# TECHNICAL REPORT FOR THE KLIYUL PROJECT, OMINECA MINING DIVISION, BRITISH COLUMBIA, CANADA

prepared for Pacific Ridge Exploration Ltd.

Kliyul Project, Johanson Lake Area, British Columbia, Canada

Effective: June 24, 2020 Signed: June 24, 2020

Ronald J. Voordouw, P.Geo., Daniel K. Lui, GIT, and Darcy E.L. Baker, P.Geo.

Equity Exploration Consultants Ltd.





# TABLE OF CONTENTS

TABLE OF CONTENTS	2
LIST of TABLES	3
LIST OF FIGURES	3
1.0 SUMMARY	4
1.1 Introduction	4
1.2 Property Description and Location	4
1.3 Geological Setting and Mineralization	4
1.4 Exploration	4
1.5 Conclusions and Recommendations	5
2.0 INTRODUCTION	6
2.1 Scope of Work	7
2.2 Qualifications of Project Team	7
2.3 Site Visit	7
3.0 RELIANCE ON OTHER EXPERTS	7
4.0 PROPERTY DESCRIPTION AND LOCATION	7
4.1 Land Tenure	7
5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, PHYSIOGRAF	РНҮ11
5.1 Accessibility	
5.2 Local Resources and Infrastructure	12
5.3 Climate	13
5.4 Physiography	13
6.0 HISTORY	14
6.1 Historical Ownership and Exploration	15
6.2 Historical Drilling	
6.3 Historical Mineral Resource Estimates	26
6.4 Historical Production	
7.0 GEOLOGICAL SETTING AND MINERALIZATION	26
7.1 Regional and Local Geology	26
7.2 Regional Metallogeny	
7.3 Property Geology	
7.4 Property Mineralization	
8.0 DEPOSIT TYPES	
9.0 EXPLORATION	40
10.0 DRILLING	40
11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY	40
12.0 DATA VERIFICATION	40
13.0 MINERAL PROCESSING AND METALLURGICAL TESTING	
14.0 IVIINEKAL RESOURCE ESTIVIATES	42
23.0 ADJACENT ENUFERTIES	

24.0	OTHER RELEVANT DATA AND INFORMATION	43
25.0	INTERPRETATION AND CONCLUSIONS	43
26.0	RECOMMENDATIONS	44
27.0	REFERENCES	46

# LIST OF TABLES

Table 2.1: Abbreviations and units	6
Table 4.1 Mineral tenure for the Kliyul property. Source: Pacific Ridge (2020)	10
Table 6.1 Kliyul exploration history. Source: Pacific Ridge (2020)	17
Table 6.2 Kliyul drilling history. Source: Pacific Ridge (2020)	19
Table 6.3 Kliyul drill hole collar location and orientation data. Source: Pacific Ridge (2020)	20
Table 6.4 Kliyul Main Zone drill highlights. Source: Pacific Ridge (2020).	22
Table 7.1 Kliyul intrusive units. Source: Pacific Ridge (2020)	36
Table 7.2 Kliyul alteration assemblages. Source: Pacific Ridge (2020)	37
Table 26.1 Proposed work for the 2020 Kliyul work program.	45

# LIST OF FIGURES

Figure 4.1 Kliyul Project location map. Source: Barnes and Miller (2018)	8
Figure 4.2 Kliyul land tenure map. Source: Pacific Ridge (2020).	9
Figure 5.1 Kliyul regional location map. Source: Barnes and Miller (2018)	12
Figure 5.2 Physiography of the Kliyul Property. Source: Barnes and Miller (2018)	13
Figure 6.1 Historical drilling. Source: Barnes and Miller (2018).	14
Figure 6.2 Historical surface sampling. Source: Barnes and Miller (2018)	15
Figure 6.3 Kliyul drill hole plan map. Source: Pacific Ridge (2020).	21
Figure 6.4 Kliyul Main Zone drill highlights with labeled composites A to N correlating with those in Table 6.4. Source Pacific Ridge (2020).	: 22
Figure 6.5: Kliyul Main Zone drill cross-section. Refer to Figure 6.4 for cross-section location and Table 6.4 for dril intercepts denoted by capital letters. Source: Pacific Ridge (2020)	l 23
Figure 7.1 Location of the Property in the context of BC geological terranes. Source: Barnes and Miller (2018)	27
Figure 7.2 Regional mines and mineral occurrences. Source: Barnes and Miller (2018).	29
Figure 7.3 Regional geology in the vicinity of the Kliyul Property. Source: Bayliss (2016)	31
Figure 7.4 Kliyul Property scale geology. Source: Barnes and Miller (2018).	32
Figure 7.5 Local geology in the vicinity of the Kliyul Main Zone. Source: Bayliss (2016)	33
Figure 7.6 Kliyul Property stratigraphic column. Source: Barnes and Miller (2018)	34
Figure 12.1: Photos from the 22 June 2020 site visit	41

# 1.0 SUMMARY

## 1.1 Introduction

Pacific Ridge Exploration Ltd. ("Pacific Ridge") has retained Equity Exploration Consultants Ltd to produce a National Instrument 43-101 Technical Report (or the "Report") for the Kliyul Project ("Kliyul" or the "Project") in British Columbia, Canada. This Report was prepared for Pacific Ridge to satisfy TSX-V disclosure requirements related to Pacific Ridge's option to acquire up to a 75% interest in the Redton and Kliyul projects from AuRico Metals Inc. ("AuRico") as described in Section 4.0.

This represents the first NI43-101 Report summarizing work performed on the Project up to June 24, 2020.

## 1.2 Property Description and Location

The Kliyul Project is located within the Swannell Range of the Omineca Mountains, 200 km northeast of Smithers, British Columbia (BC) and 350 km northwest of Prince George, BC. The property is comprised of 77 adjoining mineral claims covering a total of 5,966.27 hectares (ha).

Most past exploration on the Property has occurred within the "Lay-Kliyul valley", a broad east of northeast trending drainage system with a base at about 1750 m above sea level (ASL). The Project is ~5 km south of the Omineca Mining Access Road and powerline that connect the 50,000 tonne/day Kemess Cu-Au mine with the provincial highway system and power grid at Mackenzie. Property access is by helicopter.

#### 1.3 Geological Setting and Mineralization

The Kliyul Project lies within the Quesnel Terrane and is underlain by Upper Triassic Takla Group volcanic and sedimentary rocks intruded by several Late Triassic through Middle Jurassic granitoid suites. This geological setting is akin to several nearby porphyry deposits, including Mount Milligan, Kemess and Kwanika.

Porphyry Au-Cu mineralization in the Kliyul Main Zone is predominantly hosted by Takla Group andesite and volcaniclastic andesite, with subordinate Au-Cu hosted in early feldspar porphyry and diorite. Principle ore minerals are chalcopyrite with minor bornite, which are disseminated in the host rock or hosted in quartz-sulphide veins. Higher gold and copper grades are correlated with potassic alteration, magnetite-cemented breccia and increased density of quartz-sulphide veins.

#### 1.4 Exploration

Pacific Ridge has not explored the Kliyul Project.

The earliest recorded work at Kliyul occurred in the 1940s whereas the most recent exploration program was completed in 2017. Results of this work provide comprehensive coverage of geological, surface geochemical and ground geophysical surveys over the Project claims, especially in the Lay-Kliyul valley. 49 drill holes have been completed on the Project including 41 targeting the Kliyul Main Zone. The two longest mineralized intercepts were collared 85 m apart and drilled at subparallel azimuths and dips, returning 217.8 m of 0.23% Cu and 0.52 g/t Au from KL-06-30 (22.0-239.8 m core depth) and 245 m of 0.18% Cu and 0.53 g/t Au in KLI-15-034 from 123-368 m core depth. It is unclear how these intercepts relate to true thickness as the orientation of the mineralized zone is unknown.

#### 1.5 Conclusions and Recommendations

The Kliyul Main Zone is the primary exploration target at Kliyul. This target comprises a nearsurface Cu-Au skarn linked to a deeper porphyry system and probably falls in the class of alkalic porphyry Au-Cu deposits and related deposit types (e.g. skarn, carbonate replacement).

For the purposes of this technical report, only the geological and drilling data was reviewed in detail. An independent review of surface geochemical and geophysical data, which has been used to successfully target for mineralization at Kliyul, is recommended.

Downhole surveys in 2006 and 2015 were completed using a Reflex EZ Shot, which works poorly in magnetic rocks. A review of downhole surveys is recommended.

The upper 100-150 m for five of six 2006 and 2015 holes (Main Zone) encountered poor to very poor ground conditions, comprising heavily fractured rock and core recovery between ~30-65%. The material impacts of poor RQD and low recovery on assay results have not been evaluated.

The true thickness, depth and width are not known for the Kliyul Main Zone, with previous interpretations suggesting it may be subvertical to steeply south dipping.

Historical procedures for drilling, core handling, sample preparation, sample security and QAQC are available for the 2006, 2007 and 2015 drill programs, and mostly missing for pre-2006 work. A comparison of historical data with the database provided by Pacific Ridge indicates that drilling data was accurately transcribed. In the opinion of the QP, the data is of sufficient quality for project evaluation and exploration targeting.

Verification work by the author suggests that uncertainty in data quality is moderate to low and could be mitigated by a further independent review of geochemical and geophysical data. Project risk is high because Kliyul is an early stage exploration project with no guarantee that exploration results to date indicate an economic ore body. Significantly more drilling is required to demonstrate economic potential and is not recommended at this time.

A C\$160,000 exploration program is recommended for 2020 and includes building of 3D geophysical and geological models, geological mapping and IP geophysics on the M39 target, relogging and resampling of drill core, spectral analysis of drill core and additional modelling/analysis of spectral and geochemical data.

## 2.0 INTRODUCTION

Pacific Ridge has retained Equity Exploration Consultants Ltd ("Equity") to produce a National Instrument 43-101 Technical Report ("NI43-101 Report" or the "Report") for the Kliyul Project in the Omineca Mining Division of British Columbia, Canada. This NI43-101 Report was prepared for Pacific Ridge to satisfy TSX-V disclosure requirements related to Pacific Ridge's option to acquire up to a 75% interest in the Redton and Kliyul projects from AuRico Metals Inc. ("AuRico") as described below in Section 4.0. The Report is written in compliance with disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101, "Standards of Disclosure for Mineral Projects".

This NI43-101 Report is based on information contained in publicly available assessment reports filed with the British Columbia Ministry of Energy, Mines and Petroleum Resources (BCMEMPR), professional opinions from first-hand experience at the Kliyul Project, data compilations as well as unpublished reports provided by Pacific Ridge. A complete list of references is provided at the end of this Report.

All map coordinates are given as North American Datum 1983 (NAD83), UTM zone 9N coordinates in meters or Latitude / Longitude. Other abbreviations and units used in this report are provided in Table 2.1.

Abbreviati	ons	Abbreviations cont.			
AAS	atomic absorption spectroscopy	QC	quality control		
Ag	silver	QSP	quartz-sericite-pyrite		
ALS	above sea level	RC	reverse-circulation drilling method		
Au	gold	RQD	rock quality designation		
Ca	calcium	SG	specific gravity		
Cu	copper	SCC	sericite-clay-chlorite		
DDH	diamond drill hole	TSX-V	Toronto Stock Exchange – Ventures		
ELF	extremely low frequency	UTM	Universal Transverse Mercator		
EM	electromagnetic	VLF-EM	very low frequency EM		
FA	fire assay	W	west		
GPS	global positioning system	Zn	zinc		
HLEM	horizontal loop EM	Units of I	s of measure		
IP	induced polarization	cm	centimetre		
IPL	International Plasma Laboratories	C\$	Canadian dollar		
ISO	International Standards Organization	g/t	grams/tonne		
К	potassium	ha	hectare		
M+I	measured and indicated	km	kilometre		
Ма	million years ago	km <sup>2</sup>	square kilometres		
Мо	molybdenum	kg	kilogram		
MTO	Mineral Titles Online	m	metre		
Ν	north	mm	millimetre		
NE	northeast	mV/V	millivolt per volt		
NI 43-101	National Instrument 43-101	nT	nanotesla		
NNE	north-northeast	oz/ton	troy ounce per short ton		
NSR	net smelter return	ppb	part per billion		
Pb	lead	ppm	part per million		
QA	quality assurance	t	Metric tonne		

#### Table 2.1: Abbreviations and units

#### 2.1 Scope of Work

The purpose of this NI43-101 Report is to provide information relating to the Kliyul Project. The scope includes the general setting, geology, exploration history, and historical drilling activity along with recommendations for ongoing exploration.

At the time of report writing, Pacific Ridge has not conducted any exploration on the Kliyul property.

#### 2.2 Qualifications of Project Team

Author Ronald J. Voordouw, Ph.D., P.Geo., is the qualified person (QP) responsible for all sections of this report.

#### 2.3 Site Visit

A site visit was completed on 22 June 2020 and is described further in Section 12.0.

