# GEOLOGICAL and GEOCHEMICAL ASSESSMENT REPORT on the

# ARCH PROJECT

| | |
|---|---|
| ARCH 1-27 | YE69501-27 |
| ARCH 28-37 | YE69528-37 |
| AR 1-68 | YE69001-68 |
| AR 70-77 | YE69070-77 |

**NTS: 115G/5 & 12**

**Latitude 61°29'N Longitude 139°41'W**

**Whitehorse Mining District**

Work performed on August 16-17, 2012

For :
Mr. Bill Harris
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And
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January 13, 2013

**SUMMARY:**

The 2360 hectare Arch Project, NTS map sheets 115G/5 & 12, lies within the Kluane Ultramafic Belt and is located approximately 15 km southerly from the Donjek River bridge on the Alaska Highway, 125 km northwest of Haines Junction, and 285 km northwest of Whitehorse, Yukon Territory. The property is situated in the Whitehorse Mining District at a latitude and longitude of 60°29'N, 139°41'W. Access is by the Quill Creek road, which continues along Arch Creek. Mr. Bill Harris of Whitehorse and Mr. Tom Morgan of Dawson City, Yukon are the registered owners and funded the current program.

The Arch Project covers a nickel-copper-platinum group element (PGE) showing and magnetic and electromagnetic anomalies on trend and within the same sequence of Pennsylvanian to Triassic rocks which host the nickel-copper-platinum group element (Ni-Cu-PGE) Wellgreen deposit, 3 to 10 km to the southeast. The Wellgreen deposit represents the most advanced property within the Kluane Ultramafic Belt, with historic production (1972-1973) of 171,652 tonnes grading 2.23% Ni, 1.39% Cu, 0.073% Co, and 2.15 g/t Pt and Pd and a resource outlined in the late 1980's of 49.9 million tonnes grading 0.36% Ni, 0.35% Cu, 0.51 g/t Pt and 0.34 g/t Pd. The Wellgreen deposit emphasizes the excellent potential for large tonnage nickel-copper-PGE deposits in the Kluane Ultramafic Belt.

Two significant nickel-copper-PGE showings occur on the Airways Minfile drilled prospect (115G 025), located just north of the southeastern Arch Project. The main mineralized ultramafic sill at the Airways showing has been traced over a 750m strike length and the main showing consists of a 60m by 15m wide zone returning 2.51% Ni, 0.57% Cu, 1.8 g/t Pt, 3.2 g/t Pd and 0.07 g/t Au over 1.5m in 1987 and 1.44% Ni, 0.75% Cu, 0.7 g/t Pt and 1.5 g/t Pd over 2.6m from 1988 drill holes. The S.P. showing returned 3.02% Cu, 3.01% Ni, 2.4 g/t Pt and 3.5 g/t Pd over 3.5m (estimated true width of 2m) in 2001 trenching.

The Arch Project covers the Conwest showing, part of the Musketeer Minfile gabbroid copper-nickel-platinum group element occurrence as documented by the Yukon Geological Survey as Minfile Number 115G 026, which also includes the Teck showing. The Conwest showing consists of 90m of oxidized, medium grained gabbro with reported values of 2,015 ppm Ni, 5,448 ppm Cu and 154 ppb Au. The Teck showing, located just east of the property, consists of a southeast trending pyritic fault zone in the hanging wall of a peridotite sill carrying 0.11 g/t Pt, 0.11 g/t Pd, 1,581 ppm Ni, 709 ppm Cu and 0.14 g/t Au over 2m. DDH A88-1, almost 2 km further east along trend of the Teck showing, intersected anomalous copper-nickel-PGE values in a serpentinized peridotite sill typical for that in peridotites adjacent to the orebodies at Wellgreen.

In addition, a 150° trending magnetic high anomaly, proximal to 150 ppb Pt in soil, occurs approximately 700m south-southwest of a gabbro sill exposed in a canyon on the Arch Project south of Arch Creek, and values of 300 ppb Pt and 75 ppb Pd (with elevated gold) in soil occur 500m southwest of the sill.

The 2012 work program consisted of mapping and prospecting, with concurrent rock geochemical sampling, in an attempt to determine the potential of the Conwest showing and the nature of westerly trending gossanous zones in the northern property area.

The Arch Project was found to be underlain by a sequence of Pennsylvanian(?) and Permian sedimentary rocks of the Hasen Creek Formation, overlain by volcanic rocks assigned to the Upper Triassic Nikolai formation. The sequence is intruded by ultramafic and gabbroic rocks of the Triassic age Kluane mafic-ultramafic complex, apparently at the contact between the Hasen Creek and Station Creek Formations. This stratigraphy is the same as the stratigraphy hosting the Wellgreen deposit.

In 2012 two occurrences of pyritic quartz-sericite schist were identified on the Arch property hosted by volcanic rocks of the Station Creek Formation, a 100m long zone on the AR 72, and a smaller zone on the AR 70, approximately 250m to the southeast. The pyritic quartz-sericite schist mineralization, particularly on AR 72, resembles volcanogenic massive sulphide style alteration. Pyritic lenses up to 20 by 20m occur with up to 7% pyrite. Soil samples from the area in 2012 returned anomalous lead, zinc, iron, gold and locally copper with maximum results of 570 ppm Cu, 367 ppm Pb, 239 ppm Zn, 206 ppb Au and 15.5% Fe.

Potential exists in the overburden covered area southeast of the Conwest showing, coincident with a magnetic high anomaly. The Conwest showing consists of 90m of oxidized, medium grained gabbro with maximum values of 6746 ppm Cu, 2636 ppm Ni, 183 ppb Au, 6.1 ppm Ag, 106 ppb Pt and 92 ppb Pd obtained in 2011. The Conwest gabbro was traced for 115m along a north-northwest trend in 2012 with anomalous values of 1487 ppm Cu, 814 ppm Ni, 25 ppb Pt and 9 ppb Pd obtained in gabbro 75m along trend to the northwest of the Conwest showing.

In 2001 an open ended, 150m by 100m wide magnetic anomaly was identified in overburden 60m northwest of the Teck showing *(Vanwermeskerken, 2001 and Brickner, 2002)*, so additional potential may exist further to the northwest on the AR claims of the Arch Project.

Rusty exposures were observed in 2011 proximal to a magnetic high anomaly south of Arch Creek, with proximal Pt and Pd in soil anomalies. Follow up by prospecting and geochemical sampling is recommended.

An airborne Z-TEM electromagnetic survey, expected to cost approximately $50,000, is recommended over the property to detect conductors.

# TABLE OF CONTENTS

**Page**

# LIST OF FIGURES

**Page**



# TABLES

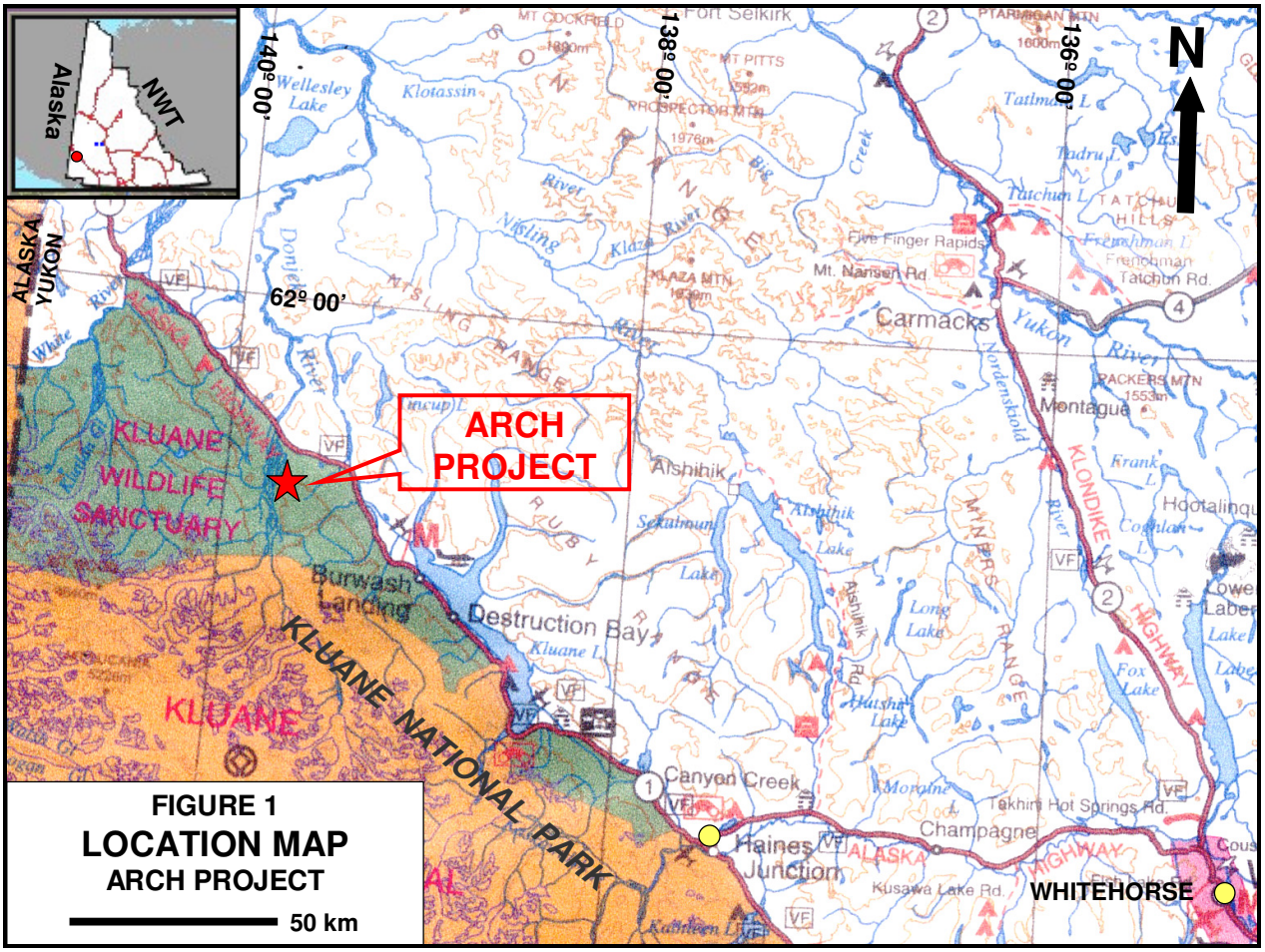


# APPENDICES

## 1.0 LOCATION AND ACCESS (Figures 1 and 2)

The Arch Project, NTS map sheets 115G/5 & 12, lies 15 km southerly from the Donjek River bridge on the Alaska Highway, 40 km by road northwest of Burwash Landing, approximately 125 km northwest of Haines Junction and 285 km northwest of Whitehorse, Yukon Territory *(Figure 1)*. The property is centered at a latitude of 60°29'N and a longitude of 139°41'W.

The property is accessible from the paved Alaska Highway (Highway 1) from Whitehorse via the Quill Creek gravel road (at km post 1799), then 18 km past the Wellgreen mine site. Helicopter access is available from Haines Junction, with a suitable staging site at the Donjek River bridge along the Alaska Highway. A bulldozer trail, in poor condition, also extends along the east side of the Donjek River to Arch Creek *(Figure 2)*.



## 2.0 LEGAL DESCRIPTION (Figure 2)

The Arch Project consists of a contiguous group of 37 Arch and 76 AR claims staked in 2011 in the Whitehorse Mining District *(Figure 2)*. The project comprises an area of roughly 2360 hectares, which is approximate since claim boundaries have not been surveyed. The project is situated within the Kluane Wildlife Sanctuary within which mining is allowed *(Figure 1)*. Asi Keyi Natural Environment Park, in which claims are not allowed, lies approximately 5 km to the west, on the west side of the Donjek River *(Figure 2)*. The Conwest showing, part of the Musketeer Minfile occurrence is located on the AR 55 claim.

