# NI 43-101 TECHNICAL REPORT MAPLE BAY PROPERTY

Stewart District, British Columbia

Latitude: 55° 26' N, Longitude: 137° 00' W UTM 436720 m E, 6143505 m N, Z.9 NAD83

for

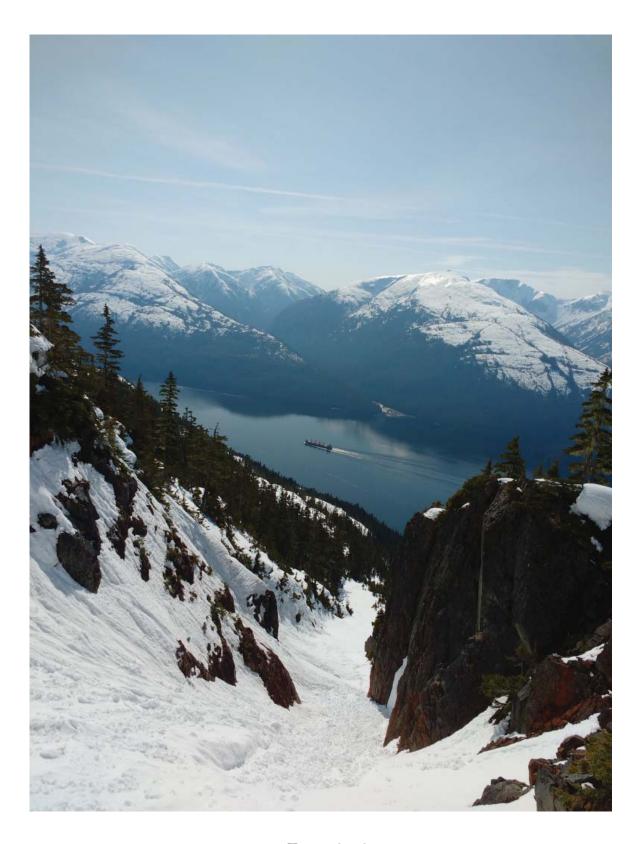
# Golden Opportunity Resources Corp.

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by

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Effective Date: September 28, 2018



# **Frontispiece**

Looking down Princess Creek Canyon from 800 meters west across the Portland Canal. A freighter is sailing south from Stewart carrying concentrates from the Pretium Resources Brucejack Mine in northwest British Columbia.

# **Table of Contents**

1.0 Summary	1
2.0 Introduction	3
3.0 Reliance On Other Experts	4
4.0 Property Description and Location	5
5.0 Accessibility, Climate, Local Resources, Infrastructure, Physiography & Suitability for Mining	
5.1 ACCESSIBILITY	
5.2 CLIMATE	
5.3 LOCAL RESOURCES	
5.4 INFRASTRUCTURE12	2
5.5 PHYSIOGRAPHY12	
5.6 SUITABILITY FOR MINING OPERATIONS	
6.0 History	
7.0 Geological Setting and Mineralization	. 24
7.1 REGIONAL GEOLOGY24	4
7.2 Geology of the Maple Bay Area29	
7.3 Lithogeochemistry of Maple Bay Rocks3	
7.4 Maple Bay Veins	
Blue Bell 103P-242	
Eagle-May Queen 103P-043	
Friday 103O-009	
Outsider 1030-018 Star 1030-019	
Princess 103P-0484	
8.0 Deposit Types	. 41
9.0 Exploration	. 42
9.1 Introduction	2
9.2 Field Traverses	
10.0 Drilling	. 48
11. Sample Preparation, Analyses and Security	. 49
11.1 Geochemical Analyses4	
12. Data Verification	. 50
13. Mineral Processing and Metallurgical Testing	. 50
14. Mineral Resource Estimates	. 51
15. Adjacent Properties	. 51
15.1 Anyox	
15.2 Swamp Point aggregate property	
16. Other Relevant Data and Information	
17. Interpretation and Conclusions	. 53
18. Recommendations	
18.1 Recommended Budget50	
19. References	
20. Certificate of Qualified Person	
20. Certificate of Qualified Person	. 60
21. Consent Form	. 62

# List of Figures

Figure 1: Location Map - Maple Bay Property.	6
Figure 2: Claim Map – Maple Bay Property.	
Figure 3: Maple Bay Vein System	9
Figure 4: Maple Bay 1906	13
Figure 5: Drill section of the Eagle May-Queen vein.	14
Figure 6: Historical estimates reviewed by J.T. Mandy in 1956.	16
Figure 7: Newspaper clipping from late 1955.	17
Figure 8: Maple Bay Princess Vein System Geology from Grove 1971	19
Figure 9: Regional Geology of the Anyox Peninsula.	25
Figure 10: Geological Map of the Anyox Area, from BCGS Bulletin 63 (Grove, 1986)	27
Figure 11: Georeferenced Historical Vein and Mine Workings Map -Maple Bay Property	30
Figure 12: Geological Mapping 2018: Maple Bay Area South	31
Figure 13: Total Alkali Silica Plot of Middlemost, 1994) for classification of plutonic rocks	34
Figure 14: Nb/Y vs Zr/TiO2 diagram for classification of volcanic rock compositions for Maple Bay	34
Figure 15: Nb/Yb versus TiO <sub>2</sub> /Yb for the Maple Bay gabbros on the Pearce (2008) MORB discrimination diagram.	35
Figure 16: P <sub>2</sub> O <sub>5</sub> vs TiO <sub>2</sub> for the igneous rocks intrusive rocks at Maple Bay	36
Figure 17: Zr vs Y for the Maple Bay gabbros.	36
Figure 18: REE spider diagram for Maple Bay gabbros.	37
Figure 19: Primitive Mantle normalized REE patterns for 10 Maple Bay intrusive rocks.	37
Figure 20: Maple Bay field stations from the 2018 survey work.	43
Figure 21: Swamp Point area field stations, Maple Bay.	44
Figure 22: Pillowed flows, pillow breccias and interflow hyaloclastite beds in the intertidal zone at Maple Point	45
Figure 23: Eagle Creek Canyon.	45
Figure 24: Shear zone in narrow creek canyon southeast of Swamp Point.	46
Figure 25: In the upper reaches of Princess Creek, April 25, 2018.	47
Figure 26: Southern extent of the Swamp Point aggregate project	
List of Tables	
Table 1: Units and Abbreviations.	
Table 2: Coastal Copper Claim Status	
Table 4: Recommended Phase 1 Exploration Budget	

# 1.0 Summary

The Maple Bay Property (the "Property" or the "Maple Bay Property") of Golden Opportunity Resources Corp. (the "Issuer"), optioned from Rich River Exploration Ltd. ("Rich River" and Craig Lynes), is located 60 km south of Stewart, British Columbia within a geological entity known as the Anyox Pendant (the "Pendant" or the "Anyox Pendant"). The Property is a 1395 ha mineral claim named Coastal Copper and occurs along the mountainous eastern shore of the Portland Canal near Maple Bay. Mineral title within the Property covering a significant part of the historically documented vein system is held by 25 active Crown Grants owned by DLV Resources Ltd. While the Crown Grants exclusively own the mineral rights within their bounds, they share rights of access and occupancy for mineral exploration with the Coastal Copper Claim, which allows the Issuer to determine Property-wide geological information pertinent to discovery of new vein systems to which it would have mineral title. Pursuant to the Option Agreement (as defined below) the Issuer acquired a 51% interest in the Property for a \$5000 payment to Rich River as the stage 1 consideration. The remaining 49% interest in the Property can be acquired in stage 2 by payment of \$155,000 to Rich River, the issuance of 600,000 common shares in the capital of the Issuer and the completion of \$600,000 in exploration expenditures on the Property by the Issuer. A 3% NSR remains payable to the Optionors and can be purchased for a total of \$1,750,000.

The Pendant is a Paleozoic to Mesozoic volcanic and sedimentary succession preserved as a roof pendant or enclave within the Tertiary Coast Plutonic Complex. The eastern part of the pendant hosts the historically famous Anyox massive sulphide deposits that were mined during the period from 1922 to 1935 and produced 22 Mt of ore at grades of about 1% copper. Geologically the Anyox massive sulphide deposits are located in the basalt-dominated upper part of the Jurassic Hazelton Group volcanics and lie close stratigraphically to the conformable contact with overlying argillaceous turbiditic beds of the Bowser Lake Group. The Anyox VMS deposits are not indicative of mineralization in the Maple Bay area.

The western part of the pendant hosts large quartz veins near Maple Bay in highly deformed metavolcanic and metasedimentary rocks that are in part demonstrably Jurassic in age and correlatable with the Hazelton Group, but probably also include structurally interleaved strata and intrusive rocks of Devonian age. Mylonitic shear zones and gabbroic sills are spatially associated with the veins, but of unclear relationship. The veins are characterized by a strong chalcopyrite-pyrrhotite assemblage in massive to sucrosic quartz that cements brecciated rock fragments and are extensive in length, up to 1000 meters, and depth (a few hundred meters) and are typically several meters thick with concentrations of sulphides forming lenses near the footwall or hanging wall. Grades of mineralization are best indicated by historical production records from the Outsider Vein, which is located within the Coastal Copper Claim, where 125,966 tonnes grading 1.9 per cent copper were produced between 1906 and 1928. In the last two years of production the ore averaged 0.139 grams per tonne gold and 10.29 grams per tonne silver.

Exploration by the Issuer determined that the gabbroic sills associated with the veins are of the same N-MORB composition as the Hazelton Group basalts hosting the massive sulphide deposits at Anyox and therefore probably represent feeders for overlying flows that are absent in the central parts of the Maple Bay Property, but preserved along the coast. The deformed rocks through which they intrude are thus, probably, significantly older basement rocks and unrelated to massive sulphide deposition. The veins were probably emplaced during the deformation event that caused folding of the Anyox massive sulphide deposits and are younger than the Coast Plutonic Complex intrusions that envelop the pendant and form cross cutting dykes through the veins.

Several mineralized samples were collected in float near the Outsider vein that verify significant grades of copper mineralization in the veins. One sample contained 5 wt% copper, and 26 g/t silver in a quartz-pyrrhotite-pyrite-chalocopyrite assemblage. Another float sample from the same creek contained 0.8 % copper, 5 g/t silver and 0.3 g/t gold in a quartz-chalcopyrite-pyrrhotite assemblage. Samples from a spoil pile and from outcrops near a snow-filled adit on the Princess vein system also show significant grades of copper. The spoil pile sample contained 49% SiO<sub>2</sub>, 4.83% copper, 23% Fe, 18 g/t Ag, and 35 ppb Au. A sample 3 m from the portal in brecciated rock contained veinlets of quartz with chalcopyrite and pyrite and assayed 2.8% Cu, and 12 g/t Ag. Further from the vein in a brecciated massive dioritic textured rock with quartz-calcite veinlets was analysed at 90% SiO<sub>2</sub> indicating a high proportion of quartz veining and contained 2470 ppm Cu and 8 g/t Ag and 5 ppb Au.

The history of exploration on the Maple Bay Property dates back to the early 1900s and involved numerous campaigns of prospecting, diamond drilling and drifting along the veins with brief periods of production in 1906 and in the 1920s. Several drifts remain accessible, but no underground development work has taken place since the 1970s. Numerous attempts were made to define resources during the 1970s by reputable consulting firms and some diamond drilling and underground drifting was undertaken. Diamond drilling records and drill core have not been preserved and estimates of grade and tonnage, although geologically informative, do not conform to NI 43-101. The most recent geological work on the Property is primarily by researchers and geological surveys on the origin of important massive sulphide deposits at the nearby Anyox mining camp, cataclastic zones in the Anyox Pendant and the stratigraphy and structure of the Maple Bay area. Current work by the author established the origin of the gabbroic sills associated with the large quartz-copper veins explained above in this section.

A phased program of geological mapping and structural interpretation is recommended with a camp located in the alpine areas around the Princess vein system. The first phase would focus on producing a property-wide geological map with emphasis on structural interpretation of the vein systems exposed in the alpine areas of the Maple Bay Property and within the Crown Grants. The outcomes of the first phase exploration would include establishing the relationship of the veins to mylonite zones and gabbro sills and identifying other relevant features that might indicate the position of unexposed vein deposits. A budget of \$105,040 is recommended for phase 1. A second phase would be warranted if the first phase showed definitive results and could be used to verify the structural model as an exploration tool for blind vein systems, test grades of less well defined veins, and determine if acquisition of the Crown Grants by option or purchase is warranted.

# 2.0 Introduction

Craig Lynes of Rich River Explorations Ltd. is the sole owner of the Coastal Copper mineral tenure that is the subject of the Maple Bay Property, a mining exploration property in northern British Columbia. The tenure confers the right to occupy the surface of the claim to conduct exploration and development, but the Property also encompasses 25 active Crown Grant Mineral claims covering about 20% of the area of the Property. These Crown Grant Mineral claims hold mineral rights within their areas and such Crown Grant Mineral claims are not owned by the Issuer. In this technical report the description of the history of the present area of the Property, its geology and exploration potential includes essential information from the area of the Crown Grants that is inseparable from the remainder of the Property. For the purpose of maintaining a coherent narrative of historical exploration and development events, the "Property" includes all the ground within the bounds of the Coastal Copper claim (except an isolated one cell mineral claim), but subdivided into two classes, class A parts of the Property ("Class A"): within the Coastal Copper mineral claim, but outside of the Crown Grants; and class B parts of the Property ("Class B"): areas of the Coastal Copper claim covered by Crown Grants.

The Coastal Copper mineral tenure is the subject of a property option agreement (the "Option Agreement") between the Issuer, Craig Lynes and Rich River dated March 13, 2018. Accordingly, the author was requested by the Issuer to complete a NI-43-101 technical report on the Maple Bay Property to determine if it merited significant exploration expenditure as a qualifying property for an IPO by the Issuer. Judging from the history of small scale mining on the property in the early 20th century, a long history of sporadic exploration, development, and geological studies, but the lack of a detailed Property wide geological map along with outstanding geological uncertainties, the author decided that the field component of the technical report should involve several traverses to examine the geological setting of the mineralized systems.

In conjunction with detailed geological examination of the Property, all existing geological information was researched and evaluated in preparation of this report. Such information includes a variety of unpublished company geological reports and letters, British Columbia and federal government geological reports, geological maps and government claim maps. Information was also obtained from the web-based Map Place and Mineral Titles Online (British Columbia government websites) and government and corporate news releases. Historical information was gathered from mineral assessment work reports on file in the British Columbia Assessment Report Information System (ARIS) by companies that have completed mineral exploration programs within or proximal to the bounds of the current Maple Bay Property over the past 100 years. A list of reports, maps and other information sources used in the preparation of this report is provided in the References section of this report.

The author has not relied on other expert geoscientists or engineers for the contents of this report, but has referred to the work of various geological experts in its preparation, including Carol Evenchick Ph.D. of the GSC, and E.W. Grove and D.J. Alldrick of the BC Geological Survey, authors of geological papers and maps on the region. The author has also utilized maps, sections and documents obtained by Craig Lynes from private archives and Geological Survey Branch "Property Files" that were completed in the last 100 years showing the location of underground workings, surface traces of veins, and various assays, drill results and tonnage and grade estimates. The author believes that much of this earlier work was carried out to industry standards of the time.

The author examined the Maple Bay Property during the period from April 16 through April 27, 2018 to investigate the geology hosting the vein systems and review observations made by geologists from the GSC, BCGS and various company geologists. The author made personal

inspection of many outcrops throughout the Property (i.e. Class A and Class B) and immediate environs (i.e. outside the Property) as well as in the vicinity of known veins. The author also collected 19 rock samples for lithogeochemical analysis to investigate the petrology of related rocks and to verify the range of reported grades.

The author believes the information in this technical report remains accurate and is unaware of material change in the scientific and technical information prior to the filing date. The

	surement Units, Element Abbre- nd Acronyms used in this report are as follows:	Eu Hg La Mo Pb	Europium Mercury Lanthanum Molybdenum Lead
Measureme	ent Units:	Sb	Antimony
С	Celsius	Te	Tellurium
cm	centimetre	W	Tungsten
g/t	grams per tonne	Hg	Mercury
ha	hectares	Zn	Zinc
km	kilometre		
kg	kilogram	Acronyms:	
m	metre	AAS	Atomic Absorption Spectroscopy
mm	millimetre	ARIS	BC Assessment Report Index System
Ma	Million years ago	ASL	Above Sea Level
Mt	Million tonnes	BCGSB	B.C. Geological Survey Branch
ppb	parts per billion	EM	Electromagnetic
ppm	parts per million	EMPR BC	Ministry of Energy Mines and Petroleum
t	tonnes		Resources
		FA	Fire Assay
Element Ab	breviations:	GPS	Geographic Positioning System
Ag	Silver	Mag	Magnetometer
As	Arsenic	QA	Quality Assurance
Au	Gold	QC	Quality Control
Bi	Bismuth	RGS	BC Regional Geochemistry Survey
Ca	Calcium	UTM	Universal Transverse Mercator
Cd	Cadmium	VMS	Volcanogenic Massive Sulphide
Cu	Copper		

**Table 1: Units and Abbreviations.** 

# 3.0 Reliance On Other Experts

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 assumed to be correct and was last checked on September 25, 2018.

# 4.0 Property Description and Location

The Maple Bay Property (Figure 1) is located on the east side of the Portland Canal, 56 km south of Stewart, British Columbia and 125 km from Prince Rupert. The Property is located in 103P-08, 103O-05 centered near UTM Zone 9: 435720 m E, 6143505 m N, 55°26'N 130°00'W NAD83 datum. The Maple Bay Property consists of 1 claim, the Coastal Copper claim, which totals 1394.8 hectares and is the result of the amalgamation of 18 preexisting tenures on February 26, 2018 numbered 1022621, 1022622, 1022623, 1022624, 1022625, 1022626, 1022627, 1022628, 1022629, 1022630, 1022631, 1022632, 1022698, 1022699, 1023502, 1023505, 1023518, and 1032713. The claim surrounds a single cell claim held by a third party, C.H. Maddin FMC #116570, and is itself bordered on the landward sides by claims held by TA Mineral Resources Ltd FMC #217871. Twenty-five Crown Grants Mineral Claims (i.e. Class B of the Property) hold mineral rights within 363 hectares of the Coastal Copper Property and are described below in Table 3 and Figure 2 and in the text on page 7.

**Table 2: Coastal Copper Claim Status** 

Title Number	Owner	NTS Map	Issue Date	Good To Date	Status	Area (ha)
1058887	116233 - Lynes, Craig Alvin (100%)	103P-08; 103O-05	2018/Feb/26	2024/Nov/26	GOOD	1394.77

A mineral claim establishes subsurface rights to the owner for minerals (base and precious metals) as outlined in the *Mineral Tenure Act* (British Columbia). The Coastal Copper claim is in good standing as of the date of this report. Craig Lynes is listed as the owner of the Coastal Copper claim in the BC Mineral Titles On-line system (http://www.mtonline.gov.bc.ca/), the boundaries of which are predetermined geographically defined cells conforming to a fixed grid system within the provincial claim system. Neither the claim nor a property boundary has been surveyed or marked on the ground, nor is this required for resolution of property issues.

Mineralized zones within the Property are shown on Figure 3. These zones will be de-

DISTR LOT	LOT ID	LOT STATUS	CRWNGRNTNO	MINING DIV	PIN SID	CLAIM NAME	Area
577	800804	CROWN GRANTED	4173/712	SKEENA	1538620	MAY QUEEN	20.9
527	802062	CROWN GRANTED	6016/931	SKEENA	1535020	HARVEY	18.9
562	802063	CROWN GRANTED	900/879	SKEENA	1537550	STAR	14.7
564	802064	CROWN GRANTED	902/880	SKEENA	1537710	REGINA	22.2
565	802065	CROWN GRANTED	896/879	SKEENA	1537840	COPPER KING	23.5
566	802066	CROWN GRANTED	901/880	SKEENA	1537970	HOPE	20.9
567	802067	CROWN GRANTED	898/879	SKEENA	1538040	BROWN	14.5
568	802068	CROWN GRANTED	899/879	SKEENA	1538170	CONSTANCE FRACTION	2.6
569	802069	CROWN GRANTED	897/879	SKEENA	1538200	TUNNEL FRACTION	1.7
571	802137	CROWN GRANTED	7771/848	SKEENA	1538330	BLUE BELL	20.9
2877	801817	CROWN GRANTED	7459/845	SKEENA	1805920	COMSTOCK	10
2878	801818	CROWN GRANTED	8054/851	SKEENA	1806090	ANACONDA	12.8
2879	801819	CROWN GRANTED	6546/836	SKEENA	1806120	GERTIE	9.5
2880	801820	CROWN GRANTED	6545/836	SKEENA	1806250	LIZZIE	19
2881	801821	CROWN GRANTED	7769/848	SKEENA	1806380	MAPLE BAY FRACTION	4.4
2882	801822	CROWN GRANTED	7460/845	SKEENA	1806410	COMSTOCK FRACTION	10.5
489	801858	CROWN GRANTED	6324/834	SKEENA	1532130	PRINCESS MAY	13.4
500	801859	CROWN GRANTED	6325/834	SKEENA	1532840	PRINCESS ALEXANDRA	7.1
575	801860	CROWN GRANTED	6403/835	SKEENA	1538460	ROSE	20.9
576	801861	CROWN GRANTED	7768/848	SKEENA	1538590	THISTLE	19.2
578	801862	CROWN GRANTED	4302/199	SKEENA	1538750	EAGLE	20.3
579	801863	CROWN GRANTED	7529/846	SKEENA	1538880	SCOTLAND FOREVER FRACTION	4.2
580	801864	CROWN GRANTED	752/978	SKEENA	1538910	SUMMIT	16.6
581	801865	CROWN GRANTED	753/978	SKEENA	1539080	ELSIE	20.9
938	801870	CROWN GRANTED	6404/835	SKEENA	1571800	DUCK FRACTION	11.9

Table 3: Crown Granted claims within Coastal Copper claim 1058887.