# 3.0 RELIANCE ON OTHER EXPERTS

For section 4.0, the author has relied Gerald G. Carlson, President & CEO of Pacific Ridge, for terms of their underlying agreement with AuRico and how that ties into tenure ownership, as detailed in a January 17<sup>th</sup>, 2020, press release authored by Gerald G. Carlson (Pacific Ridge, 2020). Also, for section 4.0, Danette Schwab, Vice President of Exploration for Pacific Ridge, has communicated to the author that Pacific Ridge is unaware of any environmental liabilities for the Project (D. Schwab, personal communication, 15 April 2020). The author has not relied on a report, opinion, or statement of an expert for other information concerning legal, political, environmental, or other issues.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

#### 4.1 Land Tenure

The Kliyul property lies approximately 200 km northwest of Mackenzie within the Omineca Mountains of north-central British Columbia. It lies within the Omineca Mining District, centred at 56°30' north latitude and 126°09' west longitude (Figure 4.1). The Project consists of 77 contiguous mineral claims that sum to 5,966.27 hectares (Table 4.1, Figure 4.2) although the actual area of the Property is 5,194.54 ha due to overlapping of "legacy" and Mineral Titles Online (MTO) mineral claims. Until 31 January 2008, legal boundaries of the legacy claims were determined by the location of initial and final claim posts for each claim. Legal boundaries of the MTO claims are given by map coordinates to form a seamless grid over the province. Effective 31 January 2008, the positions of these posts have been deemed to be at the locations registered on the MTO claim map so as to give precise certainty as to the claim locations. In Table 4.1 legacy claims are indicated by Title Numbers <500,000 whereas MTO claims are >500,000.

On January 17, 2020 Pacific Ridge signed an earn-in agreement with AuRico, a wholly owned subsidiary of Centerra, to acquire up to a 75% interest in the Kliyul and Redton copper-gold porphyry projects (the "Properties"). Pacific Ridge has the right to earn a 51% interest in the Properties by making cash payments totalling C\$100,000, issuing 2.0 million shares and spending C\$3.5 million on exploration by December 31, 2023. The Company then has the right to increase its interest in the Properties to 75% by making additional payments totalling C\$60,000, issuing 1.5 million shares and completing an additional C\$3.5 million in exploration by December 31, 2025. The agreement is subject to regulatory approval. The Kliyul Project is subject to underlying royalties of 2% of net smelter returns.

Pacific Ridge has applied for a multi-year area-based (MYAB) exploration permit for 3 years of work on the Kliyul Property, with the permit currently under review by the BCMEMPR.

Pacific Ridge are unaware of any environmental liabilities or any other risks that may prevent them from carrying out future work.



Figure 4.1 Kliyul Project location map. Source: Barnes and Miller (2018).



Figure 4.2 Kliyul land tenure map. Source: Pacific Ridge (2020).

Title No.	Claim Name	Owner	Map No.	Issue Date	Good To	Area (ha)
245065	KLI NO. 1	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245066	KLI NO. 2	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245067	KLI NO. 3	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245068	KLI NO. 4	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245070	KLI NO. 6	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245071	KLI NO. 7	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245072	KLI NO. 8	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245074	KLI NO. 10	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245075	KLI NO. 11	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245076	KLI NO. 12	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245077	KLI NO. 13	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245078	KLI NO. 14	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245079	KLI NO. 15	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245080	KLI NO. 16	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245081	KLI NO. 17	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245082	KLI NO. 18	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245083	KLI NO. 19	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245084	KLI NO. 20	AuRico Metals Inc.	094D060	1970/AUG/10	2028/FEB/05	25.00
245155	KLI NO.21	AuRico Metals Inc.	094D060	1970/SEP/11	2028/FEB/05	25.00
245156	KLI NO.25	AuRico Metals Inc.	094D060	1970/SEP/11	2028/FEB/05	25.00
245157	KLI NO.26	AuRico Metals Inc.	094D060	1970/SEP/11	2028/FEB/05	25.00
245158	KLI NO.27	AuRico Metals Inc.	094D060	1970/SEP/11	2028/FEB/05	25.00
245159	KLI NO.28	AuRico Metals Inc.	094D060	1970/SEP/11	2028/FEB/05	25.00
245382	KLI #39	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245383	KLI #40	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245384	KLI #41	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245385	KLI #42	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245386	KLI #43	AuRico Metals Inc.	094D050	1971/JUL/12	2028/FEB/05	25.00
245387	KLI #44	AuRico Metals Inc.	094D050	1971/JUL/12	2028/FEB/05	25.00
245388	KLI #45	AuRico Metals Inc.	094D050	1971/JUL/12	2028/FEB/05	25.00
245389	KLI #46	AuRico Metals Inc.	094D050	1971/JUL/12	2028/FEB/05	25.00
245390	KLI #47	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245391	KLI #48	AuRico Metals Inc.	094D060	1971/JUL/12	2028/FEB/05	25.00
245777	UTA #4	AuRico Metals Inc.	094D060	1973/AUG/29	2028/FEB/05	25.00
245778	UTA #6	AuRico Metals Inc.	094D060	1973/AUG/29	2028/FEB/05	25.00
245779	UTA #8	AuRico Metals Inc.	094D060	1973/AUG/29	2028/FEB/05	25.00
319492	YUL-7	AuRico Metals Inc.	094D060	1993/JUL/15	2028/FEB/05	25.00
319493	YUL-8	AuRico Metals Inc.	094D060	1993/JUL/15	2028/FEB/05	25.00
319494	YUL-9	AuRico Metals Inc.	094D060	1993/JUL/15	2028/FEB/05	25.00
319495	YUL-10	AuRico Metals Inc.	094D060	1993/JUL/15	2028/FEB/05	25.00
319496	YUL-11	AuRico Metals Inc.	094D060	1993/JUL/15	2028/FEB/05	25.00
319497	YUL-12	AuRico Metals Inc.	094D060	1993/JUL/20	2028/FEB/05	25.00
319498	YUL-13	AuRico Metals Inc.	094D060	1993/JUL/20	2028/FEB/05	25.00
532002	KLI 51	AuRico Metals Inc.	094D	2006/APR/13	2028/FEB/05	446.18
532005	KLI 52	AuRico Metals Inc.	094D	2006/APR/13	2028/FEB/05	357.07
532011	KLI 53	AuRico Metals Inc.	094D	2006/APR/13	2028/FEB/05	392.93
532014	KLI 54	AuRico Metals Inc.	094D	2006/APR/13	2028/FEB/05	446.02
534992	MOC1	AuRico Metals Inc.	094D	2006/JUN/06	2028/FEB/05	392.93

Table 4.1 Mineral tenure for the Kliyul property. Source: Pacific Ridge (2020)

Title No.	Claim Name	Owner	Map No.	Issue Date	Good To	Area (ha)
535013	JOH2	AuRico Metals Inc.	094D	2006/JUN/06	2028/FEB/05	446.28
598705	KLIYUL	AuRico Metals Inc.	094D	2009/FEB/04	2028/FEB/05	875.26
672564	KLIYUL	AuRico Metals Inc.	094D	2009/NOV/21	2028/FEB/05	17.85
675143	THE RITZ VEIN	AuRico Metals Inc.	094D	2009/NOV/26	2028/FEB/05	17.85
684403	GOLDWAY 2	AuRico Metals Inc.	094D	2009/DEC/13	2028/FEB/05	35.69
684404	GOLDWAY	AuRico Metals Inc.	094D	2009/DEC/13	2028/FEB/05	17.85
684583	RH ADVISORY	AuRico Metals Inc.	094D	2009/DEC/13	2028/FEB/05	35.70
684763	GOLDWAY 3	AuRico Metals Inc.	094D	2009/DEC/14	2028/FEB/05	35.70
689123	GOLDWAY 5	AuRico Metals Inc.	094D	2009/DEC/24	2028/FEB/05	231.95
701023	SUGAR BABY	AuRico Metals Inc.	094D	2010/JAN/18	2028/FEB/05	53.53
832262		AuRico Metals Inc.	094D	2010/AUG/27	2028/FEB/05	35.70
832282		AuRico Metals Inc.	094D	2010/AUG/27	2028/FEB/05	35.70
832302		AuRico Metals Inc.	094D	2010/AUG/27	2028/FEB/05	35.70
832322		AuRico Metals Inc.	094D	2010/AUG/27	2028/FEB/05	35.70
832925	SB2	AuRico Metals Inc.	094D	2010/SEP/07	2028/FEB/05	142.76
836390	GW	AuRico Metals Inc.	094D	2010/OCT/21	2028/FEB/05	17.85
837391	V4	AuRico Metals Inc.	094D	2010/NOV/03	2028/FEB/05	17.84
838699	GW2	AuRico Metals Inc.	094D	2010/NOV/21	2028/FEB/05	107.08
838764	GW3	AuRico Metals Inc.	094D	2010/NOV/23	2028/FEB/05	17.85
838835	WIERD	AuRico Metals Inc.	094D	2010/NOV/24	2028/FEB/05	17.86
838843	GW4	AuRico Metals Inc.	094D	2010/NOV/24	2028/FEB/05	17.85
838884	94D	AuRico Metals Inc.	094D	2010/NOV/24	2028/FEB/05	35.70
838885	94D	AuRico Metals Inc.	094D	2010/NOV/24	2028/FEB/05	17.85
840872	GW 5	AuRico Metals Inc.	094D	2010/DEC/15	2028/FEB/05	17.85
840942	JOH	AuRico Metals Inc.	094D	2010/DEC/16	2028/FEB/05	71.35
840978	JOH 3	AuRico Metals Inc.	094D	2010/DEC/16	2028/FEB/05	142.68
1022107	TETRIS	AuRico Metals Inc.	094D	2013/SEP/05	2028/FEB/05	71.37
1022108	DOUGHNUT	AuRico Metals Inc.	094D	2013/SEP/05	2028/FEB/05	17.83
1036122	TSALACHUDY001	AuRico Metals Inc.	094D	2015/MAY/14	2028/FEB/05	231.97

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, PHYSIOGRAPHY

#### 5.1 Accessibility

The Kliyul Project is located within the Swannell Ranges of the Omineca Mining Division in north central British Columbia. It is located approximately 60 km southeast of the Kemess mine, 225 km to the northwest of Mackenzie and 200 km to the northeast of Smithers (Figure 4.1). The Property is centered at latitude 56°30'35" N and longitude 126°09'04" W (or UTM NAD83 Zone 9; 675310 m E, 6266425 m N) on NTS map sheets 94D (8 and 9), and BCGS map sheets 94D (49, 50, 59, 60). The Omineca Resource Access Road lies approximately 5 km to the northeast of the Property although currently the Property is only accessible by helicopter. A staging area along the access road, near Johanson Lake, is approximately 11 km from the 2015 camp location (UTM NAD83 Zone 9: 678400 m E, 6266350 m N) and was used in the past to mobilize the camp and gear via helicopter. The Omineca road connects with BC Highway 39 near Mackenzie.

#### 5.2 Local Resources and Infrastructure

The nearest road-accessible community is Mackenzie (population 3,700), which lies 230 km southeast of Kliyul and is also serviced by the CN rail line. Smithers (200 km southwest; population 5,400) and Prince George (360 km southeast; population 74,000) are both serviced by regularly scheduled commercial flights. Both cities have emergency hospital facilities as well as significant industrial and logistical support options, including helicopter services. Additionally, Centerra also holds the nearby Kemess Mine property and the infrastructure associated with the past producing Kemess South Mine. The Kemess camp is well-placed to provide logistical support for the Kliyul Project, as it is only 60 km to the northwest (Figure 5.1) and approximately 1 hour away by road from the staging area at Johanson Lake. Kemess has year-round, regularly scheduled fixed-wing air charters from Prince George and Smithers - used for both personnel and cargo - and receives regular ground delivery of groceries and fuel from Prince George via the Omineca Resource Access Road.

The high-voltage BC Hydro power line that follows the Omineca Resource Access Road services the Kemess Mine and is connected to the provincial grid. At its nearest point, the power line runs 6 km north of the Kliyul Property.

The camp site on the Property still has some remaining infrastructure although most materials have been removed. Remaining on site are eleven 14' x 16' and two 14' x 24' plywood tent floors, two sump covers constructed of decking, one generator platform, three outhouses and neatly stacked lumber for building tent frames. These are remaining from Teck Resources 2015 field season and were used during the 2017 field season.



Figure 5.1 Kliyul regional location map. Source: Barnes and Miller (2018)

Surface rights over the Kliyul Project are mostly owned by the Crown and administered by the Government of BC and would be available for any eventual mining operation. The project area has abundant water and water rights could be obtained for milling. It is still too early to determine potential tailings storage areas, potential waste disposal areas, and potential processing plant sites.

# 5.3 Climate

The climate in the region is typified by cold winters with an average of approximately two metres of snowfall, and moist cool summers. Freezing temperatures and snow can occur at any time of the year. First snowfall generally occurs by late September and snow melt is generally mostly complete around late June to early July, with some glaciers and portions of the Property retaining snow year-round. Extreme and sudden weather changes are possible at higher elevations and winds through the Lay-Kliyul valley may be strong and persistent. Exploration activity on the Kliyul Project is most practical from late June to late September, with drilling likely possible until late October.