The registered owner of the Arch claims is Mr. Bill Harris of Whitehorse, Yukon and the registered owner of the AR claims is Mr. Tom Morgan of Dawson City, Yukon. The current program was completed on August 16 and 17, 2012 over the AR 53-56, AR 70 and AR 72-75 claims and funded by Bill Harris and Tom Morgan. A table summarizing pertinent claim data follows and complete details are shown in Appendix II:

**TABLE 1: Claim data**

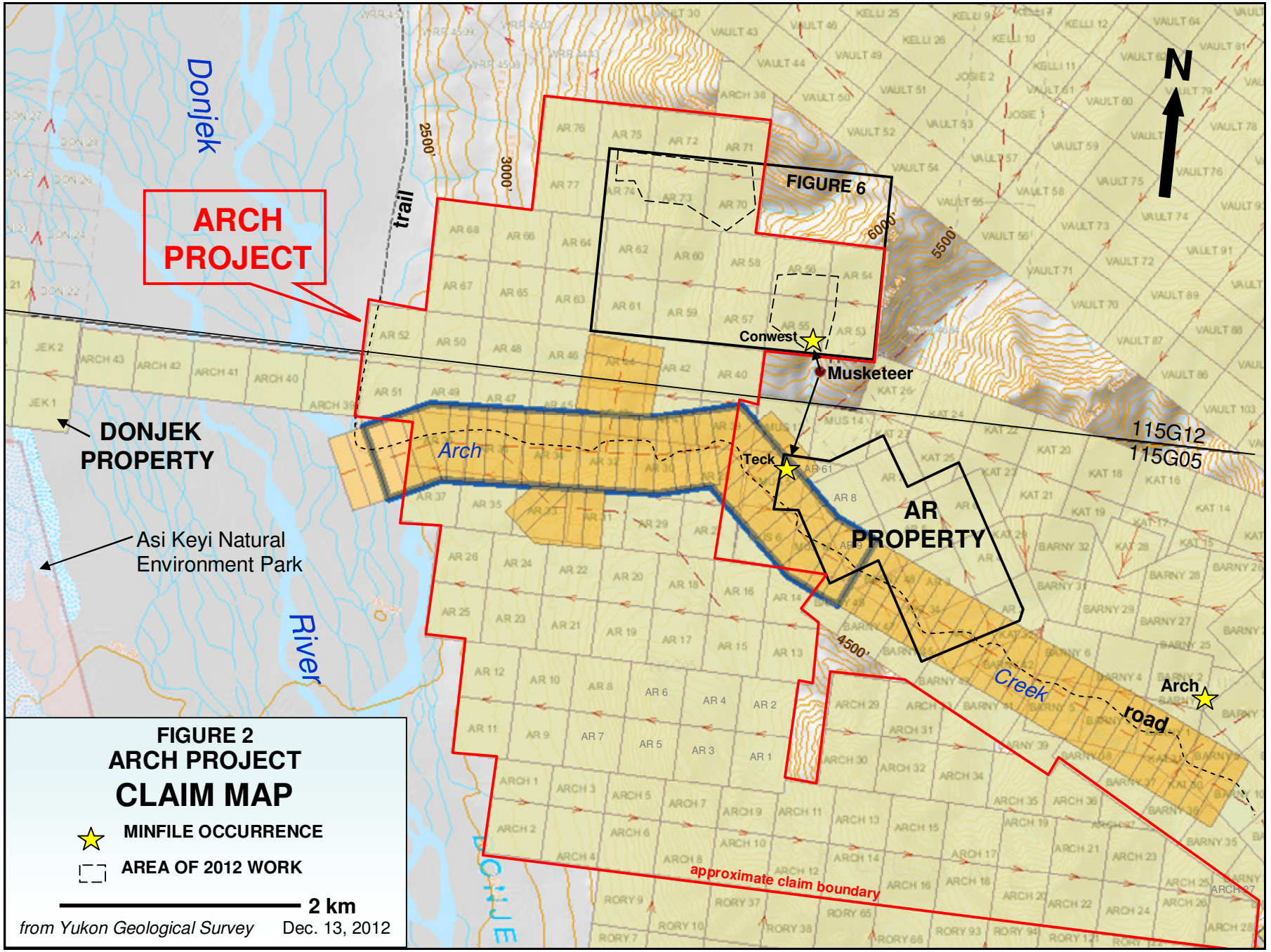
| Claim Name | Grant No. | No. of Claims | Registered Owner | Expiry Date | New Expiry Date |
|---|---|---|---|---|---|
| ARCH 1-27 | YE69501-27 | 27 | Bill Harris | 18/08/2012 | 18/08/2015* |
| ARCH 28-37 | YE69528-37 | 10 | Bill Harris | 18/08/2012 | 18/08/2014* |
| AR 1-38 | YE69001-38 | 38 | Tom Morgan | 18/08/2012 | 18/08/2013* |
| AR 39-68 | YE69039-68 | 30 | Tom Morgan | 22/08/2012 | 22/08/2013* |
| AR 70-77 | YE69070-77 | 8 | Tom Morgan | 22/08/2012 | 22/08/2013* |
| **TOTAL** | | **113** | | | |

*new expiry date based on acceptance of this report

## 3.0 PHYSIOGRAPHY AND CLIMATE (Figures 1 and 2)

The property is transected by Arch Creek, just east of the Donjek River within the Kluane Ranges of the St. Elias Mountains in southwestern Yukon *(Figure 1)*. Elevations range from just below 2500 feet along the Donjek River to 6300 feet on the ridge crest on Arch 20 in the southeast property area, along the southern property boundary *(Figure 2)*. Topography is moderate to steep with outcrop exposure best developed on north facing slopes, along ridges and in creeks. Vegetation consists of black spruce and poplar at lower elevations, with alder, buckbrush and moss on the higher slopes. Soil development is generally poor. The Arch Creek area is covered by a thick succession of glacio-fluvial gravels up to 40m thick, which inhibits mapping and trenching.

The area has a northern interior climate strongly influenced by the St. Elias Mountains. The area is known for high winds which constantly blow from the mountains into the Shakwak Valley, just north of the property. Winter temperatures average less than –20º Celsius while summer temperatures average 20º Celsius. The exploration season extends from June to October.


Donjek
ARCH PROJECT
trail
2500'
3000'
FIGURE 6
6000'
5500'
N
Conwest
Musketeer
DONJEK PROPERTY
Arch
Teck
115G12
115G05
AR PROPERTY
Asi Keyi Natural Environment Park
River
4500'
Creek
Arch
road
approximate claim boundary
FIGURE 2
ARCH PROJECT
CLAIM MAP
MINFILE OCCURRENCE
AREA OF 2012 WORK
2 km
from Yukon Geological Survey Dec. 13, 2012

## 4.0 HISTORY (Figure 2)

The Arch Project covers the Conwest showing, which is part of the Musketeer showing (Minfile Number 115G 026), a Minfile occurrence as documented by the Yukon Geological Survey *(Deklerk, 2009)*. The Musketeer showing comprises both the Conwest and Teck gabbroid copper-nickel-PGE showings. The Musketeer showing location is for the Conwest showing, which is slightly further north than plotted in Minfile and is located on the AR 55 claim. The Teck showing (originally Musketeer) occurs on the AR Project on AR 61, just east of the Arch Project. A summary of the work completed by various operators is tabulated below:

1952-56 Staked by Conwest Exploration Company Ltd. and to the east and west by Teck Exploration Company Ltd. to cover favourable stratigraphy on trend of the Wellgreen deposit, followed by geological mapping and prospecting in 1953. Two significant copper-nickel showings were identified. Magnetic, electromagnetic and resistivity geophysical surveying of the combined claim group was completed by Teck Exploration Company Ltd. in 1955 *(Walker, 1955) and 1956 (Clarke, 1956)*.

1967 Re-staking followed by magnetometer and EM-16 geophysical surveying and geological mapping by J.B. O'Neil and C. Gibbons *(Hilker, 1967)*.

1972 Geological mapping, geochemical sampling, magnetometer and electromagnetic surveying by the Nickel Syndicate (Canadian Superior Exploration Ltd., Aquitaine, Home Oil Company Ltd. and Getty Mines Ltd.) under option. The geophysical survey delineated a strong magnetic high and several moderately weak or broad conductors, and the mapping outlined pyritic mafic and ultramafic rocks, including peridotite, gabbro, diorite and andesite flows *(Deklerk, 2009)*.

1986-88 Geochemical sampling in 1986 and drilling of 85.6m in one hole in 1988, which returned anomalous values from a peridotite sill to east of Arch Project *(Eaton, 1988)*, by Kluane Joint Venture (All-North Resources Ltd. and Chevron Minerals Ltd.). Geological mapping, geochemical sampling and magnetometer and VLF-EM surveying completed by Rockridge Mining Corporation and Pak-Man Resources Inc. in 1987 under option from Kluane Joint Venture *(Eaton, 1987)*.

1987-88 Property examination of southern Arch Project undertaken for Dawson Eldorado Mines Inc. in 1987*(Hart and Doherty, 1987)* and Gold City Resources Inc. in 1988 *(Van Angeren, 1988).*

1988-89 Soil geochemical sampling and magnetometer surveying conducted by Lodestar Exploration Inc. under option from Harjay Exploration Ltd. on the SF and Missy claims in southwest property area, outlining a magnetic high anomaly proximal to Pt, Pd and Au in soil anomalies *(Davidson, 1989)*.

1999-2001 Geochemical sampling, road rehabilitation and blast trenching in 2000 and geochemical rock sampling and magnetometer and VLF-EM geophysical surveying in 2001 were completed by Auterra Ventures Inc. under option from Cabin Creek Resources Management Inc. (T. Morgan) on the AR Project, east of the Arch Project. A 150m by 100m wide magnetic anomaly was identified in overburden 60m northwest of the Teck showing and a 475m long, 30 to 150m wide magnetic anomaly, coincident with the axis of a relatively continuous VLF-EM conductor along its southeast edge, was identified in the vicinity of DDH A88-01 *(Vanwermeskerken, 2001 and Brickner, 2002)*.

## 5.0 2012 WORK PROGRAM

A total of 4 man-days were spent on the Arch Project on August 16 and 17, 2012. The 2012 work program consisted of mapping and prospecting, with concurrent rock geochemical sampling, in an attempt to determine the potential of the Conwest showing and the nature of westerly trending gossanous zones in the northern property area. The mapping program is discussed under sections 6.2 “Property Geology” and 6.3 “Mineralization and Alteration” and the geochemistry under section 7.0 “Geochemistry”. Mapping is shown in Figure 6 with sample locations and traverses, and sample descriptions are shown in Appendix III.

## 6.0 GEOLOGY

### 6.1 Regional (Figures 3 to 5)

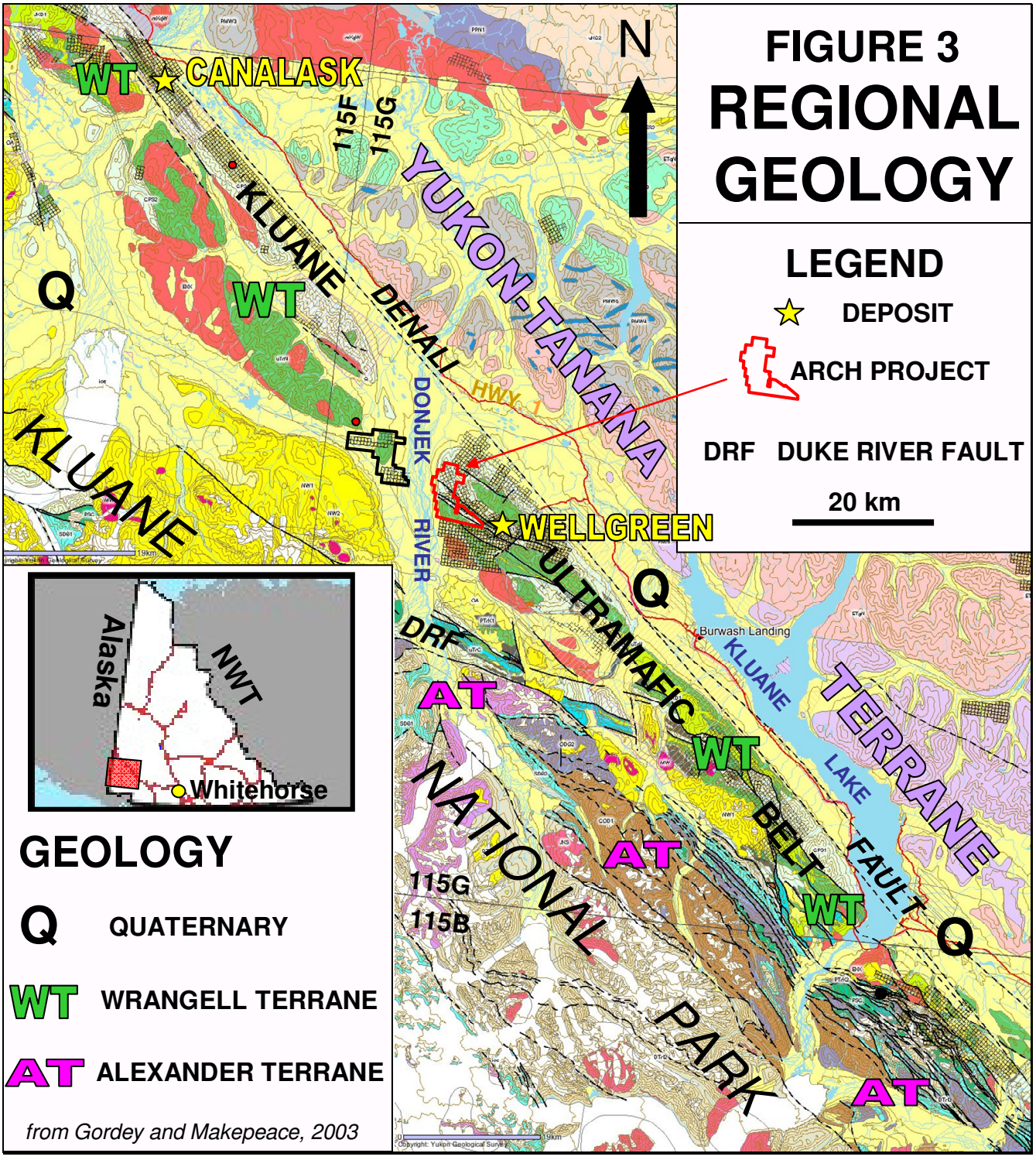
The Arch Project lies within a displaced portion of the Wrangell Terrane bounded by the 290° trending Duke River Fault to the south and the 310° Denali Fault System to the north *(Figure 3)*. The regional area has been mapped by Campbell and Dodds (1979) and compiled by Gordey and Makepeace (2003), with additional mapping and compilation by Israel (2004).