The "Area" column highlighted in yellow is in units of hectares.

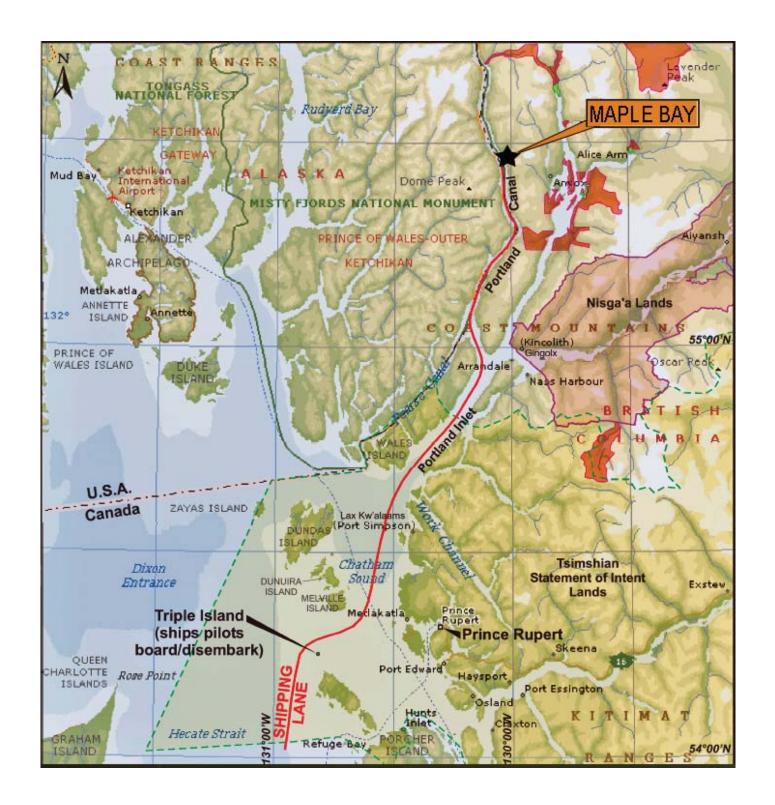


Figure 1: Location Map - Maple Bay Property.

The shipping lane route runs from Port Rupert to Stewart through Portland Inlet and Portland Canal. Map modified from a presentation by Ascot Resources on their Swamp Point aggregate project at Minerals North, April 2007.

scribed in more detail in subsequent sections of this report. There are neither mineral resources nor reserves, economic or otherwise, established on the Maple Bay Property or within the Crown Grants at this time, despite past production and numerous studies and exploration campaigns. Mine-related infrastructure exists on the Property in the form of old exploration and production drifts on several of the vein systems. Historical surface relicts consist of cables and tramming equipment from a 2 km tramway from one of the former mines to tidewater on the north shore of Maple Bay. It is the author's opinion that the Property covers sufficient area with ample water resources for mine-related infrastructure should the project advance to the mine development stage.

Although Craig Lynes of Rich River holds a 100 percent ownership in the Coastal Copper claim, 25 Crown Grant Mineral claims and fractions not owned by the Issuer exist within the Property covering many of the known vein systems. These Crown Grants cover an area of 361.4 hectares and are tabulated in Table 3 and shown in Figure 2. Current ownership of these Crown Grants is by DLV Resources Ltd as stated in their Management Discussion and Analysis document for fiscal year 2015. Results from preliminary searches on the British Columbia government website GATOR indicate the Crown Grants are considered active and as they do not appear in any gazetted list of reverted claims for the region, it is prudent to assume that DLV Resources Ltd. owns the mineral rights underlying them. As well, historical records and correspondence shows that the various Crown Grants have been the subject of various transfers of ownership and option agreements within the last 50 years. The author is unaware of any third-party agreements on these with either Craig Lynes or the Issuer. Similarly, the author is unaware of any outstanding Net Smelter/Profit returns or other royalties, payments or encumbrances to which the Coastal Copper claim or the various Crown Grants are subject other than those specified in the Option Agreement between the Issuer and Rich River (together with Craig Lynes, the "Optionor") dated March 13, 2018.

The Crown Grants are assumed to hold 100% mineral rights within their boundaries, but probably not surface rights. Significantly, the recorded holder of a claim has the right to occupy the surface of the claim to conduct exploration and development including with Crown Grant Mineral claims not owned by the mineral claim owner. The Crown Grant owner however, may object to someone exploring for what they may claim to be their minerals, as they too have similar, if not the same rights. Any such dispute would be a private matter that the two parties would have to sort out, but which may be beneficial to both parties since the Crown Grant owner may wish to sell their mineral title and the mineral claim owner may wish to acquire it. The owner of a Crown Grant Mineral claim has all of the rights that exist in their Crown Grant, which usually include a right to explore for, develop and produce all minerals, and may include the right to use timber and other resources, and occupy the surface for the purposes of mining and developing the minerals. Mineral rights with most Crown Grant Mineral claims are somewhat similar to modern day mining leases. A cell claim provides the exclusive right to explore and develop, and a mining lease conveys the rights to the minerals for production. Crown Grants are similar to leases in that they dispose of the minerals to the Crown Grant owner.

The mineral title listed in Table 2 is under option to the Issuer as outlined in the grant of Option Agreement. The Issuer acquired a 51% interest in the Property upon paying \$5,000 to the Optionor upon execution and delivery of the Option Agreement. In order to acquire the remaining 49% interest in the Property, subject to a 3% Net Smelter Return ("NSR") royalty, the Issuer must spend \$600,000 on exploration, make payments of \$155,000 and issue 600,000 common shares to Rich River at various milestones up to the fourth anniversary of the Issuer's listing of the Issuer's common shares on the Canadian Securities Exchange.

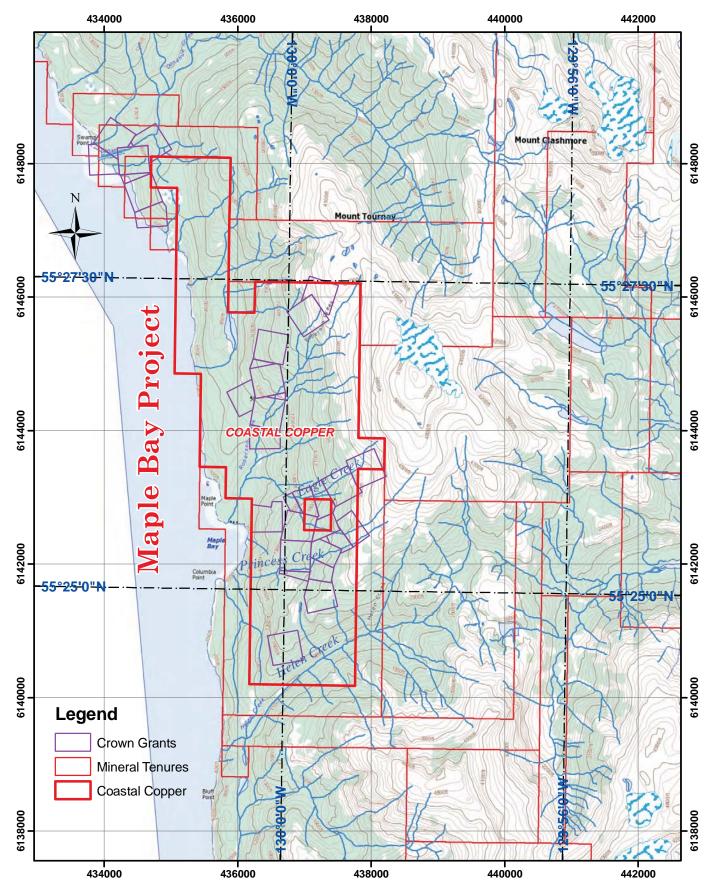


Figure 2: Claim Map – Maple Bay Property.

The Coastal Copper tenure of Craig Lynes is highlighted as shown in legend. Crown Grants within the Property are outlined in purple and listed in Table 3. Base topographic map sheets are NTS 103O-08 and 103P-05 Toporama Series available from the NRCAN website. Contours are at 100 foot intervals and UTM grid lines are spaced at 2000 m intervals. Map drawn by the author in ArcGIS 9.3, September 2018.

The Issuer will issue common shares as follows:

- 100,000 common shares to be issued upon listing;
- 100,000 common shares on or before the first anniversary of listing;
- 100,000 common shares on or before the second anniversary of listing;
- 100,000 common shares on or before the third anniversary of listing; and
- 200,000 common shares on or before the fourth anniversary of listing.

All share issuances made according to the above are to be made to Rich River.

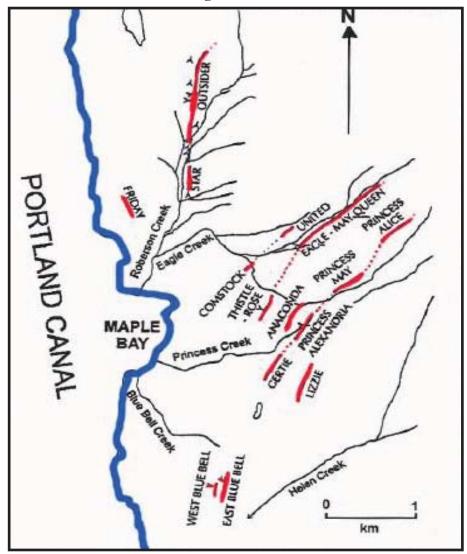


Figure 3: Maple Bay Vein System.

The major veins on which exploration and development work have taken place are indicated by thick red lines. Dotted lines indicate traced connections between thicker vein segments. The veins are labelled with their commonly known names. Map from a prospectus prepared by Craig Lynes (February, 2018).

The Issuer will make the following cash payments and work commitments:

- \$25,000 cash and \$200,000 exploration expenditure on or before the second anniversary of listing;
- \$30,000 cash and \$100,000 exploration expenditure on or before the third anniversary of listing; and,
- \$100,000 cash and \$300,000 exploration expenditure on or before the fourth anniversary of listing.

All cash payments will be made to Rich River.

The Issuer has also agreed to pay the Optionor a 3% NSR royalty upon earning a 100% interest in and to the Property. The Issuer may purchase the first 1% of the NSR for \$750,000 and the remaining 2% for an additional \$1,000,000.

Retention of the Property requires filing of Statements of Work with the BC Mineral Titles system reflecting expenditures on qualifying exploration and development work. On the basis of legislation in the Mineral Tenure Act the required work must amount to a minimum of \$5/ hectare/year for first 2 years the claims are held, and then \$10/ha/year for years 3 and 4, \$15/ ha/year for years 5 and 6, and finally \$20/ha/year for each subsequent year. Technical reports (assessment reports) must be filed and accepted after review by the BC Ministry of Energy and Mines describing the applicable work with cost statements justifying the exploration expenditures. A technical report for the Maple Bay Property was filed by the author in September, 2018 with Mineral Titles and was accepted by Geological Survey reviewer Ted Fuller (pers. comm.) on January 10, 2019 (BC MEM assessment report number 5696348).

Notice of Work applications will be necessary to permit future mechanically-assisted exploration (diamond drilling, trenching) and certain types of geophysical surveys (IP). The author believes that there are no significant factors that would impede expeditious granting of required permits by BC Ministry of Energy Mine and Petroleum Resources considering the previously disturbed nature of much of the Coastal Copper Property ground, proximity to a historically significant base metal mining camp at Anyox 10 km to the east, and a permitted potential aggregate extraction project at Swamp Point adjacent to the northern boundary of the claim. The author is unaware of other known liabilities, environmental or otherwise, on ground covered by the mineral claims making up the Maple Bay Property.

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# 5.0 Accessibility, Climate, Local Resources, Infrastructure, Physiography & Suitability for Mining

# 5.1 ACCESSIBILITY

The Maple Bay Property (Figure 1) is located on the east side of the Portland Canal 60 km south of the town of Stewart, British Columbia and 120 km from Prince Rupert by water or air (Figure 1).

The Property is located in 1:50,000 topographic maps sheet NTS 103P05 and 103O-08 centered near UTM zone 9 coordinates 435716 m E, 6142968 m N, or in latitude and longitude 55°25'N by 130°00'W all in the NAD 83 datum. Access to the Property from Stewart, BC at 55 56'09"N 129 59'27"W is via water on the Portland Canal, a 3 km wide fiord, or by helicopter or float plane. Docking sites may be found in Maple Bay on a graval bar at the outlet of Roberson Creek even at high spring tides, but the tidal range is up to 7 meters which could leave a boat stranded 50 to 100 meters from water if beached at high tide. Helicopter access is most practical and essential for alpine areas of the Property. Landing sites along the shore at low tides are readily found on the exposed intertidal zone while at extreme high tide few sites are available except on the above mentioned bar at the mouth of Roberson Creek. Helicopter landing zones are readily found in the alpine and in a few meadows on the coastal bench on the west side of the Property. During the recent investigations for this report toe-in site on snow avalanche deposits were found below the snow-filled gullies of major creeks.

Within the Property travel is difficult except along the lower reaches of Roberson Creek where tall mature trees have inhibited the growth of significant undergrowth. Elsewhere, steep old growth forested slopes are commonly impeded by deadfall. Perennial avalanche slide zones are densely overgrown by slide alder and broken or stunted spruce trees. Former trails used during the early days of mining have all disappeared.

# **5.2 CLIMATE**

The climate is classified as Humid-Continental at Stewart to West-Coast Marine in Prince Rupert with rainfall exceeding 180 centimeters per year at Stewart. Monthly average temperatures range from 0°C in January to 20°C in July, and precipitation averages over 180 cm per year, including about 60 cm of snow between December and March. Summers and winters are mild, but significant snow accumulation can occur in the town of Stewart. The uppermost slopes of Mount Tournay may be snow covered for up to four months of the year. During the recent Property visit residual snow was present in the forest to near sea level and was significant above 400 meters in shadier areas and continuous above 800 meters. Spring snow slides occurred during warmer days on site. The general operating season for surface work is from June through October at high elevations on the Property and perhaps from April though November near sea level.

# 5.3 LOCAL RESOURCES

The Property is well situated with respect to local resources for the purpose of exploration and mining. Ample water supply is available from surface sources such as Roberson, Princess and Helen Creeks as well as potential subsurface sources on the Property. Meals, accommodation, and communication (cell service and internet) are available in Stewart, a former mining town that first served the Premier Gold Mine from about 1918 to 1953 and then the Granduc Mine from 1964 through to about 1984 when it closed and was the shipping port for Cassiar

Asbestos. Presently, Stewart shipping facilities are utilized as the shipping terminus for concentrates from the Pretium Resources Brucejack Mine and may become the same for the Red Chris porphyry copper Mine near Iskut, British Columbia. Stewart is highway accessible from a branch of Highway 37 and is a 4 hour drive from either Smithers or Terrace, both of which provide full range of supplies and services. Gasoline, diesel fuel and supplies are available in Stewart and the town has a medical clinic, RCMP detachment and school. Regularly scheduled airline flights, skilled personnel and unskilled labourers are available in Terrace and Smithers. The population of Stewart is approximately 494 (Statistics Canada, 2011).

# 5.4 INFRASTRUCTURE

The project is water and air accessible from Prince Rupert and Stewart, British Columbia. Limited docking facilities are located at the north end of the Property at the Swamp Point aggregate project. Historic surface infrastructure is largely destroyed, although cables from the tramline active in the 1920s are still under tension across ravines despite the collapse of their wooden supporting towers. Underground workings are evident and presumably accessible at several of the old veins, but the author did not attempt to enter any of these during his visit. Numerous underground surveys are available showing the details of the adits, cross cuts and winzes.

## 5.5 PHYSIOGRAPHY

The Property is focused around Maple Bay, which is a significant reentrant along the Portland Canal and the outlet for several large creeks. The valley of Roberson Creek trends north from the bay and flows through the main area of moderate to shallow terrain in the area. A moderate ridge separates Roberson Creek from the main sound. To the east the land rises sharply in a series of benches and cliff bands forming the lower flanks of Mount Tournay which rises to 1800 m. Steep creeks at Princess and Eagle follow deep clefts across the benches into Roberson Creek or Maple Bay. Significant sections of the slope above Roberson Creek below the main alpine slopes of Mount Tournay are perennial snow avalanche slopes that cut through forest leaving shattered trees, slide alder, and scrub. Other slopes less prone to avalanche are forested in old growth amabalis or alpine fir and mountain hemlock.

# 5.6 SUITABILITY FOR MINING OPERATIONS

Maple Bay is ideally suited for marine transport being a good sheltered anchorage on the shipping lane between Prince Rupert and Stewart. Previous operations established wharves for ore transhipment and the bay is about 20 hectares in size below the low tide mark. Swamp Point about 5 km north of the Maple Bay embayment currently has shipping infrastructure built for mass transport of aggregates although the facilities have not been activated.

Space for mining operations is also available on the north shore of Maple Bay in the Roberson Valley where about 60 hectares of moderate to flat land exists between sea level and a 150 meter contour. Sufficient space is thus available for mining infrastructure including tailing and waste disposal facilities. Huge glaciofluvial aggregate resources are available at the Swamp Point aggregate deposit that might be utilized for construction of tailing and waste disposal facilities. These aggregates would likely be transported by water, but a 5 km road appears feasible with only a short section contouring across steep terrane. As there are no conflicting private holdings in the immediate land area north of Maple Bay including Crown Grants, surface rights should be sufficient for mining. Much of the Roberson Creek valley was logged in the early 1900s and is now covered in places by mature forest.

# 6.0 History

The Maple Bay area has a long history of exploration and mining in the northwest region of British Columbia. Some of the earliest claims in the region, the Blue Bell claims, were staked south of Maple Bay in 1896 by one Lt. Mosier of the US Navy. The subsequent history of the Maple Bay Property and its environs is connected with that of Stewart and the various significant mineral deposits found in the area including the Premier, Anyox and Granduc. Development at Maple Bay first resulted in production from the Outsider vein of copper ore that was processed at the Hadley smelter in Alaska. When the volcanogenic massive sulphide deposits at Anyox were discovered the quartz vein ores at Maple Bay became smelter flux with credits only for copper and possibly the minor silver and gold contents. No further production from any of the veins was recorded after 1924 to the present although numerous engineering and academic geological studies focused on the origin and potential of the veins system.

Throughout the historical account that follows, the reader should be aware of the use of various terms of reference: "Maple Bay" refers to the geographic embayment feature on the east



Figure 4: Maple Bay 1906. Looking north across Maple Bay to the loading wharf at the end of the tramway from the Outsider Mine. The tramway followed a cleared path through old growth forest for about 2 km to the mine. The steep western slope of Mount Tournay is on the right.

shore of the Portland Canal known as Maple Bay where used in a geographic context, and to the historical mining camp; "Maple Bay Property" refers specifically to the current area of the Coastal Copper Mineral Claim including Crown Grants (i.e. Class B parts of the Property); and "Maple Bay area" and Maple Bay district" refer to the general environs of the Maple Bay Property. The mineralized veins that are the subject of the historical account lie almost entirely within the current boundaries of the Maple Bay Property principally within various Crown Grant Mineral Claims as shown in Figures 11 and 12 under "Geology of the Maple Bay Area" except for the peripheral extent of some veins in the high alpine areas to the east. The Anyox mining camp is referred to repeatedly since it is tied historically to Maple Bay, and lies approximately 15 km to the east of the present Property. Mineralization at Anyox is generally considered to be of a volcanogenic massive sulphide type and is not indicative of mineralization on the Property although geological aspects of Anyox are important in an understanding of the geology of the Maple Bay area. The reader is cautioned that the occurrence of mineralization off the Property (e.g. at Anyox) is not necessarily indicative of mineralization on the Property

Maple Bay has been a subject of numerous government geological survey and industry studies since its early mining days. Geological survey papers and maps included Clothier (1919, 1922, 1924), Dolmage (1922), Mandy (1933, 1936), Hanson (1935), Grove (1971, 1986), Evenchick and Holm (1997). No detailed comprehensive geological maps of the entire Maple Bay Property have been produced. Various maps showing the surface traces of the major veins, underground plan of working and drill holes with some geological and surface cover information have been produced sporadically since the early 1900s. Early geological observations noted the proximity of the Coast Plutonic Belt and that the veins occur within a roof pendant of volcanics and sedimentary rocks similar in some ways to the host rocks at the Anyox volcanogenic massive sulphide deposits about 10 km to the east. The host rocks included pillowed basalts, limestones, siltstones, layered andesitic volcanics and sill-like hornblendites. In the Anyox area to the east of Maple Bay, the sequence is overlain by marine siltstones eventually attributed to the Bowser Basin Formation. The whole sequence was intruded by Tertiary granitoids related to the surrounding batholith.