# 5.4 Physiography

The Kliyul Property is centered by the Lay-Kliyul valley - a broad, east of northeast trending, drift, and moraine-covered valley at approximately 1,750 m ASL - that is surrounded by ruggedly incised peaks, hanging valleys and cirques. Elevations on the Property range from 2,300 m to 1,340 m ASL (Figure 5.2) with treeline at approximately 1,550 m ASL. Most of the Project is above treeline, with more wooded valleys located in the southeast and eastern corners of the Property, along the Kliyul and Croyden creeks, respectively.



Figure 5.2 Physiography of the Kliyul Property. Source: Barnes and Miller (2018).

Vegetation in the Lay-Kliyul valley and on south-facing slopes is dominated by grasses, heathers, and sparse shrubs, whereas north-facing slopes and cirques are generally formed by lichencovered boulder fields. Wooded valleys consist primarily of mosses and densely tangled dwarf balsam, willows, and alder, locally disrupted by partially regrown avalanche and mass-wasting tracks.

## 6.0 HISTORY

The earliest recorded work at Kliyul is from the 1940s with the discovery of gold-bearing quartz veins. The first documented exploration dates from 1970 when Kennco Explorations Ltd ("Kennco") staked the original KLI claims, which now form the core of the Kliyul claim block. Since then, the Kliyul Property and the surrounding area have seen steady exploration, as summarized in Table 6.1.

A total of 49 drill holes have been drilled on the Kliyul Property; 45 of these have documented collar locations with 37 drill holes (5,933 m) drilled into the Main Zone (Figure 6.1). Core from some of this drilling is intact and stored in two locations; pre-2015 drill core is stored at 676235 m E, 6265840 m N (UTM NAD83 Zone 9) and the 2015 drill core is stored at 678150 m E, 6266340 m N. Details of historical drilling are presented below.

While there has been significant historical surface sampling, most analyses were limited to the elements of interest to the explorers at the time and most samples were analysed for fewer than 11 elements (Figure 6.2).



Figure 6.1 Historical drilling. Source: Barnes and Miller (2018).



Figure 6.2 Historical surface sampling. Source: Barnes and Miller (2018)

# 6.1 Historical Ownership and Exploration

This section summarizes the ownership and exploration history of Kliyul, subdivided into work done on the Kliyul Main Zone, BAP Ridge/Independence and Ginger/Bagel/Mordor. Historical drilling and core sampling are described in additional detail.

# 6.1.1 Kliyul Main Zone

In 1970, Kennco staked the KLI claims over what is now the Kliyul Main Zone and defined an isolated magnetic high through a ground magnetic survey. Follow-up work, in 1971, comprised silt and soil geochemical sampling that defined a 500 m diameter >300 ppm Cu anomaly, along with spotty Au, Ag and Mo (Stevenson 1971). An IP survey, also completed in 1971, showed a corresponding 600 m x 1800 m zone of high chargeability.

From 1973 to 1974 the KLI claims were optioned to Sumac Mines, who drilled 14 holes for 989.9 m and discovered silicified, epidote-bearing, andesite with chalcopyrite and magnetite (Rogers 1974). No analytical results were reported.

In 1981, Vital Mines acquired the KLI claims and completed four diamond drill holes for 602.9 m. They discovered a "near vertical stockwork of calcite-epidote-magnetite veinlets" cutting volcanic rocks, with disseminated and vein-hosted chalcopyrite (Rodgers 1981).

In 1984, BP optioned the Kliyul Property and conducted 1:5,000 mapping, surface geochemical sampling (rock, soil), drill core relogging and selective resampling on 1,593 m of historical drill core. Results were used to describe the Main Zone as an "irregular 200 m by 100 m zone of magnetite-rich skarn mineralization" (Smit and Meyers 1985).

In 1990, Placer Dome Inc. optioned the KLI claims and completed geochemical grid sampling, 30.6 line-km of VLF-EM and a ground magnetic survey. Results identified three areas of interest: (1) 400 m x 400 m Cu-in-soil anomaly over the Kennco anomaly defined in 1971, (2) 600 m long Au-Ag-As-Zn-Pb anomaly along BAP ridge, and (3) As-Mo-Zn-Cu  $\pm$  Ag  $\pm$  Pb anomaly associated with a diorite stock in the northwestern corner of their grid. Geophysical surveys identified several conductors interpreted as sulphide-rich shale and failed to outline any new magnetic anomalies (Price et al 1990).

Noranda Inc. ("Noranda") optioned the KLI claims in 1992, completing 1:5,000 mapping of geology and alteration focussed on the Main Zone. The following year, Noranda expanded the claim block, completed a test pit and soil sampling program, drilled six reverse circulation (RC) holes (for 560.0 m) and flew an airborne magnetic, EM and radiometric survey (Gill 1994). Two years later, Noranda completed 10 diamond drill holes (for 1,120.5 m) to test magnetic highs coincident with Cu-Au anomalies derived through their soil and test pit program. Drill results were interpreted as having intersected a propylitic halo, possibly related to a porphyry system at depth (Gill 1994a).

In 2006, Geoinformatics acquired the Kliyul Property and completed two diamond drill holes (for 751.5 m) targeting 3D inversions of historical magnetic data. Holes were collared 50 m apart and both intersected Cu-Au mineralized intervals, including 0.23% Cu and 0.52 g/t Au from 22.0 m to 239.8 m core depth in KL-06-30, as well as 0.21% Cu and 0.62 g/t Au from 346.0-378.0 m in KL-06-31 (Mair and Bidwell 2007). It is unclear how these intercepts relate to true thickness as the orientation of the mineralized zone is unknown.

In 2009, Rimfire Minerals Corporation merged with Geoinformatics to form Kiska Metals Corporation ("Kiska"). In 2010, Kiska initiated a core relogging program that demonstrated the deeper porphyry potential of the Kliyul Main Zone (Lui 2010). In 2011, Kiska completed 30.8 line-km of pole-dipole IP that showed the Main Zone as an area of high chargeability and high to moderate resistivity (Voordouw 2012).

In 2013, Teck Resources Ltd. ("Teck") optioned the Kliyul from Kiska and completed Propertywide 1:5,000 mapping and sampling, as well as 1:1,000 mapping over the Main Zone and 29.9 line-km of pole-dipole IP and ground magnetics (Bayliss 2016). The IP survey was completed west of the 2011 survey, covering the Dortatelle fault and ground to the west. The following year, Teck completed 1,908 m of drilling in four holes, intersecting porphyry-style Au-Cu mineralization in three of them. Notable intercepts include 0.18% Cu and 0.53 g/t Au over 245 m in KLI-15-034, as well as 0.2% Cu and 0.26 g/t Au over 162.4 m in KLI-15-033 (Bayliss 2016). It is unclear how these intercepts relate to true thickness as the orientation of the mineralized zone is unknown. Teck also completed 10 line-km of infill poledipole IP and ground magnetic surveys, as well as additional geological mapping and rock sampling.

Year	Company	Zone of Activity	Summary of Activities	Reference
1946-1947	Sturgeon Gold Mines	Ginger Zone	Prospecting, channel sampling	White 1948
1970-1971	Kennco	Kliyul Main Zone	Staked KLI claims, ground magnetics (1970), silt and soil sampling, IP (1971)	Stevenson 1971
1974	Sumac Mines	Kliyul Main Zone	14 DDH for 989.9 m	Rogers 1974
1974 - 1976	BP Minerals	BAP Ridge	Surface sampling, IP (1974), trenching, extend soil grids (1975), Max-Min EM (1976)	Betz 1976
1981	Golden Rule	Independence/BAP	Staked KC claims over lapsed BAP, prospecting	Fox 1982
1981	Vital Mines	Kliyul Main Zone	4 DDH for 602.9 m	Rodgers 1981
1984	BP Minerals	Kliyul Main Zone	Optioned KLI, relogged and resampled 1,593 m of historical core, 1:5,000 scale, reconnaissance rock and soil sampling	Smit and Meyers 1985
1984	Golden Rule	Independence/BAP	Prospecting	Wilson 1984
1985	Ritz Resources	Independence/BAP	Soil sampling, ground magnetics/VLF (6.6 line-km)	Christopher 1986
1986	Lemming Resources	BAP Ridge	Talus fine sampling (N = 90)	Rebagliati 1986
1990	Placer Dome	Kliyul Main Zone	Geochemical grid sampling, ground VLF-EM/magnetics (30.6 line-km)	Price et al 1990
1990	Golden Rule	Parish Hill and Dortatelle Fault	Staked JO claims, reconnaissance silt sampling, prospecting	Fox 1991
1992	Swannell Minerals	Dortatelle/ Darb	Staked Darb property, mapping, soil grid sampling (100 m x 200 m spacing)	Leriche and Taylor 1992
		Kliyul Main Zone	1:5,000 mapping (1992), six RC holes for 560.0 m, airborne magnetic/EM/ radiometric survey, soil sampling, test pitting, chip sampling (1993); 10 DDH for 1,120.5 m (1994)	Gill 1994a, 1994c
4000 4005	Navanda	Ginger B	Chip sampling (1993)	Gill 1994c
1992-1995	Norarida	Independence/BAP	Optioned KC claims, soil and rock sampling, ground magnetics (8.6 line-km) (1994)	Gill 1994b
		JO claims	Soil and rock sampling, ground magnetics (1994), infill and extension soil sampling (1995)	Gill 1995a, 1995b
1996	Intl. Conquest	JOH Claims	5 drill holes (154.83 m)	Leriche and Harrington 1996
2006 2007	Coninformation	Kliyul Main Zone	2 DDH (751.5 m)	Mair and Bidwell 2007
2000-2007	Geomormatics	BAP Ridge	3 DDH (1,247.0 m)	Mair and Bidwell 2008
2010-2011	Kiska Metals Inc.	Kliyul Main Zone	Relogging (2010), IP survey (30.6 line-km), prospecting (2011)	Lui 2010; Voordouw 2012
2013-2015	Teck Resources	Kliyul Main Zone, Ginger and BAP	1:5,000 property-wide and 1:1,000 detailed (Main Zone) mapping and sampling, IP/ground magnetics (29.9 line-km), relogging (2014), 4 DDH (1,908 m), mapping, IP/ground magnetics (2015)	Lui 2014; Bayliss 2016
2017	AuRico Metals, First Quantum Minerals	Property-scale evaluation	Property-scale evaluation, 1:5,000 to 1:10,000 mapping, grid-based rock sampling (350 m spacing), ground ELF survey.	Barnes and Miller 2018

Table 6.1 Kliyul exploration history. Source: Pacific Ridge (2020)

Kiska was acquired by AuRico in 2017, who then optioned the Property to First Quantum Minerals Ltd. Subsequent work comprised a property-scale evaluation that included 1:5,000 to 1:10,000 geological and alteration mapping, property-wide rock sampling on a 350 m spaced grid, and a ground-based extremely low frequency (ELF) survey (Barnes and Miller 2018). Results corroborated previous interpretation of the Main Zone as a near-surface skarn and porphyry target, and follow-up drilling was recommended at the Main Zone, Bagel Zone and BAP Ridge.

In 2019, AuRico was acquired by Centerra who optioned Kliyul to Pacific Ridge in 2020 in a transaction that trigged this technical report.

#### 6.1.2 BAP Ridge/Independence

BP Minerals staked the BAP claims in 1974 and carried out extensive surface sampling and an IP geophysical survey, with results returning anomalous Cu-Mo values and showing widespread development of narrow quartz-sulphide veins in epidote-altered monzonite. The following year, BP blasted three trenches and extended their soil grid, but returned no further notable results. In 1976, BP completed seven lines of Max-Min EM survey, identifying six northwesterly-trending zones of weak conductivity that were interpreted as either shear zones or water-filled faults (Betz 1976). Subsequently, BP allowed all but three claims to lapse.

In 1981 Golden Rule Resources staked the KC claims, over BPs former BAP claims, and undertook a prospecting program that discovered quartz-pyrite-chalcopyrite-galena veins on what is now the southern border of the Kliyul Property (Fox 1982). Veins are northwesterly striking and range from 0.3-2.0 m wide. Thirty-four rock samples were assayed, with 28 returning values <1 g/t Au and six assaying between 1.3 g/t to 36.4 g/t Au as well as 1.2 g/t to 150 g/t Ag (Fox 1982).

In 1984 Golden Rule further explored high grade Au-bearing veins on the KC claims, reporting a partially silicified fracture zone striking 070° and hosting 0.2-1.3 m wide quartz veins (Wilson 1984). These quartz veins host patches of sulphide with up to 30% pyrite and lesser galena, chalcopyrite, and sphalerite, with some rock samples returning anomalous values of gold and silver.

Ritz Resources optioned the KC claims in 1986, completing soil sampling and 6.6 line-km ground mag/VLF over two small grids in the northwestern corner of the Property (Christopher 1986).

Also, in 1986, Lemming Resources optioned the remaining BAP claims from BP and collected 90 talus fine samples to refine the location of historical Au anomalies (Rebagliati 1986).