Regionally, the Arch Project is situated within the 600 km long Kluane Ultramafic Belt *(Figure 3)*, which is characterized by Triassic aged mafic (gabbro to diorite) to ultramafic (commonly peridotite) sills that are referred to as the Kluane mafic-ultramafic suite. The Kluane mafic-ultramafic suite hosts a number of magmatic nickel (Ni) - copper (Cu) - platinum group element (PGE) ±gold (Au) occurrences within the Wrangell Terrane from Northern British Columbia, through Yukon and into Alaska.

The mafic-ultramafic intrusions in the belt are sill-like bodies that preferentially intrude the country rock sequences at or near the contact between the Hasen Creek Formation (clastics, tuffs, argillite, limestone and minor mafic volcanics) and Station Creek Formation (tuffs, pyritic black tuff and mafic volcanics), part of the Pennsylvanian(?) to Permian Skolai Group *(Figures 4 and 5)*. Many of the ultramafic sills have marginal gabbro phases at their bases and upper contacts that appear to be preferentially mineralized. The Kluane Belt nickel-copper-PGE occurrences are particularly enriched in the rarer platinum group elements osmium, iridium, ruthenium and rhodium. Previous exploration within the belt primarily focused on the nickel-copper potential.

The Kluane Belt is considered one of the largest nickel-copper-PGE mineralized mafic-ultramafic trends in North America, second only to the nickeliferous intrusions from the Circum-Superior Belt, which includes the Thompson Nickel Belt, Manitoba. Similarities in the geologic setting have also been drawn to that of the Noril'sk Talnakh region of Siberia, the world’s largest nickel-copper-PGE producing area.

The Wellgreen deposit represents the most advanced property within the Kluane Belt, with historic production (1972-1973) of 171,652 tonnes grading 2.23% Ni, 1.39% Cu, 0.073% Co, and 2.15 g/t Pt and Pd and a resource outlined in the late 1980's of 49.9 million tonnes grading 0.36% Ni, 0.35% Cu, 0.51 g/t Pt and 0.34 g/t Pd. The Wellgreen deposit emphasizes the excellent potential for large tonnage nickel-copper-PGE deposits in the Kluane Ultramafic Belt.



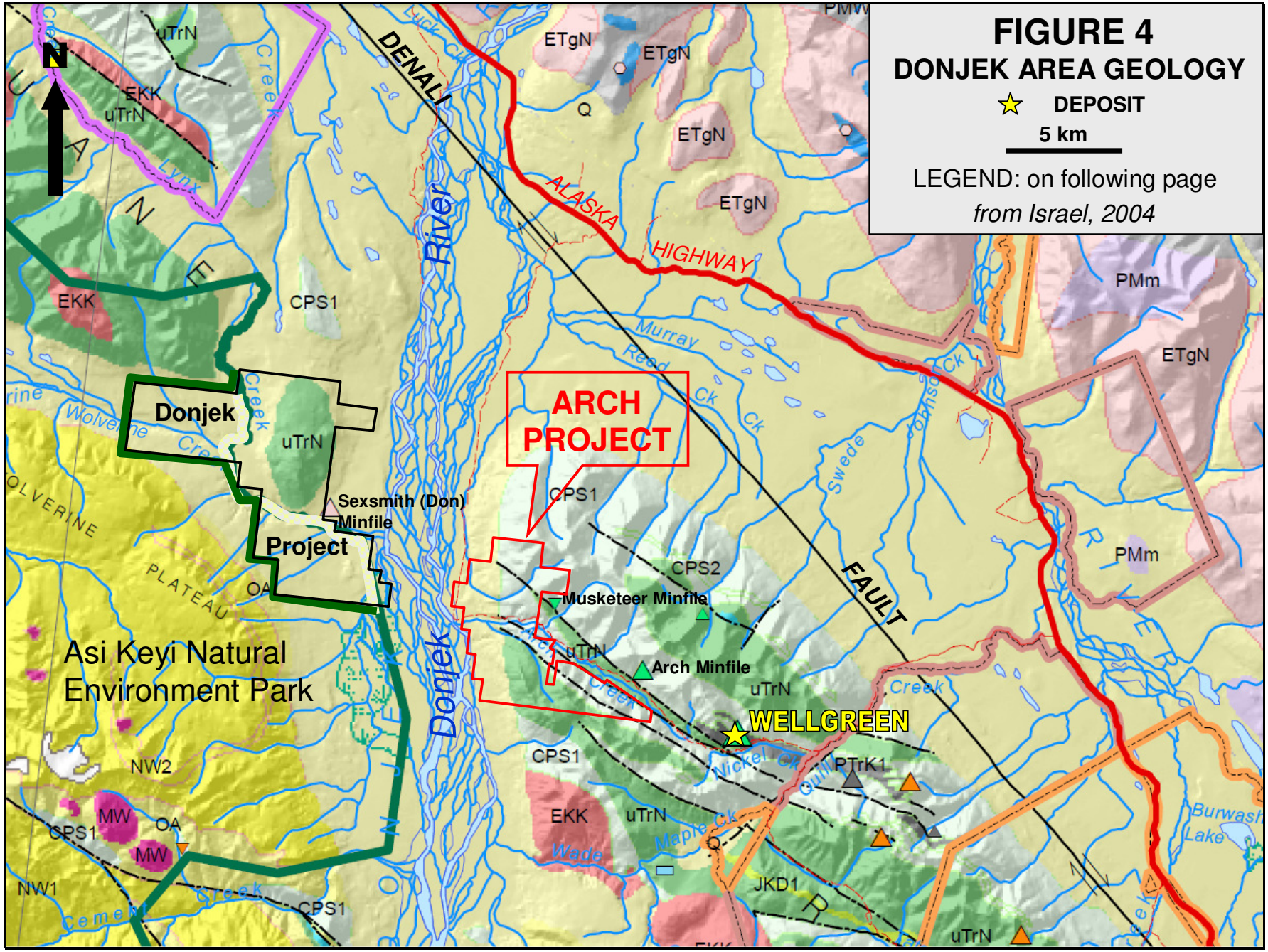


FIGURE 4
DONJEK AREA GEOLOGY
DEPOSIT
5 km
LEGEND: on following page
from Israel, 2004
N
DENALI
ALASKA HIGHWAY
Donjek River
Donjek
ARCH PROJECT
Donjek Project
Sexsmith (Don) Minfile
Musketeer Minfile
Arch Minfile
WELLGREEN
FAULT
Asi Keyi Natural Environment Park
Lynx Creek
Wolverine Creek
Murray Creek
Reed Creek
Swede Ck
Nickel Ck
Maple Ck
Wade Creek
Cement Creek
Burwash Lake
ETgN
PMm
uTrN
EKK
CPS1
CPS2
OA
MW
NW1
NW2
PTrK1
JKD1
Q

QUATERNARY

Q — **Q: QUATERNARY**
unconsolidated glacial, glaciofluvial and glaciolacustrine deposits; fluviatile silt, sand, and gravel, and local volcanic ash, in part with cover of soil and organic deposits

MIOCENE TO PLIOCENE AND (?) YOUNGER

NW — **NW: WRANGELL LAVAS**
mafic to felsic volcanic rocks (1) with local conglomerate (2)

MID TO LATE MIOCENE

MW — **MW: WRANGELL SUITE**
fine- to medium- grained, hornblende +/- biotite granodiorite and porphyritic (K-feldspar) hornblende granodiorite; medium-grained, uniform biotite diorite and pyroxene gabbro; subvolcanic hornblende +/- biotite rhyolite, rhyodacite, dacite, and trachyte

OLIGOCENE

OT — **OT: TKOPE SUITE**
light pinkish-grey, medium- to coarse-grained, homogeneous, biotite and/or hornblende granite (locally miarolitic); lesser light creamy-grey biotite-hornblende granodiorite, dark grey biotite-hornblende quartz diorite and gabbro diorite

PALEOCENE TO OLIGOCENE

OA — **OA: AMPHITHEATRE**
yellow-buff to grey-buff sandstone, pebbly sandstone, polymictic conglomerate, siltstone and mudstone; minor brown-grey carbonaceous shale and thin lignitic coal; mostly fluvial and lacustrine deposits, local debris-flow deposits; some shallow marine **(Amphitheatre; Kulthieth)**

EOCENE

ES — **ES: SEWARD SUITE**
non- to weakly foliated, light to mid-brownish-grey, medium-grained, biotite- and hornblende-biotite tonalite and granodiorite; rarer granite and quartz diorite

LATE EARLY CRETACEOUS

EKK — **EKK: KLUANE RANGES SUITE**
mid-grey, medium- to coarse-grained, biotite-hornblende granodiorite, quartz diorite, quartz monzonite, and hornblende diorite

EKP — **EKP: PYROXENITE CREEK ULTRAMAFIC**
medium-grained hornblende pyroxene gabbro, and biotite-hornblende diorite; olivine and hornblende clinopyroxenite

UPPER JURASSIC TO LOWER CRETACEOUS

JKD — **JKD: DEZADEASH**
clastic succession (1) but locally including undifferentiated younger strata (2)

LATE JURASSIC TO EARLIEST CRETACEOUS

JKS — **JKS: SAINT ELIAS SUITE**
nonporphyritic and porphyritic (K-feldspar), biotite-hornblende granodiorite; lesser nonporphyritic biotite and/or hornblende tonalite; locally includes biotite-hornblende quartz monzodiorite, quartz diorite, granite, and quartz monzonite

CRETACEOUS AND (?) OLDER

KY — **KY: YAKUTAT**
greywacke and conglomerate in thick members or interbedded with siltstone, argillite, or slate; melange with blocks (to several km) of greenstone, limestone, marble, granitic rocks, chert, and greywacke in a matrix of cherty and tuffaceous pelite **(Yakutat Gp.)**

KV — **KV: VALDEZ**
dark grey argillite and greywacke: includes granitoid dykes, sills, and locally plugs, green pillow lava, breccia, and tuff; metamorphosed equivalents include brown schists, granitoid gneisses and dark green amphibolite **(Valdez Gp.)**

UPPER TRIASSIC

uTrC — **uTrC: CHITISTONE**
thin interbedded light to dark grey argillaceous limestone and dark grey argillite; massive light grey limestone, limestone breccia and darker grey, well-bedded limestone; white to creamy white gypsum and anhydrite **(McCarthy, Chitistone and Nizina limestones)**

uTrN — **uTrN: NIKOLAI**
amygdaloidal basaltic and andesitic flows, with local tuff, breccia, shale and thin-bedded bioclastic limestone; volcanic breccia, pillow lava and conglomerate at base; locally includes dark grey phyllite and minor thin grey limestone of Middle Triassic **(Nicolai Greenstone)**

PENNSYLVANIAN TO (?) LOWER PERMIAN

CPS — **CPS: SKOLAI**
volcanic rocks succeeded upward by clastic strata (1) and including minor limestone (2)

LATE TRIASSIC AND (?) OLDER

PTrK — **PTrK: KLUANE ULTRAMAFIC SUITE**
mafic to ultramafic intrusions in 1) Wrangell Terrane and 2) Alexander Terrane

LATE PENNSYLVANIAN TO EARLY PERMIAN

CPI — **CPI: ICEFIELD RANGES SUITE (270-290 MA)**
mid- to dark greenish-grey, medium-grained, nonfoliated and foliated, biotite-hornblende quartz monzodiorite-quartz diorite-diorite, veined and intruded by leucocratic granodiorite and quartz syenite (agmatite); pink hornblende syenite **(Icefield Ranges Suite)**

PALEOZOIC, (?) DEVONIAN AND/OR YOUNGER

PSC — **PSC: STEELE CREEK**
massive medium- to coarse-grained, rusty grey-green hornblende pyroxene gabbro, minor medium grained gabbro-diabase and gabbro-pegmatite intrusions; rare pods of black peridotite; screens of flows, volcaniclastic rocks, minor argillite, and rare chert **(Mt. Cairnes Gabbro-Greenstone Complex; Steele Ck-Mt. Constantine Gabbro Complex)**

