## NI 43-101 Technical Report Vulcan Property

Location:

Fort Steele Mining Division, Southeastern British Columbia NTS Map Sheets 82F009 & 82F016 Latitude 49°46' N, Longitude 116°21' W

> for Brascan Gold Corp.

> > **Prepared by:**

Paul Ransom, P.Geo. Stephen Kenwood, P.Geo.

Effective Date: February 1, 2021

#### **NOTICE**

This Technical Report ("Report") has been prepared for Brascan Gold Corp. ("Brascan") by Paul Ransom, P.Geo. and Stephen Kenwood, P.Geo., qualified persons as defined under National Instrument NI 43-101, based on assumptions as identified throughout the text and upon information and data supplied by others.

The Report is to be read in the context of the methodology, procedures and techniques used, the author's assumptions, and the circumstances and constraints under which the Report was written. The Report is to be read as a whole; sections or parts thereof should therefore not be read or relied upon out of context.

The authors have, in preparing the Report, followed methodology and procedures, and exercised due care consistent with the intended level of accuracy, using his professional judgment and reasonable care.

## **1.0 SUMMARY**

#### **1.1 Introduction**

This report has been produced at the request of the management of Brascan Gold Corp. ("Brascan"), a private BC company, for filing with the Canadian Securities Exchange (the "CSE").

- Stephen Kenwood, P.Geo is the independent Qualified Person for items in this technical report, with the exception of Item 7.
- Paul Ransom P.Geo, is a non-independent Qualified Person responsible for Item 7, Geology, in this technical report.

On September 26, 2020, Brascan Gold Corp. and Eagle Plains Resources Ltd. ("Eagle Plains") entered into an agreement whereby Brascan could earn a 60% undivided right, title and interest in the Vulcan Property by making certain cash and share payments and incurring exploration expenditures on the Vulcan Property. Under the terms of the option agreement, Brascan has an option to earn a 60% interest in the Property by completing exploration expenditures of \$4,000,000, making cash payments of \$500,000 and issuing 1,200,000 common shares to Eagle Plains over a 4 year period.

The purpose of the report is to summarize salient features of the Property and to provide recommendations for further exploration of the Property, if warranted.

#### 1.2 Project Location, Description, Access and Ownership

The Vulcan Property is located in the Fort Steele Mining Division in south-east British Columbia approximately 35 kilometres west of the City of Kimberley. The Property is within the Purcell Mountains in the northern headwaters of the St. Mary River; it extends 20 kilometres from north of Mt Patrick south along the east flank of Mt Bonner to Redding Creek. A 10 km paved year-round highway to St. Mary Lake leaves Highway 95 in Kimberley and a further 20 kilometres of Forest Service Road (FSR) provide access to the property. FSR branches extend 10 kilometres (Dewar Creek) and 14 kilometres (White Creek) provide access to west and east parts of the property respectively. Numerous logging roads cross portions of the property that were heavily logged within the last 5 years. Rural residential power reaches St. Mary Lake. The closest access to rail transportation is in Cranbrook, 40 km southeast of Kimberley. Highway 3, the southern trans-provincial, also known as the Crow's Nest Highway, passes through Cranbrook.

The property is comprised of 18 claim units totaling 8617 hectares and is 100% owned by Eagle Plains Resources Ltd.

## **1.3 History**

The Sullivan Mine, located in Kimberley, was discovered in 1892 and since that time adjacent parts of the Purcell Mountains have been extensively explored for other silver, lead and zinc occurrences.

The Vulcan lead-zinc showing on Mt. Patrick was discovered in the 1950s by the Consolidated Mining and Smelting Company (CM&S, later Cominco). Work by CM&S included mapping, trenching and in 1958, three short drill holes.

It was during this time that the volcanogenic ore deposit concept was established and a number of geological features associated with Sullivan were observed at Vulcan, including sedimentary (pebble) fragmentals, albitite alteration and tournaline alteration. The geological interpretation at that time was that mineralization at Vulcan was at the same stratigraphic level as Sullivan.

The claims were allowed to lapse and the area was restaked by Texas Gulf Sulfur in 1971 as the Hilo who abandoned the claims after completing geological mapping, mercury-zinc soil sampling, magnetometer surveys and electromagnetic surveys.

Cominco developed renewed interest in the Vulcan area in the 1970's after the development of the use of markers to allow precise stratigraphic determinations within the 2 to 3 km of siliciclastic rocks of the Middle Aldridge Formation. The stratigraphic location of the Vulcan mineralization was identified as corresponding to the lower Middle Aldridge Contact (LMC). From 1979 through 1986 Cominco drilled 6 holes, one near the Hilo showing area and 5 holes near Dewar Creek, conducted several University of Toronto Electro Magnetometer (UTEM) surveys as well as Horizontal Loop Electro Magnetometer (HLEM) and Magnetometer (Mag) surveys and soil geochemical sampling.

The next significant work was by Ascot Resources in 1991-1992 who optioned the Vulcan property from Cominco. Ascot drilled 8 holes in the Hilo area and a single hole near White Creek. Most of the holes in the Hilo area intersected the LMC as well as Sullivan type indicators including fragmentals, pebble conglomerates, calc-silicate and albite alteration and disseminated sulphides.

In 1995 the current Vulcan property was included in a regional airborne EM/radiometric sponsored by the BC Geological survey.

Since initiating claim acquisition in the Vulcan area in 2002, Eagle Plains has undertaken database compilation including reinterpretation of existing geophysical data, and digitizing of historical drillholes, geological maps and geochemical results. Fieldwork by Eagle Plains has included airborne high resolution Time Domain Electro Magnetic and AGG gravity geophysical surveys, ground based magnetometer surveys, geological mapping and prospecting, and silt and soil geochemical surveys. In 2019, SJ Geophysics completed a 2.8 line-kilometre hybrid Volterra Magnetotelluric (MT)/Volterra Induced 3D Polarization (3DIP) geophysics survey focused on the LMC on the southern part of the property.

## 1.4 Geology and Mineralization

## 1.4.1 Geology

The Vulcan Property is located within the Omineca Belt of south-east British Columbia. The Property is underlain by Middle Proterozoic Aldridge formation, and the contact between the Lower and Middle divisions of the Aldridge Formation (the LMC) is projected along the Property. The LMC is the stratigraphic level that the Sullivan orebody occurs at, and has been a primary exploration target in the Aldridge Formation.

The Aldridge Formation is part of a rift fill sequence composed primarily of rocks originally deposited as sands, silts and muds transported into position as turbidites (slurries that migrated rapidly down slope following collapse of over steepened delta and shelf accumulations).

Work by Cominco in the 1960's and 70's led to the recognition of a set of marker units that can be used to determine the precise stratigraphic location within the thick sequence of Middle Aldridge rocks.

### 1.4.2 Mineralization

Mineralization seen in core at Vulcan consists primarily of finely disseminated pyrrhotite. Millimetre to centimetre-wide quartz and/or calcite veins were common to all rock types, and generally carry minor pyrrhotite, locally with trace chalcopyrite, galena and sphalerite. These stringers were also seen to host fine, acicular tourmaline needles to 0.5 centimeters in length. Minor pyrrhotite±chalcopyrite, pyrite stringers were also noted in all lithologies and in all holes, and appeared to show no preferred orientation.

The most significant form of mineralization to Sullivan-type exploration is the pyrrhotite-laminated wacke. This unit, located directly beneath the Lower-Middle Aldridge Contact (LMC), was noted in all completed West Basin holes at the Vulcan, and consists of strata-controlled Fe±Ag-Pb-Zn sulfides hosted by a biotite-rich, locally albite-altered laminated wacke to subwacke. This mineralization is exposed at the Main Showing, where pyrrhotite-sphalerite-galena mineralization occurs over 7.5 meters, with historical values to 0.35 % Pb, 1.25 % Zn over 1.5 meters. Exploration activity elsewhere in the East Kootenay area has indicated that this anomalous horizon is widespread, and typical of the "Sullivan-Time" stratigraphic interval.

Skarn type mineralization has also been noted at the Hilo 4 occurrence adjacent to Jurak Lake. The showing was historically referred to as the "Old Workings" where massive concentrations of scheelite, pyrrhotite and chalcopyrite with lesser concentrations of arsenopyrite, pyrite, galena and sphalerite are hosted within veins and are selectively replacing diorite. Tourmaline, garnet and actinolite alteration are associated with the mineralization (Minfile 082FNE102).

## 1.5 Exploration, Deposit Type and Drilling

## 1.5.1 Exploration

2020 work by Eagle Plains included prospecting in the northern part of the property in Aldridge Formation fragmentals sitting stratigraphically below the economically important Lower-Middle Contact. Eagle Plains also completed a two hole diamond drilling program which included a borehole EM survey. Total expenditures on the property in 2020 were \$204,957.00

The 2020 borehole electromagnetic (EM) surveys of DDH VU20001 and -002 were completed by SJ Geophysics between June 6-10<sup>th</sup>, 2020. VU20001 was surveyed using an open-hole method after the drill rig has been removed from the drill pad and VU20002 was surveyed using a through the rod method.