Following an eight-year hiatus, Noranda optioned the KC claims in 1994 and completed a soil and rock sampling program along with 8.6 line-km of ground magnetics. Results defined a 100-750 m wide and 1600 m long northwesterly-trending anomaly with >100 ppb Au in soil, as well as several distinct NW-SE and N-S magnetic breaks correlating with mapped structural features (Gill 1994b).

In 2007, Geoinformatics drilled three holes (1247.0 m) on the BAP Zone, intersecting sericitepyrite ± chlorite ± quartz alteration with narrow magnetite-pyrite-chalcopyrite zones at depth but otherwise no significant mineralization (Mair and Bidwell 2008)

#### 6.1.3 Ginger Zone, Bagel, Mordor, Dortatelle Fault

Work done by Sturgeon Gold Mines in 1946-1947 included sampling of several quartz-sulfide veins on their Ginger claims, with some channel sampling returning anomalous Au and Ag (White 1948).

In 1990, Golden Rule staked the JO claims in what is now the southwestern part of the Kliyul Project, completing reconnaissance silt sampling and prospecting. Results returned several Au-bearing silt samples draining the Dortatelle Fault near the western end of the KLI claims (Fox 1991).

In 1992, Swannell Minerals staked the Darb claims in the northern part of the current Kliyul claim block, completing mapping and soil grid sampling (100 m sample spacing on 200 m spaced lines). Sampling returned several anomalous Cu, Mo, and Au results (Leriche and Taylor 1992).

In 1993, as part of a larger-scale exploration program, Noranda resampled the Ginger B vein, with select chip samples returning anomalous gold and silver values from pyritic andesite with 30-50% quartz veining (Gill 1994c).

In 1994, Noranda conducted a program of soil and rock sampling, as well as ground magnetics, on the JO claims (Gill 1995b). Results defined a 100-600 m wide, 1.7 km long, anomaly with >50 ppb Au. Noranda also discovered a magnetite-pyrite-epidote-garnet skarn showing referred to as the "Pacific Sugar Zone" (within Mordor Zone on Figure 6.1). This mineralized structure ranges form 3-6 m thick and occurs over a 40 m by 100 m area; some chip samples returned anomalous Cu and Au hosted in a melanocratic diorite. The following year, Noranda extended their soil grid and increased the sample density (to 50 m x 100 m) to better define the Au soil anomaly. Results show this anomaly trends parallel to the Lay-Kliyul valley floor, possibly indicating strong glaciofluvial control (Gill 1995a).

In 1996, International Conquest Exploration optioned the JOH claims and drilled five short holes (for 154.93 m) into the Pacific Sugar (or Mordor) Zone just to the north of the current Kliyul claim block. Three of these holes returned 4 m to 9.4 m core length intervals that assayed 0.2-0.3% Cu and 0.4-0.6 g/t Au whereas the other two holes returned negligible results (Leriche and Harrington 1996). It is unclear how these intercepts relate to true thickness as the orientation of the mineralized zone is unknown.

#### 6.2 Historical Drilling

A total of 49 historical drill holes have been completed at Kliyul, including six reverse circulation (RC) and 43 diamond drill holes. The oldest four of these holes lack records for all drilling data and so are excluded from the database. Thirty-seven of the 45 documented holes (82%) were drilled into the Kliyul Main Zone, with remaining holes drilled into the JOH (N = 5) and Norwest (N = 3) targets.

Data integrity varies from program to program. Programs from 1993 to 2018 have documented collar files, drill logs and assays (Table 6.2), and 80-85% of this core is stored on site. The 1974 Sumac and 1981 Vital Pacific drill holes, on the other hand, have poor accuracy for collar locations, no downhole surveys, only partially legible drill logs and no certified analytical data.

Operator	Year	Holes	Holes	Core	Metres	Collars?	Logs?	Assays?	Core?
Sumac	1974?	KL-1 to -4	4	AQ	?	No	No	No	?
Sumac	1974	KL-5 to -15	11	BQ	989.8	Yes	Yes	No <sup>1</sup>	KL-5 to -8, 15
Vital Pacific	1981	KL-16 to -19	4	NQ	603.2	Yes	Yes	No <sup>1</sup>	Yes
Noranda	1993	RC-KL93-1 to -6	6	RC	560.0	Yes	Yes	Yes	No
Noranda	1994	NK-94-20 to -29	10	BDBGM	1120.5	Yes	Yes	Yes	Yes
International Conquest	1996	JOH96-1 to -5	5	?	154.8	Yes	Yes	Yes	?
Geoinformatics	2006	KL-06-30 to -31	2	NQ2	751.5	Yes	Yes	Yes	Yes
Geoinformatics	2007	NW_07_01 to _03	3	NQ2	1247.0	Yes	Yes	Yes	Yes
Teck Resources	2015	KLI-15-032 to 035	4	HQ/NQ	1908.0	Yes	Yes	Yes	Yes
Totals			49		>7334.7				

Table 6.2 Kliyul drilling history. Source: Pacific Ridge (2020)

<sup>1</sup>The drill hole database contains sample intervals and analytical values for these holes, but the source of the sample intervals is unknown

Hole	Easting <sup>1</sup>	Northing <sup>1</sup>	Azimuth (°)	Dip (°)	Length (m)
KL-5	676307	6265904	60	-55	82.9
KL-6	676308	6265903	180	-50	78.9
KL-7	676226	6265857	60	-55	107.3
KL-8	676226	6265857	330	-50	133.8
KL-9	676803	6265820	0	-90	47.8
KL-10	677145	6265828	180	-50	91.4
KL-11	675807	6265588	225	-50	96.6
KL-12	675345	6265666	225	-50	100.6
KL-13	676306	6265906	0	-45	68.6
KL-14	676803	6265820	180	-45	60
KL-15	676928	6265751	0	-45	121.9
KL-16	676308	6265903	240	-60	163.4
KL-17	676308	6265903	240	-90	54.6
KL-18	676243	6265932	150	-60	142.3
KL-19	676111	6265943	130	-71	242.9
KL93-1	676335	6265628	0	-50	88
KL93-2	676672	6265801	0	-50	112
KL93-3	676651	6265886	33	-50	60
KL93-4	676325	6265829	50	-50	120
KL93-5	676196	6265838	60	-50	100
KL93-6	676244	6265782	60	-50	80
NK-94-20	676140	6265791	35	-70	152.4
NK-94-21	676238	6265773	35	-70	125
NK-94-22	676304	6265697	35	-70	108.5
NK-94-23	676397	6265675	35	-70	152.4
NK-94-24	676388	6265840	35	-70	64
NK-94-25	676070	6265838	35	-70	131.1
NK-94-26	674799	6266199	25	-70	118.9
NK-94-27	676882	6266044	35	-45	91.4
NK-94-28	677240	6265504	210	-45	103
NK-94-29	678358	6265392	215	-65	73.8
JOH96-1	676012	6266947	0	-90	77.7
JOH96-2	676012	6266947	165	-50	33.8
JOH96-3	676025	6266960	0	-90	21.3
JOH96-4	676025	6266960	165	-50	1.5
JOH96-5	676025	6266960	160	-60	20.4
KL06-30	676486	6265920	230	-60	325.4
KL06-31	676520	6265954	225	-70	426.1
NW_07_01	677990	6265100	40	-55	431.9
NW_07_02	677700	6265040	60	-50	428.9
NW_07_03	678050	6264964	110	-60	386.2
KLI-15-032	676341	6266009	229.5	-66.6	480.0
KLI-15-033	676685	6265836	236.6	-56.3	429.0
KLI-15-034	676401	6265931	233.6	-66	489.0
KLI-15-035	676404	6265932	53.5	-54.2	510.0

 Table 6.3 Kliyul drill hole collar location and orientation data. Source: Pacific Ridge (2020)

<sup>1</sup>Easting and northing are UTM NAD83 Zone 9



Figure 6.3 Kliyul drill hole plan map. Source: Pacific Ridge (2020).

Drill collar location and orientation data is provided in Table 6.3 and shown on Figure 6.3. 90% of pre-2006 holes drilled into the Main Zone focussed on shallow skarn potential, with 36 of 37 holes drilled to <165 m depth and the deepest drilled to 243 m. The 2006 and 2015 holes, on the other hand, were all drilled between 325-510 m core depth with the aim of testing for deeper porphyry potential.

The true thickness, width and depth of mineralization is unknown. Intercept lengths shown in Table 6.4 and Figure 6.4 are not indicative of true thickness (width, length, depth). Previous interpretation suggests a subvertical to steeply south-dipping mineralized zone (Figure 6.5); however, more drilling is required to determine the true dimensions.

Core recovery for the 2006 and 2015 drilling on the Main Zone ranged from 75-90% (base of overburden to end of hole) whereas rock quality designation (RQD) classifies as fair, ranging from 50-70%. However, the upper-most 100 m to 150 m of these holes shows low recovery (35-60%) and very poor (<10%) RQD in five of six drill holes. This 100-150 m core depth is equal to 85 m to 140 m true depth. Below 85-140 m true depth, RQD is good to excellent (72-94%) and recovery ranges form 85-99%. The material impacts of poor RQD and low recovery on assay results have not been evaluated; we recommend that they should.

Hole	From (m)	To (m)	Width (m)*	Cu (%)	Au (g/t)	Figs 6.4, 6.5
KL-5	10.8	68.3	57.5	0.32	0.99	А
KL-6	30.1	78.9	48.8	0.31	1.33	В
KL-7	20.0	71.0	51.0	0.17	1.19	С
KL-93-4	46.0	102.0.	56.0	0.34	0.89	D
KL-93-5	16.0	76.0	60.0	0.26	1.36	Е
KL-06-30	22.0	239.8	217.8	0.23	0.52	F
KL-06-31	346.0	378.0	32.0	0.21	0.62	G
KLI-15-033	32.5	194.9	162.4	0.20	0.26	Р
KLI-15-034	37.5	90.0	52.5	0.24	0.17	Н
	123.0	368.0	245.0	0.18	0.53	I
Including	280.6	301.0	20.4	0.39	2.55	J
	426.0	465.7	39.7	0.20	0.66	К
KLI-15-035	331.0	380.0	49.0	0.16	0.22	L
	399.5	462.8	63.3	0.26	0.28	М
including	414.0	433.5	19.5	0.43	0.56	Ν

Table 6.4 Kliyul Main Zone drill highlights. Source: Pacific Ridge (2020).

\*Width is presented as core length. Relation of these lengths to true thickness is unknown



*Figure 6.4 Kliyul Main Zone drill highlights with labeled composites A to N correlating with those in Table 6.4. Source: Pacific Ridge (2020).* 



*Figure 6.5: Kliyul Main Zone drill cross-section. Refer to Figure 6.4 for cross-section location and Table 6.4 for drill intercepts denoted by capital letters. Source: Pacific Ridge (2020)* 

#### 6.2.1 Drilling Procedures

Drilling procedures were best documented for the 2006 and 2015 programs. There are no descriptions of drill procedures for the 1974, 1981 and 1994 programs, and only partial descriptions for drilling done in 1993 and 1996.

Significant drilling intercepts (Table 6.4) were generated in the 1974, 1993, 2006 and 2015 drilling programs. The 1974 holes were drilled by D.W. Coates Enterprises Ltd of Vancouver, BC, using BQ wireline (Rogers 1974); no further drilling, core handling or quality assurance and quality control (QAQC) details are provided. In 1981, drilling was done by Buccaneer Diamond Drilling Lt of Williams Lake, BC, (Rodgers 1981) with no further details provided. The 1993 RC holes were drilled by Midnight Sun Drilling Ltd of Whitehorse, Yukon, (Gill 1993) with no further details provided.

The 1996 drilling was done by RDF Holdings Ltd of Courtenay, BC, using an IAX "Gopher" diamond drill (Leriche and Harrington 1996). Core was placed in wooden core boxes and then logged and split. Half of the core was placed in plastic sample bags for shipment to the analytical lab. The program was hampered by lack of water due to freezing, lost time due to weather, and difficult drill set-ups in steep terrane.

The 2006 diamond drilling program was completed by Full Force Drilling Ltd of Peachland, BC, using a helicopter-portable Mandrill 1200 hydraulic drill (Mair and Bidwell 2007). All drill core was transported from the Property to the Geoinformatics' Redton field camp for logging and sampling. Drilling procedures for the 2007 program are not provided.

The 2015 program was completed by Hy-Tech Drilling using their helicopter-portable Fly Tech 5000 drill rig (Bayliss 2016). Drill core was flown from each drill site to a temporary exploration camp for re-orientation, logging, and sampling (Bayliss 2016).

Collar locations for the 1993, 1994 and 1996 drill programs were based off Placer Dome's metrically chained and slope corrected grid (Gill 1993; 1994a; Leriche and Harrington 1996). There is no information on how the 2006 holes were spotted. The 2015 drill hole collar locations were surveyed using a differential GPS (Bayliss 2016).