The earliest significant mention of Maple Bay in government surveys is the British Columbia Bureau of Mines Bulletin No.2 1906 by Herbert Carmichael (1907) that describes 3 groups of claims, the Outsider, Eagle and Bluebell Groups (Class B). Prior Annual Reports for 1902 and 1904 (Flewin, 1905) described statutory amounts of assessment work mainly surface exploration on the Copper King Group, which subsequently became the Outsider Group, such as tracing

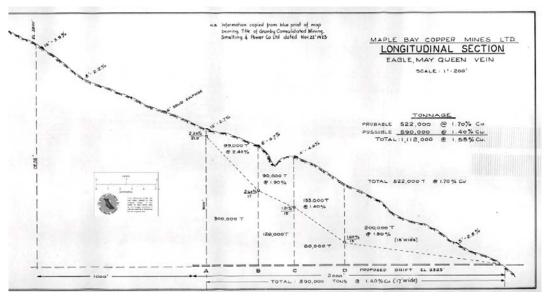


Figure 5: Drill section of the Eagle May-Queen vein.

From 1923 based on 8 drill holes and a drift on the base level at 2326 feet elevation. The graphic is available in BC Geological Survey Property Files.

veins, outcrop stripping and sampling along a "ledge" 2300 feet in length varying from 5 to 20 feet in width. The 1906 report (Carmichael, 1907) states that the properties were being worked by the Brown Alaska Company ("Brown Alaska") and that ore shipments from the Outsider vein were being sent to a smelter in Hadley, on Kasaan Peninsula, Prince of Wales Island, Alaska. Mine infrastructure developed by 1906 included the tramline and loading wharf pictured in Figure 4 leading from mine development work 6000 feet north on 3 levels of the Outsider Vein. The lowest level, at 1100 feet ASL, was at the time 300 feet long and connected internally to 2 upper levels at 1175 and 1195 feet respectively, driven 100 feet and 40 feet, but without any stopes yet developed. The Outsider vein was described as having a dip of 60 degrees to the east and pinching and swelling from 5 to 14 feet wide along its strike and consisting of well mineralized quartz with disseminated chalcopyrite averaging 3% copper. A cross-cut drift at the 1195 foot level had also been driven 550 feet north of the main vein in schist and had cut a three foot wide section of vein at 150 feet in where it was not well-mineralized, but drifts along the veins had encountered expanded vein sections. Blast hole drilling for the mining tunneling operations was powered by a water powered compressor installed at Maple Bay. The Outsider vein is entirely within Class В.

The other two groups of claims, the Blue Bell and Eagle Groups had lesser development work by 1906. On the Blue Bell development included a tunnel at the 1500 foot elevation 50 feet long into a quartz vein that varied from 18 inches to 5 feet wide and a cross cut 150 feet below that was 185 feet long, but had not yet hit the vein while the Eagle claims, on the flanksof Mount Tournay at 3000 feet altitude, had been explored delineating a vein of some 1500 feet in length (Carmichael, 1906). The Eagle Groups appear to be presently in Class B.

Mining operations by Brown Alaska at Maple Bay ceased in the fall of 1907 as a result of a drop in the copper price and a general economic recession (Clothier, 1908). With the demise of Brown Alaska, the Property was acquired by Woldson and Associates from Spokane, Washington. Clothier (1919) in the Ministry of Mines annual report for 1918, reported that in the Outsider vein development work had outlined ore shoots, in one case where the vein swelled to over 16 feet in width over a horizontal length of 200 feet and appearing to have an average grade of about 2% copper. Granby optioned part of the south of the Outsider Mine, but dropped it when they were unable to develop a satisfactory oreshoot. In subsequent years the annual reports record variable amounts of exploration work including stripping and trenching presumably sufficient to meet assessment work obligations, but no further mining until 1920s after Granby, who operated the Hidden Creek mine at Anyox, optioned the whole Property in 1922.

In 1923 Granby completed a diamond drilling programme on the Eagle-May veins system (Class B) consisting of 8 drill holes to delineate the vein system along 1850 feet of the line of surface trenching of the vein (Figure 5) between the 2326 and 3200 foot elevations. This vein system had been staked in 1902 and exposed by stripping and trenching to expose a lenticular quartz vein varying in width from 6 to 12 feet. Clothier (1919) reported six samples of quartz, chalcopyrite and pyrrhotite in the 2300 foot level crosscut ranging from 1.0 to 3.5% copper and also described a lensey nature of the mineralization in surface trenches higher in the system showing 3.25 feet of massive sulphide ore at the hanging wall averaging 7.6% and another 3.25 feet at the hanging wall assaying 4.6%. Transverse sections of the veins blocked out between the minimal drill intersections by J.T. Mandy (private reports from 1923) show estimates of 590,000 tons at 1.4% Cu along the drilled section (Figure 5). The same section shows another 1,150,000 tons estimated beyond the last drill hole 1250 feet horizontally to the end of vein outcrops several hundred feet up the mountain side based and assuming a 10 foot wide vein from surface to the 2326 foot elevation ASL. No details were shown for core size (although a later program used EX, which is 7/8" diameter), drill logs and sampling intervals, surface sampling or assumptions about

SUMMARY OF REPORTS MADE BY JOSEPH T. MANDY - DATED MARCH 31st, 1952 AND F. J. HEMSWORTH - DATED JANUARY, 1956.

Indicated & Probable Ore Reserves by Diamond Drilling & Reports of Previous Operators

EAGLE VEIN - Re: Granby drilling
Width 17 ft. - 522,000 Tons 1.7% Indicated

Probable - 590,000 Tons 1.4 plus %

Width 10 ft. Undetermined -1,110,000 Tons

Over shorter widths from higher grade sections Dr. J. T. Mandy

Width 9.5 ft. 478,000 tons 3.03%

#### OUTSIDERS GROUP - Re Granby

Estimated ore reserves in old workings on 7 levels from which approximately 98,000 tons shipped. Net smelter return 1.78%

Approximately 400,000 tons 2.5% copper

#### ANACONDA VEIN

estimates

Re drilling 1955 by this company

Overall Indicat

35,000 tons 6.07% copper.

#### Indicated Dollar Value of above Tonnage at 46 cents a pound.

522,000 tons	of	1.7%	-	\$	9,211,000.
590,000 tons	of	1.4 Plus %	-		7,500,000.
400,000 tons	of	2.5%	-		10,800,000.
35,000 tons	of	6.07%	-	2	1,932,000.
ted and Proba	ble	Value		\$	29,443,000.

## FURTHER ZONES TO BE TESTED

Eagle Vein Much more diamond drilling will be necessary on the northern section of this vein for values as high as 7% have been indicated over good widths, and lengths. These zones as yet not investigated except on surface.

Anaconda Vein Preliminary diamond drilling was started on this vein in 1955 and indicates a high grade ore shoot still open on both ends drilled only to depth of 150 feet. More diamond drilling necessary to extend for true length and depth.

Princess Vein Carries numerous highgrade ore shoots from surface investigation over good widths. Approximate length 6,900 feet. Diamond Drilling just commenced before winter shut down in 1955. This vein to be diamond drilled and explored extensively on surface as soon as possible.

Thistle Vein Estimated length 1,000 feet, widths from 20 to 30 feet. From surface sampling values ranging from 2 1/2% to 8 1/2% copper. This vein to be explored surfacely and diamond drilled as soon as possible.

Gertie Vein Shows highgrade shoots from surface exploration. Has to be diamond drilled and investigated as soon as possible.

Outsiders Group

This was a producing section having 7 levels - work done by Granby.

Extensive exploration consisting of surface work and diamond drilling is required to increase known tonnage.

> There are many more veins on this property that from grab samples contain good commercial and highgrade values. These veins all have yet to be investigated.

## Figure 6: Historical estimates reviewed by J.T. Mandy in 1956.

None of the categories used in this report by Mandy conform to present NI 43-101 standards and Mandy apparently had a financial interest in the Property at the time. A qualified person has not done sufficient work to classify the historical estimate as a current mineral resource or reserve and the Issuer is not treating the historical estimate as a current mineral resource or reserve. Most of the referenced veins are in Class B of the Property, except parts of Thistle and Gertie which extend into Class A.

# High Grade Oreshoot

Underground work also is to be started this year on the Anaconda and Thistle veins. In the 1955 program, when work included some diamond drilling, a small but high grade oreshoot was indicated on the Anaconda claim, to the south of the Eagle-May structure. Four holes put down on the Anaconda averaged 6.1% copper across a true width of 4.8 ft for a length of 700 ft. Holes Surface went to depth of 80-130 ft. sampling carried out previously along the vein averaged 6.3% copper across 4.1 ft. for a length of 500 ft. Average of the drill and surface samples is 6.2% copper across 4.5 ft. for length of 600 ft. To depth of 150 ft. the oreshoot is calculated to contain 35,000 tons of 6% copper, says Mr. Hemsworth.

The proposed plan is to crosscut from the 1,875-ft. elevation. The Thistle vein, northwest of the Anaconda, would be intersected at a distance of about 500 ft. and depth below the surface outcrop of 175 ft. An additional distance of about 900 ft., or total crosscut of 1,400 ft., would intersect the Anacorda vein at a depth of 525 ft. If it persists to this level it would contain over 100,000 tons of high grade ore, says Mr. Hemsworth.

Figure 7: Newspaper clipping from late 1955.

Work being reported at Maple Bay by Bidgood Kirkland .Gold Lake Mines. Located in BCGS Property File archives, but source publication noted indicated. The Anaconda vein is with Class B Property.

the possibility of ore shoots. The data is of historical interest, but without any basis except for the most speculative tonnage-grade calculation it is non-compliant with current NI 43-101 classifications.

An internal report to the Granby Mining company by Austen Bancroft in 1925 highlights the state of development work at the Outsider Mine (Class B) and recommended advanced exploration of the Outsider vein to maintain reserves that were proving beneficial to smelting operations at Anyox. Some calculations of interest: from January 1924 through to the end of August 1925, 57,500 tons of ore from the Outsider vein were shipped to Anyox with an average composition of 1.75% Cu, 72.2%  ${\rm SiO_2}$ , 3.13%  ${\rm Al_2O_3}$ , 10.9% Fe, 6.7% S, 2.39% CaO, and 1.99% MgO. Bancroft (1925) also worked out by density calculations that this ore consisted of 82.5% quartz, 12.41% pyrrhotite and 5.07% chalcopyrite with the remainder wall rock silicate minerals.

No work is recorded on the Maple Bay area until the early 1950s when the Property was examined by F.J. Hemsworth, a mining consultant on behalf of Bidgood Kirkland Gold Mines Limited, between October 11 and 13, 1956. A report on previous work from the Granby era was also produced by Mandy, dated March 31, 1952 shown in Figure 6, as a synopsis of grade estimations for the various veins systems and their ore potential.

The Property was then operated under Maple Bay Copper Mines Limited based in Vancouver which acquired 22 Crown-granted claims (presently there are 26), 24 recorded mineral claims and 16 fractions. Work during 1955 involved diamond drilling and outcrop stripping and trench-

ing on the Princess and Anaconda Veins (Class B). These veins are in the subalpine above 2400 feet elevation and were accessed by a reopened 3 mile pack trail from the beach at the mouth of Roberson Creek on the north shore of Maple Bay. Ten diamond drill holes totalling 3000 feet were completed delineating sections of the veins and encouraging a follow-up programme for 1956 that began in June. Most of the 1956 drilling was done on the Anaconda and Princess veins with some on the Lizzie. The drilling was all apparently packsack drilling obtaining EX core (7/8"diameter) in 16 holes totalling 3,400 feet. This work all appears to have been done on Class B Property.

Other development work in 1956 included constructing a half mile of road from the beach camp to the Star adit portal, rehabilitating an old adit at the Star Vein (Class B) and laying underground rail to the drift face. The drift was extended another 165 feet to a final length of 815 feet. Three underground diamond drill holes totalling 400 feet were completed in the Star mine. A camp to accommodate a crew of twenty men, and comprising a cook-house, bunk-house, and office, was erected at the beach at Maple Bay (Minister of Mine Annual Report, 1957).

The following year, (Ministry of Mines Annual Report for 1957) the exploration programme was completed by four men who were employed for stripping and trenching on several quartz veins during August and September. However, the next month, the machinery and equipment was moved from the Maple Bay beach camp and placed in storage in Prince Rupert.

Following the development work in the 1950s the Property appears to have lain dormant through the 1960s until some part of the Property was optioned to Great Slave Mines Ltd, Vancouver by Maple Bay Copper Mines Ltd. Grove (1971) in the Geology Exploration and Mining annual report for British Columbia reported that the operator had drifted along the Princess Vein for 435 feet from the 2400 foot adit and in 1970 had driven a 1515 foot crosscut from the 1875 foot level to intersect the Anaconda and Princess Veins (all Class B). Grove, as the regional geologist had revised the geology of the Maple Bay area by identifying zones of mylonites and other cataclastic rocks in the rocks hosting the veins within the Anyox pendant. A drift map completed by Grove in 1970 along the Princess drift shows the relationship of mylonites, schists, undeformed feldspar porphyries and diorites and the massive sulphide veins exposed in the drift. Grove observed that the veins were largely confined to the cataclasite zones within an assumed Lower Jurassic volcano-sedimentary succession. Grove (1971) described the setting of the Eagle and Princess veins systems as near vertical north-east trending veins within a sequences of ultra-mylonites, chlorite biotite schist and brecciated hornblendite based in part on detailed drift mapping (Figure 8). The ultramylonite has grey-black laminations and a hard flinty nature. Fine-grained pyrite is pervasively disseminated throughout the mylonite in amounts up to 5% and coats joint surfaces. The hornblendites, Grove observed, were deformed, but without penetrative directional texture and composed of 60 percent hornblende in a subophitic arrangement with plagioclase. The veins in the Anaconda-Princess area were composed of sugary white quartz with pods, streaks and specks of fine-grained sulphides in crudely banded and vuggy structures.

A series of reports and exploration by Pentland (1969, 1970), Derry, Michener and Booth, a mining consulting firm based in Toronto, were commissioned by Maple Bay Copper Mines in the early 1970s and the subsequent owner, Yorkeshire Copper Mines Ltd. Pentland (1970) reviewed much of the previous attempts to define ore resources in the various parts of the Maple Bay system and stated in summary:

"There has not been sufficient work completed to calculate a proven tonnage but the small amount of exploration work that has been done to date suggests something in the order of two and one quarter million tons. However, the limits of the veins, both horizontally and vertically, are

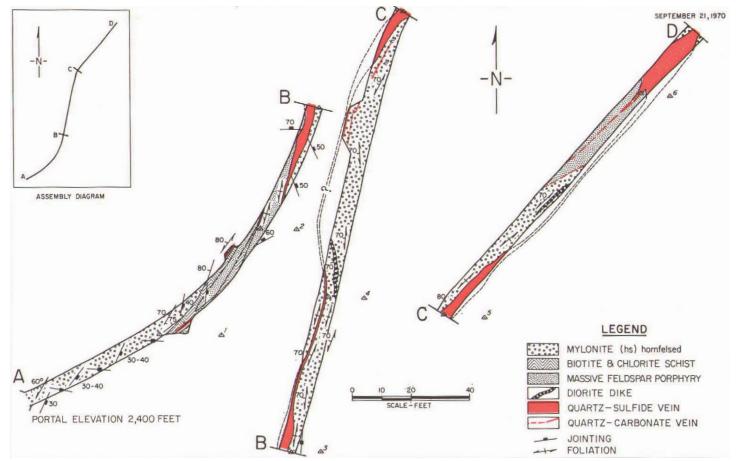


Figure 8: Maple Bay Princess Vein System Geology from Grove 1971.

Detailed mapping along the Princess drift shows sinuous nature of sulphide vein cutting massive feldspar porphyry and diorite dikes that appear to intrude intermittently in the mylonites

unknown and, therefore, it is expected with some confidence that this tonnage may be multiplied several times." He also cautioned that "It is not possible to give more than a guess at the average grade at the present time." He reviewed the various grade calculations by Mandy (1952) and Hemsworth (1955) and concluded "when all this evidence is added together, it seems to indicate an average grade of something between two and 3 percent." All of this estimation appears to refer to Class B.

Pentland's evaluation of mineral resources at Maple Bay, on what were in 1970 historical estimates, is significant and indicates that none of the estimates and categories used by Mandy (1952) shown in Figure 6 would conform to current NI 43-101 definitions. However, his comments indicate that the historical estimates are relevant to continuing exploration of the Property. The author's opinion is that the historical estimates might conform to the least certain categories of geological resources, but would require considerable additional exploration drilling to confirm and upgrade without certainty of defining any category of reserves. As discussed above, the original estimates were based on widely spaced drill holes using small diameter core combined with undefined sampling protocols in exploration drifts and surface trenches. Additional uncertainty is indicated by the arbitrary application of an ore shoot factor of 40% in some estimates, which while acknowledging a discontinuous or lensy nature of the ore, indicates a significant lack of definition. Original records and drill core are also unavailable so verification would be impossible except by repetition of the exploration work. Upgrading the historical estimates would require a considerable exploration drilling program. As it stands a qualified person has not done sufficient work to classify the historical estimates in any category of current mineral resources, let alone mineral reserves, and as such the Issuer is not treating the historical

estimates as a current mineral resource and assumes that all lie within Class B ground parts of the Property.

In 1971, C.E. Michener and R.J. MacNeill, of Derry, Michener and Booth (consulting mining engineers, Toronto) examined underground and surface exposures of the Princess-Anaconda veins system, portals for the Outsider Vein and surface expressions of other veins notably the Eagle-May Queen veins (all Class B). The objective of their one day examination was to design an exploration programme, mainly for the Princess-Anaconda vein, to prove sufficient reserves to warrant mining, which they estimated would require about 400,000 tons. They recommended that a drift be driven at the 600 foot level below the existing workings of the Outsider Mine to intersect down-dip extensions of the vein for exploration and, ultimately, haulage purposes if warranted. They noted that locations of previous drilling collars on the Princess vein were not precisely known although there was evidence of continuity. They confirmed a grade of 3.1% across the vein in the cross cut drift by their own sampling. For exploration of the Princess vein they proposed underground drilling from the existing 1800 foot level in fans upward and down and that the work be rigorously supervised and documented by a geologist.

Responding to the recommendations of Michener and MacNeill (1971), Maple Bay Copper Mines collared an adit at an elevation of about 600 feet to test the Outsider Mine Vein at depth. However, the drifting stopped at about 750 feet (236 m), short of intersecting the projected downdip extension of the vein. A follow-up report from C.E. Michener in 1974 noted that the previously recommended exploration programme had not been completed, and proposed a new programme involving underground drilling again on the Outsider and Princess- Anaconda veins in order to outline about 400,000 tons of reserves. The report noted that the strongest veins system was the Eagle-May Queen system (Class B), but recommended on the basis of the more difficult access that exploration be deferred until positive outcomes were achieved on the other systems. They noted the favourability of the Maple Bay location for transportation and the advantage of the physical layout of the vein system topographically above near sea level flat ground for mining efficiency and logistics. The report included a thorough set of plans and sections showing the existing underground workings and drill holes throughout the Maple Bay camp.

Following these reports and studies no other exploration or development is recorded on the Maple Bay veins until the 1990s and over the years, to the present, the Crown Grants and overlain mineral claims changed hands a number of times. Several proposals have been written attempting to restart exploration and development. However, regional geological studies have contributed to resolving contentious aspects of the geology at Maple Bay such as the stratigraphic sequence of the host rocks. The proximity to the Anyox VMS deposits, 15 km east of the Property, had led to assumptions that the more deformed and higher metamorphic grade rocks at Maple Bay were affiliated with the Hazelton Group rocks at Anyox and therefore might have exploration potential for massive sulphide deposits or even that some of the veins systems might be of volcanogenic origin.

Grove (1986) in BCGS Bulletin 63 described the geology of several maps sheets ranging from north of Stewart south to the Anyox peninsula and established that the eastern part of the pendant was correlated with Middle Jurassic Salmon River Formation of the Hazelton Group. Grove also observed the prevalence of cataclasite zones in relation to some of the mineral deposits within the region such as those which occur at the Granduc and at Maple Bay. However, he correctly attributed the formation of the Granduc deposit to volcanogenic massive sulphide seafloor exhalitive processes.

Sharp (1980) did a thorough study of the geology of the Anyox camp and inferred from lithology and geochemical signatures that the tholeitic basalts in the host rocks were were formed

in an ocean basin or back-arc tectonic setting. He also correlated the volcanic rocks and overlying sedimentary rocks with Upper Triassic and Lower Jurassic units of Wrangellia in the Queen Charlotte Islands.