DEVONIAN TO UPPER TRIASSIC AND (?) OLDER

DTrI — **DTrI: ICEFIELD**
a grouping of diverse, dominantly upper Paleozoic partly equivalent strata subdivided into three dominant facies including pelitic rocks (1), carbonate (2), and volcanic rocks (3)

SILURIAN AND DEVONIAN

SDB — **SDB: BULLION**
a grouping of carbonate (1) and clastic (2) strata that may be partly equivalent

LOWER ORDOVICIAN TO DEVONIAN AND (?) OLDER

ODG — **ODG: GOATHERD**
a grouping of carbonate (1) and clastic (2) strata that may be in part equivalent

CAMBRIAN TO ORDOVICIAN AND (?) YOUNGER

COD — **COD: DONJEK**
greywacke greenstone assemblage (1) with minor carbonate (2)

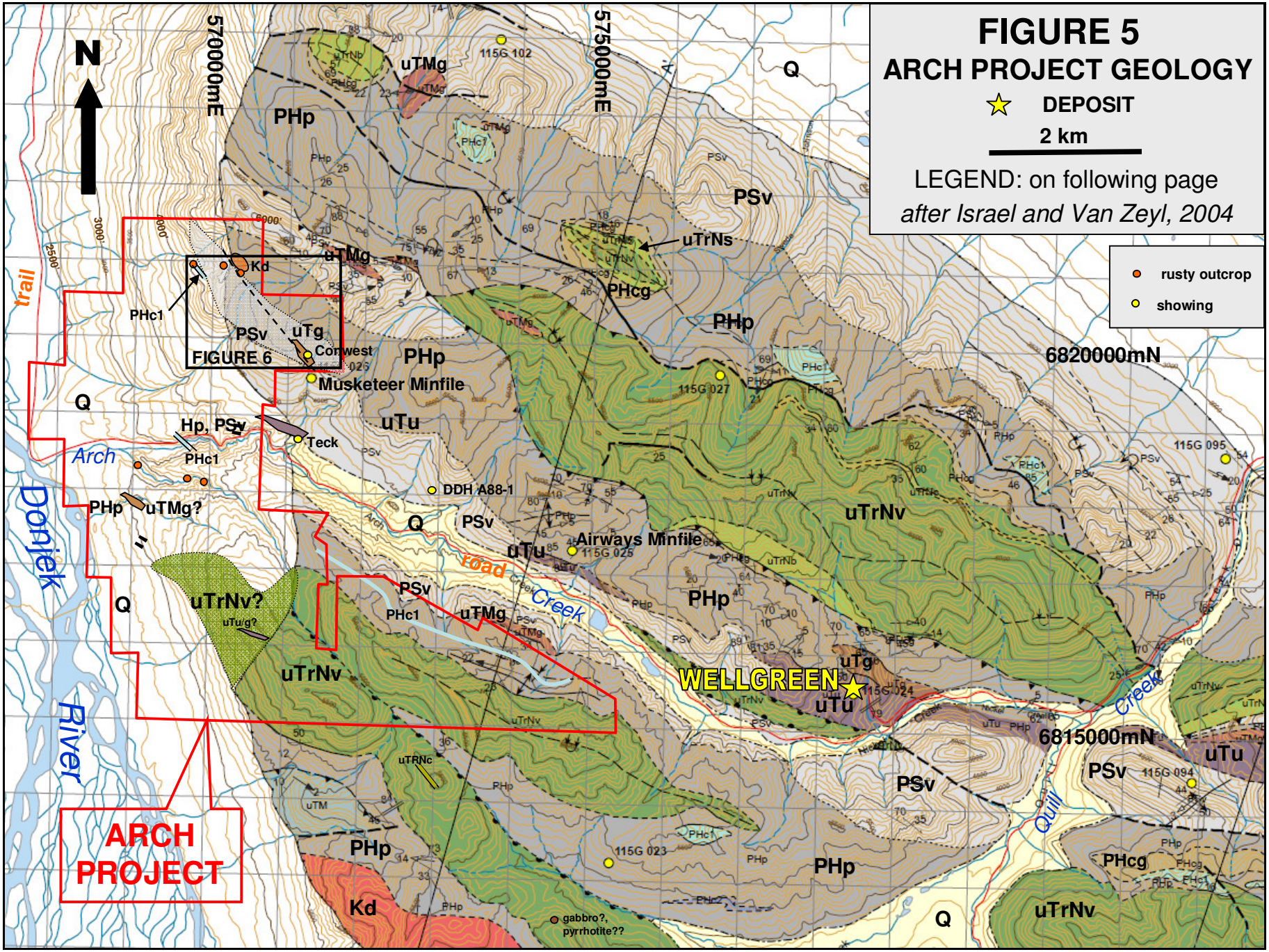


FIGURE 5
ARCH PROJECT GEOLOGY
DEPOSIT
2 km
LEGEND: on following page
after Israel and Van Zeyl, 2004
rusty outcrop
showing
N
570000mE
575000mE
6820000mN
6815000mN
PHp
uTMg
PSv
uTrNs
PHcg
uTrNv
uTu
Q
Kd
PHc1
uTg
uTRNc
uTrNv?
uTu/g?
Hp, PSv
uTMg?
FIGURE 6
Corwest
Musketeer Minfile
Teck
DDH A88-1
Airways Minfile
WELLGREEN
gabbro?, pyrrhotite??
115G 102
115G 027
115G 095
115G 025
115G 024
115G 094
115G 023
trail
Arch
Donjek
River
road
Creek
Quill
ARCH PROJECT

# LEGEND for FIGURE 5

**Minfile showing**

## QUATERNARY

Q — unconsolidated alluvium, colluvium and glacial deposits

## INTRUSIVE ROCKS

### OLIGOCENE

*Tkope suite*

Ofp — fine- to medium-grained, equigranular hornblende +/- biotite quartz-feldspar porphyry

### CRETACEOUS

*Kluane Ranges suite*

Kd — fine- to medium-grained, equigranular hornblende +/- pyroxene diorite and gabbro

### TRIASSIC

*Maple Creek gabbro*

uTMg — fine- to coarse-grained diabase and gabbro sills and dykes, locally abundant epidote- and chlorite-altered. Locally columnar jointed

*Kluane mafic-ultramafic complex*

uTg — coarse-grained and pegmatitic gabbro

uTu — peridotite, dunite and clinopyroxenite, layered intrusions, locally with gabbroic chilled margins

## STRATIGRAPHIC ROCKS

### TRIASSIC TO CRETACEOUS

*Tatamagouche succession*

uTKp — dark to light grey phyllite, minor greywacke and brick red pebble conglomerate, may include upper parts of McCarthy Formation

### UPPER TRIASSIC

*McCarthy Formation*

uTM — light to dark grey shale and argillite interbedded with buff-coloured limestone

*Nikolai formation*

uTrNc — thinly bedded grey limestone and minor maroon to olive green argillite

uTrNv — dark green to maroon amygdaloidal basalt and basaltic andesite flows, locally pyroxene-and plagioclase-phyric; and developed pillows. Rare olivine crystals

uTrNb — light to dark green volcanic breccia; angular clasts of amygdaloidal and pyroxene porphyry volcanic rocks and minor argillite in a fine-grained matrix

### PENNSYLVANIAN (?) AND PERMIAN

*Hasen Creek Formation*

PHcg — pebble- to cobble-conglomerate, rounded to sub-angular clasts of siltstone, chert, greywacke and minor mafic volcanic rocks. massive to graded beds several metres thick

PHc2 — light to dark grey limestone, fossiliferous and frequently pebbly, commonly graded and cross-bedded

PHc1 — light grey to white bioclastic limestone, local cherty interbeds

PHp — dark to light grey/brown siltstone turbidites, siliceous argillite, chert and minor volcaniclastic sandstone and tuffs

*Station Creek Formation*

PSv — dark to light green volcanic breccia, crystal tuff and tuffaceous sandstone; breccia clasts consist of augite phyric basalt within tuffaceous matrix; minor augite phyric, local amygdaloidal basalt flows

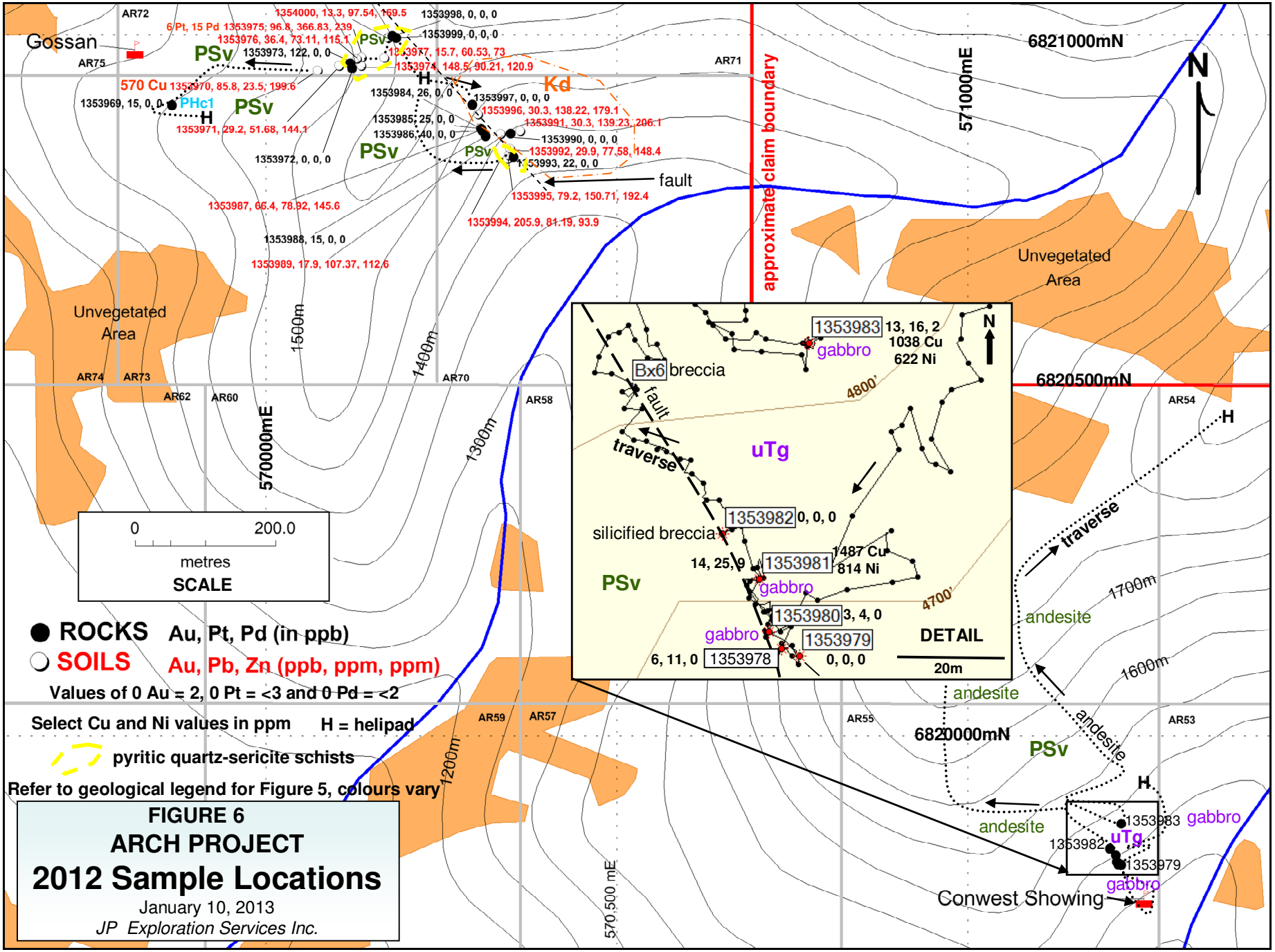



**FIGURE 6**

# ARCH PROJECT

# 2012 Sample Locations

January 10, 2013

*JP Exploration Services Inc.*

## 6.2 Property (Figures 4 to 6)

The property geology is shown in Figure 5, modified from Israel and Van Zeyl (2004), based on current and previous detailed mapping. Current mapping is also shown with sample locations and select results in Figure 6.

The Arch Project is underlain by a succession of Pennsylvanian(?) and Permian volcanic and sedimentary rocks of the Skolai Group, overlain by volcanic rocks of the Nikolai Formation *(Figure 4)*. The Skolai Group includes a basal volcanic sequence (Station Creek Formation), overlain by clastic rocks and limestone of the Hasen Creek Formation *(Figure 5)*. The Skolai Group is intruded by ultramafic and gabbroic rocks of the Upper Triassic age Kluane mafic-ultramafic complex and diabase and gabbro sills and dykes of the Triassic Maple Creek gabbro *(Figure 5)*. All of the above units are intruded by granodiorite, diorite and gabbro dykes and sills, possibly of the Cretaceous age Kluane Ranges suite. A larger diorite body of the Kluane Ranges suite lies just south of the property *(Figures 4 and 5)*. A number of northwest trending faults and fold axes transect the property.