Downhole surveys (both azimuth and dip) were collected for the 2006, 2007 and 2015 drill campaigns using a Reflex EZ shot drill hole survey tool. Downhole tests were taken at 60 m and 30 m intervals for the 2006/07 and 2015 drilling respectively (Mair and Bidwell 2007; 2008; Bayliss 2016). Adjacent readings for the 2006 and 2015 surveys show a high drill hole deviation rate (8°-10°/100 m) whereas the 2007 holes drilled on the Norwest (or BAP Ridge) target show more moderate deviation of 2°-3°/100 m. Unusually strong deviation in Main Zone drilling could be related to poor ground conditions that extend 85-140 m vertically below the surface and/or the poor downhole survey data generated from using EZ Shot tools in magnetic rocks. Further evaluation is recommended.

Oriented core data was collected in both the 2006 and 2015 drilling programs, using an ACE and ACTIII core orientation tool respectively (Mair and Bidwell 2007; Bayliss 2016). Oriented core measurements show highest reliability in the deeper more competent rock (Bayliss 2016). Results of this work were not reviewed for the purposes of this report.

A downhole physical property probe was used in 2015 to collect chargeability, resistivity, magnetic susceptibility, and gamma count measurements following the completion of drilling (Bayliss 2016). Results of this work were not reviewed for the purposes of this report.

#### 6.2.2 Core Handling Procedures

Core handling procedures were best documented for the 2006, 2007 and 2015 programs (Mair and Bidwell 2007; 2008; Bayliss 2016) and are partially recorded for the programs done in 1974, 1981, 1993, 1994 and 1996.

There are drill logs for 45 of 49 drill holes, with the missing holes comprising the four first holes drilled on the Property by Sumac Mines in 1974 or earlier (KL-1 to -4). Drill log records for the other 45 holes include lithology, mineralization, and alteration at varying degrees of detail.

Geotechnical data (recovery, RQD) is available for the 2006, 2007 and 2015 drilling (Mair and Bidwell 2007; 2008; Bayliss 2016) and helps define a near surface (to 85-140 m true depth) zone of poor to very poor RQD and 35-60% recovery.

Magnetic susceptibility measurements were taken over regular intervals of drill core as part of the 2006, 2007 and 2015 programs (Mair and Bidwell 2007; 2008; Bayliss 2016), and on historical core

as part of the 2015 relogging program. Out of 8,377 measurements, 30% returned magnetic susceptibility of >5 SI units that is probably sufficient to disrupt downhole EZ Shot surveys.

#### 6.2.3 Core Sample Preparation

Sampling of RC chips from Noranda's 1993 program was done at 2.0 m intervals (Gill 1993). All samples were sent to Noranda Exploration laboratory in Delta, BC. Core samples were pulverized to 120 mesh (0.13 mm), digested in aqua regia and then analyzed for gold (atomic absorption finish) and 30 other elements (ICP finish).

Diamond drill core from Noranda's 1994 program was sampled at approximately 2.0 m intervals, with sample length dependent on lithology as well as mineralization intensity. All samples were sent to Noranda Exploration laboratory in Delta, BC (Gill 1994a). Core samples were pulverized to 120 mesh (0.13 mm), digested in aqua regia and then analyzed for gold (atomic absorption finish) and 30 other elements (ICP finish).

Half core samples from the 1996 program were shipped to International Plasma Laboratories of Vancouver, BC (Leriche and Harrington 1996). Samples were analysed for gold (fire assay, atomic absorption finish) and 30 other elements (aqua regia, ICP finish).

The 2006 core was cut in half using a core saw and sampled at 2.0 m intervals, with some sampling at 1.0 m over strongly mineralized zones (Mair and Bidwell 2007). All samples were collected and submitted to ACME Analytical Laboratories Ltd, Vancouver, ("ACME") for analysis. Samples were analyzed for a suite of 53 elements bi ICPOES and ICPMS methods using a 30-gram charge. Field standards and blanks were inserted by Geoinformatics at a ratio of 1:18 to ensure the accuracy and reliability of results (Mair and Bidwell 2007).

Sample preparation procedures for the 2007 program are not described although the database suggests similarities with the 2006 program. This includes a nominal sample length of 2.0 m and the same analyses done by the same lab (ACME).

The 2015 core was halved with a core saw, with 2 m sample lengths submitted for geochemical analyses (Bayliss 2016). Shorter lengths were sometimes sampled in highly mineralized zones or to honor lithological breaks, and longer intervals were sometimes sampled in intervals of poor recovery.

#### 6.2.4 Core Sample Security

Descriptions of sample security procedures are provided only for the 2015 campaign (Bayliss 2016). Descriptions for other campaigns could not be found or do not exist.

For the 2015 campaign, core samples were placed and sealed in plastic bags that were then put into numbered rice sacks and closed with numbered security cable ties. Security tie numbers were recorded and shared with the analytical laboratory. Sample shipments occurred once a week, by flying from camp to Johanson Lake and then trucking to Bureau Veritas Laboratories ("BV"), Vancouver, through an established contractor network. Upon arrival at the lab, all rice sacks were checked for evidence of tampering (cutting, resealing, removed seals) after which BV would return a signed chain of custody form (Bayliss 2016). No evidence of tampering was found.

#### 6.2.5 Core Sample Quality Control Quality Assurance Program

In the 2006 campaign, Geoinformatics inserted field standards (or CRM) and blanks at a ratio of 1:18 to monitor the accuracy and reliability of results (Mair and Bidwell 2007); however, a description of the QAQC program and results could not be located. A cursory review of 2006 CRM and blanks from the Pacific Ridge database suggests assays would have passed typical QAQC protocols.

The 1,324 core samples collected and analyzed for the 2015 campaign included 64 core duplicates, 70 crusher duplicates, 72 blanks and 65 standards (Baylis 2016). In addition, 82 pulp samples, including four standards, were submitted for external check assays.

QAQC for 2015 assays was reviewed on a batch by batch basis. Standards (or Certified Reference Material) returned a low failure rate of 0.7%, comprising two failures that were re-analyzed and subsequently passed QAQC (Bayliss 2016). Bias and precision were deemed within acceptable limits. Core and crusher duplicates showed good to excellent reproducibility, respectively. Overall, the 2015 core sample analyses passed the internal Teck QAQC review and were deemed fit for purpose. Check assays done by ALS indicate that the data obtained from the primary lab (BV) is acceptable.

#### 6.3 Historical Mineral Resource Estimates

There are no known historical mineral resource estimates for the Kliyul Property.

#### 6.4 Historical Production

No ore production has been reported for the Property.

# 7.0 GEOLOGICAL SETTING AND MINERALIZATION

#### 7.1 Regional and Local Geology

The Kliyul Project is situated within the Quesnel Terrane, a Mesozoic island arc built on Late Paleozoic basement that is tectonically juxtaposed against the ancestral continental margin ("miogeocline") of North America (Figure 7.1). Most of the eastern margin of the Quesnel Terrane is in fault contact with miogeoclinal Cassiar Terrane, except in the southeast where they are wedged apart by oceanic rocks of the Slide Mountain Terrane. The western margin of the Quesnel Terrane is mostly bound by the oceanic Cache Creek Terrane. Shuffling of terranes along Cretaceous-Tertiary dextral strike-slip faults juxtaposed the Quesnel Terrane against the Stikine Terrane in the vicinity of Kliyul. The Stikine Terrane is a markedly similar volcanic arc terrane and may have originated as a northern extension of the Quesnel arc system, subsequently brought into its present position by counterclockwise oroclinal rotation and sinistral translation during the Late Triassic and Early Jurassic (237-174 Ma) (Schiarizza and Tan 2005).

The Quesnel Terrane consists mostly of Late Triassic volcanic and sedimentary rocks, assigned to the Takla Group in northern and central BC and to the Nicola Group in the south. These rocks are locally overlain by Lower Jurassic sedimentary and volcanic rocks and are cut by several suites of Late Triassic to Mid Jurassic intrusives. In north-central BC, Late Paleozoic (>251 Ma) basement occurs along the eastern margin of the Quesnel Terrane as the volcano-sedimentary Lay Range assemblage.



*Figure 7.1 Location of the Property in the context of BC geological terranes. Source: Barnes and Miller (2018).* 

Late Triassic to Early Jurassic intrusive rocks are an economically important component of the Quesnel Terrane. These include both calc-alkaline and alkaline plutonic suites, as well as Alaskan-type ultramafic-mafic intrusions. Many such intrusions occur in the Hogem batholith, which extends more than 150 km from the Johanson Lake area, near Kliyul, to the Nation Lakes area in the south.

The oldest structural components of the Quesnel Terrane are Early Jurassic, east directed, thrust faults, developed during emplacement of Quesnel onto the miogeoclinal Cassiar Terrane. To the west, Middle Jurassic east-dipping thrust faults imbricate the Cache Creek Terrane during its emplacement onto the Stikine Terrane. Post-accretionary structural history includes the development of prominent dextral strike-slip fault systems in the Cretaceous to Early Tertiary. These structures include the Pinchi, Ingenika and Finlay faults, which form the western boundary of Quesnel Terrane and, collectively, may have accommodated more than 100 km of cumulative displacement.

#### 7.2 Regional Metallogeny

The Quesnel and Stikine terranes host porphyry deposits of both the alkalic and calc-alkalic suites, as well as precious and base metal deposits and mineral occurrences (Figure 7.2). Major mineral occurrences hosted in Quesnel Terrane and occurring reasonably close to the Kliyul Property include the Kemess and Mt. Milligan mines, as well as the Lorraine and Chuchi prospects.

The Kemess project – and it's three known calc-alkaline porphyry copper deposits – is the nearest advanced project to the Kliyul Property, located 65 km northwest of Kliyul but on the other side of the Pinchi-Ingenika-Finlay fault system and within the Stikine, rather than the Quesnel Terrane. The newly proposed Kemess Underground project is projected to produce 105,000 ounces of gold and 44 million pounds of copper annually for an estimated mine-life of 12 years (Witte et al. 2015) (*Note: the author has not verified the resources at Kemess and the mineralization there is not necessarily indicative of mineralization on the Kliyul Project*).

Mt. Milligan is an open pit mine with proven and probable reserves of 191.03 Mt at 0.23% Cu and 0.39 g/t Au (Centerra Gold 2020) (*Note: the author has not verified the reserves at Mt. Milligan and the mineralization there is not necessarily indicative of mineralization on the Kliyul Project*). It is located approximately 155 km northwest of Prince George and is hosted in an Early Jurassic (U-Pb age of 186.9 +/- 0.3 Ma) quartz-monzonite to monzodiorite intrusion and it host rocks, which comprise the Late Triassic Witch Lake volcanic succession of the Takla Group (Mills et al. 2009). Gold and copper are strongly associated with a magnetite-rich potassic core developed within a monzonitic stock, as well as adjacent basaltic trachyandesites. A high degree of structural control is thought to have influenced both intrusive emplacement and hydrothermal fluid flow.

The Lorraine Property, located approximately 80 km southeast of Kliyul, hosts several coppergold occurrences related to alkalic intrusives. The Lorraine Main Zone has indicated resources of 6.4 Mt at 0.61% Cu and 0.24 g/t Au and inferred resources of 28.8 Mt at 0.45% Cu and 0.19 g/t Au, at a cutoff grade of 0.2% Cu (Giroux and Lindonger 2012) (*Note: the author has not verified the resources at Lorraine and the mineralization there is not necessarily indicative of mineralization on the Kliyul Project*). The deposit is hosted in a large composite intrusive complex that is part of the Hogem batholith. Mineralization is generally disseminated, pyrite deficient, and associated with magnetite.



Figure 7.2 Regional mines and mineral occurrences. Source: Barnes and Miller (2018).

The Chuchi property is located 170 km southeast of Kliyul. Mineralisation at the property was drilled in the 1990s and showed copper and gold porphyry-style mineralisation hosted in monzodiorite and host volcanic rocks but has no current resource estimate.

#### 7.3 Property Geology

Several campaigns of regional (Schiarizza and Tan, 2005; Figure 7.3) and detailed to propertyscale mapping have been done over or on the Project. The most recent efforts (Bayliss 2016; Barnes and Miller 2018) completed additional 1:1,000, 1:5,000 and 1:10,000 mapping with the aim of unifying historical mapping efforts for the Property (Figure 7.4) and the Main Zone (Figure 7.5), in addition to compiling a stratigraphic section for the Property (Figure 7.6).

#### 7.3.1 Stratified Units

The main stratified units on the Property include the **Kliyul Creek** (**KC**) and **Goldway Peak** (**GP**) units, which are part of the Lower and Upper Takla Group, respectively. The Kliyul Creek unit has been subdivided into subunits of sandstone-carbonate, siltstone-limestone, and pillowed basalt (Schiarizza and Tan 2005). Property-scale mapping, however, found that only the sandstone-carbonate subunit occurs on the Property, where it comprises felsic volcaniclastic, limestone and clastic sedimentary rocks (Lui 2014).

**Felsic volcaniclastic (KCfc, Fvc)** consist of light green to gray to buff, hornblende ± alkalifeldspar ± plagioclase, porphyritic to aphanitic, volcanogenic lithics, lapilli-tuffs, breccias and conglomerates. Weathered outcrops tend to form rounded yellow-orange outcrops whereas fresh rocks show a general paucity in chlorite alteration (Lui 2014).