Smith, (1993) characterized the geochemistry of the volcanics from the Anyox mining camp as typical of a back-arc or marginal basin setting based on the low overall trace element abundance, weak island arc tholeite signatures and high <sup>207</sup>Pb/<sup>204</sup>Pb ratios. The lead isotope and samarium-neodymium ratios Smith (1980) concluded were consistent with an Early to Middle Jurassic age of the rocks in the vicinity of the volcanogenic massive sulphide deposits. He also noted that the observed progression in the Anyox area from siliceous to argillaceous sedimentation favoured a back-arc setting and that the position of the massive sulphide deposits was consistently within 10 meters of the contact between the volcanic section and overlying argillaceous and turbiditic sedimentary rocks. The geochemical character of the volcanics he postulated could be imparted by contamination of normal mid-ocean ridge basalt magmas with material from a nearby arc sources or young subcontinental lithosphere and that this could be consistent with proximity to early arc-volcanic assemblages in the Alexander or Stikine terranes. sis research by Macdonald (1999) examined the geology of the Anyox Peninsula and the setting of the Hidden Creek mine and showed that the volcanic rocks are typical normal mid-ocean ridge basalts (N-MORBs) based on their rare earth element profile. Lesser volumes of basalt in the Hidden Creek host rock stratigraphic section showed transitional and enriched mid-ocean ridge affinities (E-MORBs)

Mazerolle (1996) reported on mapping extensions of the known vein systems at Maple Bay for New Dolly Varden Mines Ltd. He also reported on rock sampling (42 samples) and silt sampling (9 samples) as well as 800 hectares of geological mapping (1:5,000 scale). This work focused on easterly extensions in the alpine zone on the flanks of Mount Tournay of the Princess and Eagle - May Queen veins (east of Class A and possibly Class B). He recommended drilling combined with downhole geophysics to detect and assess massive sulphide mineralization at depth (Mazerolle, 1996).

In a significant study commenting on the enigmatic origin of the western part of the Anyox Pendant, Alldrick et al. (1995) noted that evidence indicated subaqueous deposition for most of the Maple Bay rocks and that they were intruded by mafic dykes and sills absent of kinematic indicators of deformation. They suggested based on parallelism of veins and strata that the veins may have been emplaced prior to deformation alluding to a possible common origin with the VMS deposits of the eastern Pendant that display chert beds at the stratigraphic horizon of the sulphide deposits. IBK Capital (1999) picked up on the idea and extended it to the possibility that the sulphide mineralization at Maple Bay might have a deeper source from which it was structurally remobilized.

Evenchick and Holm (1997) reported in Current Research for the GSC on field work in the Anyox Pendant including two traverses in the Maple Bay area designed to determine the stratigraphic position of the highly deformed sequence. Alldrick et al. (1996) had previously postulated that the volcanic rocks hosting the Hidden Creek massive sulphide deposits and the overlying sedimentary rocks to be Upper Triassic strata, and interpreted the western half of the pendant where the Maple Bay veins occur to be Devonian or older to account for a U–Pb age of 363 ±3 Ma for a "diorite sill" east of the summit of Mount Tournay. This prompted the review by a Evenchick et al. (1997) who correlated the eastern sedimentary unit with lithologically similar and coeval rocks of the Middle and Upper Jurassic Bowser Lake Group, based on regional mapping of the pendant east of the ore zones. They also showed that the "diorite sill" of Alldrick (1996) was actually a fault bounded unit and therefore suspect as a geochronologic marker.

Evenchick and McNicoll, (2002) analysed the results of the geochronologic sampling by Evenchick and Holm (1997) and established that the sequences sampled in the Maple Bay area were probably correlatable in age with Jurassic rocks in the Hazelton Group at Anyox. Detrital zircons from a sandstone unit on Maple Point have U-Pb ages that show it to have been deposited after 180 Ma. Meanwhile a deformed granite at Swamp Point was dated at ca. 186 Ma from which they inferred that it intruded basement rocks that may have included the tectonically emplaced 363 Ma Devonian granite from Mount Clashmore and could have been the source of detrital zircons in the sandstone deposited on older basement. The entire western Maple Bay section they termed the Clashmore Complex to indicate remaining uncertainty in age and correlation of the highly deformed rocks. They also concluded that establishing the Jurassic Hazelton Group age for rift related volcanism in the Anyox Pendant extended the metallogenetically important Eskay Rift hypothesis (Alldrick et al., 2004) for the valuable Eskay Creek gold-rich VMS deposit significantly to the south and potentially correlating the strata at Maple Bay with the Eskay facies of the Hazelton Group.

In 2006, TA Minerals performed airborne electromagnetic and magnetic surveying over the Maple Bay area. The survey by Aeroquest identified several anomalies of varying priority and recommended detailed ground magnetometer and electromagnetic (EM) geophysical surveys in the area of Outsider vein extensions.

Mark (2010) reported for TA Minerals, the then and current holder of most of the Maple Bay (surrounding the Property) and Anyox mineral claims, on the results of a soil geochemical survey employing the MMI (mobile metal ion) proprietary technique involving partial extractions in the sample preparation. The area of the claim covered most of the peninsula, but the work did not cover any parts of the Maple Bay area. McMillan et al. (2011) updated some follow-up work on a few of the geochemical anomalies within areas of the Anyox Pendant claims, but no work was done in the immediate Maple Bay area. Goldsmith (2013) reported on geochemical work in the TA Minerals claims southeast of Maple Bay. None of the work has any implications for the Maple Bay area mineralization. The TA Minerals claims group crosses the entire Anyox Peninsula minus the area around Maple Bay held in the Coastal Copper Claim.

Kikauka (2014) reported on an exploration program on the Coastal Copper claim at Maple Bay consisting of geological mapping, geochemical analysis of soil (25 samples) and rock chips (6 samples), and magnetometer surveying (4.275 line km). The work was carried out between June 25 and 30, 2014 in order to identify Cu-Ag-Au bearing mineralization and test soil geochemistry and magnetometer surveying to identify and delineate copper vein mineralization. Rocks were collected from known traces of the Outsider, Star, Friday, Eagle-May Queen and Comstock. The 6 rock chip samples returned copper ranging from 42,010, in the Outsider vein, 269 ppm copper in the Friday vein, Silver ranged from 36.7 ppm in Outsider to 18.6 ppm with several returning insignificant values. Gold ranged from 105 ppm in Outsider to 160 ppm in Friday again with insignificant values elsewhere. Star and Comstock showed high values of zinc at 1162 and 1566 ppm Zn respectively, which is unusually high compared to the other veins. Soil surveys corroborated the location of the veins although it was noted that soil development was very poor in steeper areas and soil geochemistry ranged from 542 ppm Cu near the 42,010 ppm Cu rock sample site to 10,712 ppm Cu at the end of the Comstock vein. A magnetometer survey was conducted over an EM anomaly that had been previously delineated by an airborne survey for TA Minerals in 2006.

Currently the Maple Bay Crown Grant claims are owned by DLV Resources Ltd, but an MD&A from 2016 stated that they are no longer in the mineral exploration business and liquidating assets. The current status of the Crown Grants is active and therefore holders of the mineral title with their boundaries. Surface rights are unknown, but unlikely to be held by the

Crown Grants.

The history of exploration, development and mining in the Maple Bay project area shows that the Maple Bay Property merits attention as a potentially economic resource and it holds significant important information for future development efforts and should be examined carefully. While historical resource estimates are not compliant with current NI 43-101 standards, the estimates remain valuable data that can guide ongoing efforts to explore and develop the Maple Bay vein systems. Compilation of the existing mine plans and exploration data including old drill hole logs, if available, should be undertaken in a 3-d digital modelling program as a starting point for future exploration.

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# 7.0 Geological Setting and Mineralization

# 7.1 REGIONAL GEOLOGY

The regional geology of the Granby Peninsula (Fig. 9) and the Stewart region has been reexamined periodically since the early 1900s commonly coincident with the discovery of major ore deposits such as the VMS deposits at Anyox in the early 1900s (on the Granby peninsula), Granduc in the 1960s (NW of Stewart) and Eskay Creek in the 1980s as well as the prolific Premier gold deposit near Stewart in the 1950s. The earliest regional geology maps (Hanson, 1935) observed that the stratified supracrustal rocks of the Anyox Peninsula and islands to the east in Observatory Inlet were confined to a roof pendant enveloped by Tertiary age plutonic rocks of the Hyder Pluton, part of the Coast Range Batholith. The geology of the Anyox Pendant is summarized in the abstract of Evenchick and Holm (1997):

The Anyox pendant underlies a 400 km² region of Paleozoic(?) to Mesozoic volcanic, sedimentary, and plutonic rocks within the Coast Belt. Strata were deformed in an unknown number of events prior to being engulfed by Tertiary granite. The eastern two-thirds of the pendant consists of Jurassic turbidites of the Bowser Lake Group, underlain by Jurassic or Triassic volcanic rocks. Age, stratigraphic position, and structural history of the western third of the pendant are enigmatic. Units are highly strained and include felsic granitoid, mafic intrusive rocks, ultramafic rock, and metasedimentary and metavolcanic rocks. They are transected and bounded by a network of north-trending cataclastic and mylonitic shear zones. Tertiary granitoid rocks range from granite to quartz monzodiorite. Pendant rocks and Tertiary granite are intruded by lithologically distinctive dyke swarms which record northeast extension followed by north west extension.

Intrusive contacts are observed between the stratified rocks of the pendant and plutonic rocks on all sides except along the Portland Canal where the contact is an extensional fault, the Portland Canal Fault, that tectonically juxtaposes on its western side migmatites, strained plutonic rocks and Tertiary intrusions. The pendant is broken into north-south trending belts or domains separated by plutonic rocks and displaying different grades of metamorphism and deformation. In the east, the grade of metamorphism ranges from sub-greenschist to upper greenschist facies, and primary volcanic and sedimentary textures and contacts are well preserved. The stratified rocks are subdivided into a western volcanic dominated assemblage correlated with the Jurassic Hazelton Group, and an overlying clastic sedimentary sequence of the Bowser Lake Group. The Hazelton volcanics are assigned on the basis of unequivocal U-Pb geochronology (Evenchick and McNicoll, 2002), and a stratigraphically underlying relationship to Bowser Lake Group turbidites and other clastic sediments of the Ritchie-Alger assemblage. The intensity of deformation and metamorphic grade increases westerly within the Hazelton Group volcanics up to a boundary on the west with a sheared granitic unit that has been dated as Jurassic by U-Pb methods. West of the sheared granites the western domain of the Anyox Peninsula, in which the Maple Bay Property veins lie, is significantly higher in metamorphic grade, ranging up to amphibolite facies, and in degree of deformation, with few primary contacts and rock depositional textures preserved. The rocks of the western part of the pendant, in the vicinity of the Maple Bay Property, were named the "Clashmore metamorphic complex" by Evenchick et al. (1997; Evenchick and McNicoll, 2001) to acknowledge the complex geology and stratigraphic ambiguity.

A Devonian age intrusive complex with an ultramafic western margin (Childe, 1997) divides the western belt of rocks (Fig. 9), but contacts were interpreted to be tectonic by Evenchick and McNicoll, (2002) rendering its age ambiguous for dating the rocks near Maple Bay. The Devonian granitoids are thus probably basement rocks upon which volcanic and sedimentary

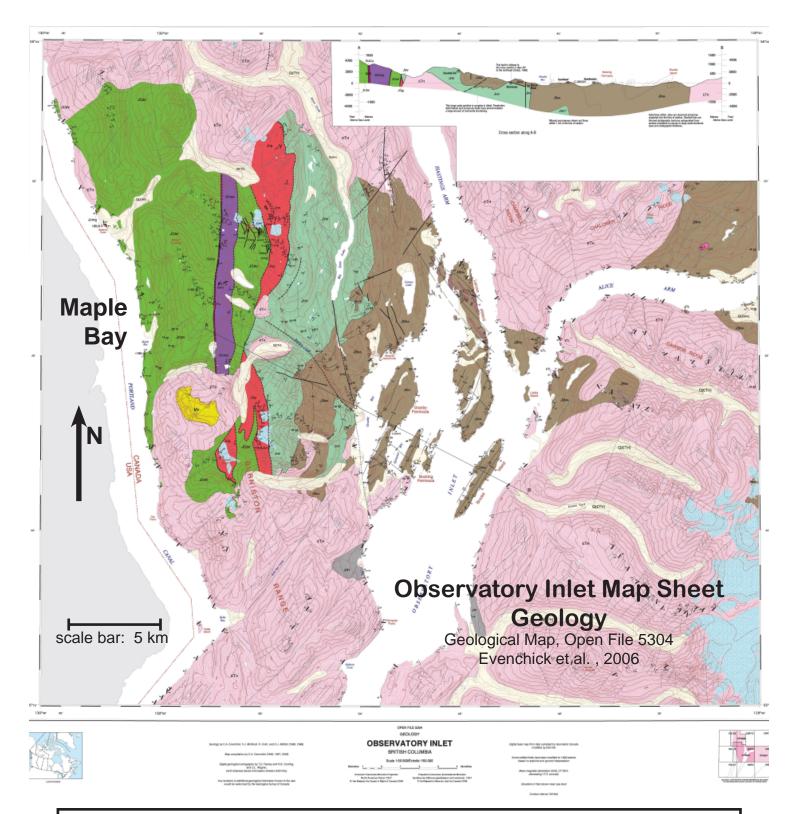


Figure 9: Regional Geology of the Anyox Peninsula.

Legend of geological units and symbols is on next page. The Maple Bay Property is principally underlain by the Jurassic Hazelton Group volcanics (JCsv - dark green unit) bordered by the coast and the Devonian mafic intrusive complex (DCmp - purple). The Anyox VMS deposits are hosted with Lower-Middle Jurassic Hazelton (JHv - green) volcanics and Bowser Basin turbiditic sediments (JBRA - brown). The volcanics form roof pendants within Paleocene and Eocene granitoid plutonic rocks principally assigned to the Hyder Pluton (ETH - pink). The red unit separating the Anyox and Maple Bay areas is a sheared cataclastic unit.

#### QUATERNARY

#### PLEISTOCENE AND RECENT



Glacial till, alluvium, and colluvium; S denotes 60 year old slag heap at mouth of Anyox Creek; unit designators in parentheses are the inferred underlying bedrock units.

#### **TERTIARY**

#### MIOCENE



Volcanic breccia and flows, volcanic- and granite-pebble and cobble conglomerate. A preliminary whole rock  $^{\circ}$ Ar/ $^{\circ}$ Ar age for dacite near the top of the succession is 21.8  $\pm$  0.4 Ma (V.J. McNicoll, unpublished data, 1998, in Evenchick et al., 1999).

#### EOCENE

#### LARCOM DYKE SWARM



Fine-grained leucocratic granitoid dykes with plagioclase and hornblende phenocrysts; 52 ± 1 Ma (U-Pb) (V.J. McNicoll, unpublished data, 1998, in Evenchick et al., 1999).

## ALICE ARM INTRUSIONS



Quartz monzonite porphyry.

## PALEOCENE AND EOCENE

#### HYDER PLUTON



Biotite-hornblende granite, quartz monzonite, and granodiorite, includes minor garnet ± muscovite granite; locally with potassium feldspar megacrysts. Preliminary U-Pb ages of 5 samples range from 61 Ma to 51 Ma (V.J. McNicoll, unpublished data, 1998, in Evenchick et al., 1999).

#### JURASSIC

#### UPPER MIDDLE TO UPPER JURASSIC

BOWSER LAKE GROUP



RITCHIE-ALGER ASSEMBLAGE (submarine fan assemblage): sandstone, siltstone, and rare fine pebble conglomerate; sheet-like intervals up to tens of metres thick are dominated either by siltstone, shale, and very fine-grained sandstone or by fine- to coarse-grained sandstones; siltstone and/or fine-grained sandstone is dark grey- and black-weathering, sandstone is medium- and light-grey-weathering; abundant turbidite features (e.g. Bouma cycles, flame structures, flute-and-groove casts); marine fossils; local hornfels with metamorphic assemblage of biotite, andalusite, muscovite, rare cordierite.

## LOWER AND LOWER MIDDLE JURASSIC

#### HAZELTON GROUP



Eastern belt of metavolcanic rock; volcanic breccia, pillowed volcanic flows, massive volcanic flows, chlorite schist; minor siliceous volcanic and/or sedimentary rock, including metachert, tuff; thin mafic dykes; minor sills of diorite, and gabbro.

## JURASSIC(?)



Highly strained metasedimentary and metavolcanic rock; age and correlation uncertain.

#### DEVONIAN TO JURASSIC

CLASHMORE COMPLEX (units JCg, JCsv, JCmg, DJCu, and DCmp)



Sheared granitic unit; cataclastic and mylonitic granitic and quartzo-feldspathic rock 176.9 ± 0.2 Ma (U-Pb); includes tectonic lenses of strained mafic rock (JCm).

## LOWER AND LOWER MIDDLE JURASSIC

## HAZELTON GROUP



Central and western belts of metavolcanic and metasedimentary rock, intruded by gabbro, diorite, and quartz dirorite; cut by a network of shear zones; includes volcanic breccia, pillowed volcanics, massive flows, chlorite schist, psammitic schist, sliceous metavolcanic or metasedimentary rock, grit, conglomerate, mafic intrusive rock, minor marble; JCsvb, JCsvs, JCsvg, and JCsvf are tectonic lenses of volcanic breccia, sedimentary rock, gabbro, and felsic plutonic rock respectively; may include older strata, but inferred to be largely Early Jurassic age based on correlation with JHv to the east and detrital zircon geochronology.



Biotite hornblende metagranite; inclues Swamp Point metagranite;  $185.6 \pm 0.3$  Ma (U-Pb).



Ultramafic rock; fine tectonic(?) layering, and common fault breccia; age and correlation uncertain; spatially associated with DCmp.

#### DEVONIAN



Mafic intrusive complex; variety of compositions and textures, cut by a network of shear zones;  $363 \pm 3$  Ma (U-Pb).

Geological boundary (defined, approximate, assumed or inferred under Q)	
Trace of individual beds from ground observation and airphoto interpretation	
Linear features observed on airphotos; inferred to be joints, faults, or glacial in origin	
Fault, unknown displacement (defined, approximate, assumed)	
Fault, inferred under Quaternary	
Normal fault, ornament on downthrown side (approximate)	
Anticline, trace of axial surface (defined, approximate, overturned)	1
Syncline, trace of axial surface (defined, approximate, overturned)	*
Bedding (upright, top unknown, overturned)	5 10 15 X
Foliation (undivided, first generation, transposition, mylonitic, gneissic)	30 7 35 7 40 4
Fault (displacement sense unknown, dextral, sinistral, contractional, extensional)	40 10 45 pt
Shear zone (hanging wall up, hanging wall down)	5 10 10
Axial surface of fold (generation unknown, first generation)	15 , 20 ,
Fold axis (generation unknown, 's' fold generation unknown, 'z' fold generation unknown, first generation, second generation, crenulation)  Lineation (stretching, mineral, slicken striae)  Joint (inclined, vertical)	15 × 20 × 25 × 1
Lineation (stretching, mineral, slicken striae)	1° 1" 1
Joint (inclined, vertical)	20/ /
Dyke, mostly basalt (inclined, vertical)	
Vein (inclined)	
Fossil locality (catalogue number)	C-1234
Radiometric age, U-Pb (in Ma); < before the age value indentifies oldest possible age based on age of youngest detrital zircon	176.9±0.2 (A)
BC MINFILE occurrence and map reference number. Refer to table for deposit name, BC MINFILE number, deposit status, and commodities	15
Cross-section	A B

# **Legend for Figure 9**

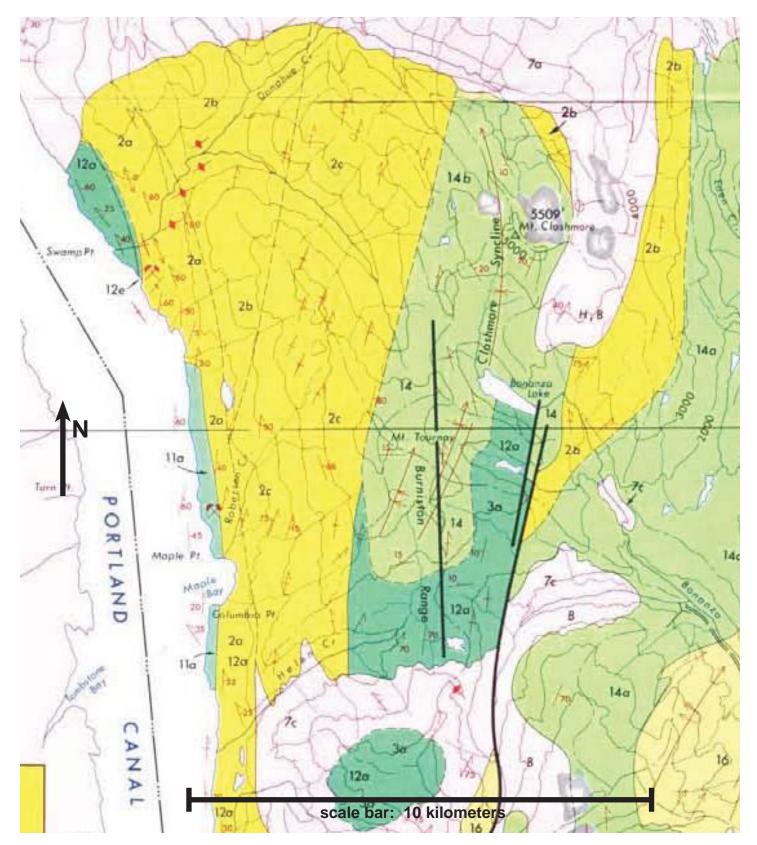


Figure 10: Geological Map of the Anyox Area, from BCGS Bulletin 63 (Grove, 1986). Units distinguished in the Coastal Copper claim area: 11a Unuk River Formation; pillow lava; 2a hornfels phyllite, semi-schist, schist; 2b gneiss; 2c cataclasite and mylonite; 12 red, green and purple volcanic breccia 12a crystal tuff; 12e chert; 14 Betty Creek Fm broken pillow breccia.

sequences were deposited, or a block of an even older basement structurally interleaved with the Maple Bay area stratigraphic sequence. Detrital zircons from a fine grained sandstone, collected by Evenchick and Holm (1997) on the southern shore of Maple Bay, however, indicates a 180 Ma maximum age for the sequence of stratiform rocks in which it occurs. Conversely, a metagranite at Swamp Point on the western edge of the Anyox Pendant north of the Maple Bay Property yielded a minimum age of 185.6 +/- 1.4 Ma for the rocks it intrudes implying that an older sequence of strata form the basement at Swamp Point and perhaps south to Maple Bay. The detrital zircon age from the sandstone indicates that the sequence formed in the Jurassic and probably correlates with the Hazelton Group on the eastern part of the Pendant. However, while this may be the case, the evidence of tectonic interleaving of the Devonian granitoids, which may be basement rocks, and the general high degree of deformation creates some doubt that all of the stratiform rocks in the western part of the Pendant near Maple Bay are of Hazelton Group age. Evenchick and McNicoll (2002) concluded that most of the stratified rocks in the peninsula were Jurassic or younger, but that basement rocks may be as old as Devonian in accord with basement in other parts of the Stikine Terrane. This division of the western Pendant into possible Hazelton and older accords with mapping by Grove (1986) shown in Figure 10 in which he distinguishes unit 11a along the coast where Evenchick and Holm (1997) obtained their Jurassic age detrital zircons from older deformed rocks in unit 2.