A small, incompletely defined (at least 130m long) body of andesite to diorite hornblende porphyry to minor gabbro, probably of the Kluane Ranges suite, was identified on the AR 70 claim in 2012 *(Figure 6)*. The southwestern boundary appears to be bounded by a 310-315° trending fault *(Figure 6)*, which may be a continuation of the 150-160° trending fault southwest of the Conwest gabbro body *(Figure 5)*. The Conwest gabbro was traced for 115m along a north-northwest trend in 2012. The AR 70 fault occurs on the AR 70 and 72 claims with andesitic volcanic rocks of the Station Creek Formation exposed southwest of the fault. A marble horizon, probably of the Hasen Creek Formation was encountered on the northwest AR 73 claim *(Figure 6)*.

The peridotite sill at the Teck showing, just east of the property trends northwest and dips moderately to steeply southwest, at the contact between the Station Creek and the Hasen Creek Formations *(Figure 5)*. The stratigraphy appears to be right side up with pyritic siltstone of the Hasen Creek Formation exposed in the hanging wall of the sill and andesite of the Station Creek Formation in the footwall. The immediate footwall of the sill, which is the favourable site for mineralization, is not exposed.

Mapping in 1989 *(Davidson, 1989)* uncovered a gabbro sill (possibly the Maple Creek gabbro) in a canyon south of Arch Creek, hosted by a sequence of bedded conglomerate, sandstone, shale, siltstone and minor limestone of the Hasen Creek Formation, trending 130°/steep *(Figure 5)*. A dark weathering ultramafic looking body was identified during an aerial reconnaissance in 2011 at approximately 569064mE, 6817856mN (Nad 83, zone 7), which may be the gabbro body. A rusty outcrop lies 100m to the west at 568970mE, 6817827mN and a fault zone was identified 100m to the east. In addition three iron stained exposures were observed along a northwest flowing tributary of Arch Creek at 569062mE, 6818335mN; 569762mE, 6818153mN; and 569969mE, 6818131mN (Nad 83, zone 7). Suitable landing sites could not be found to investigate further. Another ultramafic/gabbro body has previously been mapped on the AR 3, 5 and Arch 5 and 7 claims *(Hart and Doherty, 1988)*.

## 6.3 Mineralization and Alteration (Figures 4 to 6)

The Arch Project covers the Conwest showing, part of the Musketeer Minfile occurrence *(Figure 4)* as documented by the Yukon Geological Survey as Minfile Number 115G 026 *(Deklerk, 2009)*. The Musketeer showing comprises the Conwest and Teck gabbroid copper-nickel-platinum group element (PGE) showings and magnetic and electro-magnetic anomalies within the same sequence of Pennsylvanian to Triassic rocks which host the nickel-copper-PGE Wellgreen deposit, 3-10 km to the southeast *(Figure 5)*. Arch Creek, which bisects the property, is a placer gold bearing creek.

The Conwest showing consists of 90m of oxidized, medium grained gabbro, east of and subparallel to, a south-southeast trending fault. The intrusion occurs as two separate bodies, 15m or more in width, that are flanked by quartz ±calcite stringer stockwork zones within the volcanic host rock. Both the intrusion and stockwork zones are mineralized with interstitial and disseminated pyrite and chalcopyrite ±pentlandite. Chip sampling in 2000 returned maximum values of 2,015 ppm Ni, 5,448 ppm Cu and 154 ppb Au. Mineralized gabbro was traced for 115m along a north-northwest trend in 2012.

The Teck showing, just east of the Arch Project, consists of a small exposure of a 1m wide, southeast trending pyritic fault zone within variably calcareous felsic to intermediate feldspar porphyry in proximity to a peridotite sill, locally serpentinized and variably mineralized with fine disseminated pyrite, magnetite and pyrrhotite. Reportedly a chip sample collected from a carbonate altered section of the sill returned 0.11 g/t Pt, 0.11 g/t Pd, 1,581 ppm Ni, 709 ppm Cu and 0.14 g/t Au over 2m.

DDH A88-1, almost 2 km further east along trend of the Teck showing, targeted a magnetic high coincident with a VLF-electromagnetic conductor and intersected a 25m wide serpentinized ultramafic sill which averaged 0.03% Cu, 0.22% Ni, 0.004 oz/t Pt and 0.004 oz/t Pd *(Figure 5)*. The values are typical for that in peridotites adjacent to the orebodies at Wellgreen *(Eaton, 1988)*.

In 2012 two occurrences of pyritic quartz-sericite schist were identified on the Arch property hosted by volcanic rocks of the Station Creek Formation, a 100m long zone on the AR 72, and a smaller zone on the AR 70, approximately 250m to the southeast. The pyritic quartz-sericite schist mineralization on AR 72 resembles volcanogenic massive sulphide style alteration. Pyritic lenses up to 20 by 20m occur with up to 7% pyrite.

On the Arch property a 150° trending magnetic high anomaly, proximal to 150 ppb Pt in soil, occurs approximately 700m south-southwest of a gabbro sill exposed in a canyon south of Arch Creek *(Figure 5)*. Values of 300 ppb Pt and 75 ppb Pd (with elevated gold) in soil occur 500m southwest of the sill. *(Refer to Davidson, 1989.)*

## 7.0 GEOCHEMISTRY (Figure 6)

### 7.1 Procedure

A total of 18 rock and 14 soil samples were collected from the Arch Project during the 2012 program for geochemical analysis. All samples were located and recorded by GPS in the field using UTM coordinates, Nad 83 datum, Zone 7 projection. Sample descriptions, locations and select results (Au, Pt, Pd, Ag, Cu, Ni, Pb and Zn) are documented in Appendix III and locations are plotted on Figure 6, with select results. Complete results are outlined in Appendix IV.

The rock samples consisted of grab and chip samples of rusty, altered and sulphide bearing zones encountered during mapping and prospecting. The samples were placed in clear plastic sample bags, numbered and secured in the field. Soil samples primarily consisted of rusty talus fines along westerly trending rusty zones, dominated by pyritic quartz-sericite schists, and were collected by digging down with a rock hammer.

Five rock samples were collected of variably altered pyritic and chalcopyrite bearing gabbro, northwest of the Conwest showing with one sample of silicified breccia from a steep, 150-160° trending fault which occurs southwest of the Conwest gabbro body. Twelve rock and 14 soil samples were collected along westerly trending gossanous zones, dominated by pyritic quartz-sericite schists, in the northern property area.

Samples were delivered by the author to the Whitehorse sample preparation facility of Acme Analytical Laboratories Ltd., then internally sent to their facility in Vancouver, British Columbia for analysis. Rock samples were analyzed for Al, Sb, As, Ba, Bi, B, Cd, Ca, Cr, Co, Cu, Ga, Au, Fe, La, Pb, Mg, Mn, Hg, Mo, Na, Ni, P, Ag, K, Sc, Sr, S, Tl, Th, Ti, W, V and Zn by ICP-ES, a 34 element ICP package which involves a nitric-aqua regia digestion using 0.5g (1D) and an emission spectrometry finish. Gold, platinum and palladium were analyzed by Acme's Group 3B-ES, 30g analysis, which involves a fire assay pre-concentration with an ICP-emission spectrometry (ICP-ES) finish. Soil samples were analyzed for the above 34 listed elements and Be, Ce, Cs, Ge, Hf, In, Li, Nb, Rb, Re, Sn, Ta, Y, Zr, Au, Pt and Pd by ICP-MS, a 53 element ICP package which involves a nitric-aqua regia digestion using 15g and a mass spectrometry finish (1F-15).

Acme is an IS0 9001:2008 accredited facility, certificate number FM 63007. Quality control procedures were implemented at the laboratory, involving the regular insertion of blanks and standards and repeat analyses.

### 7.2 Results

Previous sampling of the Conwest showing by the author in 2011 returned maximum values of 6746 ppm Cu, 2636 ppm Ni, 183 ppb Au, 6.1 ppm Ag, 106 ppb Pt and 92 ppb Pd. In 2012 values of 1487 ppm Cu, 814 ppm Ni, 25 ppb Pt and 9 ppb Pd were obtained from gabbro 75m along trend to the northwest of the Conwest showing (Sample 1353981) and

1038 ppm Cu, 622 ppm Ni and 16 ppb Pt, 115m along trend to the northwest (Sample 1353983). No significant results were returned from a sample of silicified breccia from the fault to the southwest.

Soil samples from the pyritic quartz-sericite schists on the AR 70-72 claims returned anomalous lead, zinc, iron, gold and locally copper with 367 ppm Pb, 239 ppm Zn, 11% Fe, and 160 ppm Cu (Sample 1393975) obtained from the AR 72 exposure and maximum results of 570 ppm Cu (1393970), 367 ppm Pb, 239 ppm Zn (1393975), 206 ppb Au and 15.5% Fe (1393994). No significant results were returned from rock samples of the pyritic quartz-sericite schists.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

There is good potential for the discovery of magmatic nickel (Ni) - copper (Cu) - platinum group element (PGE) ±gold (Au) mineralization on the Arch Project, similar to that of the Wellgreen deposit, which lies 3-10 km to the southeast along trend.

The Arch Project covers the Conwest showing, part of the Musketeer Minfile occurrence *(Figure 4)* as documented by the Yukon Geological Survey as Minfile Number 115G 026 *(Deklerk, 2009)*. The Musketeer showing comprises the Conwest and Teck gabbroid copper-nickel-platinum group element (PGE) showings and magnetic and electromagnetic anomalies within the same sequence of Pennsylvanian to Triassic rocks which host the nickel-copper-PGE Wellgreen deposit, 3-10 km to the southeast. In addition, Arch Creek, which bisects the property, is a placer gold bearing creek.

Two significant showings occur on the Airways Minfile drilled prospect (115G 025), located just north of the southeastern Arch Project. The main mineralized ultramafic sill at the Airways showing has been traced over a 750m strike length and the main showing consists of a 60m by 15m wide zone returning 2.51% Ni, 0.57% Cu, 1.8 g/t Pt, 3.2 g/t Pd and 0.07 g/t Au over 1.5m in 1987 and 1.44% Ni, 0.75% Cu, 0.7 g/t Pt and 1.5 g/t Pd over 2.6m from 1988 drill holes. The S.P. showing returned 3.02% Cu, 3.01% Ni, 2.4 g/t Pt and 3.5 g/t Pd over 3.5m (estimated true width of 2m) in 2001 trenching.

In 2001 an open ended, 150m by 100m wide magnetic anomaly was identified in overburden 60m northwest of the Teck showing *(Vanwermeskerken, 2001 and Brickner, 2002)*, so additional potential may exist further to the northwest on the AR claims of the Arch Project.

Potential exists in the overburden covered area southeast of the Conwest showing, coincident with a magnetic high anomaly. The Conwest showing consists of 90m of oxidized, medium grained gabbro with maximum values of 6746 ppm Cu, 2636 ppm Ni, 183 ppb Au, 6.1 ppm Ag, 106 ppb Pt and 92 ppb Pd obtained in 2011. The Conwest gabbro was traced for 115m along a north-northwest trend in 2012 with anomalous values of 1487 ppm Cu, 814 ppm Ni, 25 ppb Pt and 9 ppb Pd obtained in gabbro 75m along trend to the northwest of the Conwest showing.

In 2012 two occurrences of pyritic quartz-sericite schist were identified on the Arch property hosted by volcanic rocks of the Station Creek Formation, a 100m long zone on the AR 72, and a smaller zone on the AR 70, approximately 250m to the southeast. The pyritic quartz-sericite schist mineralization, particularly on AR 72, resembles volcanogenic massive sulphide style alteration. Pyritic lenses up to 20 by 20m occur with up to 7% pyrite. Soil samples from the area in 2012 returned anomalous lead, zinc, iron, gold and locally copper with maximum results of 570 ppm Cu, 367 ppm Pb, 239 ppm Zn, 206 ppb Au and 15.5% Fe.

Rusty exposures were observed in 2011 proximal to a magnetic high anomaly south of Arch Creek, with proximal Pt and Pd in soil anomalies. Follow up by prospecting and geochemical sampling is recommended.

An airborne Z-TEM electromagnetic survey, expected to cost approximately $50,000, should be considered over the property as an initial phase to detect conductors.