The results from VU20001 identified up to 6 conductive zones along the length of the boreholes ranging from weakly conductive (5-20 siemens) to significantly conductive (>100 siemens). Conductor 1 and 2 are located between 130-160 m and are consistent with the bottom of a near-surface resistivity low suggesting the presence of disseminated sulphides. Conductor 4 is thought to be related to graphite and possibly magnetite along the contact between sediments and gabbro. Conductors 5 and 6 are interpreted to be related to an off hole multi-layer conductivity zone between 330 - 340m depth. The survey of VU20002 indicated there are no strong conductors along the borehole.

The EM plates modelled from the borehole EM responses of VU20001 and -002 correlate well with IP/MT low resistivity anomalies identified in the 2019 survey. They also correlate well with UTEM data collected in 1986 by Cominco.

A total of 30 rock samples were collected during the 2020 field program. Two of the samples collected from Aldridge Formation sediments returned anomalous results. Sample TTVUR001 was a grab

sample collected along the top contact of a fragmental at the inferred LMC and returned 932.3 ppm Pb. Sample TTVUR003 (float sample of quartz vein material) returned 19.2 g/t Ag and 215.7 ppm Pb. Several anomalous results were reported from grab and float samples associated with Moyie Sills. These include JCVUR006 (float sample of galena mineralized quartz vein hosted in gabbro) which returned 88.6 ppm Ag, and 1.8% Pb and BRVUR002 (grab sample of galena-sphalerite mineralized quartz vein) that returned 0.7 g/t Au. Sample TTVUR007 (float sampled of galena-sphalerite mineralized quartz-carbonate vein hosted in gabbro) returned 286 g/t Ag, 5.2% Pb, 0.7% Zn and >100 ppm W

## 1.5.2 Deposit Type

Many different types of mineral deposits occur in SE British Columbia including Sedimentary Exhalative (Sullivan, Wilds Creek) deposits, manto (Blue Bell ) deposits, high grade silver veins (Slocan Camp) and gold porphyry systems (Keena). The most important of these is the Sullivan Mine, a classic sedimentary "exhalative" massive sulphide deposit, which is the target model for the Vulcan.

Sedimentary Exhalitive or SedEx deposits form in a sedimentary basin by the submarine venting of hydrothermal fluids and whose principal ore minerals are sphalerite and galena, typically associated with large content of associated iron minerals, principally pyrite and pyrrhotite. The age of known SedEx deposits range from the Middle Proterozoic with the Sullivan thought to be Middle Proterozoic in age.

Mineralization at the Vulcan exhibits the characteristics of a typical SedEx deposit. The laminated pyrrhotite mineralization and presence of tournaline relate strongly to a distal hydrothermal alteration. The mineralized laminations also occur near the contact of the Lower and Middle Aldridge which was also the case at the Sullivan.

In terms of a geophysical signature, SedEx deposits often generate large positive gravity anomalies because of high density Fe sulphide minerals (pyrrhotite and pyrite) in addition to the high density Pb and Zn sulphides.; however, it is difficult to gauge the thickness of the actual target. Although SedEx deposits are known to be a major source of zinc and lead, they are relatively rare. In addition to gravity surveys, ground based geophysics measuring electrical conductivity and magnetics has been successfully implemented to target pyrrhotite mineralization.

## 1.5.3 Drilling

The most recent drilling on the Vulcan project was in 2020 with two NQ2 sized drillholes completed for a total of 975.2m. The drillholes targeted coincident geophysical (historic UTEM and HLEM and recent (2019) IP) anomalies sitting stratigraphically below the interpreted Lower-Middle Contact (LMC) of the Aldridge Formation.

Although neither drill hole intersected significant mineralization, drill hole VU20002 did intersect a zone of moderate albite-KSpar-sericite-biotite-pyrrhotite-tourmaline-sphene alteration. Further petrographic analyses of this interval supports the interpretation that increased alteration in this zone may be indicative an exhalate horizon, a favourable alteration feature in SedEx exploration.

## 1.6 Sample Preparation, Analyses and Security

Rock samples from the 2020 prospecting program were collected by TerraLogic Exploration ("Terralogic") and Eagle Plains Resources field crews. All rock samples were collected in poly sample bags and labelled with a distinct sample ID. Location data was collected using handheld GPS's and sample descriptions were collected in field notebooks and later entered into a Microsoft Office

Database. The samples were transported by TerraLogic to the company's field house in Cranbrook, British Columbia, and arranged in numerical order. Samples that were damaged or had unclear labels were re-bagged and labelled and placed back into order. The personnel responsible for the shipping print off a list of all the samples collected from the current field program from the geochemical database and cross referencing to make sure all samples are accounted for. The poly bags are placed in rice bags, zip tied and labelled with the shipment number and shipping/receiving addresses. The samples were then delivered to Overland West Shipping in Cranbrook British Columbia and shipped directly to Bureau Veritas Laboratory at 2050 Shaughnessy St, Vancouver, BC, V6P 6E5. Bureau Veritas prepared the rock samples by crushing the sample to  $\geq$ 70% passing 2 mm, pulverize 250 g to  $\geq$ 85% passing 75µm (PRP270-50). The requested analyses for base metals included 33 element aquaregia digestion with ICP-ES finish (AQ200). Over limit analysis was requested using 23 element aqua-regia digestion with ICP-ES finish (AQ370; overlimit triggered if  $\geq$ 1% Pb and Zn). Precious metal analysis included 30 g lead collection fire assay fusion with AAS finish (FA430).

Drill collar location were marked using a handheld GPS and the drill was aligned using a handheld compass by the supervising geologist. Both holes were drilled using NQ2 core diameter. Core from DDH VU20001 was transported from the drill pads to an on-site secure logging location with 24/7 supervision by TerraLogic Exploration personnel. Core from DDH VU20002 was transported to a secure logging facility in Cranbrook, BC for detailed logging.

A total of 28 drill core samples and 2 QAQC samples were sent for geochemical analysis by Bureau Veritas, Vancouver for the following analyses: Preparation by crushing 1 kg to  $\geq$ 70% passing 2 mm, pulverize 250 g to  $\geq$ 85% passing 75µm (PRP270-50) and 33 element aqua-regia digestion with ICP-ES/MS finish (AQ200). Over limit analysis was requested using 23 element aqua-regia digestion with ICP-ES finish (AQ370; overlimit triggered if  $\geq$ 1% Pb and Zn). The drill holes were selectively sampled at the discretion of the logging geologist. All sample intervals ranged from 0.54-1.33 m drill length.

## 1.7 Data Verification

Author Kenwood visited the Vulcan property by helicopter along with Terralogic's Kerry Bates on January 28, 2021; the property was completely covered in waist deep snow at the time of the visit. The helicopter was able to land at the VU20001 drill site but we were unable to find the drill collar. The author also visited Terralogic's core logging facility in Cranbrook on January 28<sup>th</sup> and viewed core from holes VU84-4, VU20001, and VU20002. Due to the accumulation of snow on the property, no verification samples were taken by the author on the property but three, 2 metre long XRF scans of drill core from hole VU20002 were done by Terralogic on the day of the visit. Results from the XRF scans were consistent with results from scans done on the core drilled in the 2020 program.

The author is of the opinion that the data presented in this report can be relied upon and is more than adequate for the purposes used in this report.

#### **1.8 Resource Estimates**

To date there have been no resource estimates on the Vulcan property.

#### **1.9 Interpretation and Conclusions**

The 2020 drill program targeted overlapping geophysics anomalies (historic UTEM and HLEM with recent (2019) IP and MT). Interpretation of the drill holes results indicate that the geophysical anomalies are not the result of SedEx style mineralization but correlate well with pyrrhotite mineralization and graphitic bands (possibly a fault) hosted within, or adjacent to gabbro (Moyie Sills).

While the 2020 Borehole EM survey suggests the potential for off-hole anomalies the geologic observations indicate that the anomalies are the result of the previously described sulphide mineralization and graphite formation associated with the sills and do not represent near-surface base-metal mineralization.

At the Vulcan, the styles of mineralization, host rocks and alteration share strong similarities to the geology of the Sullivan deposit. The best sulfide mineralization at Vulcan is exposed in a surface showing. At the Hilo and Vulcan showings, stratiform pyrrhotite-galena-sphalerite mineralization occurs on the "Sullivan Horizon" in a 7.5 meter thick zone which includes 1.5 meters averaging 1.6% combined Pb-Zn. Grab samples of this zone assay up to 5.5% Pb-Zn and 22 gpt Ag. Outside of the Sullivan deposit, this type of occurrence is very rare in the Aldridge Basin.