Several attempts have been made to correlate the volcanic strata in the vicinity of Maple Bay with defined volcanic sequences by comparing major, trace and REE lithogeochemistry. Macdonald (1999) geochemically analysed volcanic and sedimentary rocks from the Anyox Pendant area, particularly the Hidden Creek VMS deposit environs, and classified them by geotectonic environment. His main conclusion in his lithogeochemical studies from rare earth element (REE) compositional patterns was that the VMS hosting volcanics and many of the crosscutting dykes were tholeitic basalts with REE patterns typical of basalts generated at mid-ocean spreading ridges. Ti/P, Al2O $_3$ -P2O $_5$ , and Zr -Ti ratios allowed him to subdivide the basalts into N-MORB, transitional and enriched MORB basalts indicating a complex spreading ridge environment sourcing fractionated magma chambers. The large volumes of gabbroic rocks in the Maple Bay area are similar in character to rocks around the VMS deposits in the eastern Anyox Pendant where they were considered to be feeders for the volcanic flows (Sharp, 1980).

The economic geology of the eastern Anyox Pendant is significant and has been speculatively considered indicative of the potential of the more enigmatic Maple Bay domain in the western part. The massive sulphide deposits at Anyox, such as the Hidden Creek deposit, produced over 22 million tonnes of copper ore at an average recovered grade of 1.68% Cu, 10.8 g/t Ag and 0.20 g/t Au between 1914 and 1935 to produce 321,546 tonnes of copper, 206,309 kg (6.6 million oz) of silver, and 3773 kg (121,300 oz) of gold (Minfile 103P 021). Zinc and lead were also present in the ores, but not recovered. The geology of the Hidden Creek deposit has been described in a thesis by Macdonald (1999) and in early reports such as Dolmage (1922). Notably the main sulphide lenses occur at or near the contact between the Hazelton Group volcanic and overlying sediments of the Bowser Lake Group. The mineralization consists mainly of pyrite, pyrrhotite and chalcopyrite with a strong association between economic grades of copper and pyrrhotite, while massive pyrite intervals are generally barren. Mineralogical zoning in the sulphides lenses grades from pyrrhotite-chalcopyrite cores to sphalerite and pyrite on the margins. Dimensions of the main lenses are in hundreds of meters of length and width and tens of meters in thickness. Gangue in the lenses is dominantly sucrosic silica. Silicified argillites and schists form thin cherty bands and irregular masses within the massive sulphides and are spatially associated with the higher copper grades and originally Dolmage (1922) proposed that the sulphides had been formed by replacement during silicification.

Cherty beds at the mafic volcanic - turbidite contact are now thought to be chemical sediment deposits at the sea floor above the sulphides, but in some other massive sulphide deposits such as Myra Falls, cherty beds grade laterally into argillites and have been demonstrated to have formed by silicification related to protracted post-ore hydrothermal circulation through overlying sediments (Jones, 2001). Other ore deposits within the eastern Anyox pendant include some significant quartz veins that were mined for smelter flux at the Anyox Smelter. These generally occur within the sedimentary succession and one type of bull quartz veins may contain base metal sulphides and the other type follows fold axes. Alldrick (1986) speculated that the veins might be remobilized from the cherty units and might be used as proximal ore indicators.

On a broad scale the Stikine terrane is well endowed with VMS deposits including Granduc, which occurs in a similar style to Anyox in complexly deformed mafic volcanic and sedimentary rocks (Lewis, 2001) of the Triassic Stuhini Group. The gold-rich Eskay Creek VMS deposit is hosted in the upper part of the Hazelton Group like Anyox. It has been proposed that the Eskay deposit formed in an extensive rift environment within the Stikine Terrane (Alldrick et al, 1995) that has now been extended to the Anyox area (Evenchick and McNicoll, 2002) and which raises interest in the potential for exploration using speculative deposit models in the Anyox pendant.

# 7.2 Geology of the Maple Bay Area

Field traverses described under "Exploration" ranged across the structural trend of the Coastal Copper Claim from shoreline around Maple Bay and Swamp Point across Roberson Creek valley and up into the alpine around the dense swarm of veins in the Princess and Eagle - May Queen area shown on historical maps (Figure 11). Traverses were designed to examine the host rocks between veins for structural and lithologic data. Lithological variations are subtle across strike and there is no distinct sense of any stratigraphy. However, exposure is minimal in the Roberson Creek valley and on the forested slopes and especially in the slide path areas south of Eagle Creek and this may bias the impression and interpretation of stratigraphy. As well, in many outcrops clear bedding indicators were not observed or were nearly parallel with structural fabrics creating ambiguity.

Along the coast at Columbia Point and Maple Point, (Fig. 12 (outside of the Property)) fair exposures were observed during low tide in the intertidal zone where prolificmusselsdidnot obscure the rocks. There the section appears stratigraphically intact and highlighted by distinct pillowed basalt flows, basaltic pillow breccias, and hyaloclastites with clear bedding contacts that strike NNW and dip moderately to the east exposed in the intertidal at Maple Point (Fig. 22 in section 9.0). These are cut at high angles to bedding by dykes trending NE at both Columbia Point and Maple Point that are probably related to Coastal Plutonic Complex or the Hyder Pluton. Similarly distinctive metabasalts outcrop at the south edge of the Swamp Point glaciofluvial deposits where loading facilities have been constructed. Abundant white quartz veins cut the basalts at Swamp Point.

Inland, across a low ridge separating the coast from Roberson Creek Valley, outcrops are too sparse to determine any stratigraphic sense and intrusive rock contacts are rare. Without context and with a high degree of alteration by metamorphism it was difficult to interpret an extrusive or intrusive origin for some coarse plagioclase-phyric rocks which could have either been crystal lithic tuffs or diorites or gabbros.

On the lower slopes east of Roberson Creek good exposures were observed in steep walled canyons and in places in bluffs in steeper parts of the old growth forest. Shallower slope areas were overlain by colluvium. In this section there was an apparent association of greywackes, ar-

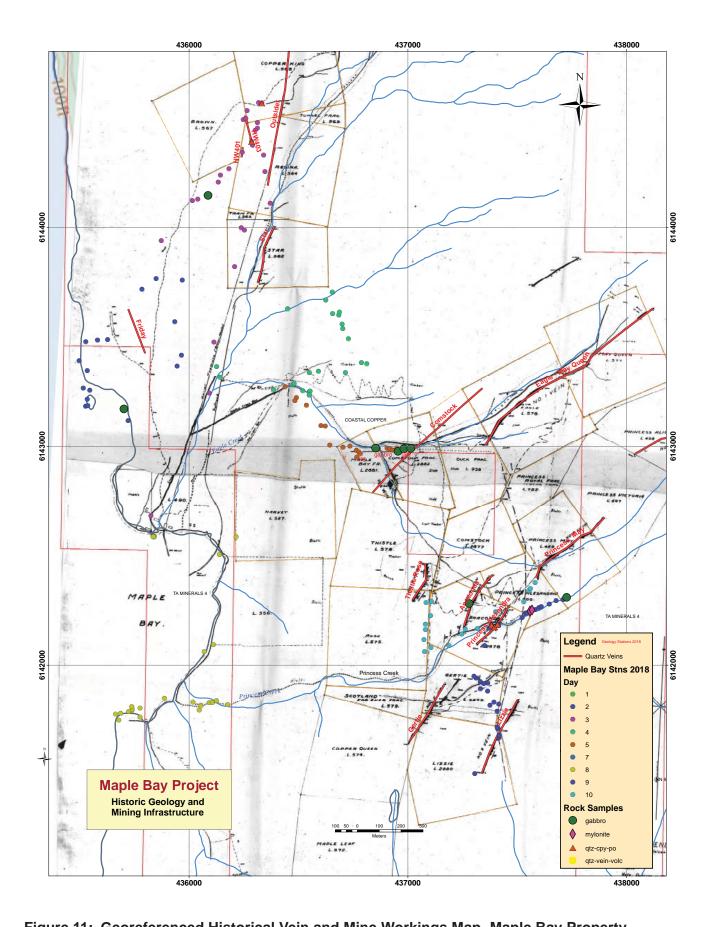


Figure 11: Georeferenced Historical Vein and Mine Workings Map -Maple Bay Property.

The old map was compiled in 1949 from earlier maps and is georeferenced here using current Crown Grant geometry by the author in ArcGIS 9.3 (Sept, 2018). Legend shows symbols for veins, new stations by traverse day, and analysed samples from the author's field work in April, 2018. Grid scale is in meters showing-

UTM zone 9.

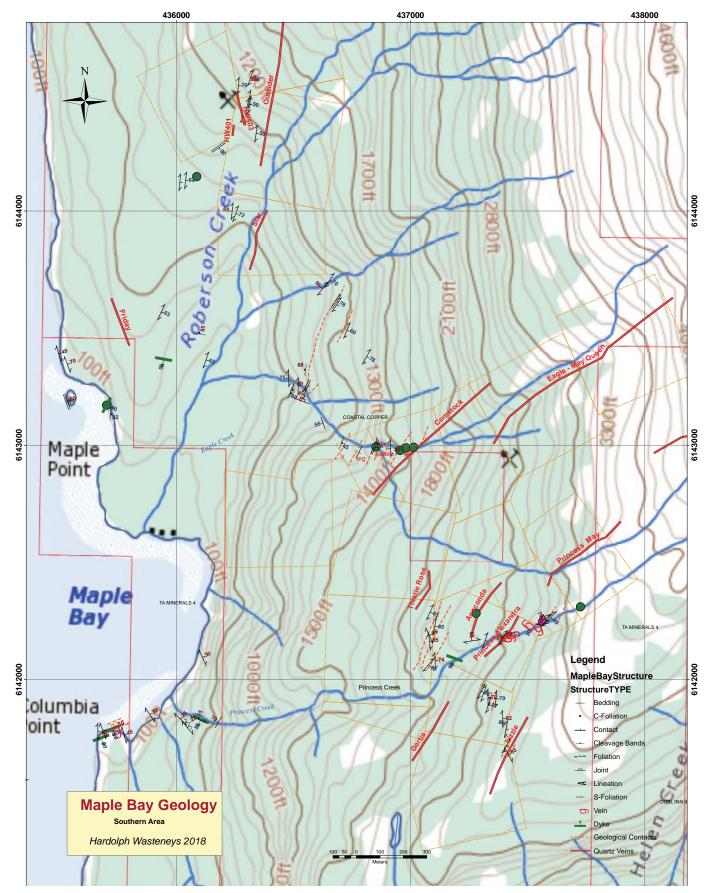


Figure 12: Geological Mapping 2018: Maple Bay Area South.

Map shows the author's geological structural data, interpreted contacts, and traces of veins from historic data in Figure 9. Rock sample stations symbolized as in Figure 9, dark green circles: gabbros, red triangles: veins, Pink diamond: mylonite. Map drawn by the author in ArcGIS 9.3 September, 2018 using an NTS system base maps with UTM Zone 9 grid lines.

gillites and siltstones that probably formed turbidite units. Contacts were rarely observed and foliations were measured subparallel to identified bedding suggesting a high degree of deformation to the point of transposition of bedding into cleavage planes. However, some discordant bedding plane contacts dip in a range from SE to SSW. Structural data collected by Evenchick and Holm (1997) show a scattering of poles to bedding on stereograms indicative of complex interference folding consistent with multiple stages of deformation.

In the sub-alpine around the Princess and Eagle vein systems (Class B), foliation in schists and laminations in mylonites consistently strike NNE and dip steeply (Fig. 12). However, in some cherty laminated metasediments, that may be mylonites, the strike of lamination is at high angles to the general NNE trend in the vicinity of mapped veins. It is not clear if the lamination was rotated during vein emplacement, but it may be indicative of shear zone kinematics. A shear zone exposed in the walls of a canyon above the Princess Alexandra vein show curving laminations in mylonites and foliations in more schistose rocks, with steep dipping slickenlines. Sucrose quartz lenses appear rolled in the foliations and minor sulphides are pervasively disseminated. The sheared rocks are confined between large feldspar phyric gabbro sills that show little foliation but some development of chlorite.

The mineralized quartz veins were only observed in one outcrop in the Princess Creek canyon where a portal was located at about 800 meters elevation. Samples were collected from a spoil pile below the portal and from brecciated rocks just above it. The spoil pile sample contained 49%  $\mathrm{SiO}_2$ , 4.83% copper, 23% Fe, 18 g/t Ag, and 35 ppb Au. A sample 3 m from the portal in brecciated rock contained veinlets of quartz with chalcopyrite and pyrite and assayed 2.8% Cu, and 12 g/t Ag. Further from the vein in a brecciated massive dioritic textured rock with quartz-calcite veinlets was analysed at 90%  $\mathrm{SiO}_2$  indicating a high proportion of quartz veining and contained 2470 ppm Cu and 8 g/t Ag and 5 ppb Au. (The portal and adit are in Class B).

Two samples from the shear zones above the Princess Alexandra veins were analysed; one by whole rock methods and the other by multi element ICP. The whole rock sample was silicious and rusty weathering and the whole rock analysis showed 92%  ${\rm SiO_2}$  reflecting either silicification of a metasediment or a cherty argillite although most argillite would have much lower silicon. Iron was reported quite high both as oxide  ${\rm Fe_2O_3}$  at 5.5% and as elemental Fe at 4% by ICP method MS41. While this possibly reflects disseminated pyrite, as other major element oxides except  ${\rm Al_2O_3}$  (1%) where very low, the amount of Sulphur shown at 0.24% is too low to account for all of the iron in sulphides. Copper reports at 838 ppm. The other shear zone rock contained deformed quartz lenses and disseminated sulphides, but was only by aqua regia dissolution and ICP . It reported no significant concentrations of copper (34 ppm) or sulphur (<0.01%) or Au (<5 ppb), but 4% Al, 6.6% Fe, 4% Mg and high Cr and Ni reflecting a probable mafic volcanic composition.

The origin of the veins remains enigmatic, but some factors are apparent. Most veins occur in association with thick gabbro sills cutting shear zones of mylonitic belts consisting of cherty argillite - like rocks. The area can be divided into 3 domains: a coastal domain (unit 11a of Fig 10), where mafic volcanic flows and volcaniclastics show diagnostic textures, a central zone of probable turbiditic sequences of greywackes and argillites (unit 2a of Fig. 10), and an eastern domain hosting the NE striking veins in a section dominated by gabbros and mylonites (unit 2c of Fig. 10). The setting of the northerly striking Outsider vein was not sufficiently exposed, but gabbros were noted locally and parallel massive quartz veins were located to the west (Figure 12).

## 7.3 Lithogeochemistry of Maple Bay Rocks

No geochemical data were available for Maple Bay volcanic rocks to compare with Macdonald's (1999) rocks from the Hazelton Group in the vicinity of the Hidden Creek VMS deposits so 10 rocks from clearly intrusive dioritic and gabbroic units were collected by the author in Class A and B parts of the Maple Bay area as well as off the Property. The rocks were analyzed by lithium borate flux fusion and appropriate ICP MS methods as well as a standard aqua regia dissolutions ICP AES analysis described above.

The whole rock results plotted on a total alkali silica diagram in Figure 13 (TAS of Middlemost, 1994) classify the rocks as gabbros although there were considerable variations in the phenocryst compositions that suggested more dioritic compositions. By comparison using the Nb/Y - Zr/TiO<sub>2</sub> discrimination diagram of Floyd and Winchester (1977) for volcanic rocks (Figure 14), one of the rocks, MB18-03, is classified as an alkaline basalt, while the remaining 9 are consistent with the basaltic classification. Further classification of these mafic rocks using the Nb/Yb - TiO<sub>2</sub>/Yb discrimination diagram in Figure 15 (Pearce, 2008) reveals that the division shown on Figure 14 is replicated placing the 9 gabbros in the field of normal mid-ocean ridge basalts (N-MORBs) while the MB18-03 gabbros falls outside of the MORB array.

Further investigation of the MORB geochemistry of the gabbros looks at fractionation trends involving incompatible elements such as titanium (TiO<sub>2</sub>), phosphorus P<sub>2</sub>O<sub>5</sub>), zirconium (Zr) and yttrium (Y). The importance of this at Maple Bay is to more directly compare to the data set for the eastern Anyox Pendant where Macdonald studied the stratigraphy of the Hidden Creek Massive sulphide deposit that has been positively correlated to the upper Hazelton Group (Evenchick and McNicoll, 2002) and interpreted as a late stage rifting environment within the Stikine Terrane. The P<sub>2</sub>O<sub>5</sub> vs TiO<sub>2</sub> plot on Figure 16 shows a linear trend at a slope of 0.075 indicating the fractionation trend of P and Ti in the gabbroic parent magmas. The non-MORB sample MB18-03 an alkaline gabbro from probable Tertiary intrusive suites, discriminated in Figure 14, also plots outside of the fractionation trend showing that it is not consanguineous with the other gabbros. Comparison with Macdonald's basalt data, shown in the inset of Figure 16 reveals the same fractionation trend for N-MORBs from Anyox suggesting a common origin for the Maple Bay gabbros and Anyox basalts. This is corroborated further in a Zr vs Y plot (Figure 17) where the field of Anyox Volcanics from Macdonald (1999) is superimposed on the field of Maple Bay gabbros. The fractionation trend for tholeitic basalts in Zr vs Y ranges from 2 to 5 on this diagram and one sample outside the range of the Anyox volcanics emphasizes the steeper slope trend line (ratio of Zr/Y closer to 2). Rare earth element spider plots are a definitive means of classifying the igneous rocks by their geochemistry. Macdonald produced chondrite normalized plots for 4 samples of the Hidden Creek tholeiitic basalts which compare exactly to the patterns shown by the Maple Bay gabbros. The 9 N-MORB type gabbros all show consistent (REE) patterns in Figure 19 characterized by LREE depletion (i.e. left side of the graph at lanthanum (La)) and heavy rare earth (HREE) enrichment (e.g. lutetium, Lu). The single LREE enriched - HREE depleted sample, MB18-03, that was consistently discriminated as a non- MORB gabbros in previous diagrams, here shows a markedly different pattern with LREE enrichment and HREE depletion more typical of calc-alkaline fractionation trends. It was collected from a more alkaline dioritic intrusive unit on the shores of Maple Bay with a trend across the strike of local strata and therefore likely related to Tertiary intrusive rocks of the Coast Plutonic Complex. The strike of the dyke across the structural trend of local units was the main feature differentiating this gabbro from the other nine. Of the nine N-MORB gabbros one shows a negative europium (Eu) anomaly a typical sign of plagioclase fractionation. Appropriately this occurs in the most REE enriched of the gabbros, being the most evolved.

