of the zone with detail sampling in undisturbed ground around known showings. Mapping should range into the areas north of the Rainbow zone where lineaments have been defined to determine is any potential exists for other lenses.

IP work on the Rainbow zone would likely take 4 days for a couple of longitudinal lines and several cross lines. Geological mapping and soils sampling could be done concurrently.

In the Quatse Lake Pluton access is west of the Coal Harbour Road to the focus area in the core of the mag anomaly. Geological work should focus on finding outcrops in the zone and traversing the main creek. IP lines should be run perpendicular to the mag low and be about 1.2 kilometers in length. An “a” spacing of 50 meters should be used with conventional n=1 to 6 interval measurements and with lines spaced 100 meters apart. IP work could be expected to take 5 days depending on the bush.

The budget for the survey work is shown in Table 9. A geologist and at least one assistant should be hired for a minimum of 18 days. Geophysical work should expect to be contracted for 10 days with 2 days for mobilization.

| **Item** | **number** | **rate** | **Cost** |
|---|---:|---:|---:|
| Geologist | 22 | $1,000.00 | $22,000.00 |
| Assistant | 20 | $550.00 | $11,000.00 |
| Assistant | 20 | $550.00 | $11,000.00 |
| IP &mag Survey | 10 | $4,130.00 | $41,300.00 |
| Mob-demob geophysics | 2 | $2,050.00 | $4,100.00 |
| Camp/accommodation | 20 | $500.00 | $10,000.00 |
| transport crew | 20 | $200.00 | $4,000.00 |
| Geochemistry; soils | 200 | $42.95 | $8,590.00 |
| Geochemistry: rocks | 30 | $48.15 | $1,444.50 |
| contingency | 6 | $1,000.00 | $6,000.00 |
| **TOTAL** | | | **$119,434.50** |

**Table 9:** Recommended Budget for the North Island Property Exploration

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# Certificate of Qualified Person

## Statement of Qualifications: Hardolph Wasteneys Ph.D., P.Geo.

I, Hardolph Wasteneys, Ph.D, P.Geo., resident near Strathcona Park Lodge, Upper Campbell Lake at 40960 Gold River Highway, Campbell River, British Columbia, do hereby certify that my qualifications, stated below, apply to the National Instrument 43-101 F1 Technical Report on the North Island Copper Property, Northern Vancouver Island, British Columbia (the “Technical Report”) authored by me with the effective date of July 27, 2022.

1. I am a self employed Professional Geoscientist registered as a member of the Association of Professional Engineers and Geoscientists of British Columbia, member number 32102, and have worked primarily in mineral exploration, mining, geological and U-Pb geochronological research, and geological education since 1976.
2. I graduated with the degree of Bachelor of Science in Geological Engineering, Mineral Resources option from the Faculty of Applied Science, Queen’s University, Kingston in 1979 by which date I had 10 months of geological field experience in Ontario, British Columbia and NWT.
3. My degree of Doctor of Philosophy was granted by Queen’s University, Kingston in 1990 in the field of economic geology with research specialized in the study of epithermal ore deposits and shoshonitic volcanics of southern Peru under the supervision of Prof. Alan H. Clark. My research work involved 3 months of field work at a remote mine.
4. In post-doctoral research I worked at the Jack Satterley Geochronology Laboratory in the Royal Ontario Museum directed by Dr. T. E. Krogh from 1990 to 1997 in the field of U-Pb geochronology and completed numerous independent studies on the timing of ore deposition and regional metamorphism in collaboration with university and government survey geologists and resulting in several publications in peer reviewed international journals.
5. I have read the definition of “Qualified Person” set out in National Instrument 43-101 Standards of Disclosure for Mineral Properties (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “Qualified Person” for the purposes of NI 43-101.
6. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
7. Relevant field experience for evaluation of the North Island Copper Property includes exploration and research in volcanogenic massive sulphide deposits at Palmer (Haines AK, 2006 to 2009 and 2020), in magmatic hydrothermal deposits at Brynnor (iron skarn 2008-2009 Vancouver Island), copper skarns and porphyries (Galore Creek, 2011; Vancouver Island, ongoing), molybdenum porphyries (Cassiar, 1979) and exploration for porphyry copper deposits in the Dease Lake area (2013-2014).
8. I have no beneficial interest in Questcorp Mining Inc., am independent of the entities applying all of the tests in Section 1.5 of NI 43-101 and hold no interests in any aspects of the North Island Copper Property.
9. I have not had prior involvement with the North Island Copper Property that is the subject of the Technical Report.
10. I am responsible for all aspects of the Technical Report including my presentation and interpretation of the Questcorp Mining Inc. field data
11. I visited the North Island Copper Property between November 7 and 23, 2021 for the purposes of this Technical Report.
12. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
13. I am familiar with the North Island Copper Property held by Questcorp Mining Inc. having completed geological mapping and sampling on the property in November 2021.

"***Hardolph Wasteneys***"

PROFESSIONAL
PROVINCE OF
Dr. H. A. WASTENEYS
#32102
BRITISH COLUMBIA
GEOSCIENTIST

# Consent Form

To: British Columbia Securities Commission

Alberta Securities Commission

Canadian Securities Exchange

Dear Sirs/Mesdames:

Re: Questcorp Mining Gold Corp. (the “Issuer”)

I, Hardolph Wasteneys, Ph.D., P.Geo, do hereby consent to the public filing of the technical report entitled “NI 43-101 Technical Report on the North Island Copper Property, Northern Vancouver Island, Central British Columbia” and dated effective July 27, 2022 (the “Technical Report”) by the “Issuer” with the securities regulatory authorities referred to above. I do further hereby consent to the use of extracts from, or a summary of, the Technical Report, in the preliminary prospectus of the Issuer dated ________________ (the “Preliminary Prospectus”) and to being named in the Preliminary Prospectus. I confirm that I have read the Preliminary Prospectus and that the disclosure in the Preliminary Prospectus fairly and accurately represents the information in the Technical Report that supports the disclosure in the Preliminary Prospectus. I have no reason to believe that there are any misrepresentations in the information contained in the Preliminary Prospectus that is derived from the Technical Report or that are within my knowledge as a result of the services performed by me in connection with the Technical Report.

Hardolph Wasteneys, Ph.D. P.Geo.

______________, 2022

Date and Signature Page

**Effective Date of this Report:** July 27, 2022

**Last Revision Date:** July 27, 2022

**Date of Signing:** July 27, 2022

"*Hardolph Wasteneys*"

Hardolph Wasteneys Ph.D. P.Geo.