Relogging of the 1984-85 drillholes drilled by Cominco, Eagle Plains and Terralogic Exploration geologists were impressed by thin bands of stratabound massive sulphide, mainly pyrrhotite with trace amounts of galena, sphalerite and chalcopyrite, in Holes Vu-84-4 and Vu-85-1. These sulphides occur in the Lower Aldridge Formation, below the inferred trace of the LMC. The relationships between the two occurrences are enigmatic and it is not known if they represent vein occurrences or a lower mineralized stratigraphic horizon. The LMC remains untested in this area and its position is complicated by a tabular, gabbro "sill" that appears to cross this critical stratum obliquely.

The Vulcan property remains in early-stage exploration but is prospective for SedEx style mineralization and additional work is recommended.

#### 1.10 Recommendations

Additional follow up prospecting and mapping should be carried out in the area of 2020 prospecting, along the White Creek Batholith contact and in the area of recent logging in the southern part of the property. Ground based MT and 3DIP geophysics should be completed in the area of the 1984-85 Cominco drillholes where the LMC remains untested.

All geological information including geochemistry, geological mapping, geophysics, and drill hole data should be compiled and input into Leapfrog software to construct a geological model to help locate areas where the LMC has not been adequately tested.

A two phase program is recommended with the second phase work contingent on results from Phase 1. The budget for the recommended Phase 1 program is CAD \$100,000.00 dollars.

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## **2.0 INTRODUCTION**

This report has been produced at the request of the management of Brascan Gold Corp. a private British Columbia company, for filing with the CSE.

On September 26, 2020, Brascan Gold Corp. and Eagle Plains Resources Ltd. ("Eagle Plains") entered into an agreement whereby Brascan could earn a 60% undivided right, title and interest in the Vulcan Property by making certain cash and share payments and incurring exploration expenditures on the Vulcan Property. Under the terms of the option agreement, Brascan has an option to earn a 60% interest in the Property by completing exploration expenditures of \$4,000,000, making cash payments of \$500,000 and issuing 1,000,000 common shares to Eagle Plains over a 4 year period.

The purpose of the report is to summarize results from work programs carried out on the Property and to provide recommendations for further exploration and development work on the property, if warranted. This technical report was prepared in accordance with standards laid out by National Instrument 43-101 and Form 43-101F (Standards of Disclosure for Mineral Projects). The property is 100% owned by Eagle Plains.

The Report is based on geological and geophysical data published by the British Columbia provincial government, including a geological bulletin, mineral descriptions in BC MINFILE, and technical work summarized in assessment reports that have been filed by various owners and operators on the property, including Eagle Plains. These reports are referenced throughout the Report and listed under References in Section 27.

Stephen Kenwood, P.Geo., and Paul Ransom, P.Geo are considered to be Qualified Persons under the National Instrument 43-101 Standards of Disclosure for Mineral Projects.

The authors have also relied on written, unpublished information, and on personal communication with Eagle Plains personnel.

Stephen Kenwood, P.Geo., visited the Property on January 28, 2021 and reviewed core from hole VU84-4 and holes VU20001 and VU20002 at the Terralogic core logging facility.

The authors are of the opinion that the data presented in this report can be relied upon and is more than adequate for the purposes used in this report.

There have been no material changes to the subject property between the last visit to the property by Stephen Kenwood, P.Geo., on January 28, 2021 and the Effective Date of this report. The author has researched any possible public filings including assessment reports on the BC Government ARIS Database and/or news releases that may have filed on SEDAR for the vendor company, Eagle Plains Resources Ltd.

All coordinates presented in the Report are in Universal Transverse Mercator (UTM), North American Datum 1983 (NAD83) in Zone 11 North of British Columbia, Canada. All dollar amounts are presented in Canadian dollars.

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## **3.0 RELIANCE ON OTHER EXPERTS**

Claim status and title data has been extracted from the Mineral Titles office of British Columbia and there are no apparent environmental concerns. There has never been a title opinion and no environmental evaluation has been provided to the author.

## 4.0 PROPERTY DESCRIPTION AND LOCATION

#### 4.1 Property Location

The Vulcan Property is located in the Purcell Mountains approximately 30.0 kilometers northwest of the historic Sullivan Mine at Kimberley, British Columbia (Figures 1, 2). The property is within the Fort Steele Mining Division.

#### **4.2 Property Description**

The property is comprised of 18 claim blocks totaling 8617 hectares (Table 1) (Figure 2). The property is 100 % controlled by Eagle Plains Resources Ltd. ("Eagle Plains").

On September 26, 2020, Brascan Gold Corp. and Eagle Plains Resources Ltd. ("Eagle Plains") entered into an agreement whereby Brascan could earn a 60% undivided right, title and interest in the Vulcan Property by making certain cash and share payments and incurring exploration expenditures on the Vulcan Property. Under the terms of the option agreement, Brascan has an option to earn a 60% interest in the Property by completing exploration expenditures, making cash payments and issuing common shares to Eagle Plains according to the following schedule:

Exploration Expenditures

- \$100,000 on or before July 31, 2021
- An additional \$600,000 on or before June 30, 2022
- An additional \$800,000 on or before June 30, 2023
- An additional \$1,000,000 on or before June 30, 2024
- An additional \$1,500,000 on or before June 30, 2025

Cash Payments

- \$10,000 on execution of Formal Agreement (paid)
- \$15,000 on Exchange Approval of listing of shares
- An additional \$25,000 on or before June 30, 2022
- An additional \$65,000 on or before June 30, 2023
- An additional \$100,000 on or before June 30, 2024
- An additional \$285,000 in cash or an equivalent amount of common shares of Brascan on or before June 30, 2025

Share Consideration

- 200,000 shares on Exchange approval of Agreement and Exchange listing of shares
- An additional 200,000 shares on or before July 31, 2021
- An additional 200,000 shares on or before June 30, 2022
- An additional 200,000 shares on or before December 31, 2023
- An additional 200,000 shares on or before December 31, 2024
- An additional 200,000 shares on or before December 31, 2025

#### Table 1: Tenure Summary

Title Number	Claim Name	Title Type	Issue Date	Good To Date	Status	Area (ha)
398960	JURAK 1	Mineral	2002-12-16	2024-06-29	GOOD	450
406826	VC	Mineral	2003-11-21	2024-06-29	GOOD	150
406827	VC	Mineral	2003-11-21	2024-06-29	GOOD	50
408455	VC	Mineral	2004-03-03	2024-06-29	GOOD	450
1067959	VULCAN	Mineral	2019-04-17	2022-06-29	GOOD	333.6
1067976	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	479.46
1067977	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	459.06
1067978	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	584.2
1067979	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	375.7
1067980	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	208.87
1067981	VULCAN	Mineral	2019-04-18	2022-06-29	GOOD	208.8
1070469	VULCAN SOUTH	Mineral	2019-08-19	2020-08-19	PROTECTED	1065.1
1070472	VULCAN SOUTH 2	Mineral	2019-08-19	2020-08-19	PROTECTED	1024.2
1070584	VR	Mineral	2019-08-23	2020-08-23	PROTECTED	522.7
1070929	VULCAN	Mineral	2019-09-09	2020-09-09	PROTECTED	209.0
1074110	VULCAN	Mineral	2020-01-24	2021-01-24	PROTECTED	1316.1
1075283	VULCAN EAST	Mineral	2020-03-17	2021-03-17	PROTECTED	396.6
1070928	VULCAN	Mineral	2019-09-09	2020-09-09	PROTECTED	333.9
					TOTAL:	8617.1

### EAGLE PLAINS RESOURCES FMC# 138073 BC TENURE VULCAN PROJECT DECEMBER 15, 2020

\* Due to the COVID19 situation, on March 27, 2020, the BC Government extended the lapse date for all mineral claims until December 31, 2021; claims that have expiry dates within this period have Protected status

#### (Tenure information is current and taken from the BC MTO system on December 15, 2020)

In British Columbia, the owner of a mineral claim acquires the right to the minerals which were available at the time of claim location and as defined in the Mineral Tenure Act of British Columbia. Surface and placer rights are not included. Claims are valid for one year and the anniversary date is the annual occurrence of the date of record (the staking completion date of the claim). To maintain a claim in good standing the claim holder must, on or before the anniversary date of the claim: (a) record the exploration and development work carried out on that claim during the current anniversary year; or (b) pay cash in lieu of work. A report detailing work done and expenditures must be filed with, and

approved by, the B.C. Ministry of Energy and Mines. The exploration and development work expenditures required to hold a claim are calculated on a per hectare basis. The cost for holding a claim in years1-2 is \$5/ha, in years 3-4 \$10/ha, years 5-6 \$15/ha and \$20/hectare thereafter. Cash in lieu of work payments are double the requirements for exploration work.