#### Middlemost (1994)

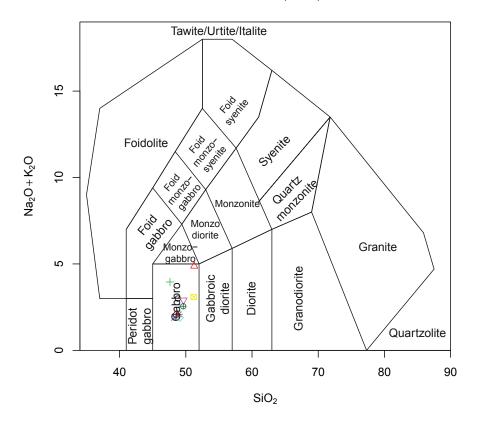


Figure 13: Total Alkali Silica Plot of Middlemost, 1994) for classification of plutonic rocks.

The Maple Bay igneous rocks all plot in the Gabbro field. Symbols on the plot are used in common with other plots herein.
All geochemical plots have been constructed using GCDkit (Janousek et al. 2007).

Nb/Y – Zr/TiO<sub>2</sub> plot (Winchester and Floyd 1977)

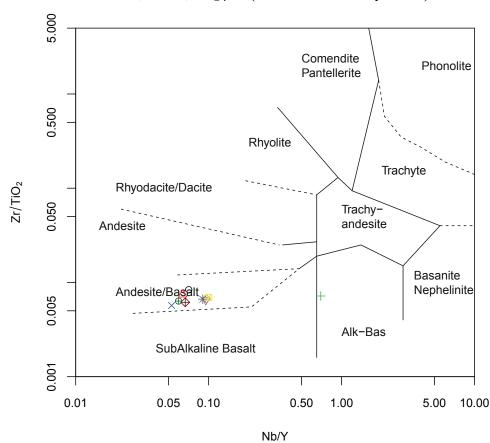


Figure 14: Nb/Y vs Zr/ TiO2 diagram for classification of volcanic rock compositions for Maple Bay.

Plotting symbols are the same as for Figure 16. All of the rocks plot in the andesite /basalt discrimination field except MB18-03, which classifies as an alkaline basalt.

#### Nb/Yb - TiO<sub>2</sub>/Yb (Pearce 2008)

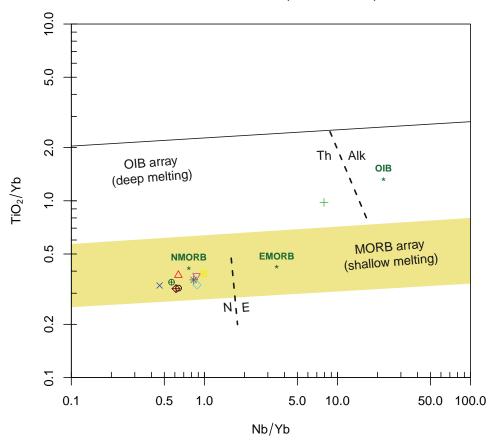


Figure 15: Nb/Yb versus TiO<sub>2</sub>/Yb for the Maple Bay gabbros on the Pearce (2008) MORB discrimination diagram.

Symbols representing sample point are in common with those in Fig, 13 and 14. The green cross is for MB18-03 a probable intrusive rock from the Tertiary Coast Plutonic Complex.

Fractionation or evolution of gabbroic magmas results in the spread of the N-MORB REE concentrations on Figure 18 and reflects a range in magnesium number or mg# (Mg number being the molar ratio of MgO to the sum of MgO and  ${\rm Fe_2O_3}$ ). Magnesium is a compatible element that is rapidly depleted during fractionation by incorporation in mafic minerals such as olivine and pyroxene. On Figure 19 mg#s are shown to represent a range from primitive magma with mg# ca. 68 to more evolved (mg# 40) magmas with increasing REE concentration. A negative europium (Eu) anomaly, indicative of plagioclase fractionated magmas is only apparent for the most fractionated low mg# number gabbro. Meanwhile the gabbro with the distinctive calcalkaline REE trend has an intermediate mg# of 55 consistent with a completely different origin and probably much younger age despite similar appearances in hand specimens.

Overall, the geochemistry of the gabbros is definitive: they appear to be consanguinous with the basalts in the eastern Anyox Pendant associated with the massive sulphide deposits. However, they are distinctly intrusive rocks in contrast to the extrusive basalts of the Anyox area, and do not appear to have in the Maple Bay area, extrusive equivalents.

The remaining samples analysed were not of lithogeochemical interest and included 5 from vein material or sulphide breccias, and 2 from mylonites in the Princess Vein section, and 2 from a quartz vein array in the Swamp Point area. These were discussed in Section 7.2 on geology. Whole rock analyses were completed on two of the mylonites one of the Swamp Point quartz vein samples and one of the sulphide breccias.

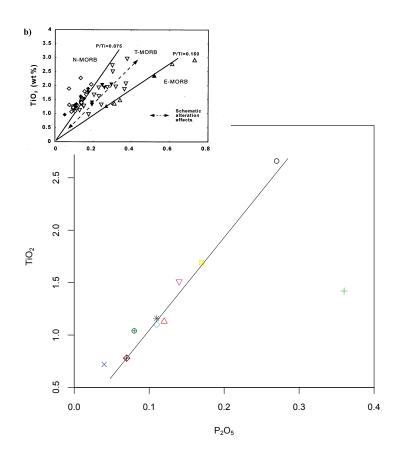


Figure 16: P<sub>2</sub>O<sub>5</sub> vs TiO<sub>2</sub> for the igneous rocks intrusive rocks at Maple Bay.

Inset shows data from Macdonald (1999) for unaltered and altered volcanic rocks at the Hidden Creek Mine with trend line for N-MORB to E-MORB fractionation. Symbols on the main plot correspond to those on Fig. 19 and follow the N-MORB trend line shown as the steepest line in the inset. The green cross to the right is an alkaline gabbro-diorite possibly from the Coast Plutonic Complex.

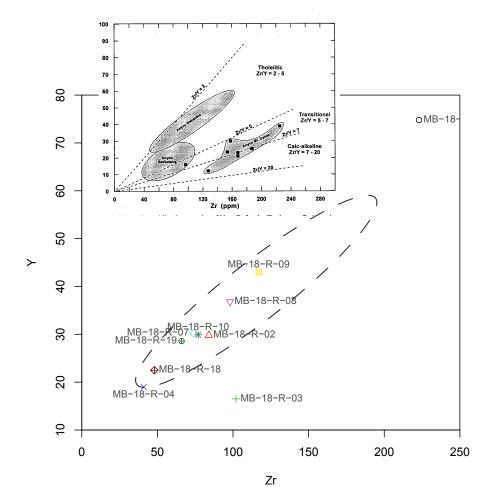


Figure 17: Zr vs Y for the Maple Bay gabbros.

Zr-Y for the Maple Bay gabbros with superimposed ellipse for Anyox Volcanics shown in the inset from Macdonald (1999). Inset shows ellipses for fields of Anyox Volcanics, sediments and mafic dykes at the Hidden Creek Mine with Zr-Y fractionation lines dividing fields for Tholeiitic, Transitional, and Calc-Alkaline rocks.

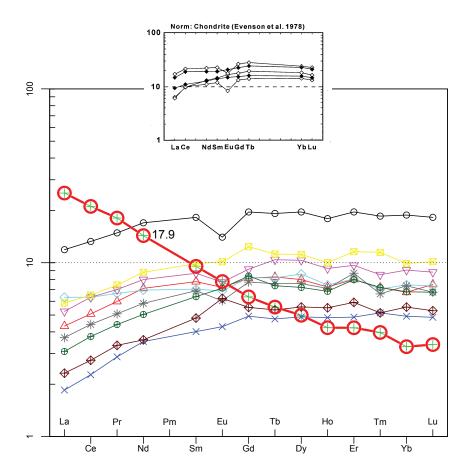


Figure 18: REE spider diagram for Maple Bay gabbros. REE compositions normalized by average primitive mantle **REE** compositions (Sun and McDonough, 1995). Inset shows REE normalized plot of basalts form the Anyox area Hidden Creek mine stratigraphy from Macdonald (1999). Highlighted points are for a dioritic dyke near the west margin of the pendant.

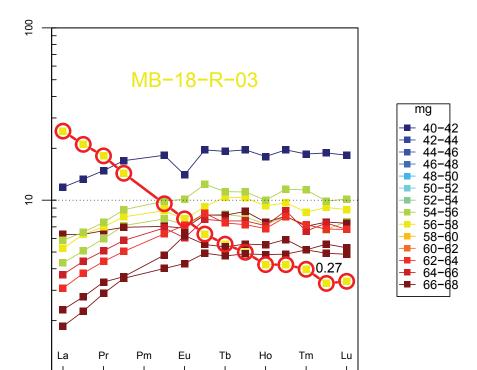


Figure 19: Primitive
Mantle normalized REE
patterns for 10 Maple
Bay intrusive rocks.
Colour scale on right
shows range of "mg#'s" for
the rocks indicating that
parent magmas are relatively primitive melts from
the mantle.

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### 7.4 Maple Bay Veins

The historically mapped traces of the Maple Bay veins are shown in Figures 11 and 12. Only a marginal section of one of the Princess veins (Class B) was observed and sampled by the author. The Maple Bay veins have been extensively described in historical reports reviewed above and described by Alldrick et al. (1995) and also summarized in Minfile records. Grove (1986) examined many of the veins personally, including producing drift maps such as that in Figure 8, and his summary description is as follows:

The Maple Bay cataclasite zone includes a broad area of cherty looking, weakly foliated ultramylonites bounded on the west by chloritic biotite schists and on the east by phyllonites. Foliation in these rocks is essentially vertical and northerly trending. In the central ultramylonite zone where irregular blocks of weakly crushed hornblendite crudely aligned in a northerly direction, the zone has been closely faulted and extensively veined by quartz sulphide lenses. The deformed zone and quartz veins are cut by Tertiary intrusives forming the north and south boundaries of the Anyox pendant.

Vein deposits in the Maple Bay section are represented by fracture-controlled, tabular quartz veins characterized by drusy, finely crystalline quartz in which the open spaces are irregularly filled with interstitial chalcopyrite, pyrrhotite, and minor pyrite ore shoots are lenticular. These veins have been traced on the surface for over 1100 metres and are known to extend to depths more than 600 metres. This group of veins occupies dilation features controlled by intersecting fracture sets within the ultramylonite segments of the Maple Bay cataclasite zone. They are cut by Hyder plutons deposits related to Middle Jurassic Texas Creek plutonism.

Observations by Grove (1986) regarding the occurrence of ultramylonites and mafic sills in relation to the veins, have been at least partially corroborated by the author. Minfile descriptions of the various veins are perhaps the most salient synopsis available and have been reproduced below, with minor editing to eliminate repeated descriptions of host rocks:

#### Blue Bell 103P-242

"The Blue Bell occurrence comprises two veins, the Blue Bell and about 98 to 122 metres to the west, a smaller satellite vein. The Blue Bell vein has been traced along strike for 230 metres and varies from 0.46 to 1.52 metres in width, averaging 0.98 metres. The smaller vein has been traced along strike for 98 metres and varies from 0.30 to 0.91 metres in width. Both veins strike 010 degrees and dip 45 degrees to the east. Mineralization consists of chalcopyrite and pyrite. High-grade sorted material assayed 11.3 per cent copper, 178 grams per tonne silver and 0.69 grams per tonne gold (Minister of Mines Annual Report 1906). The Blue Bell vein averages 8.44 per cent copper over a length of 180 metres and an average width of 0.98 metres (Assessment Report 5550). A limited amount of stripping, trenching and tunneling failed to intersect the vein at depth." The Blue Bell vein as described is partly in Class B.

#### Comstock 103P-040

The Comstock showing is located 730 metres northeast of Maple Bay on the east side of the Portland Canal, 55 kilometres south of Stewart. The area was explored in the early 1900's for copper. The occurrence consists of a vein, over 10 metres wide, containing granular textured milky white quartz with up to 10 per cent disseminated chalcopyrite and minor disseminated pyrite. Chlorite inclusions ("chlorite seams") occasionally occur in the vein. The vein is reported to host good gold and copper values (Energy, Mines and Petroleum Resources Annual Report 1911 p.72). The Comstock vein is entirely in Class B.

#### Eagle-May Queen 103P-043

The Eagle-May Queen quartz vein is located about 1.3 kilometres northeast of Maple Bay on the east side of the Portland Canal, 55 kilometres south of Stewart. Drilling in the 1920's established a moderate tonnage of copper ore for this deposit. The Eagle-May Queen vein pinches and swells, varying in width from 1.5 to 10.7 metres, strikes northeast for about 1000 metres and dips 80 degrees southeast. The United vein, a small satellite vein about 195 metres to the northwest and adjacent to the Eagle-May Queen's vein south end, strikes northeast for 122 metres parallel to the vein. These quartz veins are hosted in greenstone that strikes northeast and dips 60 to 80 degrees southeast. These conformable relationships suggest the veins may be lenses of volcanogenic massive sulphides similar to the Anyox ore bodies. The Eagle-May Queen vein locally contains bands of country rock and mineralization consists of chalcopyrite, minor pyrrhotite and pyrite and trace sphalerite. Rare lenses of cupriferous massive sulphides up to 1.8 metres thick occur in the walls of the vein. Based on diamond drilling in 1923, indicated reserves are estimated at 473,506 tonnes grading 1.7 per cent copper; and inferred reserves are estimated at 535,189 tonnes grading 1.4 per cent copper (Geology, Exploration and Mining in British Columbia 1970, page 77). Most of this vein system is in Class B.

[Note: the use of the terms "indicated" and "inferred" do not conform to NI 43-101 standards and the terms do not have the meanings ascribed to them by the Canadian Institute of Mining, Metallurgy and Petroleum in the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by the CIM Counsel, as amended.]

### Friday 1030-009

At the Friday showing, a coarse-grained milky white quartz vein is hosted in interbedded dark grey siltstone and fine-grained sandstone of the Hazelton Group. Siltstone inclusions occur along the western margin of the vein. The Friday vein, 4 to 5 metres in width, strikes 170 degrees for up to 180 metres and dips near vertical. The quartz is considered to be of high purity. The Friday Veins lies entirely in Class A.

#### Outsider 1030-018 Star 1030-019

The Outsider-Star quartz vein system consists of two veins, both striking at about 010 degrees. The more significant of the two is the Outsider vein but the Star vein is generally considered to be its southern extension. The Outsider vein dips 45 degrees east, has been traced for about 900 metres and varies from 0.6 to 6.1 metres in width, averaging 3.0 metres. The Star vein has been traced along strike for 680 metres and varies from less than 0.5 metres to 1.8 metres in width. The Outsider vein lies along the contact between greenstone (hanging wall) and silicified argillite (footwall) and is conformable to the bedding of the host rocks.

Mineralization in the Outsider vein consists of chalcopyrite and pyrrhotite with minor pyrite and traces of sphalerite in a gangue of fine-grained grey to white quartz. Higher grade ore lies near the wall of the vein. The Star vein consists of fine-grained white quartz with pyrrhotite and lesser chalcopyrite. Locally, up to 50 per cent of the vein consists of sulphides.

Discovered in 1896 during the Gaillard Expedition, the Outsider vein was mined initially during 1906 and 1907 and shipped ore to the Brown-Alaska smelter in Alaska. Between 1924 and 1928, 112,966 tonnes of ore was produced for silica flux and copper smelting at Anyox. A total of 125,966 tonnes grading 1.9 per cent copper were produced from the Outsider vein between 1906 and 1928. In the last two years of production the ore averaged 0.139 grams per tonne gold and 10.29 grams per tonne silver. In 1917, the Star vein produced 4845 tonnes of quartz carrying mi-

nor copper, gold and silver values (Minister of Mines Annual Report 1917). Unclassified reserves for the Outsider property are 181,440 tonnes grading 1.5 per cent copper (CIM Special Volume 37, page 183). The Outsider Vein is in Class B.

#### Princess 103P-048

The occurrence comprises five northeast trending quartz veins. The most important is the Princess vein, which strikes northeast and dips steeply to the southeast. The vein varies in width from less than 0.5 metres to over 2.4 metres and is hosted in a massive to slightly banded finegrained felsic tuff. The vein comprises fine-grained milky white quartz and is mineralized with chalcopyrite, minor pyrrhotite and pyrite. Sulphides locally comprise up to 40 per cent of the vein (Pell, J. 1982). Locally, the vein becomes a quartz-chalcopyrite breccia. Assays of all samples from surface trenches average 2.06 per cent copper over an average width of 2.3 metres and a sample vein assayed 3.10 per cent copper over 2.4 metres in a drift (Assessment Report 5550 p.5).

Another quartz vein, varying from 1.2 to 3.7 metres in width, is located 400 metres to the northeast. This vein strikes northeast for 411 metres on the Princess Alice claim (L.498). It contains chalcopyrite mineralization and is likely an extension of the Princess vein. The various parts of the Princess vein system are all in Class B.

The Gertie vein lies 207 metres along the strike of the Princess vein to the southwest, and continues southwest for about 305 metres. This vein is also likely an extension of the Princess vein. The north end of the Gertie Vein is in Class B and the south in Class A.

The Lizzie vein, which parallels the Gertie vein, occurs 340 metres to the southeast. The Anaconda vein lies 120 metres northwest of, and is parallel to, the southern end of the Princess vein. It consists of quartz with chalcopyrite, pyrrhotite and pyrite. Inferred reserves are estimated at 29,400 tonnes grading 2.04 per cent copper with traces of gold and silver over an average width of 2.4 metres (Property File - Sargent, H. 1942 page 4). The north end of the Lizzie vein is in Class A, the south end in Class B.

The Thistle vein occurs about 256 metres to the northwest of the Anaconda vein. It strikes 017 degrees for 180 metres, dips steeply to the west and is up to 7.6 metres wide. The vein is hosted in greenstone and consists of fine-grained milky white quartz with minor disseminated chalcopyrite and a few chlorite stringers. The vein is estimated to average 3.3 per cent copper over a length of 183 metres and an average width of 4.0 metres Assessment Report 5550). The Thistle vein is in Class B.

# 8.0 Deposit Types

The salient characteristics of the Maple Bay deposits include relatively simple sulphide mineralogy and zoning of mineral assemblages in large veins, a lack of observable wall-rock alteration, large vertical and lateral continuity, inclusions of wall rock forming brittle breccia textures, and minor evidence of post-depositional deformation. Intrusive rocks spatially associated with the veins included gabbro and diorite dykes, and there are no other large felsic bodies in the vicinity. Classification of the deposit type rules out most types of magmatic hydrothermal veins involving felsic intrusion such as the epithermal clan of veins or any association with porphyry deposits. As well the lack of contemporaneous deformation in the formation of the veins, suggests that they are NOT akin to orogenic types of vein deposits such as Archean gold veins.

Within the deposit types defined by the BC Geological Survey, the mineralized veins of the Maple Bay Property may conform to "Cu +/-Ag, Au Quartz Veins". These deposit type veins crosscut clastic sedimentary and volcanic rock sequences, are emplaced along faults and postdate the major deformation and metamorphism of host rocks. Examples of these deposit types in British Columbia include the Davis-Keays (094K 012, 050), Churchill Copper (094K 003), Copper Road (092K 060), however these examples are Au poor, whereas the Maple Bay quartz-sulphide veins contain variable Au values.

Another comparable deposit type for Maple Bay mineralization includes "Polymetallic Cu-Zn-Ag +/-Au Quartz Vein, Breccia & Stockwork" in the BC Geological Survey deposit profiles. Porter-Idaho (103P 089) located 7 km southeast of Stewart, British Columbia may be similar in age, but the Maple Bay veins are low in Pb and Zn compared to Porter-Idaho. Felsic intrusions are associated with the Porter Idaho polymetallic veins through hydrothermal fluids that filled dilatant fault and fracture zones.

## 9.0 Exploration

#### 9.1 Introduction

The current field work by the author contributed to the exploration of the Property through geological mapping and lithogeochemistry and is described in sections 7.2 and 7.3 above. The objective of the examination was to understand the geology of the Property and the controls on mineralization. No concerted attempt was made to explore for, or sample, mineralized veins due to snow cover although where encountered check samples of vein material were collected for analysis to reconcile field interpretations.