Kliyul Creek **limestone** (**KCc**, **L**) consists of light to dark gray marls forming beds, discontinuous lenses, and intercalations with clastic sedimentary and volcanic rocks. Marble occurs near the Kliyul Main Zone and skarn development was noted near the Joh and M39 occurrences, north and southeast of the Main Zone respectively (Lui 2014).

**Clastic sedimentary rocks (KCs, Cs)** consist of gray to green-brown siltstone, sandstone, and conglomerate, interlayered with black shale and medium gray pelite. They may also contain lenses of limestone and limestone-bearing felsic volcaniclastic rocks. In outcrop the clastic sedimentary rocks tend to weather recessively, forming low profile outcrops and sub-crop boulder fields (Lui 2014).

The **Goldway Peak unit (GP)** is a homogeneous assemblage of pyroxene-rich volcanic breccias (Schiarizza and Tan 2005) that, on the Kliyul Property, was subdivided by Lui (2014) into mafic volcaniclastic rocks and volcaniclastic to volcanic schists.

**Mafic volcaniclastic rocks** (**GPa, GPb, Mvc**) are defined as homogeneous, dark green to gray to black, aphanitic to hornblende ± augite ± plagioclase porphyritic lithics, lapilli-tuffs, breccias and conglomerates. Augite-bearing basaltic lavas, porphyry dykes, sills and flows and volcanic sandstone/siltstone also occur in this unit, along with sparse layers of limestone. The unit is resistant to weathering, forming prominent rusty orange-red serrated peaks and ridges (Lui 2014).

Closer to the Dortatelle Fault, mafic volcaniclastic rocks comprise schists (ScMvc) and augitebearing schists (ScMvca), the highly deformed nature of which is the primary feature that separates them from the less affected Goldway Peak rocks (Lui 2014).



Figure 7.3 Regional geology in the vicinity of the Kliyul Property. Source: Bayliss (2016).



Figure 7.4 Kliyul Property scale geology. Source: Barnes and Miller (2018).



Figure 7.5 Local geology in the vicinity of the Kliyul Main Zone. Source: Bayliss (2016).



E<sub>fgd</sub> - Early Altered Fine-Grained Diorites (includes the mineralised Valley Diorite)

#### Late Triassic Mafics to Ultramafics

LT<sub>um</sub> - Small-Volume Lamprophyre and Gabbro

Figure 7.6 Kliyul Property stratigraphic column. Source: Barnes and Miller (2018)

LISS - Limey Siltstones to Sandstones

SAND - Carbonate-Rich Sandstones to Greywacke

VTUF - Volcanic Tuff/Volcaniclastic Sandstone VTFF - Volcanic Tuffs with 10-20% feldspar phenocrysts

KCv - Volcanic and Volcaniclastic Subunit VCBX - Volcaniclastic Breccia >5% fragments (pebble to cobble)

#### 7.3.1 Intrusive Units

Regional mapping (Schiarizza and Tan 2005) of intrusive units on and around the Kliyul Property identified several plutons and intrusive complexes, including the Late Triassic (*c*. 237-201 Ma) Kliyul Creek complex and Dortatelle intrusions, and the 174  $\pm$  2 Ma (Mid Jurassic) Darb Creek pluton. Late Cretaceous (*c*. 100-66 Ma) granitoids occur just southeast and northwest of the Property. Property- to prospect-scale mapping (Lui 2014; Bayliss 2016; Barnes and Miller 2018), however, showed that these larger-scale units comprise several generations of intrusive rocks that may include: (1) Upper Triassic ultramafic-mafic, (2) early altered diorite, (3) mid to late diorite to granite, and (4) late intrusives. The below descriptions integrate the area-based nomenclature of Schiarizza and Tan (2005) with the property-scale map of Barnes and Miller (2018) (Table 7.1).

Late Triassic **ultramafic-mafic** rocks of Barnes and Miller (2018) comprise scarce gabbro and lamprophyre that, on the Property, form four small intrusions aligned along a northwest trend, falling in areas mapped by Schiarizza and Tan (2005) as the much larger ultramafic-mafic Kliyul Creek and Johanson Lake complexes. The **Kliyul Creek complex** trends north-northwest, from the southeast corner of the Property into the Lay-Kliyul Valley, and is approximately 13 km long and 1 km wide (Schiarizza and Tan 2005).

The **early altered diorite** suite includes fine-grained mineralized intrusives like the Valley diorite that hosts the Main Zone, phyllic-altered Bagel microdiorite and Paprika diorite, and a younger but still relatively altered hornblende porphyritic diorite (Barnes and Miller 2018). Intrusive bodies tend to form plugs, stocks, dykes, sills, occurring mostly in the east half of the Property within the Lay-Kliyul valley and the area mapped as Kliyul Creek complex (Schiarizza and Tan 2005).

**Mid- to late**, altered, feldspar porphyritic dykes cut the early diorite suite but are, in turn, crosscut by mostly unaltered, medium- to coarse-grained, diorite to monzonite (Barnes and Miller 2005). These "unaltered" intrusions, however, typically shows epidote alteration and/or veining along their margins. Larger intrusions within this suite include the Haven diorite at the west end of the Property (near Solo Lake) as well as the Ridge diorite and AGRN alkali granite that, together, form the core of what was mapped as the Kliyul Creek complex by Schiarizza and Tan (2005).

Late intrusives comprise pink alkali granodiorite emplaced within the Kliyul Creek fault system and as the Mordor pluton, which was mapped as 174 ± 2 Ma Darb Creek pluton by Schiarizza and Tan (2005). The latest intrusions are represented by a series of unaltered feldspar- and quartz-porphyritic dykes that are, in turn, cut by strongly flow-banded aplitic dykes ranging from 1-5 m wide (Barnes and Miller 2018).

The Kliyul Main Zone lies just west of the Kliyul Creek intrusive complex in the **Lay-Kliyul Valley**, which hosts numerous plugs, dykes and sills of early altered diorite, mid to late granitoid (altered porphyritic dykes and sills) and late intrusives (aplitic dykes, late porphyritic dykes and sills). Small intrusions (i.e. plugs, dykes, sills) of the early altered diorite are most likely causative of the Kliyul Main Zone. A plug-like early diorite intrusion in the Ginger Zone is associated with significant propylitic and Cu-enriched, vuggy, quartz stockwork veining (Lui 2014).

Complex/Pluton	Schiarizza and Tan (2005)	Barnes and Miller (2018)	Age Range	
Darb Creek tonalite pluton	Tonalite, quartz monzonite	Late intrusive (Mordor batholith)	174 ± 2 Ma	
		Late intrusive (dykes and sills)		
Johanson Lake complex	Mafic-ultramafic	Mid to late diorite to granite	Late Triassic to Mid Jurassic?	
		Ultramafic-mafic suite		
	Mafic-ultramafic	Early altered diorite		
(Lay-Kliyul Valley trend)	Tonalite, quartz monzonite	Late intrusives	Late Triassic to Mid Jurassic?	
		Mid to late diorite to granite		
Solo Lake/Haven diorite	Mafic-ultramafic	Mid to late diorite to granite (Haven diorite)	Late Triassic to Early Jurassic?	
		Mid to late diorite to granite		
Kliyul Creek intrusive complex	Mafic-ultramafic	Early altered diorite	Late Triassic to Early Jurassic?	
		Ultramafic-mafic suite		

Table 7.1 Kliyul intrusive units. Source: Pacific Ridge (2020)

#### 7.3.2 Structure

There are at least three significant fault systems on the Kliyul Property, with two younger northsouth structures (Dortatelle, Kliyul Creek) linked by an older east-west fault zone (Lay-Kliyul Valley). A large anticline may be present south of the Lay-Kliyul valley fault.

The **Dortatelle fault system** is a north-striking, dextral strike-slip, fault that has been traced for at least 35 km from south of Johanson Lake through the Kliyul Property to where it is truncated by, or merges with, the Finlay-Ingenika fault system. The Dortatelle was possibly active into the Early Tertiary and so post-dates most rocks on the Property.

The Kliyul Creek fault system (KCFS) system occurs in the southeastern part of the Property and comprises a NNW-trending fracture zone developed over and across the Kliyul Creek intrusive complex, which appears to be emplaced along, and sinistrally displaced by, this structure (Lui 2014). Like the Dortatelle fault, the KCFS may have been active into the Early Tertiary (66-23 Ma) but also appears to host the Late Triassic Kliyul intrusive complex, suggesting this structure may have been active in the Late Triassic or earlier.

The **Lay-Kliyul Valley fault system**, which hosts the Main Zone, is characterized by east-west trending fabrics and lineaments that appear to link the Kliyul Creek and Dortatelle fault systems (Zhang and Hynes 1991). Lui (2014) suggested mostly dip-slip movement on this fault system.

The proposed **Kliyul Creek anticline** is interpreted as a northwest-trending feature transecting the Lay-Kliyul valley and deforming stratigraphy of the Kliyul Creek unit. The overlying Goldway Peak unit does not appear as strongly deformed, suggesting deformation occurred primarily between deposition of the Kliyul Creek and Goldway Peak units. Lui (2014), however, mentioned that an unconformity has yet to be discovered between the two stratigraphic units.

#### 7.3.3 Hydrothermal Alteration

Drill core logging has been used to characterize seven different alteration assemblages (Table 7.2) and described below in approximate order of hottest to coolest. Higher Au-Cu grades are typically correlated with hotter hydrothermal fluids.

Assemblage	Code	Mineralogy	Vein
Potassic	bPOT	MAG, (BT) as CL	EP-CL-MAG, banded QZ-MAG
Sodic-Calcic	SOC	EP, ACT, AB	EP ± AB
Sodic	AB	AB, EP (no ACT)	
Phyllic	PHY	QZ, SE, PY, minor CL	QZ, SE, PY, minor CL
Silica	SIL	SI ± Phyllic	
Propylitic	PPL	CL, EP, CA	CL, EP, CA
Chlorite-dominant	CHL	CL	

Table 7.2 Kliyul alteration assemblages. Source: Pacific Ridge (2020)

**Potassic alteration (bPOT)** assemblages are correlated with higher Au-Cu grades and occurs as breccia cement and patchy to pervasive replacements of volcanic host rocks. Co-genetic banded magnetite-quartz veins suggest high temperature hydrothermal alteration. **Sodic-calcic alteration** (**SOC**) assemblages host numerous epidote veins with or without albite halos. Actinolite is a minor component and typically occurs in veins and vein halos. Albite-dominant alteration that lacks actinolite is characterized as **sodic alteration (SOD)**. **Phyllic alteration (PHY)** shows selective to pervasive alteration of the host rock, with two of the better examples seen in the top of drill hole KLI-15-032 and the bottom of KLI-15-033 (Bayliss 2016). **Silica alteration (SIL)** is scarce and consists of pervasive silica flooding, in some places occurring with phyllic alteration. **Propylitic alteration (PPL)** usually occurs distal to Au-Cu mineralization and includes the selective replacement of mafic minerals with chlorite and epidote. Calcite is mostly present in veins. The **chlorite-dominant assemblage (CHL)** lacks associated epidote and calcite.

At surface, the most prominent alteration feature on the Property comprises a 6 km long, northwest-trending, corridor of phyllic alteration first mapped by Schiarizza and Tan (2005) and earlier, in part, by Gill (1993, 1994a). Further mapping by Lui (2014) shows this corridor can be refined into distinct zones of (magnetite-destructive) phyllic alteration, the most significant of which comprises a 1 km by 0.5 km that overprints hydrothermal potassic alteration the Main Zone (Lui 2014).

Anhydrite/gypsum veins occurs at true depths below 120-140 m, with the more fractured and friable nature of overlying rocks possibly related to the dissolution of anhydrite/gypsum veins within a near-surface sulphate leach zone (Lui 2014).

Another prominent surface alteration feature occurs in the Ginger Zone, comprising a 1.6 km by 0.8 km propylitic zone encircling the "Ginger stock" and possibly overprinting phyllic alteration related to the Main Zone (Lui 2014).

## 7.4 Property Mineralization

At least three types of mineralization occur on the Property including porphyry Au-Cu, goldbearing quartz veins and polymetallic prospects. Each is summarized below.

## 7.4.1 Porphyry Gold-Copper

The main focus of exploration drilling has been at the Kliyul Main Zone porphyry prospect (Figure 6.1), with drilling to date defining Au-Cu mineralization (greater than 0.1 g/t Au and/or 0.1% Cu) over a near-surface horizontal area of approximately 500 x 350 m and to a vertical depth of 440 m. Chalcopyrite, with lesser amounts of bornite, occurs within veins and as disseminations. Veinhosted chalcopyrite and/or bornite occurs mostly in chlorite-epidote  $\pm$  pyrite veins, with lesser amounts in quartz-sericite-anhydrite-calcite  $\pm$  pyrite veins and quartz-chlorite-magnetite  $\pm$  pyrite veins. Bornite occurs in magnetite breccia and replacing mafic minerals within equigranular diorite (e.g. KLI-15-035).

The bulk of mineralization is hosted by the mafic volcanic and volcanoclastic rocks of the Goldway Peak unit, with lesser amounts occurring in feldspar porphyry and equigranular diorite of the early diorite suite. The highest copper and gold grades are correlated with magnetite-cemented breccia and increased vein density.