The author is not aware of any other significant factors or risks that may affect access, title, or the right or ability to perform work on the property. The author is not aware of any environmental liabilities on the property. 140°0'0"W

130°0'0"W

0.0°0%

50°0'0"N



130°0'0"W

120°0'0"W



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

The property is accessible by road, by proceeding 10.0 kilometers west of Kimberley on the paved highway to St. Mary Lake, then 20 kilometres along the St. Mary River Forest Service Road (FSR). FSRs cross the property, 8.0 kilometers north on the Dewar Creek logging road on the northwest and 14 kilometres in the White Creek area on the northeast. A 4x4 access road was built by Cominco in 1979 to access the West Basin area; the road extends 2.5 kilometers east of the Dewar Creek FSR 8.0 kilometers marker. The road has steep (+15%) grades and several tight switchbacks; The West Basin 4x4 road was restored and water barred at the close of the 1992 program, and still provides a popular recreational access route to St. Mary Alpine Park and a portion of it is in use by outdoor enthusiasts. This road extends to an alpine meadow at 2,025.0 meter elevation, and ends near the West Basin, approximately 1.5 kilometers northwest of the peak of Mt. Patrick, on the Jurak 1 claim. Access to Jurak Lake basin is by an old pack trail (2.00 hours on foot from the end of the road). Low elevations of the eastern half of the property can be accessed by traveling northeast on the St. Mary – White Creek FSR.

Alternate access to the alpine portions of the property is by helicopter charter from Cranbrook, British Columbia (0.35 hrs one way).

The weather is typical of the Purcell Range, with moderate to dry summers and heavy snowfall in the winters. Most of the property is free from snow beginning in May until October, and the road infrastructure allows drilling from April to November.

The claims are located in the Purcell Mountain Range. The western half of the claims covers rugged mountainous areas up to 3,300 m elevation. The eastern part of the claims covers more moderately sloping mountainous terrain and includes parts of the wider, moreflat White Creek valley at approximately 1,240m elevation. The tree line is gradual, with sparse tamarack (larch) persisting to approximately 2,400 m.

Rail facilities are located at Cranbrook, 50.0 kilometers south east of the property, which could be used to ship ore 280 kilometers to the Teck-Cominco smelter at Trail, British Columbia, approximately 130.0 kilometers southwest of the Vulcan property. Direct air service is provided from Calgary and Vancouver to the Cranbrook Airport, located approximately 40.0 kilometers east of the property. There is a well-established mining support industry in the area that services the southeastern British Columbia coal mines and, until 2001, the Sullivan Mine in Kimberley.

## 6.0 HISTORY

The northern part of the Vulcan property was originally staked by Cominco in 1957. During 1957-58, Cominco conducted prospecting, detailed mapping, trail building and an experimental magnetometerelectromagnetic survey. Three short pack sack drill holes were also completed on the Main Showing for which brief logs and thin section data provide limited detail.

The Vulcan Ag-Pb-Zn±Cu-W showing was recognized as being controlled at least in part by stratigraphy. Widespread tournaline alteration was also noted and observed to be controlled by stratigraphy. A strong similarity between the Vulcan and the Sullivan Mine was documented by O.E. Owens of Cominco at this time. Lead-zinc-silver mineralization was noted to "occur in the same type

of rocks, at the same point in the stratigraphic succession, (Lower-Middle Aldridge Contact, LMC) and as the same type of mineralization" as at Sullivan (Owens, 1958).

Recommendations for deep drilling were made, with such a program to be deferred until after regional geological studies were completed.

In 1971, Texas Gulf Sulfur (TGS) staked and renamed the showings Hilo. TGS resampled the showings, and conducted detailed geological mapping of the Main Showing area carried out limited geophysics and soil zinc and mercury sampling. No further work was done by Texas Gulf.

In the 1970s, regional stratigraphic correlation studies by Cominco established that the Vulcan mineralization occurs on the LMC. Regional studies also suggested that the Sullivan type setting defined by the 1958 work was unique, and appeared to be localized in the northwestern part of the current Vulcan claims.

The Vulcan was staked again by Cominco Ltd. in 1976. A 4x4 access road was constructed to the property, and a single drill test of the LMC was completed (Vu-79-1, 188.0 meters) from the road. No mineralization or lithogeochemical anomalies were found at the LMC which was marked by a distinctive pyrrhotite laminated wacke underlain by fragmental rocks. Minor weak Pb-Zn mineralization was located in the Lower Aldridge Formation in this hole (1.1 meters @ 0.35% Pb, 0.30% Zn).

The property boundaries were extended to the south in 1982.

In 1983, Cominco conducted rock geochemical sampling of the fragmental unit and LMC sequence throughout the Vulcan 1-3 claims. Several Pb-Zn-As anomalies were delineated by this work.

A surface UTEM and HLEM survey was conducted in 1984 covering the LMC and fragmental unit on the Jurak 1 claim. Eight UTEM lines (1.2 - 1.8 kilometers length) were surveyed from one transmitter loop. Weak UTEM anomalies were interpreted as indicating a "weak extensive (larger than loop dimension) conductor, with depth to top varying from 100.0 meters to 200.0 meters" (Visser, 1984). The conductor was located in the area of the completed Cominco drill hole.

Cominco's work program on the West Basin Zone was discontinued following this survey. The objective of subsequent Cominco work was to locate and evaluate the LMC on the more accessible, lower elevation ground on the south flank of Mount Patrick.

Mapping, contour and grid soil geochemistry and UTEM/HLEM surveys were completed. Patchy soil Pb-Zn anomalies were outlined on the lower slopes of Mt. Patrick along the projection of the LMC. UTEM and HLEM anomalies were located on the inferred LMC extension and over the Lower Aldridge Formation. Five drill holes (Vu-84-1 to 4 and Vu-85-1) totaling 970.8 meters were completed by Cominco to test the best geophysical anomalies. All holes with the exception of Vu-85-1 were entirely within the Lower Aldridge, and the anomalies were found to be caused by graphite and pyrrhotite (±chalcopyrite) mineralization. The LMC remains untested in this area, and additional weak geophysical anomalies occur on the possible projection of the LMC.

No further Cominco work programs were carried out in the 1986-90 period.

Ascot resources optioned the Vulcan Claims in 1991. Additional claims were staked in August of that year, and in late September, Ascot carried out a five hole, 1,003.0 meter drill program over 2.6 kilometers of LMC strike length. The objectives of the Ascot program were to use drilling and down

hole EM surveys to define the distribution of base metal sulfides and of the sub-basin which forms the sulphide host at shallow to intermediate depths (to roughly 200.0 meters), in order that deeper drill tests could be planned.

Ascot conducted a three hole, 1,825.8 meter follow-up drill program in 1992 to provide deep down-dip testing of the Lower/Middle Aldridge Formation contact. Upon completion of this drilling, Ascot directed attention to the White Creek area, located 7.0 kilometers to the south of West Basin. A stratiform sulphide-bearing showing was discovered along the bank of White Creek earlier in that summer which returned values of 0.42% Pb, 0.35% Zn, and 4.2 g/t Ag over 1.0 meter. A 5.0 line-kilometer UTEM geophysical survey was completed which indicated the presence of two weak to moderate-strength conductors, one which was associated with the mineralized zone. One further drill hole: VU-92-4 was drilled to test the geophysical conductors at depth. The hole intersected a mineralized zone which they traced back to the surface showing, but mineralization was weaker than at surface.

In 1996, Abitibi Mining Corp., on behalf of Hastings Management Corp., completed a one hole, 209.1 meter drill program on what was known as the PMR-red claim block to test Aldridge rocks for "Sullivan time" (R. Woodfill, 1996). The borehole was interpreted to have intersected metasedimentary rocks of the Lower Aldridge Formation, further drilling was not recommended. No samples were taken for assay. Total exploration expenditures for the 1996 program were \$15,341.00.

Since acquiring the Vulcan Property in 2002, Eagle Plains Resources Ltd., has expanded its claims to the current tenure holdings outlined in Table 1 and Figure 2.

Work conducted on the Vulcan property in 2005 included reprocessing and reinterpretation of 1995 EM geophysical data and the development and implementation of a GIS database. In 2005, as part of a data compilation on an unrelated project in southeastern British Columbia, Eagle Plains requested an independent contractor, Condor Geophysics, to verify and reprocess Geoterrex-Dighem (now Fugro Airborne Surveys) EM survey data collected in 1995 by a joint partnership between BC Ministry of Employment and Investment, Energy and Minerals division, BC Geological Survey Branch and the Geological Survey of Canada. During the course of the data verification by Condor, it was found that the GPS height and the barometric altimeter height were both corrupted, rendering the original geophysical maps and related data included in the 1996 public release unsuitable for geophysical interpretation. After considerable effort Condor was able to arrange for the government to supply replacement SRTM (Shuttle Radar Topography Mission) elevation data that has reasonable resolution and based on this new data set were able to produce a new interpretation of the 1995 data. As the 1995 survey also covered the Vulcan claim area Eagle Plains contracted Condor to correct and reinterpret the EM data for the area referred to as the St. Mary Block. Compilation work included scanning, rectifying and digitizing the historic geology maps, creating a drill-hole database, inputing the historic drill logs, and the creation and interpretation of new sections. A geochemistry database was also implemented utilizing historic rock, silt and soil sample data. The geochemistry and drill-hole databases will allow for a more organized approach to the interpretation of the geology of the Vulcan. Base data for the area covered by the Vulcan claim block was also acquired, processed and integrated into the GIS in order to facilitate map creation and improve data visualization.