# APPENDIX I: Selected References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# Appendix II: Statement of Claims

| Grant Number | Claim Name | Claim No. | Claim Owner | Record Date | Expiry Date |
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| YE69064 | AR | 64 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69065 | AR | 65 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69066 | AR | 66 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69067 | AR | 67 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69068 | AR | 68 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69070 | AR | 70 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69071 | AR | 71 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69072 | AR | 72 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69073 | AR | 73 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69074 | AR | 74 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69075 | AR | 75 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69076 | AR | 76 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |
| YE69077 | AR | 77 | Tom Morgan - 100% | 22/08/2011 | 22/08/2013 |

# APPENDIX III: Sample Descriptions

August 16-17, 2012

## ARCH PROJECT, YT
## 2012 SAMPLE DESCRIPTIONS AND RESULTS - JP

| SAMPLE | | Nad 83, Zone 7 | | ELEV. | | | Au | Pt | Pd | Ag | Cu | Ni | Pb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Location | EASTING | NORTHING | (m) | TYPE | DESCRIPTION | ppb | ppb | ppb | ppm | ppm | ppm | ppm | ppm |
| 1353969 | West AR | 569866 | 6820899 | 4528 | rock grab | quartz carbonate altered(?), silicified marble(?), crosscutting quartz veinlets, fine pyrite | 15 | <3 | <2 | <0.3 | 16 | 48 | 15 | 182 |
| 1353970 | West AR | 570076 | 6820946 | 4563 | soil | talus fines,10 cm depth, medium - light brown C horizon | 85.8 | <10 | 5 | 0.6 | 570 | 156 | 23.5 | 199.6 |
| 1353971 | West AR | 570107 | 6820953 | 4615 | soil | talus fines,12 cm depth, medium - light brown C horizon | 29.2 | <10 | <2 | 1.0 | 90 | 26 | 51.68 | 144.1 |
| 1353972 | West AR | 570123 | 6820952 | 4651 | rock grab | rusty weathering, pyrite sericite altered andesite talus blocks, with sooty, black vugs | <2 | <3 | <2 | <0.3 | 66 | 8 | <3 | 112 |
| 1353973 | West AR | 570120 | 6820959 | 4655 | rock grab | strong to intense jarosite and rusty quartz-sericite-pyrite altered andesite +/- some pyritic andesite, in outcrop | 122 | <3 | <2 | 1.5 | 70 | 24 | 7 | 108 |
| 1353974 | West AR | 570138 | 6820953 | 4684 | soil | rusty talus fines, 20 cm depth, from main gully | 148.5 | <10 | <2 | 1.7 | 102 | 13 | 90.21 | 120.9 |
| 1353975 | West AR | 570139 | 6820965 | 4697 | soil | strong rusty C horizon soil, 5cm depth, from weathered out quartz-sericite-pyrite outcrop | 96.8 | 15 | 6 | 4.8 | 160 | 18 | 366.83 | 239 |
| 1353976 | West AR | 570132 | 6820963 | 4719 | soil | yellow-orange clay, C horizon, 5 cm depth, above quartz-sericite-pyrite outcrop | 36.4 | <10 | <2 | 1.7 | 64 | 6 | 73.11 | 115.1 |
| 1353977 | West AR | 570171 | 6820964 | 4783 | soil | very rusty talus fines, 35 cm depth, outcrop of well fractured and limonitic (goethite) pyritic quartz-sericite schist underneath | 15.7 | <10 | <2 | 0.8 | 30 | 6 | 60.53 | 73 |
| 1353978 | west of Conwest | 571215 | 6819816 | 4602 | rock grab | gabbro with clots of pyrite (10%) up to 1 cm in size above (west) of Conwest, as talus from about 40m above, NW side of gully | 6 | 11 | <2 | 0.3 | 427 | 442 | 6 | 78 |
| 1353979 | west of Conwest | 571219 | 6819815 | 4601 | rock grab | serpentinized gabbro with less than 1% pyrite | <2 | <3 | <2 | <0.3 | 239 | 325 | 5 | 74 |
| 1353980 | west of Conwest | 571213 | 6819819 | 4640 | rock grab | talus of quartz - carbonate veinlets in carbonatized gabbro above Conwest | 3 | 4 | <2 | <0.3 | 225 | 238 | <3 | 41 |
| 1353981 | west of Conwest | 571211 | 6819829 | | rock grab | gabbro with pyrite (5-10%) and 1% chalcopyrite as clots +/- with rusty weathering and limonite on fractures, minor aphanitic quartz veinlets to 1 cm | 14 | 25 | 9 | 1.2 | 1487 | 814 | 9 | 71 |
| 1353982 | west of Conwest | 571203 | 6819838 | 4695 | rock grab | talus blocks of silicified breccia with argillite fragments and silicified greenstone-gabbro(?), matrix, no visible sulphides, from south side of gully | <2 | <3 | <2 | <0.3 | 24 | 26 | 4 | 31 |
| 1353983 | west Conwest | 571219 | 6819874 | 4749 | rock grab | gabbro with pyrite, minor chalcopyrite as clots, some fine quartz veinlets, in outcrop at west extent of Conwest showing | 13 | 16 | 2 | 0.8 | 1038 | 622 | 4 | 63 |

August 16-17, 2012

# ARCH PROJECT, YT
## 2012 SAMPLE DESCRIPTIONS AND RESULTS - JP

| SAMPLE | | Nad 83, Zone 7 | | ELEV. | | | Au | Pt | Pd | Ag | Cu | Ni | Pb | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Location | EASTING | NORTHING | (m) | TYPE | DESCRIPTION | ppb | ppb | ppb | ppm | ppm | ppm | ppm | ppm |
| 1353984 | West AR | 570307 | 6820866 | 4773 | rock grab | shear zone trend 105/85S; pyritic quartz-sericite schist, rusty weathering, limonite on fractures and some boxwork, talus-crumbled outcrop, in place | 26 | <3 | <2 | 0.5 | 34 | 11 | 19 | 118 |
| 1353985 | West AR | 570307 | 6820866 | 4773 | rock grab | more oxidized, rusty limonite fracture fillings and weathered surface with boxwork after pyrite; same area as 1353984 | 25 | <3 | <2 | 0.4 | 69 | 11 | 27 | 148 |
| 1353986 | West AR | 570308 | 6820863 | 4768 | rock grab | pyritized sericite altered andesite hornblende porphyry, pale green colour, shear zone, strong limonite-goethite fracture fillings | 40 | <3 | <2 | 1.5 | 36 | 32 | 93 | 224 |
| 1353987 | West AR | 570308 | 6820864 | 4775 | soil | talus fines, medium brown C horizon from below 1353984-86 exposure, shear zone | 66.4 | <10 | <2 | 1.3 | 219 | 20 | 78.92 | 145.6 |
| 1353988 | West AR | 570313 | 6820855 | 4742 | rock grab | chip across discontinuous 3m within 6m outcrop of more sheared jarosite stained pyritic quartz-sericite schist sections of rusty sheared andesite hornblende porphyry outcrop | 15 | <3 | <2 | 0.6 | 35 | 4 | 18 | 112 |
| 1353989 | West AR | 570337 | 6820856 | 4736 | soil | yellow orange-pale green, clayey C horizon soil, 30 cm deep, above sheared outcrop on north side of gully/fault | 17.9 | <10 | <2 | 1.0 | 36 | 4 | 107.37 | 112.6 |
| 1353990 | West AR | 570349 | 6820859 | 4738 | rock grab | pyritic gabbro talus with chalcopyrite(?), looks like above Conwest showing | <2 | <3 | <2 | <0.3 | 75 | 104 | 14 | 191 |
| 1353991 | West AR | 570365 | 6820860 | | soil | orange-br C horizon talus fines from beneath rusty, well fractured to sheared outcrop of andesite hornblende porphyry, +/- jarosite, 25cm depth | 30.3 | <10 | <2 | 1.1 | 77 | 20 | 139.23 | 206.1 |
| 1353992 | West AR | 570350 | 6820835 | 4662 | soil | medium brown, weakly rusty, fine sand to weak clayey talus fines from below weakly rusty outcrop of andesite +/- hornblende porphyry | 29.9 | <10 | 3 | 1.2 | 86 | 31 | 77.58 | 148.4 |
| 1353993 | West AR | 570353 | 6820825 | 4630 | rock grab | talus blocks in gully of highly pyritic I sil quartz-calcite-chlorite-sericite-pyrite; hornfels(?) TS1 | 22 | <3 | <2 | <0.3 | 17 | 5 | 8 | 40 |
| 1353994 | West AR | 570347 | 6820820 | 4639 | soil | rusty orange-brown C horizon talus fines, 35-40cm depth, altered rusty, Mn stained, well fractured andesite to silicified pyritic quartz-sericite rock | 205.9 | <10 | 2 | 1.9 | 210 | 15 | 81.19 | 93.9 |
| 1353995 | West AR | 570349 | 6820825 | 4626 | soil | buff coloured 25cm deep clayey C horizon - bleached zone, above rusty well fractured magnetic andesite outcrop | 79.2 | <10 | <2 | 1.9 | 89 | 9 | 150.71 | 192.4 |
| 1353996 | West AR | 570305 | 6820884 | 4750 | soil | medium brown C horizon talus fines from gully area, 15-20 cm depth | 30.3 | <10 | 3 | 1.1 | 138 | 40 | 138.22 | 179.1 |
| 1353997 | West AR | 570294 | 6820900 | 4780 | rock grab | pyritic (3%) andesite hornblende feldspar porphyry intrusion - subvolcanic(?) TS2 | <2 | <3 | <2 | <0.3 | 14 | 5 | 12 | 120 |
| 1353998 | West AR | 570180 | 6820998 | 4846 | rock grab | 20 x20m lense of jarosite stained pyritic quartz-sericite schists with 5-7% pyrite aggregates within andesite package -VMS(?) altered horizon overall trend 310 | <2 | <3 | <2 | <0.3 | 8 | 3 | 32 | 104 |
| 1353999 | West AR | 570186 | 6820995 | 4850 | rock grab | rusty limonitic and intense goethite margins of pyritic quartz-sericite schist lense, intensely sheared margins, 070/85N local shearing | <2 | <3 | <2 | <0.3 | 22 | 5 | 8 | 58 |
| 1354000 | West AR | 570177 | 6820993 | 4835 | soil | medium orange brown C horizon talus fines from below outcrop of pyritic quartz -sericite schist, 20cm depth | 13.3 | <10 | <2 | 1.5 | 85 | 20 | 97.54 | 169.5 |

**APPENDIX IV**

**Geochemical Procedure and Results**

# Acme Analytical Laboratories Ltd.
## GEOCHEMICAL PROCEDURES

## SAMPLE PREPARATION

**SOIL, SEDIMENT AND VEGETATION SAMPLES**
**SS80** Dry at 60°C, sieve (up to) 100 g to -80 mesh

**ROCK AND DRILL CORE**
**R200-250** Crush **1 kg** to 80% passing 10 mesh, split 250 g and pulverize to 85% passing 200 mesh

## GROUP 1D: ICP & ICP-ES ANALYSIS – AQUA REGIA

Sample splits of 0.5g are leached in hot (95°C) Aqua Regia. A larger split size (30g) is used for more representative Au analysis. Refractory and graphitic samples can limit Au solubility. Solubility of some elements* will be limited by mineral species present. A total of 34 elements are assayed in the ICP-MS analysis.
Al, Sb, As, Ba, Bi, B, Cd, Ca, Cr, Co, Cu, Ga, Au, Fe, La, Pb, Mg, Mn, Hg, Mo, Na, Ni, P, Ag, K, Sc, Sr, S, Tl, Th, Ti, W, V and Zn

## GROUP 3B-MS AU & PGMS BY FIRE GEOCHEM

A lead-collection fire-assay 30g fusion for total sample decomposition, digestion of the Ag dore bead and ICP-MS (Group 3B-MS) analysis. Group 6 precious metals assay recommended for Au or PGMs over 1000 ppb.

### Group 3B-MS Detection Limits
**Au** 1 ppb, **Pt** 0.1 ppb, **Pd** 0.5 ppb, **(Rh)** (0.1 ppb)

Au* detection limit may vary due to natural contamination in commercial flux and sample size.
(Rh) available at client's request, results are qualitative to semi-quantitative depending on nature of samples.
**Note: Sulphide-rich samples require a 15g or smaller sample for proper fusion.**

# Group 1F-MS
# Ultratrace by ICP Mass Spec

ICP Mass Spec analysis of a 0.5, 15 or 30g sample after Aqua Regia digestion for low to ultra-low determinations on soils, sediments and lean rocks.

Larger splits (15 or 30g) give a more representative analysis of elements subject to nugget effect (e.g. Au). Au solubility can be limited in refractory and graphitic samples.

Sample minimum 1g pulp.