## 7.4.2 Gold-bearing Quartz Veins

The main gold-bearing quartz veins on the Property include Ginger B and Independence. The Ginger B vein comprises a vein set that can be traced along strike for 200 m and was emplaced into a northerly trending structural corridor (Gill, 1994a). Gold enrichment is indicated by select grab samples and occurs mostly in strongly pyritic and/or carbonate-altered wall rocks, and to a lesser extent within the quartz vein itself.

The Independence vein consists of rusty quartz exposed in four open cuts, over 300 m of strike length, and follows a northerly trend. Historical sampling returned anomalous Au (Fox 1982).

About a kilometre to the east of the Independence vein, Wilson (1984) described an extensive fracture zone trending 070°, with variable silicification and quartz veins ranging from 0.2-1.3 m wide. The vein hosts sulphide-rich patches with up to 30% pyrite and lesser galena, chalcopyrite and sphalerite, with some rock samples returning anomalous Au and Ag values (Wilson 1984).

Re-logging by Lui (2014) described narrow, gold-bearing shear and fault zones that cut porphyry mineralization in the Kliyul Main Zone. These subvertical, gold-rich, shears show similarities to known gold occurrences like the Ginger B and Independence veins, suggesting that gold-bearing veins postdate porphyry mineralization.

#### 7.4.3 Polymetallic Targets

Surface work at BAP ridge defined a 1.3 km by 0.7 km Ag-Pb-Zn soil anomaly associated with northwest-striking shear zones and quartz-pyrite-chalcopyrite-galena veins. This structural zone has been traced along strike for 1500 m (MINFILE 094D 180) and were drill tested with holes NW\_07\_01 and NW\_07\_02, which failed to intersect significant mineralization but did return increased epidote

alteration, anhydrite veining, Cu-Zn ratios and Mo with depth. Host rocks at BAP Ridge are volcaniclastic andesites of the Goldway Peak unit.

The M39 zone (Figure 6.2) is a polymetallic mineral occurrence comprising a north-trending silicified fracture zone with veins and/or stringers of quartz-pyrite, galena, sphalerite and magnetite (MINFILE 94D 140). Malachite staining occurs along stringers and fractures. Some of the grab sample assays returned anomalous Au, Ag, Pb and Zn. The M39 Zone is associated with a 1 km long Cu-in-soil anomaly and is hosted in Goldway Peak unit intruded by the early altered and mid to late diorite suites.

# **8.0 DEPOSIT TYPES**

The Kliyul Property is thought to host mineralization related to the alkalic, or less likely calcalkalic, porphyry deposit types. This portion of the Quesnel Terrane is known to host both these deposit types, including past- and currently producing mines (Logan and Mihalynuk, 2014).

Alkalic porphyry deposits tend to form in orogenic belts at convergent plate boundaries, commonly in oceanic volcanic island arcs overlying oceanic crust. In BC, alkalic porphyry deposits occur only in the Stikine and Quesnel terranes, and in association with Late Triassic to Early Jurassic volcanic and intrusive rocks (Logan and Mihalynuk, 2014). Host rocks range from fine- to coarse-grained, equigranular to coarsely porphyritic, high-level syenite to gabbro stocks, plugs and dyke complexes, which have intruded coeval and cogenetic mafic to intermediate volcanic rocks. Many such intrusive complexes host breccias and display evidence for multi-phase emplacement (Sillitoe, 2010). Potassic alteration typically forms early and in the central parts of host intrusions, and is characterized by potassium feldspar, secondary biotite, anhydrite ± magnetite, and sulphide along with hightemperature calc-silicate minerals like diopside and garnet. Outward there may be flanking zones of abundant secondary biotite that grade into propylitic alteration. In some deposits, potassic alteration may be overprinted by sericite-pyrite  $\pm$  clay  $\pm$  carbonate alteration. By comparison to calc-alkalic porphyry deposits, the alteration footprint is much smaller (Cooke et al., 2006) and the zonation, along with associated mineralization, can be much more irregular, due to structural and lithological control, and lack a well-developed pyrite "halo". Economic mineralization is typically centered on the potassic core and hosted in stockworks, fracture-fillings, disseminations and/or breccias. The principal metallic minerals are chalcopyrite, pyrite and magnetite, with bornite important in some deposits (Panteleyev 1995).

Calc-alkalic porphyry deposits are typically associated with zoned and/or multi-phase granodiorite to quartz monzonite intrusions emplaced into volcanic or sedimentary rocks (Sillitoe, 2010). These deposits are marked by complex alteration zones typically centred on the intrusive complex, comprising a potassic core enveloped by an overlapping peripheral zone of propylitic alteration. These alteration zones may be overprinted by zones of phyllic and/or argillic alteration, typically occurring between the potassic and propylitic zones or along structures. Copper and molybdenum mineralization are generally most abundant in the potassic core while pyrite is more prevalent in the propylitic and phyllic zones. The abundance of pyrite in these systems can result in the formation of strongly acidic groundwaters that, under appropriate climactic conditions, generate argillic-altered leached caps and supergene Cu mineralization. Ore sulphide mineralization comprises

chalcopyrite, chalcocite, covellite, digenite, bornite, molybdenite and locally Cu-oxide minerals. These sulphides are hosted in quartz veinlet stockworks, veins, breccias, disseminations and replacements.

Magnetite-chalcopyrite mineralization has been documented in both calc-alkalic and alkalic porphyry deposits, forming where metalliferous hydrothermal fluids encounter calcareous lithologies. Base metal ± precious metal veins are associated with both porphyry types and are typically deposited in the waning stages of their hydrothermal systems.

# 9.0 EXPLORATION

Pacific Ridge has not conducted any exploration work at the Kliyul Project.

# 10.0 DRILLING

Pacific Ridge has not conducted any drilling at the Kliyul Project. Information on historical drilling conducted at Kliyul is presented under Section 6.0 (History).

# 11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

Pacific Ridge has done no exploration or sampling work on the Kliyul Project.

Historical records of sample preparation, sample security, and quality assurance and quality control (QAQC) programs are provided for the 2006 and 2015 programs and missing for all other ones.

The Kliyul Project database provided by Pacific Ridge has 3,103 analyses of drill core samples, of which 2,394 were taken from the Main Zone, 622 from BAP Ridge target and 87 from the Mordor-Bagel targets.

Assay certificates are available for all programs done from 1993 to present (Table 6.2), with uncertified assays available from the 1981 and 1974 programs. Only the very first four holes (KL-1 to - 4) drilled on the Property lack any kind of assay data.

# **12.0 DATA VERIFICATION**

Author Voordouw conducted a site visit on 22 June 2020 and pre-visit data verification in April 2020. Pre-visit data review verified no-transcription errors for:

- 20/77 claims in Pacific Ridge (PEX) database against MTO;
- 45/45 collar locations in PEX database against historical maps;
- 420/6206 Cu and Au analyses in the Pacific Ridge database against original COA

The Property site visit included the following data verification work:

- Visit to the 2011 Kiska (Figure 12.1a) and 2015 Teck (Figure 12.1b) camp localities;
- Located collars and/or drill pads for drill holes K06-30 and 31; KLI-15-032, 034 and 035
- Examined 125 m of historical diamond drill core from three holes; K06-30 (300-325 m), KLI-15-034 (265-315 m) and KLI-15-035 (395-445 m) (Figure 12.1c, d).



Figure 12.1: Photos from the 22 June 2020 site visit showing (a) core storage racks at 2011 Kiska camp locality, (b) capped casing and anchor rod at drill pad locality KLI-15-034, (c, d) disrupted quartz-magnetite ± chalcopyrite veins/blebs in KLI-15-034 (272.5 and 282.4 m depth respectively), (e) shear style quartz-sericite-pyrite-chalcopyrite vein in volcanic rock from KLI-15-035 (427.5 m), and (f) disseminated bornite and chalcopyrite in diorite in KLI-15-035 (431.4 m). Source: Voordouw, 2020

Core is stacked on dunnage and mostly in good condition (Figure 12.1a), with deterioration in some boxes older than 15 years. Two to three cords (256-384 feet<sup>3</sup>) of lumber (stacked and in remnant structures) and five drums of fuel are stored on site.

The locations of drill hole casings KLI-15-032, 034 (Figure 12.1b) and 035 were measured with a handheld Garmin GPS and found to be offset <5 m compared to the drill hole database. Drill pads K06-30 and 31 were also located and are also offset <5 m relative to the database.

Core examination focussed on mineralized intervals (0.2-1.1% Cu, 0.3-2.1 g/t Au) in 125 m of core from three holes (K06-31, KLI-15-034, KLI-15-035). Two of these intervals included significant magnetite breccia, comprising a magnetite-rich matrix cut by quartz-magnetite veins (Figure 12.1c, d), with sulphide occurring as blebs, stringers and disseminations hosted in veins and cutting across them. Quartz-magnetite veins show brittle to ductile deformation textures, suggesting active deformation during and after emplacement. Syn-mineralization deformation is also suggested by shear vein-like structures observed in a quartz-sericite-pyrite-chalcopyrite vein (Figure 12.1e).

KLI-15-035 includes intervals of diorite with disseminated bornite and chalcopyrite, with Cusulphide possibly replacing mafic minerals (Figure 12.1f).

Besides current data verification, authors Voordouw and Lui have both managed previous exploration work on the Kliyul Property. Author Voordouw managed the ground IP survey and prospecting work completed in 2011 (Voordouw 2012). Author Lui managed the 2010 and 2014 programs (Lui 2010; 2014) and consulted on the 2015 and 2017 projects (Bayliss 2016; Barnes and Miller 2018).

It is the opinion of author Voordouw that the location, downhole survey and assay data supplied is of adequate quality for use in early project evaluation and exploration targeting. Most location and assay data are likely suitable for use in mineral resource estimation. Downhole survey data should be reviewed to eliminate low quality EZ Shot readings collected in overly magnetic ground, then re-validated prior to use for resource estimation.

# **13.0 MINERAL PROCESSING AND METALLURGICAL TESTING**

No known mineral processing or metallurgical testing has been carried out at the Kliyul Project.

# 14.0 MINERAL RESOURCE ESTIMATES

No known mineral processing or metallurgical testing has been carried out at the Kliyul Project.

# 23.0 ADJACENT PROPERTIES

There is no information on adjacent properties which is necessary to make the technical report understandable and not misleading.

## 24.0 OTHER RELEVANT DATA AND INFORMATION

No other information or explanation is necessary to make this technical report understandable and not misleading.

# 25.0 INTERPRETATION AND CONCLUSIONS

The Kliyul Project is underlain by Takla Group volcano-sedimentary rocks intruded by several suites of Late Triassic through Middle Jurassic plutonic rocks. This geological setting is equivalent to several nearby porphyry deposits, including Mount Milligan and Kwanika. Granitoids comprise several generations subdivided into early altered, mid- to late- and late; with the early diorite suite hosting most of the prospective mineralization and alteration zones (including the Main Zone).

Historical exploration has mostly focussed on the Kliyul Main Zone, with pre-2006 exploration targeting the shallow Au-Cu skarn potential of the Project and post-2006 work testing the deeper porphyry potential. Other historical work has focussed on gold-bearing quartz veins (Ginger, Independence) and structurally controlled poly-metallic showings (Ag, Pb, Zn ± Cu).

The Property is cut by two north-south to NNW-trending fault systems (Dortatelle, Kliyul Creek) linked by an east-west trending fault (Lay-Kliyul), all of which may have been active into the Tertiary. The alignment of Late Triassic to Jurassic intrusive rocks along these structures suggests they were likely syngenetic with magmatism and mineralization.

Hydrothermal alteration includes potassic assemblages that occur inboard of sodic-calcic, phyllic and propylitic assemblages. Detailed mapping of a 6 km long zone of phyllic alteration in the Lay-Kliyul valley shows it consists of several hydrothermal centers rather than just one.

The Main Zone is the primary exploration target, comprising near-surface Cu-Au skarn mineralization linked to a deeper Cu-Au porphyry system. Chalcopyrite and minor bornite occur in veins and disseminations, with the bulk of mineralization hosted in volcanic country rocks. The highest grades are correlated with early diorite intrusives, potassic alteration, magnetite-cemented breccia and/or increased sulphide-bearing vein density.

The Main Zone probably falls in the class of alkalic porphyry Au-Cu deposits, of which there are several others in BC (e.g. Mount Milligan, Kemess, Kwanika, Lorraine, Chuchi). Skarn and replacement deposits are associated with many such deposits.

The Kliyul Property has seen steady exploration since 1974, which has resulted in significant coverage of geological, surface geochemical and geophysical data. Further review and modelling of surface geochemical and geophysical data is recommended.

Historical drilling includes 49 holes for at least 7,335 m, with 37 targeting the near-surface skarn potential of the Main Zone and mostly drilled to <165 m core depth. Six other holes were drilled to between 325-510 m core depth to test potential for deeper porphyry-style mineralization. The locations for five of these six deeper holes were verified as part of the 22 June 2020 site visit. Downhole surveys in 2006 and 2015 were collected with a Reflex EZ Shot and were probably affected by magnetic

rocks; cursory review of hole deviation suggests poor quality downhole survey data or strong deviation related to poor ground conditions.