The 2006 Eagle Plains Resources exploration program at the Vulcan Project consisted of an AeroTEMII high resolution Time Domain Electro Magnetic geophysical survey. Data collection was done by Aeroquest Limited. A total of 125.5 line- kilometers of survey were flown on April 29<sup>th</sup>, 2006

with helicopter support provided by Bighorn Helicopters using an AStar 350B2.

The airborne survey defined a number of geophysical anomalies. The most interesting feature is located in the southwestern part of the survey. The contoured Aerotem Z-1 Off-time profile shows a distinct feature that roughly traces the contact between Lower and Middle Aldridge rocks. The anomaly appears to correspond with rocks located stratigraphically below the Lower-Middle Aldridge contact, and may represent a new, untested target between the Hilo 10 and Vulcan Minfile occurrences.

There is another feature located at UTM 5518000 N along the boundary with the Purcell Wilderness Conservancy. It appears to be a single point anomaly feature spatially associated with the hanging wall of a Moyie Sill.

Total 2006 exploration expenditures by Eagle Plains Resources Ltd., on the Vulcan Project were \$37,228.84.

In 2010 local prospectors Craig Kennedy, Michael Kennedy, Sara Kennedy and Shawn Kennedy completed a prospecting program on what was known as the Moly Pritchard Property (now within the current extent of the Vulcan Project) on behalf of Kootenay Gold Inc. The work program was directed toward prospecting an altered structural zone which was exposed by logging activities earlier in the year. The prospecting program discovered an altered shear zone described as a carbonate-epidote skarn with associated quartz veining, silicification, tournaline-biotite and sericite bleaching (C. Kennedy, 2011). These alterations are associated with copper and arsenic mineralization (C. Kennedy, 2011). The newly discovered mineral showing is located approximately 180.0 meters east of Dewar Creek, and was exposed by road building activities. The total cost of the 2010 program was \$8,242.00.

In 2011, Fugro Airborne was contracted by Eagle Plains Resources Ltd., to conduct a 318.0 linekilometre heliborne gravity gradiometry (AGG) survey of the Vulcan property with a North-South transverse line spacing of 100.0 meters and 2,000.0 meter spaced tie lines. The survey was successful in identifying possible discordant structures spatially associated with the Hilo 2 showing. The nature of the gravity high remains unknown but could represent a mineralized structure associated with Proterozoic growth faults that has not been detected at surface. The total cost of the 2011 exploration program was approximately \$118,583.19.

In 2011, Fjordland Exploration Inc., completed a modest work program on what was known as the Moly Pritchard Area, which is now part of the Vulcan Project. The program resulted in the collection of 169 B-horizon soil samples collected from 50.0 meter spaced stations. A total of 10 survey lines were completed spaced 200.0 meter apart covering approximately 1.8 kilometers of the inferred LMC as projected by Brown et al., in 2011. The survey was successful in identifying two coincident Pb-Zn anomalies, one in the western portion of the grid associated with the Vulcan 5 Minfile Showing and the second at the inferred LMC in the northern part of the grid. Values up to 76 ppm Pb and 716 ppm Zn occur in the western anomaly and 199 ppm Pb and 504 ppm Zn occur in the northern anomaly. In 1984 Cominco drilled a borehole (Vu-84-4) which is spatially located between the two soil anomalies. The hole intersected Aldridge Formation metasedimentary rocks and Gabbroic intrusions which contained a few stringer veins hosting minor concentrations of sulphide including pyrite, pyrrhotite, arsenopyrite, galena and chalcopyrite (Peters, 2012).

In 2012 a small work program consisted of completing due diligence work to confirm the historical results at the Hilo 3 showing along with doing geological evaluation on the showing and most prospective location to put a drill pad to test the down dip extension of the mineralization. The sample

collected at the showing returned 10.6 g/t Ag, 0.9% Pb and 0.7 % Zn over 1.0 meter. The total cost of the 2012 exploration program was approximately \$10,800.00.

The 2014 work program consisted of soil and silt geochemical surveys focused on the Lower-Middle Aldridge contact (LMC) on the eastern limb of the Vulcan anticline. A total of 210 soil samples from 8 contour lines, 4 silt samples and 2 rock samples were collected during the two-day field program. The soil geochemical survey successfully defined an 800.0 meter long 100.0 meter wide multi-element geochemical anomaly (Pb-Zn) in proximity to the projected LMC horizon, however the results do not suggest significant metal enrichment near surface. The total cost of the 2014 exploration program was \$21,000.00.

A work program in 2016 consisted of geochemical sampling, geologic mapping, ground based geophysics and remote sensing (orthophoto acquisition). A total of 574 soil samples from 20 survey lines totaling 14.3 line-kilometers, 56 rock samples, 7.6 line- kilometers of magnetometer survey from 13 survey lines, 110 geological stations and 215.0 ha of orthophoto were acquired during the 37 field-day program. Total expenditures for the 2016 work program were approximately \$47,280.00 dollars.

The 2016 exploration program was successful in confirming and expanding the (Pb-Zn) anomaly defined by Fjordland in 2011 on the southern slope of Mt. Patrick. The 2011 and 2016 soil data sets when combined, outline a 2,100.0 meter long by 50.0-100.0 meter wide multi-element (Pb-Zn) anomaly (> 90<sup>th</sup> percentile) which correlate with the inferred position of the LMC horizon on the western limb of the Vulcan anticline, located directly northeast of Dewar Creek. Maximum values returned from the 2016 soil sample survey were 235 ppm Pb and 489 ppm Zn. The northeastern end of the anomaly remains open and is located approximately 4.0 kilometers southwest of the Main Showings near Jurak Lake. The southwestern end of the anomaly appears to end at Dewar Creek, however significant Quaternary cover on the western side of Dewar Creek may have inhibited the ability to detect Pb-Zn in the soil profile. Rock sampling of the Middle and Lower Aldridge Formation metasedimentary rocks failed to return any significant Pb-Zn results in proximity to the LMC in the 2016 work area. A series of 7 channel samples across the shear zone hosted mineral occurrence discovered during the 2010 field program returned peak values of 832 ppm Cu over 1.0 meter true width (MMVUR013) and 555 ppm Cu over 1.65 meter true width (MMVUR15 & MMVUR016). Copper mineralization (chalcopyrite-bornite) occurs with magnetite in quartz-carbonate veinlets. The copper values are anomalous, but not economically significant at this location.

The 7.6 line- kilometers of magnetometer survey was successful in providing better resolution on two magnetic anomalies identified by the 1996 St Mary Block airborne geophysical survey. A total of 5 lines were completed on the first grid, and 4 of the 5 lines successfully outlined a positive magnetic response on top of, and along strike from the known magnetite-pyrite±chalcopyrite-bornite bearing mineral occurrence. The magnetometer appears to be an excellent prospecting tool for magnetite bearing shear zones, especially in areas of Quaternary cover where bedrock exposure is limited. The second grid was designed to improve the resolution of a positive magnetic anomaly detected by the 1996 St Mary Block geophysics survey west of Dewar Creek, and more importantly west (down-dip) of the inferred LMC. The 8 survey lines successfully outlined two positive magnetic anomalies located approximately 125.0 meters west of the inferred LMC contact. The anomalies occur along strike from gabbro rubble believed to be on the edge of outcrop. Due to the variable magnetic nature of the Moyie gabbro intrusions one cannot be certain that the magnetic anomalies are reflective of mafic intrusive, but it is a possibility given the distribution of gabbro rubble in the area north of the magnetometer

survey. Another plausible consideration is that the magnetic anomalies parallel stratigraphy, and may represent magnetic mineralization hosted within the Aldridge Formation metasedimentary rocks.

Geologic mapping in 2016 aided in refining the position of the Lower-Middle Aldridge contact on the western limb of the Vulcan anticline to the north by approximately 200.0 meters. This is significant because it suggests that historic drilling by Cominco in 1984 in the mapping area did not successfully test the LMC, but instead was confined to Lower Aldridge Formation metasedimentary rocks. In addition, positions of several Moyie intrusions in the Dewar Creek area were refined resulting in a much-improved base map.

Re-examination of borehole Vu-85-1 provided critical stratigraphic information helping to constrain the current interpretation of the LMC and provided insight into various styles of mineralization and alteration in the mapping area. Inspection of diamond drill hole Vu-85-1, located in the center of the soil anomaly revealed pervasive albite-tourmaline alteration and fracture/vein controlled Pb-Zn mineralization. This mineralization represents one potential source for the soil geochemical anomaly observed in the 2011 & 2016 programs. The source of the hydrothermal fluids responsible for the pervasive albite-tourmaline alteration. The alteration does not appear to be related to a Moyie intrusion, or to any significant mineralization. The alteration has selectively replaced, thinbedded, permeable strata within the Lower Aldridge Formation. Similar alteration was also observed within a boulder located 3.5 kilometers to the south, in proximity to the newly discovered copperbearing occurrence. This type of alteration requires further study to understand if it is related to a "Sullivan-type" hydrothermal system.