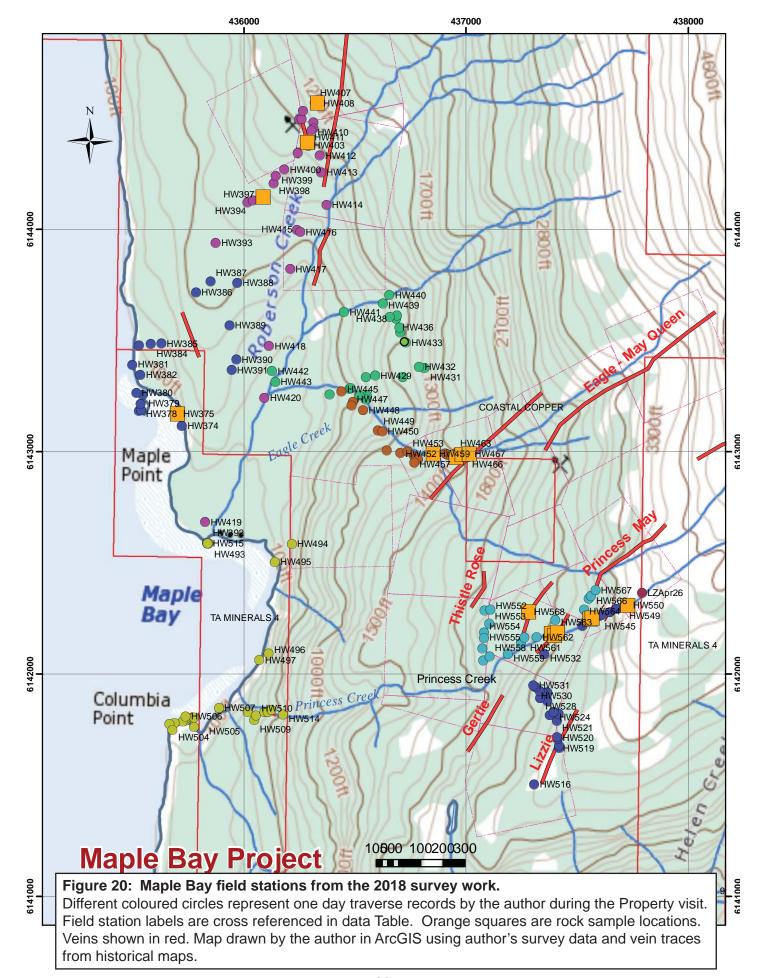
The Property was explored in the period from April 16 through April 26, 2018 by the author with the help of a field assistant, Alan Stark, and was based out of Stewart, about 57 km by helicopter north of the Maple Bay Property. Early spring conditions were prevalent with a slowly melting spring snowpack still present above about 500 meters at Maple Bay. Weather was also inclement during the first 8 days of the program with low cloud and occasional rain preventing reliable helicopter access about 300 meters due to limited visibility and potential for wing icing conditions. Clear sunny weather on the 25th and 26th allowed direct access to the alpine by helicopter. Spring tide conditions existed at the start of the program and required monitoring of tide tables in order to coordinate helicopter landings along the coast and examination of rock outcrop in the intertidal zone. At maximum flood the only coastal landing site was at the mouth of Roberson Creek on the north shore of Maple Bay. Spring tide range was up to 6.7 meters, which provided significant exposures of rock in the intertidal zone at low tide where not covered by dense packed mussels.

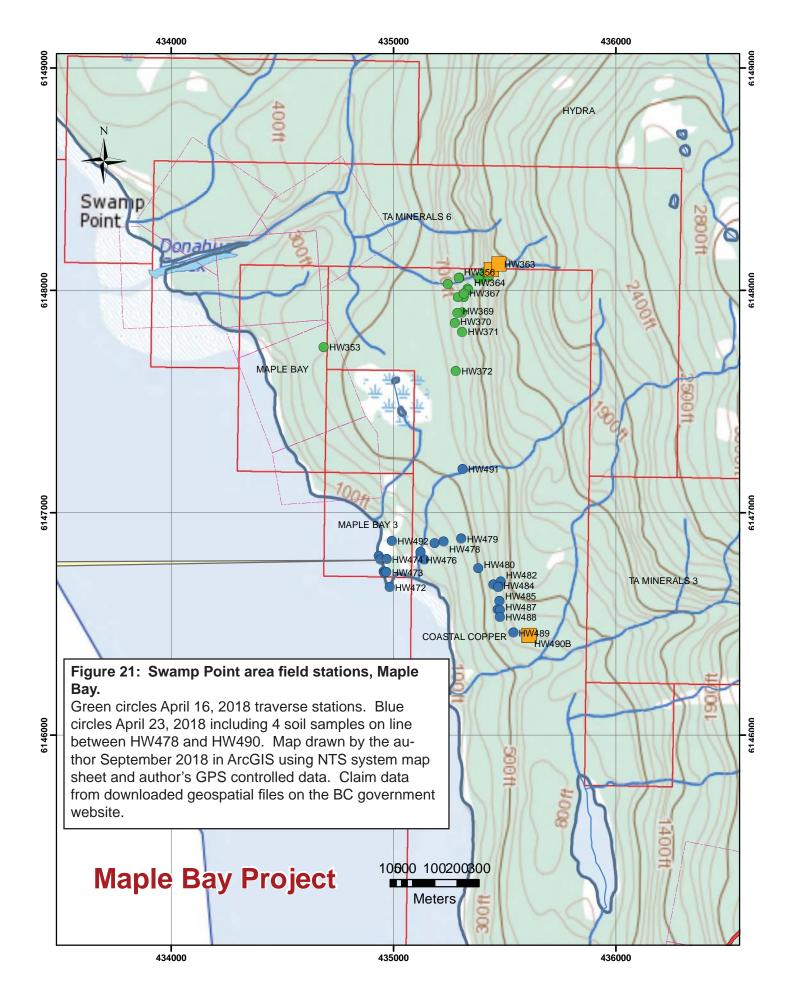
Snow conditions at the time were characterized above 500 meters by nearly continuous snow cover to about 2 meters deep with exposed outcrops on steep rock faces as result of spring melt. However, it was found that the spring snowpack also provided easy access to some steep rock faces in canyons and below cliffs that would in summer have been relatively inaccessible due to dense brush including slide alder. This access was moderated by an evident avalanche risk, which the author assessed as being moderate to high for spring type slides relative depending on position ranging from the below the low aspect shoulders to steep upper alpine faces of Mount Tournay. Fresh avalanche debris was observed in at least one gully during a period of low cloud, which may have either resulted from rain on snow or perhaps surface sluffing triggered by sun on snow above the cloud deck on the upper slopes of Mount Tournay. During clear and sunny weather on the 26th a dense spring snow avalanche was observed in mid-afternoon flowing through an existing, perennial avalanche path. Spring avalanches are not the only type in the area: dry powder blast avalanches probably occur in winter as indicated by woody debris stranded in broken trees well outside the deep gullies that capture or channel many spring avalanches.

#### 9.2 Field Traverses

Nine field traverses were completed between the 16th and 26th of April, 2018 within the Coastal Copper claim (the Maple Bay Property) and immediately adjacent areas of important outcrop along the coast such as at Maple Bay (Figures 20 and 21). The objectives were to determine the structural regime in which the veins were emplaced and identify clearly unambiguous rock units that might be related to vein mineralization. No attempt was made to access the old mine workings or the surface traces of veins, most of which were snow covered and have been the focus of many previous exploration programs.

Day one, April 16th, 2018, the traverse started from cleared areas at the Swamp Point ag-





gregate exploration site at the north end of the Coastal Copper Claim. The operations at Swamp Point were suspended some years previously and roads and clearing have partially overgrown with alder. The traverse accessed a snow-filled gully below Mount Tournay that had good and fairly continuous outcrop exposures to an elevation of 415 meters above which the slope was too

steep to safely climb and re-descend and avalanche risk was uncertain because of low cloud. Twenty field stations were completed and two rock samples collected for analysis. The section was characterized by variably foliated mafic volcanic tuffs, and metagreywackes. Sills of horn-blende gabbro displayed weak foliations indicative of shear, hornblende altered to actinolite, and pervasive disseminated pyrite and pyrrhotite. Strike of units and foliations was northerly with steep easterly dips.

Day two started at a gravel bar at the mouth of Roberson Creek and proceeded west and north along the shoreline past Maple Point, taking advantage of an ebbing tide to examine rock exposures in the intertidal zone (Fig. 22). At a point along the coast about 1 km north from the landing zone the intertidal became too steep below dense forest to continue and the traverse



Figure 22: Pillowed flows, pillow breccias and interflow hyaloclastite beds in the intertidal zone at Maple Point.

The beds strike north south parallel to coast line and dip steeply east.

was shifted into the forest in the direction of the historic Friday Vein. Dense blowdown impeded progress, and evidence of the old workings, until the top of a low ridge was reached after which the route headed south through fairly open forest to return to the landing zone on Maple Bay for pickup.

Clearly exposed pillowed basalt flows and pillow breccias were observed north of Maple Point. The flows displayed upright tops to the southeast and a northerly strike and moderate easterly dip (Fig. 22). Amphibolitic metamorphic alteration and dextral shear kinematic indicators were observed in the flows. Much of the intertidal section was made up of chlorite-epidote altered tuffs and hyaloclastites. A dyke of coarse grained hornblende diorite-gabbro was sampled at HW375 (Fig. 20). Along the forested part of the traverse, mafic tuffaceous and volcaniclastic rocks were commonly observed including coarse feldspar crystal lithic tuffs with epidote-pyrite alteration.

Day three started from a snow filled open meadow on the low ridge north of Maple Bay to aim for the area around the Outsider Vein (station HW393 - HW417) and ended at Maple Bay. The route near the Outsider vein was impeded by soft deep snow in the forest above 300 meters, avalanche debris in and dense bush near the mining



Figure 23: Eagle Creek Canyon. showing continuous outcrops of mafic intrusive rocks and traverse route up snow

areas. Moderately, foliated greywackes, fine tuffs, and possible crystal tuffs and some argillites intruded by hornblende bearing gabbro sills were observed along a route to the NE towards the Outsider vein. Foliations strike NNE and dip steeply east. Two thick massive quartz veins, over 1 to 2 meters, were observed within 150 meters of the west side of the mapped position of the Outsider vein and aligned parallel to it. Both were mainly massive white quartz, but sulphiderich float specimens were sampled in the creek bed adjacent to one of the veins and showed significant copper.

Day four started and ended on the beach at Maple Bay as a consequence of easy walking through the relatively open forest in the Roberson Creek Valley. The traverse swung farther to the east than the previous traverses along the mapped location of a trail that was used in the early 1900s to access the Eagle May-Queen veins. Slatey argillite, possible crystal tuffs, and siltstones with NNE striking foliations or laminations were mapped in the forest in contacts with greywackes showing a lower degree of foliation and distinct NE trending steep east dipping beds.

Day five, April 21, 2018, began at a toe-in drop-off on an avalanche fan at the base of Eagle Creek in the Roberson Valley and ended in an open snow field at an elevation of 500 meters on the south side of Eagle Creek. The objective of the traverse was to observe near continuous rock exposures in the steep walled canyon of lower Eagle Creek (Fig. 23). The canyon cuts across strike of structural trends and the veins at Comstock and Eagle May-Queen. Lower sections displayed a sequence of black slatey argillites interlayered with black laminated siltstones. Massive chlorite altered pyroxene and hornblende phyric gabbro sills traverse across the canyon parallel

to the laminations in the siltstone. The gabbros do not show a penetrative fabric, but are altered and hornblende phyric possibly an amphibolitization of pyroxene. Four samples of the gabbros were collected in the top 100 meters of the section traversed and all report within a range of  $\mathrm{SiO}_2$  from 48 to 50% (see section below on Geochemistry). The canyon was ascended to the 500 meter elevation where a waterfall blocked further climbing.

The sixth traverse was run from the south end of the Swamp Point facilities where shore outcrops display massive quartz veins in greenstones a sample of which had assayed with significant gold. From there it proceeded east uphill to about 260 meters elevation at the base of a steep cliff band. The section consistently was in chlorite actinolite altered mafic flows and breccias interspersed with slaty silt-stone to argillitic sediments with moderately east-dipping cleavage. At south end of the traverse a creek bed displayed narrow quartz vein arrays probably indicative of dextral shear along the WSW trend of the creek (Fig. 24). Four soil samples were also collected to test a possible response to the quartz veining prevalent in the area. No significant results were obtained.



Figure 24: Shear zone in narrow creek canyon southeast of Swamp Point.

On April 24, 2018, the seventh traverse was run in the vicinity of Maple Bay taking advantage of a low tide that exposed outcrops across a wide section of the intertidal zone. Steep terrain inland of the east side of Maple Bay prevented access to the east except at the south end of Maple Bay where Princess Creek was ascended to the base of a set of falls at about 100 meters elevation.

During the final two days of field work the weather cleared completely allowing direct helicopter access to the alpine areas around the Princess and Eagle May-Queen Veins systems. On the 25th a landing site at station HW517 on crusty snow was found at 800 meters elevation near the mapped position of the south end of the Lizzie Vein. Deep snow cover precluded observations, but a series of rock bluffs starting about half way along the trace of the vein was exposed by spring melting. Near the vein feldspar phyric mafic intrusives were observed in contact with slaty dark green metasediments with north striking foliations. Contacts were not exposed, but the intrusives showed no evidence of deformation and were inferred to have intruded the sediments. Stations HW525 to HW531, from a 100 meter interval of bluffs trending north oblique to the slope, showed mainly foliated metasediments interpreted as volcanic tuff and volcaniclastics. Foliation remained consistently north to NNE with steep easterly dips. One occurrence of nonfoliated feldspar porphyritic basalt was observed. The NE trending canyon occupied by Princess Creek was encountered at HW536 at a point where the Princess Alexandra Vein was mapped and an old adit was observed adjacent to a spoil pile. Samples of the chalcopyrite-pyrrhotite ex-

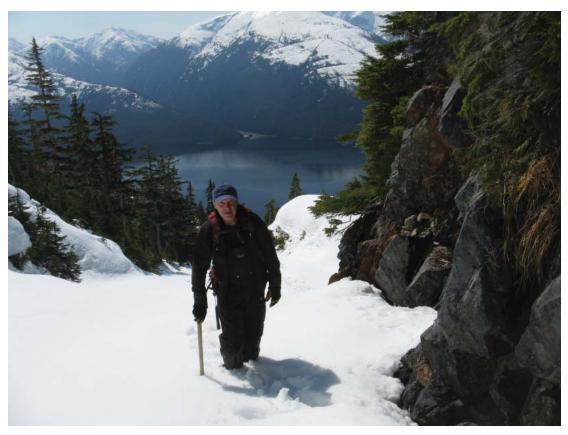


Figure 25: In the upper reaches of Princess Creek, April 25, 2018. Looking west down the canyon of Princess Creek past outcrops of gabbro towards the Portland Canal. Altitude about 800 meters. Alan Stark, geological assistant for scale.

cavated material from the adit and of mineralized massive to brecciated actinolite - altered horn-blende gabbro were collected in the canyon at the portal and yield copper assays ranging from 4.5% for the adit material to 0.25% for the altered hornblende mafic intrusive. The sample from the edge of the vein consisted of quartz with veinlets of chalcopyrite and pyrrhotite and assayed 2.5% copper. Above the adit the canyon walls trend NE and expose a nearly continuous series of outcrops (Fig. 25) at a high angle to strike for 500 meters into the alpine on the south shoulder of Mount Tournay. The section displayed a series of shear or cataclasite zones represented by

fine grained laminated argillite-like rock for which a whole rock analysis showed  $92\%~{\rm SiO_2}$ , well above the natural limits for argillites. A significant part of the section was also occupied by massive gabbroic intrusives with contacts parallel to the trend of the mylonite.

The final day of field work examined an area on the north side of Princess Creek in the vicinity of the Thistle Rose, Anaconda and Princess Alexandra and Princess May veins. The first several stations of the traverse midway between the Thistle Rose and Anaconda veins recorded a silicious or cherty rock with northerly striking lamination that was interpreted as a mylonite. The mylonite was interspersed by massive feldspar porphyritic diorite or gabbros and some foliated actinolite-chlorite metabasalts. Near the south end of the Anaconda vein a silicious mylonitic rock was observed with a near east-west strike. More silicious mylonite was observed 50 meters to the east of the end of the vein, but with a lamination that had returned to near north south. Roughly on strike with the Princess May vein in the interval between it and the Princess Alexandra a series of mafic feldspar porphyry outcrops was observed. The traverse diverted back to the west in the mid afternoon sun after observing a significant slow-moving spring snow avalanche to the north in perennial slide areas near the end of the Princess May veins. The traverse ended near the position of the Anaconda veins where a massive plagioclase phyric gabbro was sampled.

Interpretation of the traverses illustrates a cross section of the rock types of the Maple Bay area from the coast line up into the alpine on Mount Tournay. The near coastal section was characterized by mafic volcanic flows including some unequivocal pillowed flows. To the east the section at the base of the Mount Tournay slopes consisted of an interbedded series of greywackes, siltstones and argillites with generally northerly striking foliations and possibly transposed bedding parallel to foliations. Higher uphill and to the east in the vicinity of the NE striking Comstock, Thistle Rose, Anaconda, Princess Alexandra, Princess May and Lizzie veins the section is characterized by a thick series of massive feldspar and hornblende-phyric gabbroic sills intruded into mylonites and highly foliated metasedimentary rocks. The mylonitic zones appear to be precursors to the vein systems, while the gabbroic sills may be post-tectonic and intrude along the same breaks as the veins.

Rock samples were collected at nineteen stations to develop a lithogeochemical data set of the mafic intrusive rocks commonly found in the vicinity of the veins as well as various tectonites and mineralized rocks. Sampling and analytical procedures are described below. Implications of the observed geology and the lithogeochemistry are discussed in the geology section.

# 10.0 Drilling

Numerous drilling campaigns have taken place in the Maple Bay area on many of the vein systems including the Outsider, Princess-Anaconda and Eagle-May Queen. These took place in the 1920 and 1950s. However, drill core has not been preserved and logs have not been found and records show that at best drill holes were short holes in 2 hole fans perpendicular to the veins and drilled using a packsack drill. Core assays with small diameter would likely have not involved splitting the core for future evaluation. Some longer single holes were recorded, but at wide intervals along veins.

Drilling in 1955 and 1956 on the Princess and Anaconda veins (Class B) by Bidgood Kirkland Gold Mines Limited was reported as EX core, which is 7/8" in diameter and would be considered inadequate today for accurate grade determination although the vein material and host rocks are quite competent and should not have issues with core recovery. Earlier drilling, in 1926, mostly took place along the Eagle vein system by Granby consisting of 4 diamond drill holes of unreported size. The sections and location of the holes have been recorded along with as-

says from intervals, but no significant drill logs have been found. However, given the competent nature of the veins and surrounding rock it is likely that the assay from the drilling are reasonable indicators of potential and at least define the structure of the veins system enough for planning more thorough drilling campaigns.

# 11. Sample Preparation, Analyses and Security

## 11.1 Geochemical Analyses

Rock samples collected by the author at locations shown on Figures 20 and 21, were principally of a lithologic nature for analysis by whole rock methods and were therefore not of a nature sensitive to tampering. The samples generally consisted of one or two single large chunks of rock selected by the author in the field representative of the rock unit. At the collection site, samples were photographed with numbered tags and a selected piece was labelled and set aside as an archive piece available for cross checking and petrographic analysis. Samples were collected into 6 ml plastic sample bags with sample number tags and sealed with plastic zip ties. Locations were recorded by the author using a Garmin 62 GPS unit and marked on outcrops with flagging tape and embossed aluminum tags.

Samples were submitted directly to the ALS laboratory ("ALS") by personnel from Rich River Exploration Ltd. At the laboratory, the samples were dried, crushed, split and pulverized using standard rock preparation procedures. The nature of the exploration program, in the author's opinion, does not warrant rigourous quality control procedures such as insertion of certified standards or blanks by the client.

Twelve rock samples were analysed by lithogeochemical methods to determine major elements, minor and trace elements and rare earth elements (REEs). Major elements were determined by ME-ICP06: a 2 gram sample of pulp rock was fused with lithium borate flux, reground and dissolved in aqua regia and analysed by induction coupled atomic emission spectroscopy (ICP-AES). Similarly, trace elements and REEs were determined by method ME-MS81: prepared for analysis by fusing a 2 grams sample of the pulp in lithium borate, regrinding and dissolving in aqua regia and then analysis by induction couple mass spectroscopy (ICP-MS), a more precise method for low concentration elements that eliminates some peak overlaps found in emission spectra. Further analysis for other trace elements was completed by ME-MS41, an ICP analysis following aqua regia dissolution of the rock pulp, a partial dissolution method compared to flux used in ME-ICP-016 and ME-MS81, but sufficient for most sulphides and many silicate minerals.

An additional seven rocks that were mineralized and significantly altered were also analysed by ME-MS41 as well as for gold, by method Au-AA23, which is a standard fusion process for using a 30 gram sample of the rock pulp. Analytes that returned concentrations above the accepted analytical limit for the method were reanalysed using a sequence of quantitative methods for higher concentrations of base metals as required.

ALS is a certified commercial lab with ISO 9001:2000 certification and no connection to the issuer other than a regular service provider - client relationship. The laboratory in Vancouver has also been accredited to ISO 17025 standards for specific laboratory procedures by the Standards Council of Canada (SCC). ALS is a leading testing, inspection, certification and verifi-

cation company head quartered in Brisbane, Australia that services multiple industries globally and employs over 13,000 staff in over 65 countries.