For five of the six holes drilled on the Main Zone in 2006 and 2015, the upper 100-150 m (core depth) shows poor to very poor ground conditions and average recovery of 30-65%. The material impacts of poor RQD and low recovery on assay results have not been evaluated.

The true thickness, depth and width have not been evaluated for the Kliyul Main Zone. Previous interpretations suggest that alteration and/or mineralization zones are subvertical to steeply south dipping. Drill intercepts include 217.8 m of 0.23% Cu and 0.52 g/t Au from KL-06-30 (22.0-239.8 m core depth) and 245 m of 0.18% Cu and 0.53 g/t Au in KLI-15-034 from 123-368 m core depth.

Uncertainty in the Kliyul drilling database is moderate to low, with low uncertainty in transcription from historical data into the Pacific Ridge database. Pre-2006 drill holes are poorly documented, with some lacking original analytical certificates, but are also mostly shallow and less prospective than the deeper hills drilled in 2006 and 2015. Documentation for the 2006 and 2015 programs is complete and up to industry standard.

Uncertainty in the quality of other surficial exploration data (e.g. rock samples, soils, geophysical surveys) is low to moderate, and suitable for exploration targeting. Further review of geophysical and geochemical data is recommended to mitigate uncertainty.

Project risk is high because Kliyul is an early stage exploration project with no guarantee that the exploration results to date indicate an economic ore body. Significantly more drilling is required to demonstrate economic potential and is not recommended at this time. Instead, integrated modelling (geology, geochemistry, geophysics) of the Main Zone is recommended to improve understanding of mineralized zones and future drill targeting.

It is of the authors' opinion that historical geological and drilling data is of sufficient quality to use in exploration targeting.

## 26.0 RECOMMENDATIONS

Future work on the Kliyul Project should include a comprehensive review of geological, geophysical, surface geochemical data, and drilling data, followed by 3D geophysical and geological modelling. Recommendations for field-based work include detailed mapping on the M39 and Parrish Hill zones in addition to relogging and resampling of drill core to better correlate geochemical anomalism with Au-Cu mineralization. A spectral analysis program of historical core should also be considered, along with a possible ground IP and magnetic survey on the M39 target.

Cost estimate for the proposed work program is C\$158,140 (Table 26.1) split into pre-field, field-based and post-field work. In the field-based category, camp and support costs assume accommodation in a tent camp established on the Project claims. Line-cutting is not included as most of the M39 target area appears to be above treeline.

Item		Cost (C\$)	
Pre-field work			
Geophysical Consulting - review, integrate, model and interpret historical data	\$	20,000	
Geological/geochemical modelling - includes review of spectral data		20,000	
Field work			
Personnel - project geologist, assistant		13,200	
Camp and Support - camp, meals, consumables, rentals, fuel, travel		17,400	
Geochemical Analyses - resampling of drill core		9,000	
Helicopter - for mobilization in and out of the Property		12,000	
Geophysical Survey - ~10 days of production, mobilization		40,800	
Post-field work			
Deliverables - assessment report, database, spectral & geochemical data analysis		15,000	
Contingency on all work - 10%		10,740	
Total Cost		158,140	

Table 26.1 Proposed work for the 2020 Kliyul work program.

Respectfully submitted,

Signed and Sealed: "Ronald J. Voordouw"

Ronald J Voordouw EQUITY EXPLORATION CONSULTANTS LTD. Vancouver, British Columbia Effective Date: June 24, 2020

## **27.0 REFERENCES**

- Barnes, W., and Miller, E.A., 2018. Assessment report on the 2017 surface sampling and geophysics program on the Kliyul property north-central British Columbia. BCMEMPR assessment report 37285, 365 pp.
- Bayliss, Sandra. 2016. Assessment report on drilling, geological, geochemical and geophysical work conducted during 2015 at the Kliyul mineral tenure. BCMEMPR assessment report 35978, 742 pp.
- Betz, J. 1976. Report on the MaxMin II EM survey, Bap claim group. BCMEMPR assessment report 5976, 35 pp.
- Centerra Gold, 2020. Centerra Gold Inc 2019 year-end mineral reserves and resources summary (as of December 31, 2019)., <u>https://www.centerragold.com/cg-raw/cg/2019-reserves-and-resources.pdf</u>, 5 pp.
- Christopher, P.A., 1986. Geological, geochemical and geophysical report on KC Property. BCMEMPR assessment report 15583, 63 pp.
- Cooke, D.R., Wilson, A.J, House, M.J., Wolfe, R.C., Walshe, J.L., and Lickfold, V., 2006. Alkalic porphyry Au-Cu and associated mineral deposits of the Ordovician to Early Silurian Macquarie arc, New South Wales. Australian Journal of Earth Sciences, 54, p. 445-463.
- Fox, M. 1982. Geological and geochemical report, KC 1 and 2 mineral claims. BCMEMPR assessment report 10346, 35 pp.
- Fox, M., 1991. Geological and geochemical exploration report, JO 1-8 and CRO 1-5 mineral claims. BCMEMPR assessment report 21502, 64 pp.
- Gill, D.G., 1993. Drilling assessment report on the Kliyul property. BCMEMPR assessment report 23033, 82 pp.
- Gill, D.G., 1994a. Drilling assessment report on the Kliyul group of claims. BCMEMPR assessment report 23797, 160 pp.
- Gill, D.G., 1994b. Geochemical, geophysical assessment report on the Darb Northwest property. BCMEMPR assessment report 23680, 34 pp.
- Gill, D.G., 1994c. Geological, geochemical, geophysical and physical assessment report on the Joh, Darb, Croydon, Mariposite & Kliyul properties. BCMEMPR assessment report 23379, 238 pp.
- Gill, D.G., 1995a. Geochemical, geological and linecutting assessment report on the Darb northwest property. BCMEMPR assessment report 24073, 39 pp.
- Gill, D.G., 1995b. Geological assessment report on the JOH 3 group of claims. BCMEMPR assessment report 23842, 49 pp.
- Giroux, G., and Lindinger, L.J., 2012. Summary Report on the Lorraine-Jajay Property Omineca Mining Division, B.C. Technical report for Lorraine Copper Corp.
- Leriche, P.D., and Harrington, E.,. 1996. Diamond drill report on the JOH Property. BCMEMPR assessment report 25099, 66 pp.
- Leriche, P.D., and Taylor, A., 1992. Geological, geochemical and geophysical report on the Joh/Darb

property. Internal summary report for Swannel Minerals, 120 pp.

- Logan, J.M., and Mihalynuk, M.G., 2014. Tectonic controls on Early Mesozoic paired alkaline porphyry depost belts (Cu-Au ± Ag-Pt-Pd-Mo) within the Canadian cordillera. Economic Geology, 109, p. 827-858.
- Lui, D.K., 2010. 2010 geological report on the Kliyul project. BCMEMPR assessment report 31866, 83 pp.
- Lui, D.K., 2014. 2013 geological and geophysical report on the Kliyul Project. BCMEMPR assessment report 34890, 126 pp.
- Mair, J., and Bidwell, G., 2007. 2006 Assessment report, Mesilinka and Kliyul projects BCMEMPR assessment report 29112, 162 pp.
- Mair, J., and Bidwell, G., 2008. 2007 assessment report, Mesilinka project. BCMEMPR assessment report 29914, 576 pp.
- Mills, K., Huang, J., Bosworth, G., Cowie, S., Borntaeger, B., Wlhener, H., CollinS, J., Bejhuys, R.P., and Labrenze, D., 2009. Feasibility update 2009: technical report feasibility update Mt. Milligan property, northern BC. Technical report prepared for Terrane Metals Corp, 348 pp.
- Pacific Ridge, 2020. Pacific Ridge announces gold-copper acquisition in British Columbia. New release dated 17, January, 2020, <u>https://www.pacificridgeexploration.com/news/pacific-ridge-announces-gold-copper-acquisition-in-british-columbia/</u>
- Panteleyev, A., 1995. Porphyry Cu +/- Mo +/- Au in selected British Columbia mineral deposit profiles. In: Lefebvre, D.V., and Ray, G.E. (eds), Volume 1 – Metallics and Coal, B.C. Ministry of Energy of Employment and Investment, open file 1995-20, p 87-92.
- Price, S.M., G.E. Linden, R.W. Cannon, and Ditson, G.M., 1990. Geochemical, Geophysical and Prospecting Report on the KLI Claims. BCMEMPR assessment report 20578, 80 pp.
- Rebagliati, C.M. 1986. Assessment report soil geochemistry BAP 10, 14, 18 mineral claims. BCMEMPR assessment report 15182, 21 pp.
- Rodgers, T. 1981. Report on Diamond Drilling, Klisum Group. BCMEMPR assessment report 9464, 13 pp.
- Rogers, T., 1974. Diamond Drilling on the Klisum Group. BCMEMPR assessment report 5211, 20 pp.
- Schiarizza, P., and Tan, Sh., 2005. Geology and mineral occurrences of the Quesnel Terrane between the Mesilinka River and Wrede Creek (NTS 94D / 8, 9), north-central British Columbia. British Columbia Geological Survey, Geological Fieldwork 2004, paper 2005-1, p. 109–30.
- Sillitoe, R.H., 2010. Porphyry copper systems. Economic Geology, 105, p. 3-41.
- Smit, H.Q., and Meyers, R.E., 1985. Assessment report on the 1984 geological and geochemical exploration program on the KLI 84-1 claim group. BCMEMPR assessment report 13258, 212 pp.
- Stevenson, R W. 1971. Report on Soil and Silt Geochemical Survey, KLI No. 1 Group. BCMEMPR assessment report 3312, 20 pp.
- Voordouw, R., 2012. 2012 geological and geophysical report on the Kliyul project. BCMEMPR assessment report 33031, 109 pp.
- White, W.H. 1948. No Title. BC Department of Mines 1947 Annua: A100–107.

- Wilson, G.L. 1984. Geological, geochemical and geophysical report, KC 1 and 2 Mineral Claims. BCMEMPR assessment report 13580, 41 pp.
- Witte, A., Skrecky, G., Jakubec, J., Major, K., Ounpuu, M., Bostwick, C., Volk, J., Corpuz, P., and Arseneau.,
   G., 2015. NI 43-101 updated technical report for the Kemess Underground project, British Columbia,
   Canada. Technical report prepared for AuRico Metals.
- Zhang, G., and Hynes, A., 1991. Structures along the Finlay-Ingenika fault, McConnell Creek area, northcentral British Columbia (94C/5; 94D/8, 9). British Columbia Geological Survey, Geological fieldwork 1991, Paper 1992-1, p. 147-154.

## **QUALIFIED PERSON'S CERTIFICATE**

I, Ronald J Voordouw, P.Geo., residing at 1155 Judd Road, Brackendale, British Columbia, VON 1H0, do hereby certify:

- I am a consulting geologist and Director of Geoscience of Equity Exploration Consultants Ltd., a mining exploration management and consulting company with offices at 1238 – 200 Granville Street, Vancouver, British Columbia, V6C 1S4.
- 2) This Certificate applies to the report entitled "Technical report for the Kliyul Project, Omineca Mining Division, British Columbia, Canada" with an effective date of June 24, 2020
- 3) I am a graduate of University of Calgary (2000) with an Honours Bachelor of Science degree in Geology and am a graduate of the Memorial University of Newfoundland (2006) with a Doctor of Philosophy degree in Geology.
- 4) Since 2006, I have been involved with mineral exploration and research for precious and base metal deposits in Canada, South Africa and Brazil. I have managed and/or contributed to exploration programs on several porphyry projects, including the Red Chris and Mount Milligan mines, as well as the Redton and Kliyul prospects.
- 5) I am a Professional Geologist in good standing with Engineers and Geoscientists of British Columbia (license 50515) and the Professional Engineers and Geoscientists of Newfoundland and Labrador (registration number 06962).
- 6) I have read the definition of "Qualified Person" in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and according to NI 43-101 I am a qualified person owing to my education, experience and registration with professional associations.
- 7) I completed a site inspection on 22 June 2020.
- 8) I managed exploration work on the Kliyul Property in 2011 with fieldwork done from July 9<sup>th</sup> to August 5<sup>th</sup>, 2011.
- 9) I have completed a review of data provided by Pacific Ridge and publicly available assessment reports.
- 10) I am independent of Pacific Ridge Exploration (the "Issuer"), AuRico Metals (the "Vendor") and the Kliyul Property as defined by Section 1.5 of NI 43-101.
- 11) I am responsible for all sections in this report and confirm they have been prepared in compliance with NI 43-101.
- 12) As of the effective date of this report, to the best of my knowledge, information and belief, the sections of this report for which I am an author or co-author contain all scientific and technical information that is required to be disclosed so as to make the technical report not misleading.

Effective date: June 24, 2020

Signed date: June 24, 2020

Signed and Sealed: "Ronald Voordouw"

Ronald J. Voordouw, Ph.D., P.Geo.