The 2016 mapping program also indicated that the southern extension of the LMC contact does not continue as shown by Brown et al., in their 2011 compilation, but it terminates at an unknown location near the St. Mary River by an inferred splay of the Hall Lake Fault Zone. Further work is required in the southwestern-most portion of the property to assist in refining the position of the Hall Lake Thrust Fault and any splays and the overall structural architecture of the deformation zone. Furthermore it is critical that future mapping efforts resolve the relative offset of stratigraphic units within the fault zone in order to refine where the southern extension of the LMC is located on the western side of Dewar Creek.

Review of historical drill hole data in the West Basin target area has raised questions around whether drill hole Vu-92-3 was drilled deep enough to adequately test the LMC. The northern portion of the property, more specifically the West Basin target area displays many geologic similarities to the Sullivan Deposit, and represents a high-priority exploration target. It is recommended that one drill hole be completed to test "Sullivan time" at this location.

The 2017 work program consisted of geophysics interpretation, geochemical sampling and geologic mapping. The geophysics interpretation was completed by SJ Geophysics. The field work was completed by TerraLogic Exploration Inc. Total expenditures for the 2017 work program were approximately \$60,500.00 dollars.

The 2017 field program resulted in the collection of 352 b-horizon soil samples from 15 lines covering over 8.4 line-kilometers, 3 rock samples, 1 till sample and 6 bulk stream sediment samples from three different target areas. The first target area (South) of five fill-in lines just north of the confluence of Dewar and White creeks was designed to investigate and duplicate a highly anomalous gold-in-soil value reported during the Fjordland Exploration Inc. work program in 2011. The second target area (East), comprised of a grid and a single line along the valley bottom of White Creek, was designed to

test the potential for base and/or precious metal enrichment associated with a magnetic anomaly found in the 1996 heli-borne geophysical survey adjacent to and largely within Creston Formation strata east of the Hall Lake Fault Zone. The third target area (North) east of the original Vulcan showing consisted of 3 lines, two of which were extensions of contour lines west of White Creek from the 2014 survey, and one east of the creek to test for base metal enrichment across the inferred trace of the LMC. The names South, East and North are found on the report maps for this work in AR 37454. The 2017 surface mapping campaign focused on the southwestern limb and hinge zone of the Vulcan anticline, more specifically on the trace of the Hall Lake fault zone. Outcrop exposure in the mapping area is excellent along avalanche paths/creeks on the eastern slopes of Mt. Patrick and western slopes of Mt. Levesque to the southeast, moderate in forested slopes on Mt. Patrick and rare in lowlands along the St. Mary River and White Creek.

A previously unmapped granitoid intrusion of unknown age was discovered along a tributary of White Creek. Intense biotite-scapolite and calc-silicate skarn was observed within the contact aureole of the intrusion. Three traverses of the Hall Lake Fault Zone were completed west of White Creek. The fault zone is characterized by complex isoclinal folding, pervasive axial planar crenulation cleavage and mylonite. Sampling of the fault zone did not return results of economic significance.

Also, in 2017 a review of historical geophysical data across the Vulcan and nearby K9 property was undertaken. Particular attention was focused on determining whether recently mapped geological trends and exploration targets were detected on a regional scale Dighem Magnetic and EM survey completed in 1997. It was the hope that geophysical signatures might help determine whether known targets extend beyond their currently mapped extent, or if similar anomalies may be indicative of new occurrences to investigate.

Both the historic magnetic and EM surveys confirm the north to north-northeast striking geology across the target area. Subtle magnetic high trends likely trace Moyie (gabbroic) sills within the Aldridge formation. Narrow, variable spaced pyrrhotitic and/or graphitic horizons are likely sources for the observed conductive anomalies.

The geophysical surveys show it is unlikely that there are any large, highly conductive, near surface massive sulphide bodies in the study area. Extensive, near surface zones of weakly conductive material have likely masked any geophysical signatures from deeper conductors. The report concluded that ground based UTEM type of geophysical surveying is the best suited technique to detect deep conductors.

Eagle Plains' 2019 work program consisted of hybrid Volterra Magnetotelluric (MT)/Volterra Induced 3D Polarization (3DIP) geophysics. SJ Geophysics completed 2.8 line-kilometres of surveying. The primary focus of the survey was on the LMC interpreted to be located at the center of the survey line.

The program identified anomalies consistent with a Sullivan type deposit model. The geophysical anomalies are coincident with the inferred position of the Lower Middle Aldridge contact, a Pb-Zn soil anomaly identified by 2011 & 2016 field programs, and a historic UTEM geophysical anomaly identified by Cominco in 1985. Total expenditures for the 2019 work program were approximately \$40,375.00 dollars.

#### 7.0 GEOLOGICAL SETTING AND MINERALIZATION

#### 7.1 Regional Geology

The regional geologic setting of the Vulcan Property is shown in Figure 3. The map has been modified from a compilation map by Massey *et al.* (2005), and more detailed 1:50,000 compilation maps by Brown *et al.* (2011), Brown and MacLeod (2011) and Glombick *et al.* (2011a/b).

The Vulcan property and adjacent area is underlain by rocks of the Purcell Supergroup on the western flank of the Purcell Anticlinorium, a broad, north-plunging arch-like structure in Helikian and Hadrynian aged rocks. The anticlinorium is allocthonous, carried eastward and onto the underlying cratonic basement by generally north to northeast striking thrusts throughout the Rocky Mountain Orogeny during late Jurassic through Mesozoic time (Price, 1981). The oldest rocks exposed in the area are grey, rusty weathering thin bedded turbiditic siltites and quartzites of the +4,000.0 meter thick Lower Aldridge Formation, along with the facies-related, dominantly fluvial-deltaic Fort Steele Formation (the bases of which are unexposed). The Sullivan deposit is located some 20.0-30.0 meters below the upper contact of the Lower Aldridge Formation. Overlying the Lower Aldridge is a continuous section of turbiditic Middle Aldridge quartz wackes, wackes, subwackes and argillites some +3,000.0 meters thick. Within the Middle Aldridge formation several marker laminite horizons can be correlated like bar-codes over hundreds of kilometers, and represent the only accurate stratigraphic control available. A number of aerially extensive, locally thick gabbroic intrusions ("Moyie Sills") are present within the Lower and Middle Aldridge Formations. These are predominantly sills and, relatively rarely, dikes; some "Moyie Sills" were locally intruded into wet, unconsolidated sediments. The gabbro sill-dike complex that cuts the ore and associated strata at Sullivan has been dated at 1468 Ma. by Anderson and Davis (1995) a minimum age for Aldridge sedimentation and formation of the Sullivan deposit. The most recent radiometric age date from Pb in cassiterite provides a firm date on mineralization at Sullivan of 1475 ma. (Slack et. al., 2020). The Middle Aldridge is overlain conformably by the Upper Aldridge, 300.0 to 400.0 meters of thinly laminated, fissile, rusty weathering siltite/argillite.

Conformably overlying the Aldridge Formation is the Creston Formation, comprising approximately 1,800.0 meters of grey, green and maroon, cross-bedded and ripple marked alluvial fan to platformal quartzites and mudstones. The Kitchener Formation, which includes 1,200.0 to 1,600.0 meters of grey-green and buff weathering dolomitic mud- and siltstone are shallow water sediments that overlie the Creston Formation.

The upper units of the lower Purcell Supergroup are the Van Creek Formation, 200 to 850 metres thick, of greenish siltite and argillite that resembles the Creston Formation followed by the Nicol Creek Formation, 60 to 750 metres thick, of basalt, andesite, volcaniclastic rocks and nonvolcanic sedimentary rocks. (Sills in the upper part of the Kitchener Formation are subvolcanic intrusions related to the Nicol Creek volcanics.)

The upper portion of the Purcell Supergroup in the project area consists of the Dutch Creek and overlying Mount Nelson Formations. The Dutch Creek formation consists of approximately 1,200.0 m of dark grey, calcareous dolomitic mudstones. The younger Mount Nelson Formation consists of 1,000.0 meters of grey-green and maroon mudstone and calcareous mudstones and quartzites. This unit marks the top of the Purcell Supergroup.

The Purcell Supergroup in the Sullivan area was deposited along a tectonically active basin margin.

Dramatic thickness and facies variations record Purcell-age growth faults and contrast with gradual changes characteristic of most Purcell rocks elsewhere. These faults reflect deep crustal structures that

changes characteristic of most Purcell rocks elsewhere. These faults reflect deep crustal structures that were active during Purcell rifting, and that controlled development of an intracratonic basin in middle Proterozoic time.