Acme Labs now offers analysis of Pb isotopes (Pb204, Pb206, Pb207, Pb208) suitable for geochemical exploration of U and other commodities where gross differences in natural to radiogenic Pb ratios, is a benefit. Isotope values can be reported in both concentrations and intensities.

| Code | Group 1F-MS |
|---|---|
| 1F01 | Basic Suite (37 elements) 0.5g |
| 1F02 | Basic Suite (37 elements) 15g |
| 1F03 | Basic Suite (37 elements) 30g |
| 1F04 | Full Suite (53 elements) 0.5g |
| 1F05 | Full Suite (53 elements) 15g |
| 1F06 | Full Suite (53 elements) 30g |

+1F07 Lead isotope (add on)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Client:** | Tom Morgan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **File Created:** | 02-Jan-2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Job Number:** | WHI12000726 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Number of Samples:** | 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Project:** | AR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Shipment ID:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **P.O. Number:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Received:** | 20-Aug-2012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | **Method** | WGHT | 3B | 3B | 3B | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D | 1D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Analyte** | Wgt | Au | Pt | Pd | Mo | Cu | Pb | Zn | Ag | Ni | Co | Mn | Fe | As | Au | Th | Sr | Cd | Sb | Bi | V | Ca | P | La | Cr | Mg | Ba | Ti | B | Al | Na | K | W | S | Hg | Tl | Ga | Sc |
| | **Unit** | KG | PPB | PPB | PPB | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | % | PPM | PPM | % | PPM | % | PPM | % | % | % | PPM | % | PPM | PPM | PPM | PPM |
| | **MDL** | 0.01 | 2 | 3 | 2 | 1 | 1 | 3 | 1 | 0.3 | 1 | 1 | 2 | 0.01 | 2 | 2 | 2 | 1 | 0.5 | 3 | 3 | 1 | 0.01 | 0.001 | 1 | 1 | 0.01 | 1 | 0.001 | 20 | 0.01 | 0.01 | 0.01 | 2 | 0.05 | 1 | 5 | 5 | 5 |
| **Sample** | **Type** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1353969 | Rock | 2.34 | 15 | <3 | <2 | <1 | 16 | 15 | 182 | <0.3 | 48 | 18 | 2306 | 3.29 | <2 | <2 | <2 | 96 | 1.0 | <3 | <3 | 47 | 7.95 | 0.025 | 5 | 33 | 3.48 | 31 | <0.001 | <20 | 0.50 | 0.04 | 0.14 | <2 | 0.79 | <1 | <5 | <5 | <5 |
| 1353972 | Rock | 0.93 | <2 | <3 | <2 | <1 | 66 | <3 | 112 | <0.3 | 8 | 15 | 1150 | 3.08 | <2 | <2 | <2 | 99 | <0.5 | <3 | <3 | 53 | 1.09 | 0.084 | 3 | 6 | 1.84 | 58 | 0.125 | <20 | 2.25 | 0.07 | 0.07 | <2 | <0.05 | <1 | <5 | 9 | <5 |
| 1353973 | Rock | 2.78 | 122 | <3 | <2 | 11 | 70 | 7 | 108 | 1.5 | 24 | 12 | 944 | 5.15 | 2 | <2 | <2 | 34 | <0.5 | <3 | <3 | 124 | 0.40 | 0.082 | 2 | 101 | 2.63 | 128 | 0.236 | <20 | 2.17 | 0.04 | 0.12 | <2 | 2.27 | <1 | <5 | 12 | 8 |
| 1353978 | Rock | 2.03 | 6 | 11 | <2 | <1 | 427 | 6 | 78 | 0.3 | 442 | 73 | 875 | 6.24 | 4 | <2 | <2 | 60 | 0.9 | <3 | <3 | 123 | 2.53 | 0.041 | 5 | 1154 | 7.29 | 51 | 0.103 | <20 | 4.54 | 0.02 | <0.01 | <2 | 0.28 | <1 | <5 | 17 | 15 |
| 1353979 | Rock | 0.95 | <2 | <3 | <2 | <1 | 239 | 5 | 74 | <0.3 | 325 | 65 | 1193 | 6.18 | <2 | <2 | <2 | 76 | 1.0 | <3 | <3 | 127 | 5.24 | 0.037 | 6 | 947 | 7.10 | 12 | 0.081 | <20 | 4.00 | <0.01 | <0.01 | <2 | <0.05 | <1 | <5 | 17 | 16 |
| 1353980 | Rock | 1.57 | 3 | 4 | <2 | <1 | 225 | <3 | 41 | <0.3 | 238 | 32 | 1462 | 3.57 | <2 | <2 | <2 | 245 | 1.0 | <3 | <3 | 75 | 11.14 | 0.014 | 4 | 382 | 5.44 | 85 | 0.002 | <20 | 1.46 | <0.01 | 0.03 | <2 | <0.05 | <1 | <5 | 8 | 9 |
| 1353981 | Rock | 1.32 | 14 | 25 | 9 | <1 | 1487 | 9 | 71 | 1.2 | 814 | 90 | 965 | 5.95 | 20 | <2 | <2 | 73 | 1.4 | <3 | <3 | 115 | 3.61 | 0.037 | 5 | 1060 | 6.39 | 26 | 0.114 | <20 | 4.18 | 0.02 | <0.01 | <2 | 0.26 | <1 | <5 | 16 | 13 |
| 1353982 | Rock | 1.31 | <2 | <3 | <2 | 2 | 24 | 4 | 31 | <0.3 | 26 | 22 | 2817 | 3.59 | <2 | <2 | <2 | 210 | 1.0 | <3 | <3 | 36 | 20.19 | 0.023 | 7 | 10 | 3.25 | 20 | 0.009 | <20 | 1.58 | <0.01 | 0.02 | <2 | <0.05 | <1 | <5 | 7 | <5 |
| 1353983 | Rock | 2.17 | 13 | 16 | 2 | <1 | 1038 | 4 | 63 | 0.8 | 622 | 69 | 1013 | 5.76 | 4 | <2 | <2 | 110 | 1.0 | <3 | <3 | 129 | 4.79 | 0.057 | 4 | 670 | 5.05 | 17 | 0.105 | <20 | 3.66 | 0.02 | <0.01 | <2 | 0.31 | <1 | <5 | 14 | 18 |
| 1353984 | Rock | 2.04 | 26 | <3 | <2 | 7 | 34 | 19 | 118 | 0.5 | 11 | 3 | 541 | 3.28 | 6 | <2 | <2 | 8 | <0.5 | <3 | <3 | 44 | 0.23 | 0.095 | 3 | 34 | 1.15 | 39 | 0.082 | <20 | 1.19 | 0.03 | 0.17 | <2 | 1.06 | <1 | <5 | 5 | <5 |
| 1353985 | Rock | 0.95 | 25 | <3 | <2 | 8 | 69 | 27 | 148 | 0.4 | 11 | <1 | 661 | 5.41 | 10 | <2 | <2 | 10 | <0.5 | <3 | <3 | 63 | 0.12 | 0.103 | 5 | 54 | 1.43 | 47 | 0.136 | <20 | 1.55 | 0.03 | 0.15 | <2 | 0.40 | <1 | <5 | 7 | <5 |
| 1353986 | Rock | 1.07 | 40 | <3 | <2 | 2 | 36 | 93 | 224 | 1.5 | 32 | 4 | 1420 | 6.03 | 25 | <2 | <2 | 17 | <0.5 | <3 | <3 | 131 | 0.25 | 0.090 | 3 | 122 | 3.28 | 32 | 0.232 | <20 | 2.81 | 0.03 | 0.09 | <2 | 1.45 | <1 | <5 | 12 | 8 |
| 1353988 | Rock | 1.94 | 15 | <3 | <2 | 2 | 35 | 18 | 112 | 0.6 | 4 | <1 | 576 | 4.35 | 8 | <2 | <2 | 9 | <0.5 | <3 | <3 | 34 | 0.10 | 0.105 | 3 | 27 | 1.11 | 62 | 0.145 | <20 | 1.18 | 0.04 | 0.17 | <2 | 0.33 | <1 | <5 | 5 | <5 |
| 1353990 | Rock | 1.25 | <2 | <3 | <2 | <1 | 75 | 14 | 191 | <0.3 | 104 | 28 | 2258 | 5.40 | <2 | <2 | <2 | 38 | 0.7 | <3 | <3 | 127 | 2.82 | 0.112 | 5 | 222 | 3.78 | 30 | 0.035 | <20 | 3.77 | 0.03 | 0.12 | <2 | 1.87 | <1 | <5 | 15 | 11 |
| 1353993 | Rock | 1.73 | 22 | <3 | <2 | 2 | 17 | 8 | 40 | <0.3 | 5 | 5 | 346 | 2.71 | 4 | <2 | <2 | 40 | <0.5 | <3 | <3 | 36 | 0.36 | 0.102 | 3 | 10 | 1.09 | 36 | 0.131 | <20 | 1.21 | 0.07 | 0.10 | <2 | 1.49 | <1 | <5 | 6 | <5 |
| 1353997 | Rock | 1.87 | <2 | <3 | <2 | <1 | 14 | 12 | 120 | <0.3 | 5 | 11 | 1171 | 3.91 | <2 | <2 | <2 | 29 | 0.6 | <3 | <3 | 38 | 1.87 | 0.106 | 8 | 5 | 1.13 | 62 | <0.001 | <20 | 1.37 | 0.06 | 0.15 | <2 | 2.25 | <1 | <5 | 8 | 5 |
| 1353998 | Rock | 2.74 | <2 | <3 | <2 | <1 | 8 | 32 | 104 | <0.3 | 3 | 7 | 491 | 3.41 | 4 | <2 | <2 | 9 | <0.5 | <3 | <3 | 15 | 0.51 | 0.092 | 2 | 4 | 0.54 | 57 | 0.109 | <20 | 0.77 | 0.03 | 0.20 | <2 | 1.49 | <1 | <5 | 6 | <5 |
| 1353999 | Rock | 1.13 | <2 | <3 | <2 | 1 | 22 | 8 | 58 | <0.3 | 5 | 12 | 802 | 4.61 | 11 | <2 | <2 | 6 | <0.5 | <3 | <3 | 12 | 0.24 | 0.109 | 2 | 3 | 0.68 | 67 | 0.141 | <20 | 0.91 | 0.02 | 0.18 | <2 | 0.99 | <1 | <5 | <5 | <5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Client: | | | | Tom Morgan | | Number of Samples: | | | | | 14 | | | | | | | | | | | | | | | | | | | |
| File Created: | | | | 02-Jan-2013 | | Project: | | | | | AR | | | | | | | | | | | | | | | | | | | |
| Job Number: | | | | WHI12000727 | | Received: | | | | | 20-Aug-2012 | | | | | | | | | | | | | | | | | | | |
| | Method | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | | |
| | Analyte | Mo | Cu | Pb | Zn | Ag | Ni | Co | Mn | Fe | As | U | Au | Th | Zr | Cd | Sb | Bi | V | Ca | P | La | Cr | Mg | Ba | B | Re | | | |
| | Unit | PPM | PPM | PPM | PPM | PPB | PPM | PPM | PPM | % | PPM | PPM | PPB | PPM | PPM | PPM | PPM | PPM | PPM | % | % | PPM | PPM | % | PPM | PPM | PPB | | | |
| | MDL | 0.01 | 0.01 | 0.01 | 0.1 | 2 | 0.1 | 0.1 | 1 | 0.01 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.01 | 0.02 | 0.02 | 2 | 0.01 | 0.001 | 0.5 | 0.5 | 0.01 | 0.5 | 1 | 1 | | | |
| Sample | Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1353970 | Soil | 7.52 | 569.79 | 23.50 | 199.6 | 565 | 155.5 | 127.8 | 3210 | 7.89 | 19.6 | 0.5 | 85.8 | 1.7 | 2.5 | 2.16 | 0.90 | 0.56 | 105 | 0.61 | 0.176 | 8.6 | 166.7 | 2.54 | 194.8 | 2 | 10 | | | |
| 1353971 | Soil | 4.90 | 90.48 | 51.68 | 144.1 | 953 | 25.5 | 30.0 | 1822 | 7.53 | 16.4 | 0.7 | 29.2 | 3.1 | 1.5 | 1.40 | 0.90 | 0.73 | 47 | 0.61 | 0.183 | 17.1 | 31.3 | 1.04 | 162.7 | 2 | 4 | | | |
| 1353974 | Soil | 10.47 | 102.31 | 90.21 | 120.9 | 1677 | 12.8 | 13.2 | 928 | 11.75 | 7.4 | 0.4 | 148.5 | 2.3 | 0.8 | 0.20 | 0.41 | 0.71 | 94 | 0.11 | 0.266 | 6.3 | 52.1 | 1.08 | 146.7 | 3 | 8 | | | |
| 1353975 | Soil | 6.10 | 159.88 | 366.83 | 239.0 | 4802 | 17.6 | 8.9 | 990 | 10.96 | 9.4 | 0.2 | 96.8 | 0.8 | 1.0 | 0.18 | 0.42 | 0.97 | 248 | 0.21 | 0.188 | 1.8 | 92.6 | 2.72 | 111.2 | 2 | <1 | | | |
| 1353976 | Soil | 3.71 | 63.94 | 73.11 | 115.1 | 1667 | 6.1 | 4.0 | 484 | 7.97 | 4.9 | 0.2 | 36.4 | 2.8 | 0.8 | 0.11 | 0.46 | 0.52 | 62 | 0.12 | 0.142 | 14.2 | 27.3 | 1.10 | 128.6 | 1 | 7 | | | |
| 1353977 | Soil | 3.36 | 29.77 | 60.53 | 73.0 | 801 | 6.0 | 9.5 | 641 | 12.62 | 16.8 | 0.3 | 15.7 | 2.1 | <0.1 | 0.15 | 0.47 | 1.08 | 33 | 0.07 | 0.313 | 9.2 | 12.5 | 0.74 | 129.0 | 1 | <1 | | | |
| 1353987 | Soil | 8.84 | 219.42 | 78.92 | 145.6 | 1311 | 20.3 | 21.5 | 1203 | 11.96 | 18.7 | 0.4 | 66.4 | 3.8 | 1.6 | 0.25 | 0.90 | 1.13 | 61 | 0.13 | 0.214 | 9.1 | 39.3 | 1.19 | 75.1 | <1 | 2 | | | |
| 1353989 | Soil | 2.74 | 35.77 | 107.37 | 112.6 | 1020 | 3.9 | 5.0 | 533 | 13.34 | 15.2 | <0.1 | 17.9 | 2.3 | 0.3 | 0.32 | 0.52 | 0.62 | 37 | 0.23 | 0.275 | 33.1 | 9.8 | 0.63 | 95.1 | 1 | <1 | | | |
| 1353991 | Soil | 5.47 | 76.64 | 139.23 | 206.1 | 1144 | 20.1 | 25.6 | 1523 | 9.26 | 11.9 | 0.4 | 30.3 | 2.9 | 1.3 | 0.98 | 0.63 | 0.70 | 43 | 0.21 | 0.285 | 17.5 | 26.6 | 1.08 | 134.1 | <1 | 1 | | | |
| 1353992 | Soil | 3.25 | 86.36 | 77.58 | 148.4 | 1201 | 30.7 | 49.4 | 1808 | 9.97 | 36.3 | 0.3 | 29.9 | 2.0 | 0.9 | 1.28 | 0.79 | 0.78 | 46 | 0.36 | 0.230 | 19.1 | 27.7 | 0.87 | 169.7 | 1 | 1 | | | |
| 1353994 | Soil | 17.30 | 209.63 | 81.19 | 93.9 | 1856 | 15.4 | 12.8 | 505 | 15.49 | 12.8 | 0.5 | 205.9 | 3.8 | 1.0 | 0.09 | 0.80 | 1.17 | 119 | 0.11 | 0.223 | 9.0 | 50.6 | 0.71 | 147.3 | 1 | 31 | | | |
| 1353995 | Soil | 5.02 | 88.98 | 150.71 | 192.4 | 1859 | 9.2 | 9.5 | 418 | 9.57 | 10.6 | 0.3 | 79.2 | 3.3 | 0.5 | 0.19 | 0.65 | 1.04 | 31 | 0.16 | 0.249 | 18.7 | 18.9 | 0.61 | 135.5 | <1 | 10 | | | |
| 1353996 | Soil | 4.25 | 137.55 | 138.22 | 179.1 | 1118 | 40.4 | 41.7 | 2000 | 9.71 | 11.3 | 0.3 | 30.3 | 1.9 | 1.2 | 1.88 | 0.80 | 0.53 | 68 | 0.39 | 0.213 | 21.8 | 40.9 | 1.24 | 134.3 | 1 | 2 | | | |
| 1354000 | Soil | 5.37 | 84.95 | 97.54 | 169.5 | 1485 | 20.2 | 45.9 | 2827 | 13.07 | 22.6 | 0.9 | 13.3 | 5.5 | 1.1 | 3.38 | 0.76 | 1.49 | 36 | 0.27 | 0.238 | 18.9 | 14.3 | 0.87 | 91.1 | 3 | 1 | | | |
| | Method | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 | 1F15 |
| | Analyte | Y | Na | Ti | Tl | Sr | In | Al | K | W | Be | Li | Ce | Sc | Hg | Se | Te | Ga | Cs | Ge | Hf | Nb | Rb | S | Ta | Sn | Pd | Pt | | |
| | Unit | PPM | % | % | PPM | PPM | PPM | % | % | PPM | PPM | PPM | PPM | PPM | PPB | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | PPM | PPM | PPB | PPB | | |
| | MDL | 0.01 | 0.001 | 0.001 | 0.02 | 0.5 | 0.02 | 0.01 | 0.01 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 5 | 0.1 | 0.02 | 0.1 | 0.02 | 0.1 | 0.02 | 0.02 | 0.1 | 0.02 | 0.05 | 0.1 | 10 | 2 | | |
| Sample | Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1353970 | Soil | 27.34 | 0.014 | 0.133 | 0.03 | 49.4 | 0.05 | 4.34 | 0.08 | 0.2 | 1.2 | 21.4 | 18.8 | 16.8 | 42 | 3.4 | 0.50 | 7.0 | 1.22 | 0.1 | 0.07 | 0.44 | 4.1 | 0.21 | <0.05 | 1.0 | <10 | 5 | | |
| 1353971 | Soil | 14.05 | 0.027 | 0.092 | 0.06 | 81.1 | 0.03 | 1.58 | 0.14 | 0.2 | 0.6 | 9.0 | 32.1 | 5.9 | 39 | 2.0 | 1.17 | 4.4 | 1.30 | 0.1 | 0.03 | 0.78 | 6.0 | 0.78 | <0.05 | 1.5 | <10 | <2 | | |
| 1353974 | Soil | 3.64 | 0.066 | 0.270 | 0.09 | 293.0 | 0.03 | 1.42 | 0.33 | 0.2 | 0.2 | 7.1 | 11.8 | 4.7 | 28 | 6.3 | 1.60 | 4.8 | 0.73 | 0.1 | <0.02 | 1.01 | 8.6 | 1.32 | <0.05 | 3.2 | <10 | <2 | | |
| 1353975 | Soil | 2.36 | 0.022 | 0.417 | <0.02 | 57.9 | 0.02 | 2.49 | 0.12 | 0.2 | 0.3 | 13.6 | 4.4 | 13.7 | 117 | 5.3 | 3.17 | 8.1 | 1.11 | 0.2 | 0.04 | 0.42 | 2.1 | 0.81 | <0.05 | 5.3 | 15 | 6 | | |
| 1353976 | Soil | 2.43 | 0.127 | 0.233 | 0.11 | 455.9 | 0.02 | 1.29 | 0.40 | 0.1 | 0.1 | 6.6 | 22.8 | 2.2 | 65 | 2.9 | 0.92 | 5.7 | 1.27 | <0.1 | 0.06 | 1.47 | 12.2 | 1.42 | <0.05 | 3.5 | <10 | <2 | | |
| 1353977 | Soil | 4.45 | 0.056 | 0.134 | 0.05 | 112.1 | 0.03 | 1.14 | 0.22 | 0.2 | 0.1 | 4.4 | 16.0 | 2.5 | 75 | 1.8 | 1.58 | 2.9 | 1.30 | <0.1 | <0.02 | 1.15 | 6.2 | 1.12 | <0.05 | 3.3 | <10 | <2 | | |
| 1353987 | Soil | 7.27 | 0.032 | 0.134 | 0.03 | 70.8 | 0.07 | 1.69 | 0.09 | <0.1 | 0.3 | 8.9 | 19.5 | 6.5 | 78 | 3.1 | 1.57 | 4.9 | 1.38 | 0.1 | 0.03 | 1.51 | 4.6 | 0.50 | <0.05 | 3.9 | <10 | <2 | | |
| 1353989 | Soil | 2.95 | 0.527 | 0.007 | 0.15 | 704.9 | 0.07 | 0.92 | 0.47 | <0.1 | 0.2 | 6.5 | 50.2 | 3.6 | 143 | 3.3 | 1.57 | 4.4 | 0.68 | <0.1 | <0.02 | 0.12 | 21.0 | 3.09 | <0.05 | 3.5 | <10 | <2 | | |
| 1353991 | Soil | 9.30 | 0.037 | 0.019 | 0.06 | 40.8 | 0.04 | 1.69 | 0.14 | <0.1 | 0.3 | 7.8 | 33.3 | 5.4 | 67 | 3.7 | 1.11 | 5.0 | 1.60 | 0.1 | 0.04 | 0.20 | 5.6 | 0.41 | <0.05 | 11.4 | <10 | <2 | | |
| 1353992 | Soil | 15.71 | 0.063 | 0.010 | 0.05 | 116.7 | 0.06 | 1.89 | 0.15 | <0.1 | 0.5 | 7.5 | 36.5 | 11.0 | 43 | 2.1 | 1.48 | 4.6 | 1.49 | <0.1 | 0.04 | 0.22 | 6.2 | 0.54 | <0.05 | 3.1 | <10 | 3 | | |
| 1353994 | Soil | 3.20 | 0.195 | 0.228 | 0.08 | 464.3 | 0.07 | 1.26 | 0.36 | <0.1 | 0.2 | 5.3 | 13.5 | 5.9 | 115 | 2.3 | 2.09 | 5.7 | 0.69 | 0.1 | <0.02 | 1.22 | 12.4 | 1.81 | <0.05 | 4.2 | <10 | 2 | | |
| 1353995 | Soil | 3.76 | 0.204 | 0.014 | 0.16 | 518.3 | 0.07 | 1.05 | 0.66 | <0.1 | 0.2 | 5.2 | 36.6 | 3.7 | 220 | 2.4 | 2.82 | 3.8 | 0.50 | <0.1 | 0.04 | 0.43 | 19.6 | 2.05 | <0.05 | 3.2 | <10 | <2 | | |
| 1353996 | Soil | 13.31 | 0.105 | 0.016 | 0.07 | 151.2 | 0.06 | 1.95 | 0.21 | <0.1 | 0.5 | 9.2 | 42.4 | 8.8 | 46 | 2.9 | 1.25 | 5.4 | 0.98 | <0.1 | 0.03 | 0.16 | 8.1 | 1.02 | <0.05 | 8.8 | <10 | 3 | | |
| 1354000 | Soil | 21.56 | 0.017 | 0.093 | 0.04 | 47.7 | 0.04 | 1.46 | 0.08 | 0.2 | 0.9 | 6.9 | 37.9 | 5.5 | 49 | 2.4 | 1.59 | 3.8 | 2.18 | 0.2 | 0.04 | 1.03 | 4.4 | 0.90 | <0.05 | 2.6 | <10 | <2 | | |