Sample preparation and analyses by previous operators prior to the 1990s on the Maple Bay Property are not fully documented in historical literature. The author acknowledges that reasonable sampling methodology and secure chain-of-custody were adequately maintained during the course of the project. The author is unaware of any problem with the analytical procedures that would have an adverse affect on the quality of the data that is represented in this report.

## 12. Data Verification

The author reviewed the historical data and various reports in the public domain. All annual reports by the forerunners of the BC Geological Survey were checked from the early 1900s to the present.

The principal verification by the author involved a 9 day field investigation of various parts of the Property with a focus on lithogeochemical characterization of some of the intrusive phases present on the Property that may be at least spatially related to the quartz veins systems, and mapping of structural systems around a few of the veins. This work enabled a better understanding of the nature of the deposits and therefore their potential in relation to various ore deposit models. The lithogeochemical data obtained by the author is, in the author's opinion, wholly adequate for the petrological evaluation of mafic dykes spatially associated with the mineralized vein systems and a comparison with similar igneous petrological concepts at the nearby Anyox VMS camp.

Snow cover prevented any attempt at systematic evaluation of mineralized systems at higher altitudes on the Property and it was the author's opinion that such evaluation was not warranted in a short property visit. However, several mineralized samples confirm the presence of copper mineralization within the bounds of the Property.

No drill core or historical samples are known from the district and none were observed on the Property by the author.

# 13. Mineral Processing and Metallurgical Testing

There has been no recent mineral processing or metallurgical testing of quartz - sulphide vein material undertaken on the Maple Bay Property to the best of the author's knowledge. However, in the 1920s Granby Consolidated Mining, Smelting and Power Corporation utilized the silicious vein material from the Outsider Mine as smelter flux and in the process recovered copper, gold and silver credits from the Maple Bay ores. Subsequent evaluations by consultants suggested that simple beneficiation was feasible on the vein material to produce a sulphide rich concentrate. This appears generally plausible in the author's opinion since the vein material has been subjected to moderate grades of metamorphism resulting in recrystallization of sulphides to anneal grain boundaries. Conversely, some quartz veins or parts of them display sucrosic textures, which may indicate a lack of recrystallization.

The vein material does not contain significant concentrations of deleterious elements that might either inhibit efficient mineral processing nor contaminate tailings. However, a significant proportion of the sulphide mineral is pyrrhotite, which oxidizes rapidly and could be a source of acid rock drainage (ARD) if not dealt with appropriately in tailings disposal facilities.

### 14. Mineral Resource Estimates

Historical mineral resource estimates have been made for several of the Maple Bay veins at various times, but none were considered definitive when evaluated in the 1970s by consultants who evaluated the deposits (see section 6.0) and would not be compliant with NI 43-101 standards. The best indication of the nature of the resources was from historical production records dating back to the early 1900s. All of the early estimates are assumed to be from Class B parts of the Property. There are no current mineral resource estimates.

# 15. Adjacent Properties

The Maple Bay Property is adjacent to two properties that have economic significance. The most relevant is the Anyox camp where several volcanogenic massive sulphide deposits were discovered and mined in the 1920 and 30s. The second is at Swamp Point, immediately north of the Coastal Copper claim, where a large deposit of glaciofluvial gravels has been explored for potential in the aggregate market along the Pacific coast of Canada and the USA. Parts of the Property covered by Crown Grants have been distinguished as Class B Property (where known) rather than attempting to disentangle their history of exploration and development from the whole Property and classifying these parts as adjacent properties.

## 15.1 Anyox

Mineral claims, in addition to the Coastal Copper Claim, currently cover much of the Anyox Peninsula and are held by TA Minerals. The Anyox area was host to several significant volcanogenic massive sulphide deposits including the Hidden Creek deposit from which 22 M tonnes of ore was mined in the period from 1914 to 1935. The Hidden Creek Mine was only located about 10 km east of Maple Bay. The main commodity was copper and production at at average grades of 1.68% Cu, 10.8 g/t Ag and 0.20 g/t Au, (Minfile 103P 021). 321,500 t of copper, 206,000 t of zinc, and 3772 t of lead. Gold and silver grades were low and augmented by the quartz vein smelter flux from Maple Bay and subsequently Anyox area quartz veins, which also had low gold grades. Dolmage (1922) gave crude average gold grades of between 0.002 and 0.13 oz/ ton (0.07 - 4.5 g/t Au) for high-grade sulfide lenses and 0.002 and 0.004 (0.07 -0.14 g/t Au) for low-grade lenses.

The Hidden Creek deposit occurred as several sheet like massive sulphide lenses with stockwork mineralized zones in the footwall below the lenses. The massive sulphide are complexly folded, but stratigraphically deposited with a few tens of meters of the interface between the mafic volcanic–sedimentary rock contact. Alteration associated with ore deposition is typical of Cypress - type massive sulphide deposits showing a quartz–chlorite–pyrrhotite core grading outwards to a quartz–sericite–pyrite margin (Macdonald, 1999). The sulphide ores displayed a strong association between pyrrhotite and chalcopyrite and were zoned outwards from high copper silicious zones, consisting of sucrosic quartz, towards a lower copper grade massive pyrite with associated sphalerite. Dolmage (1922) also observed magnetite, arsenopyrite, native silver and galena. The cherty, siliceous zone occurred at the contact between the mafic volcanic and turbiditic sedimentary rocks and was originally thought to be the result of replacement of argillaceous sedimentary lenses.

The Anyox volcanogenic massive sulphide deposits, although located close by in rocks that are at least partly correlated with those at Maple Bay, are not indicative of mineralization or

mineral potential in the Maple Bay Property, and as well the author has been unable to verify the information regarding the Anyox area. They are mentioned as an important aspect of the geology of the Anyox Pendant that has been speculatively cited in deposit models and exploration potential for Maple Bay (Alldrick, 1986). However, the author is of the opinion that the Maple Bay veins are unrelated to volcanogenic massive sulphide deposits despite superficial similarities in ore mineralogy (chalcopyrite - pyrrhotite), planar form, gabbroic intrusions and elements of correlatable stratigraphy discussed in sections 7.2 and 17.0

### 15.2 Swamp Point aggregate property

The Swamp Point property (Fig. 26), owned by Ascot Resources, is at the north end of the Coastal Copper property. It is a large aggregate deposit that has been partially developed, but has not had any production for want of contracts. It is mentioned here because of its proximity and the potential that its infrastructure might be of value in development work at Maple Bay and that its aggregate resources might also be available for construction of tailings disposal facilities or for other purposes at Maple Bay.



Figure 26: Southern extent of the Swamp Point aggregate project. Docking anchors on outcroppings of mafic volcanics that are probably correlatable with the Hazelton Group. The aggregate deposits are exposed on the 150 meter slopes in the background. Relative sea level in the area was approximately 200 m higher than at present following melting of the continental glaciers and resulted in the subaqueous deposition of the Swamp Point aggregate deposits. Isostatic rebound exposed the aggregate deposits.

## 16. Other Relevant Data and Information

There is no additional relevant data or information known by the author on the Maple Bay property that is not disclosed in this technical report.

# 17. Interpretation and Conclusions

Historical discovery, development and mining has established the existence of numerous significant thick copper-silver-gold bearing quartz veins and vein breccias near Maple Bay that are mineralized with chalcopyrite and pyrrhotite. Although no economic reserves have been delineated, past exploration has shown high and variable grades of copper mineralization, ranging from low percentages to perhaps 8% in selected parts of the veins, and vein widths from a few meters up to 7 meters and with lateral and vertical continuity in the order of 100s of meters. The most verifiable demonstration of copper, silver and gold grades in any part of the veins has been shown by the production records from the Outsider vein in the period 1906 to 1908 when several thousand tons of 2.8% copper ore was produced, and again between 1924 and 1928, when Granby shipped about 125,000 tons of ore grading 1.8% Cu and low amounts of silver (est. 10 g/t) and gold (est. 0.14 g/t) to the Anyox smelter for use as furnace flux. Numerous campaigns of prospecting, trenching, diamond drilling and drifting have been completed on the Outsider and the other large veins of Maple Bay since the last production. However, no coherent resource estimates have been made on any of the veins that would approach compliance with current NI 43-101 standards. Crown Grant mineral claims (i.e. Class B) hold mineral rights over significant sections of the known vein system exposed at surface within the Coastal Copper Claim. The remaining area of the mineral claim (i.e. Class A) especially that between the Outsider and the Eagle May Queen systems has a high probability of discovery of unexposed veins using structural characteristics of the exposed veins as a guide.

The veins are sinuous in form and are formed subparallel to the strike of gabbroic sills, the foliation in silicified argillites and the trend of mylonites in shear zones. The host rocks are generally enigmatic in origin and have been called the Clashmore Metamorphic Complex. Although parts of the section hosting the veins are correlated by U-Pb geochronology with the upper Hazelton Group rock hosting massive sulphides at Anyox, other deformed parts of the section undoubtedly are of Devonian age. Gabbroic intrusions show little deformation and have N-MORB compositions, precisely like the basaltic flows hosting the massive sulphides at Anyox. They are thus probably of the same age, and in the Anyox area would be the feeders for basaltic flows hosting massive sulphide deposits. In the Maple Bay area, however, they intrude highly deformed metasediments including cataclasites that are not correlatable with the Hazelton Group except in the narrow section of pillowed flows and arenites along the coast at the outside of Maple Bay that have been convincingly dated as younger than 180 Ma by detrital zircon U-Pb geochronology. The section of deformed rocks through which gabbros intrude in the area of the Princess and Eagle May Queen veins is interpreted herein as being significantly older than Jurassic and may be as old as Devonian, the age of tectonic inclusions at Mount Clashmore. Basaltic flows derived from similar gabbroic feeder dykes are preserved in the coastal section of Columbia Point and Maple Point described above and eroded elsewhere in the Maple Bay domain.

The most likely interpretation of the composition and origin of the Maple Bay rocks is shown by Evenchick and McNicoll (2002) beginning with a Devonian basement of deformed sediments that is intruded by granitoids. Deformation and rifting in the Jurassic, associated with the upper Hazelton Group, resulted in the gabbro sills intruding the metasediments with concurrent extrusion of pillowed basalts now preserved along the coast of Maple Bay and in the Anyox area. To the immediate east of the Maple Bay coastal domains, deeper levels of basement have been uplifted removing the Jurassic volcanics and exposing the deformed sediments, sills and veins. The cataclasite zones including mylonites, probably developed at deep levels during the early stages of uplift. The massive quartz veins followed as ductile conditions transitioned to more brittle as overlying rocks were removed possibly by gravity sliding or listric normal faulting.

Quartz veins are commonly observed in regions of greenschist or amphibolite facies metamorphism where re-equilibration of rock compositions releases silicious fluidsthatascendfrom ductilely-deforming zones to brittle zones and deposits in fractures. Quartz veins are also commonly observed in the Anyox area where it has been speculated (Alldrick, 1986) that the quartz was remobilized from cherty layers above massive sulphide lenses. This theory has been entertained in the Maple Bay area, but it is the author's opinion that the Maple Bay veins are related to silicious fluids mobilized upwards by crystallization of gabbros, or amphibolite facies metamorphic recrystallization.

Continuing evaluation of the Maple Bay project should be cognisant of the risks in using a tempting, but speculative, model whereby the veins are viewed as indicative of the proximal presence of massive sulphide lenses. Although the age of the host rocks remains somewhat uncertain, what is certain is that the gabbro sills are related to the volcanics at Anyox, and therefore coeval, but that their intrusive relationship to metasedimentary host rocks indicates that they are significantly younger than them. This renders efforts to find massive sulphide deposits in the structural domain of the quartz veins at Maple Bay highly risky if not futile except in the coastal domain where pillowed volcanic were identified and where the section has been dated as Jurassic and probably correlative with Hazelton Group.

Despite interruption of complete ownership of mineral rights by Crown Grants within the claim that cover portions of the historically known mineralized quartz veins, large areas of the claim remain under-explored and have undetermined potential for discovery of unexposed (blind) mineralization. Significant areas exist with full mineral rights around the Friday quartz vein and between the Outsider vein and the Eagle-May-Queen vein systems. In addition the known extents of the Lizzie and Gertie veins continues beyond the Crown Grants into Class A of the Property.

## 18. Recommendations

Advancement of the Maple Bay project either requires a large budget for a detailed diamond drilling campaign with no certainty of success or a more incremental analysis of the economic geology of the vein systems in order to determine a more rational approach. Many campaigns of prospecting and sampling have been undertaken over the last century in the Maple Bay area, and yet there are no complete geological maps of the environs of the veins. The author notes that additional sampling and discovery of vein extensions alone will not determine their economic potential and that significant area of the exposed veins lie within Crown Grants. The author is of the opinion that a more thorough understanding of the structural geology and relationship of the veins to host stratigraphy would require, as a first step, detailed mapping, combined with structural analysis and geochemistry to provide a comprehensive understanding of the entire volume of the Coastal Copper claim and in particular areas outside of the Crown Grants.

Accordingly Phase 1 would include:

- 1. A detailed structural geological analysis based on thorough mapping of the area around the Eagle- May Queen to Princess veins should be completed to determine the mode of formation of the various mylonites and the emplacement of the veins and gabbros. The relationship between cataclasite development and the emplacement of the veins is not clear.
- 2. Implicit in the structural analysis, the Issuer should conduct detailed geological mapping of the alpine areas around the Princess and Eagle May Queen veins. This work might be aided by ground magnetic and perhaps electromagnetic (EM) geophysical surveys to give a good

idea of the distribution of veins and the potential for finding veins that do not continue to surface parallel to the exposed veins and in the gap between the Outsider and the Eagle-May-Queen vein systems. One of the structural features observed by the author in the gully transect east of the Princess vein, was the development of a shear zone, separated from the presumed immediate vicinity of the vein and characterized by silicified argillites or mylonites for which a whole rock analysis confirmed over 92% SiO<sub>2</sub>. Silicification along shear zones may be a precursor to vein development, or represent lateral zoning of a vein that does not appear at surface. Hence mapping of all structural features and alteration or lithologic changes is recommended as such mapping may identify the location of unexposed mineralized vein structures.

- 3. The geochemistry of identifiable volcanic lithologies units within each of the domains should be established to compare with the geochemistry of the gabbroic intrusives. Geochronology has established a minimum age of 186 Ma for the deposition of sandstones at Columbia Point that correlates it with the Hazelton Group volcanics. The same volcanic and sedimentary section appears to continue north through Maple Point where the section includes pillowed basalt flows and breccias. If the geochemistry of the basalts shows consanguinity, i.e. N-MORB REE compositions, with the gabbros sampled in this work will support the correlations of the stratified rocks with those in the Anyox area and a corresponding Jurassic or Hazelton Group origin. However, continuity has not been established with the highly deformed sections to the east that are characterized by greywacke-siltstone-argillite sequences with some suspect tuffs on the lower slopes and increasing prevalence of tectonites and gabbros in the subalpine area of the Princess veins so independent geochemistry of basalt flows will be needed to substantiate a correlation with Hazelton group for the stratified rocks. Positive correlation would increase the rationale for exploring for VMS deposits in the Maple Bay area or for suspecting that the sulphide - quartz vein breccias may represent remobilized massive sulphides. On the other hand, a negative correlation, such as a finding that the volcanics were from a non- N-MORB basalt setting, would establish that the basement rocks were unrelated to the rift related setting in which the massive sulphides at Anyox were formed and with it any likelihood that the sulphide quartz veins are remobilized from VMS deposits or that the stratigraphic section hosts undiscovered massive sulphides. The author's opinion is that the gabbroic dykes are feeders for N-MORB flows that have been eroded exposing basement rocks at the present surface.
- 4. Samples should be collected from clearly identifiable volcanic flows or pillowed basalts in the coastal area of Maple Point as well as any suspect volcanic strata on the slope areas above the Outsider vein and in the vicinity of the Princess and Eagle veins systems. These should be analysed by complete characterization methods such as ALS CCP-Pkg01, which provides whole rock analysis on fused beads (either by XRF or ICP analysis) and trace elements including REEs. The geochemistry can then be compared to that of the gabbro sills described in this report an conclusions and inferences drawn about the relation ship to the gabbros.
- 5 . Direct prospecting for extensions of existing veins and locating new intermediate veins would be a useful adjunct to the mapping program, but not a substitute. Structural analysis should be used to examine the area outside of the Crown Grants for indicators of shear zones that may host veins not exposed at surface. Exploration of the Friday Vein in the western part of the Property is not compromised by Crown Grants and should be pursued despite the historical production of silica only from the vein. This may be a result of depth of exposure.

A second phase of exploration is wholly dependent on results of the first and cannot be defined here. Hypothetically, a second phase would be undertaken after a greater understanding of the veins structural system is achieved and might involve diamond drilling using oriented core to verify predictive aspects of the model from phase 1 and to test targets outside of the Crown

Grants. If the prospects appear promising a decision should be made on whether or not the Crown Grants should be acquired.

#### 18.1 Recommended Budget

The most efficient approach to complete the recommended work program would be to establish a temporary camp in the subalpine in the vicinity of the Princess veins for a period of approximately 1 to 2 weeks. Helicopter usage should be restricted to mobilization, demobilization and supply flights from Stewart.

A recommended exploration budget for the first phase of exploration is shown in Table 4. The focus of the budget is structural geological mapping and interpretation of the best exposed areas of veins on the Maple Bay Property, which are generally referred to as the Princess vein system. These are exposed in the alpine - subalpine above about 1000 m ASL requiring snow free conditions for definitive field work. This is most likely to occur after June in most years. The overall objective of the mapping program would be to produce a property-wide geological map with special focus on structural interpretation of the vein systems.

Another component of the Phase 1 budget is for whole rock geochemical analyses to build on the data set presented in the present technical report to define the lithogeochemistry of the veins. Assay work on veins would also be included, but it is suspected that surficial leaching promoted by the pyrrhotite content of the sulphide assemblages may have reduced copper grades in surface samples. Geophysical survey work may be an efficient method for tracing veins in the subalpine and add to the structural interpretation model.

Item	No. of Units	Unit Cost	Subtotals
Chief Geologist	16 days	\$1200	\$19,200
Structural Geologist	16 days	\$1200	\$19,200
Assistant	16 days	\$420	\$6,720
Assistant	16 days	\$420	\$6,720
Geochemical Analyses	50	\$60	\$3,000
Camp supplies	2 weeks	\$1600	\$3,200
Helicopter	16.66 hours	\$1800	\$30,000
Travel	8 flights	\$500	\$4,000
Reporting and analysis	8.33 days	\$1200	\$10,000
Geophysical rentals	15 days	\$200	\$3,000
Total			\$105,040

**Table 4: Recommended Phase 1 Exploration Budget** 

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## 20. 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 BC, do hereby certify that my qualifications, stated below, apply to the NI 43-101 Technical Report entitled "NI 43-101 Technical Report, Maple Bay Property, Stewart District, British Columbia" (the "Technical Report") authored by me as of the effective date of September 28, 2018.
  - 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, BC 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 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 ("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. My field work experience relevant to evaluation of the Maple Bay Property includes a variety of exploration work dating back to 1978 for Shell Canada Resources, for Anaconda Canada Exploration in parts of the Yukon in 1980 and 1981 and in BC in 1983; Ph.D. thesis field research on epithermal vein systems in Peru, 1984. More recently I have been involved in drill programs on volcanogenic massive sulphide deposits at Myra Falls (2004-2005), Granduc (2006) and Palmer (Haines AK, 2006 to 2009) and in the field of magmatic hydrothermal deposits I have been involved in drilling programs on iron skarns (2008-2009 Vancouver Island), porphyry copper deposits (Galore Creek, 2011), and in the Dease Lake area (2013-2014). My recent exploration work has been involved in vein type systems of magmatic hydrothermal association in the Terrace Smithers region.

- 8. I have no beneficial interest in Rich River Exploration Ltd and Golden Opportunity Resources Corp., 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 Maple Bay Property.
- 9. I have not had prior involvement with the Maple Bay Property that is the subject of the Technical Report.
- 10. I am responsible for all aspects of the Technical Report including the current field data
- 11. I am familiar with the Maple Bay Property held by Craig Lynes of Rich River Exploration Ltd having visited the Property between April 16 and April 26th, 2018 for the purposes of this 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

Hardolph Wasteneys, PhD, PGeo.

Signed, at Upper Campbell Lake, BC,

Hordy Charty

June 6, 2019

## 21. Consent Form

To: British Columbia Securities Commission

Alberta Securities Commission

Manitoba Securities Commission

Canadian Securities Exchange

Dear Sirs/Mesdames:

Re: Golden Opportunity Resources 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, Maple Bay Property, Stewart District, British Columbia" and dated effective September 28, 2018 (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 June 7, 2019 (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.

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Dated this 7th day of June, 2019

## **Date and Signature Page**

**Effective Date of this Report: September 28, 2018** 

Last Revision Date: June 6, 2019 Date of Signing: June 6, 2019

Hardolph Wasteneys

Dr. H. A. WASTENEYS
#32102
BRITISH
COLUMBIA
SCIEN

Hardolph Wasteneys Ph.D. P.Geo.