#### Structure

The structural geology of the region of broadly warped westerly dipping stratigraphy is called the Purcell Anticlinorium and has an overall gentle north plunge that is repeated in all structural blocks. Boundaries between the blocks were loci of penecontemporaneous faults that have been reactivated during subsequent tectonism. Early normal faults are complex structures and display fabrics indicative of reactivation during folding and thrusting. Late normal faults are generally straight. Near and east of Sullivan numerous prominent steeply west dipping normal faults are termed Sullivan type faults. Regionally west dipping normal faults dominate however there is a wide variation in trend of many other normal faults. The dominant fault in the area of the Vulcan claims is the Hall Lake Fault that is mapped along the eastern portion of the claims. The Hall Lake Fault thrusts the Aldridge formation over the younger Creston formation to the east. The sedimentary units of the Purcell Supergroup are bounded to the north by the mid-Cretaceous White Creek Batholith that probably seals the Hall Lake fault at depth. Near this intrusion, structures are more complicated, folds become tighter and metamorphic grade is stronger.

#### Markers

A small but significant component of sediment that constitutes the Aldridge Formation is hemi-pelagic material. This material consists of remnants of organisms that lived in the photic zone of ancient oceans (the pelagic component) and of suspended silt introduced by rivers and wind. The resulting rock can be described as Carbonaceous Wacke Laminite (CWL), wacke being a term for mudstone. Because of the fine grain size of hemipelagic material, it settles very slowly and produces thin blanket-like layers on the sea floor. When and where no turbidites are introduced thick successions of CWL accumulate. Where no CWL is present between turbidites the turbidites are inferred to have accumulated rapidly or the turbidites eroded what CWL had accumulated. Throughout much of the Aldridge Formation one or two centimetres of CWL is commonly seen between turbidites. The LMC west of Sullivan is about 20 metres of CWL. There is 10 metres of CWL over the Sullivan deposit and there is about 10 metres of CWL interlayered with (and beneath) the unique sediments and ore horizons that constitute the Sullivan deposit.

Bar-code marker units that allow precise stratigraphic determinations in the Middle Aldridge Formation are a special case of CWL. These markers are distributed over 1500 metres of Middle Aldridge near Sullivan and, over 2500 metres to the west where the basin was thickest. Markers have pale laminations of silty material devoid of any carbonaceous material interlayered with CWL. The resulting light-dark laminations form bar-code-like patterns that have been matched from localities as great as 300 kilometres apart. About 20 marker units from 10 centimetres to about 10 metres thick have been named. At some localities these named markers may be a continuous sequence; elsewhere numerous turbidites may be intercalated in the same marker interval. Several mechanisms have been suggested for the origin of the markers, the most favoured is that they represent storm events on land that resulted in silty plumes offshore that periodically overwhelmed organic activity.



## 7.2 Property Geology

The most recent geological mapping work on the Vulcan property was completed by M. McCuaig in 2016-2017. Prior to this the last geological mapping program was completed under the direction of McCartney (1991) and also appears in the 1992 Geological Report for the Vulcan Property by Tim Termuende. The following to the end of Section 7, local geology descriptions from the West Basin (or Main Showing area) is from the 1992 report by Tim Termuende, and in places has been modified for clarification by the author. The geologic descriptions and references of the Sullivan Deposit are based upon the work of the following geoscientists: Hamilton et al., (1982 & 1983), Leitch et al., (1991), Leitch (1992), Leitch and Turner (1992), Lydon, J.W. (1996), Turner and Leitch (1992) and Turner et al., (1992). The resulting compilation map can be referenced in Figures 4a and 4b.

#### West Basin

The West Basin area is relatively unique in its geologic characteristics, containing features similar to those seen within the Sullivan Mine itself, and associated with adjacent Sullivan-North Star Corridor.

These features are summarized below:

a) A stratigraphic sequence which is directly correlative with the Sullivan Deposit. This includes Lower Aldridge rocks in contact with the overlying Middle Aldridge sequence (the Lower-Middle Contact, or LMC), and below, with an intraformational conglomerate. Between is predominantly laminated wacke (CWL) where in some localities is strata-controlled mineralization. This sequence has been mapped on the property over a 3.0 kilometers strike length, and has an overall thickness up to 250.0 meters;

b) Alteration including tourmaline and albite are present in association with the LMC;

c) Stratiform lead-zinc-silver mineralization has been noted in boreholes and on surface, and is stratigraphically located within the "Sullivan-Time" horizon. Showings have returned values of 1.6 % combined Pb-Zn over 1.5 meters within a weakly mineralized section 7.5 meters thick.

#### Rock Types

#### Lower and Middle Aldridge Formation Siliciclastics

The Lower Aldridge Formation regionally consists of a rhythmic succession of laminated to thin bedded fine-grained wacke (argillite) and quarzitic wacke (argillaceous quartzite). The sequence is characterized by minor amounts of fine grained disseminated pyrrhotite which imparts a characteristic rusty weathering nature to Lower Aldridge outcrops. Beds are typically graded, and local crossbedding occurs. Intervals of massive to thick bedded quarzitic wacke or quartz arenite also occur (comparable to, and possibly equivalent to, the Footwall Quartzite unit at the Sullivan Mine). Massive to poorly bedded lenses of intraformational conglomerate occur locally near the top of the Lower Aldridge Formation and are composed of Lower Aldridge rock types in a wacke matrix.

The Middle Aldridge Formation is predominantly medium to thick bedded light grey weathering wacke and quartzitic wacke turbidites consisting of medium grained massive quartz-rich bases overlain by thin wacke-subwacke (argillite) tops. Rip up clasts and flame structures are common in the bases of the quartzite beds and are indicative of a high energy, rapid deposition. Subordinate amounts of Lower Aldridge type lithologies are interbedded within the Middle Aldridge. Gabbro sills of the Moyie Intrusions intrude both Lower and Middle Aldridge, and are locally observed as dykes that crosscut stratigraphy generally obliquely but rarely at high angles.

#### Fragmental (Conglomerate)

This unit occurs near the top of the Lower Aldridge Formation. Many textural variations have been noted. The most common type contains rounded medium to fine grained biotitic quartzitic wacke fragments and flat tabular light grey subwacke fragments in a massive fine grained wacke matrix. Disseminated pyrrhotite commonly replaces the biotite-rich clasts, which locally become semi-massive pyrrhotite. Fragments comprise between 15-35 % of the rock, average 2.0-3.0 centimeters and are matrix supported. The matrix usually contains finely disseminated pyrrhotite, and the unit always weathers to a very rusty brown. Wacke and mudstone fragments are generally smaller and more angular than the quartzitic fragments.

Bedding is rare within the fragmental rock type itself, although intervals of normal bedded Lower Aldridge sediment commonly intercalated. Prominent slump folds commonly occur at the base of fragmental intervals suggesting that these fragmentals developed on unstable slopes, comparable to ones two to three kilometres from Sullivan on North Star Hill. Fragmental rocks locally contain quartzfeldspar-amphibole-biotite-pyrrhotite concentrations that are possible concretions. These are often accompanied with a pale bleached or a dark biotite-rich halos.

It was noted during 1992 work that fragment size, sorting, degree of flattening, and imbrication is directly related to the units' position relative to the regional fold straddling the West Basin/Jurak Lake ridge. Along the flanks of the fold, matrix-supported, smaller, well-sorted fragments were flattened and had coin-shaped dimensions, while near the Main Showing area (closer to the fold nose), fragments were clast-supported, larger, poorly imbricated, and only poorly to moderately sorted. This textural variation may be attributed to fold-related stresses; however it may be evidence that suggests a progression toward higher grade mineralization within the Main Showing area itself.

Two mechanisms explain the formation of Aldridge Formation fragmentals. Large slump conglomerate units formed during graben-type faulting and tilting at the close of Lower Aldridge time. Fragmentals also extrude onto the sea floor during dewatering of the Lower Aldridge sequence, perhaps utilizing zones of cross-strata permeability generated during sub-basin development. Both of these processes contributed to the formation of fragmentals of the Aldridge Formation and both were critical in development of the pre-ore environment at Sullivan.

#### Conglomeratic Rocks

These rocks are similar in all respects to the fragmental but contain <10% clasts, usually in a massive wacke matrix. Clast types are similar to those in the fragmental unit and are unsorted. Clasts are matrix supported. Fragments tend to be smaller than in the true fragmental. This rock type grades into massive wacke.

#### Massive Wacke

Massive wackes commonly occur near the top of the Lower Aldridge and are usually interbedded with conglomeratic wacke or fragmental. This rock type is believed to represent a settling out of fine material following fragmental formation and is of a similar composition to the fragmental matrix. Massive wackes fill in and cover irregular topography created during the synsedimentary faulting phase.

#### Carbonaceous Wacke Laminite (CWL), often pyrrhotitic

Carbonaceous Wacke Laminite (CWL) occurs immediately below the Lower Aldridge-Middle Aldridge contact (LMC) in holes Vu-92-2 and Vu-92-3, also in Vu-91-1 to 5 and in Vu-79-1, and averages approximately 8.0 meters in thickness. This lithology is interpreted as the regionally extensive deposit that marks the top of the Lower Aldridge Formation. The unit is directly correlated with the stratigraphic sequence that is present above the Sullivan Mine sub-basin succession of ore and intercalated clastic beds.