**APPENDIX V**

## Statement of Expenditures

| | | | | |
|---|---|---|---|---|
| **Wages:** | J. Pautler | 2 days @ 850.00/day | $1,700.00 | |
| | Bill Harris | 2 days @ 500.00/day | 1,000.00 | |
| **August 16-17, 2012** | | **Total: 4 man-days** | | **$2,700.00** |
| **Mobilization/Demobilization:** | | including fuel, wages | | **2,050.00** |
| **Geochemistry:** | 18 rocks | @ 45/ea. Au, ICP, PGE | 810.00 | |
| | 14 soils | @ 35/ea Au, ICP, PGE | 490.00 | |
| | | **Total:** (includes shipping) | | **1,300.00** |
| **Equipment Rental:** | Trucks | 4 days @ 100/day | 400.00 | |
| | Sat Phone | 4 days @ 25/day | 100.00 | |
| | 2 Radios | 4 days @ 25/day | 100.00 | |
| | | **Total:** | | **600.00** |
| **Helicopter:** | Kluane Helicopters, Haines Jct. Yukon Territory<br>3.7 hours A-star @ $1,600.00/hour + fuel | | | **6,290.00** |
| **Room & Board:** | (Groceries and Camp Costs)<br>4 man days @ $100/md | | | **400.00** |
| **Field Supplies:** | (flagging tape, batteries, sample bags, markers) | | | **50.00** |
| **Preparation, Report, Drafting, Maps & Copies:** | | | **4,500.00** | |
| **GRAND TOTAL:** | | | | **$17,890.00** |
| **Total applied for assessment:** | | | | **$17,800.00** |

## APPENDIX VI
## STATEMENT OF QUALIFICATION

I, Jean Marie Pautler, do hereby certify that:

1) I, Jean Marie Pautler of 103-108 Elliott Street, Whitehorse, Yukon Territory am self-employed as a consultant geologist and authored this report.

2) I am a graduate of Laurentian University, Sudbury, Ontario with an Honours B.Sc. degree in geology (May, 1980).

3) I am a registered member of the Association of Professional Engineers and Geoscientists of British Columbia, Registration Number 19804.

4) I am a geologist with more than thirty years of experience in the Canadian Cordillera.

5) I was involved in the 2012 program on the Arch Project on August 16-17, 2012.

6) I have no direct or indirect interest in the Arch Project, which is the subject of this report.

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Jean Pautler, P.Geo.
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