Texturally the rock type is a fine grained wacke to subwacke, similar to the massive wacke units, but it contains distinctive dark biotite-pyrrhotite rich laminations. The laminations are usually 1.0-2.0 millimeters thick and separated by several cm of massive wacke. The pyrrhotite usually occurs as fine grained disseminations within the dark laminations, but is clearly strata-controlled. Traces of chalcopyrite were observed with the pyrrhotite in Vu-92-2 and Vu-92-3. Within hole Vu-92-3, this unit was locally albitized, and appears creamy white in coloration, within which pyrrhotite lamination widths were observed to increase.

#### Gabbro

The gabbro intrusions are generally sill-like and consist of medium to coarse grained amphiboleplagioclase with minor biotite and chlorite. Minor disseminated pyrrhotite is common. In places, the gabbroic intrusions have sharp chilled margins, locally with albite-chlorite or biotite alteration selvages in adjacent sediments. Gabbro contacts can also be gradual, with coarse calc-silicate assemblages replacing adjacent sediments.

The gabbroic intrusions are often locally altered. Chlorite-biotite (+ calcite) alteration is common. Intensive alteration to massive chlorite-biotite was noted in hole Vu-92-2 and VU20001 and -002, and may be observed on the northeast-facing slope above the Main Showing.

## Granofels

Quartz-feldspar-biotite-±pyrrhotite- rock with an igneous texture was originally called granophyre where it was first described at Sullivan. The term is a misnomer and the term granofels is now used for this rock. Whole-rock chemistry of granofels and Lower Aldridge metasedimentary rock are similar; in places where the igneous texture is not intense granofels has laminated and pebble fragmental textures. Granofels is a metasediment and the texture was probably developed in proximity to gabbro intrusions.

#### Calc-silicate Unit

No calc-silicate units were recognized in core during the 1992 Cominco drill program, suggesting such rocks were localized features, apparently restricted to the up-dip regions of the LMC. Calc-silicate units

occur as conformable lenses adjacent to the mineralized zone in the Main Showing exposure, where they exhibit strong continuous parallel banding features. A continuous stratabound unit of coarse to medium grained calc-silicate rock also occurs in laminated wacke just below the LMC to the west of Mount Patrick (up-dip of Vu-91-4). Here it is 1.0-3.0 meters thick. Similar coarse calc-silicate was observed crosscutting the fragmental unit southeast of Vu-91-1 but this zone is poorly exposed.

The calc-silicate is a mottled to banded, coarse to medium grained rock with a quartz-feldspartremolite-chlorite-calcite mineralogy. Garnet, epidote, albite and biotite are common accessories. The mineralogy of this rock type is similar to the mineralogy of alteration observed in the footwall vent system of the Sullivan Mine by workers on the GSC/BCDM Sullivan Project. Termuende (1992) noted that although this rock type was identified at surface, and at shallow depth in Vu-91-1,2,4 and 5, it was not found in the deep drill holes in 1992.

Several calc-silicate units have also been noted as selective replacement and discordant dyke-like bodies hosted within metasedimentary rocks adjacent to an unnamed granitoid intrusion 400 meters east of White Creek, and over 5.0 kilometers south of the main showings.

#### Alteration

Various alteration types are recognized within the property. Most commonly noted is silicification, which consists of microcrystalline replacement (partial to complete) of silica within clastic units. Coarser grained units common to the Middle Aldridge package (quartzites, quartzitic wackes) seemed most susceptible to this alteration, likely due to their increased permeability prior to complete interstitial cementation.

Albite alteration was identified in holes Vu-92-2 and Vu-92-3. In Vu-92-2 it was noted within a fine to medium bedded wacke of the Lower Aldridge below the contact with a thick gabbro unit (479.3-485.1 meters). It is also found within the same unit directly above the fragmental contact (499.1-501.5 meters), and as irregular, patchy occurrences within gabbroic material. In Vu-92-3, it is far more prevalent, occurring below the LMC; locally within the pyrrhotite-laminated wacke, and as pervasive alteration within the underlying conglomeratic wacke and into the turbiditic fine-laminated wacke below (323.2-360.1 meters). This entire interval has a light bleached appearance and resembles some occurrences of albitite mapped underground at Sullivan and intersected in drill core adjacent to some gabbro intrusions.

Tourmaline alteration was noted in holes Vu-92-1 to Vu-92-3. Tourmaline was seen often as centimetrescale veins within all rock-types, and as fine acicular needles within quartz and/or calcite veinlets. Pervasive massive microcrystalline tourmalinite alteration, as seen associated with Sullivan-type mineralization at Sullivan and within the Sullivan-North Star Corridor, was not recognized in core. This may be because of tourmaline recrystallization in this area of somewhat higher metamorphic grade.

Chlorite/biotite alteration, as discussed above, is seen predominantly within gabbro and varies greatly in intensity. Commonly at intrusive contacts, replacement is complete within the both the gabbro and the host metasedimentary rock where primary textures are obliterated. Biotite alteration is also common within finer grained, thin bedded and massive intervals, particularly in Lower Aldridge rocks.

Sericite alteration was common in all drill holes, occurring as coatings on fracture surfaces in all rock types.

#### Structure

The main structural feature of the West Basin area is a broad open anticlinal fold plunging steeply to the northwest. O.E. Owens of Cominco conducted the most comprehensive mapping of the West Basin area and describes the structure as follows (Owens, 1958):

"The Lower Aldridge rocks have been folded into large north-south trending anticlines and synclines, and they have been refolded into a west plunging anticline by the intrusion of the White Creek batholith. Within these major folds are numerous smaller closed folds. Some of these strike north-south; others as in West Basin strike east-west. The smaller folds appear to pinch out within short distances and their plunge is variable.

The Middle Aldridge rocks are relatively slightly folded except near the granite. They are part of a thick homoclinal series dipping westward.

North-south trending, steeply dipping faults are common in the eastern part of the map area. These are usually related in space to tight folds and are probably genetically related to them.

Sulfide mineralization was not observed to have any spatial relationship to folds or faults".



## **Geology Legend**

Geological Contacts	Geology	
Amphibolite		Ct-FC - FRY CREEK BATHOLITH: Leucomonzogranite; biotitemonzogranite; biotite-muscovite monzogranite in westernmost exposures
Contact Approx; Dikes Dash		Ct-g - Massive, fine to medium grained biotite monzogranite
Contact Arbitrary		ECt-WC1 - WHITE CREEK BATHOLITH: Biotite-epidote granodiorite.
Contact_Assumed; Dikes_Dot; Sill Dashed; Sill Dotted		ECt-WC2 - WHITE CREEK BATHOLITH: Hornblende granodiorite.
Contact Compiler		ECt-WC3 - WHITE CREEK BATHOLITH: Biotite monzogranite with megacrysts of potassium feldspar; aplite and pegmatite.
Contact Defined; Sill Solid		ECt-WC4 - WHITE CREEK BATHOLITH: Biotite -muscovite leucomonzogranite.
Contact Quaternary		ECt-WC5 - WHITE CREEK BATHOLITH: Biotite monzogranite.
Contact Subdivided		Jr-ub - Ultramafic rocks, serpentinized peridotite.
Dolomite Breccia		Mp-Afr - ALDRIDGE FORMATION: Fragmental rocks interpreted as sedimentary debris flows, breccias formed in dewatering pathways, mud volcano debris, and hydrothermal breccias: s
— Fault Approximate		Mp-Al - ALDRIDGE FORMATION: LOWER: rusty brown weathering, thin- to medium-bedded, quartz wacke, quartz arenite.
<b>———</b> Fault Assumed		Mp-All - ALDRIDGE FORMATION: Lower siltites; siltstone, argillite, minor quartzite.
Fault Defined		Mp-Alq -ALDRIDGE FORMATION: "Footwall quarzites": grey quartzite, quartz wacke.
Fault Normal Approximate		Mp-Alup - Upper siltites: argillite, minor quartzite.
		Mp-Am - ALDRIDGE FORMATION: MIDDLE grey to rusty weathering, thick- to thin-bedded, quartzofeldspathic wacke, intercalated argillite and siltite,
Fault Normal Defined		Mp-Au - ALDRIDGE FORMATION: UPPER: rusty brown weathering, grey to dark grey, fissile to platy, laminated silty argillite and siltite.
▲▲ Fault_Reverse App; Fault Thrust_Approximate		Mp-C - light grey, mauve, or green siltstone and argillite; thin to medium-bedded quartz arenite, quartz wacke; lenticular bedding, ripples, cross-bedding, and mudcracks occur locally.
▲ ▲ Fault_Reverse Assumed; Fault Thrust Ass		Mp-Clmc - CRESTON FORMATION: Mud-cracked member
Fault Thrust Defined		Mp-Cm - CRESTON FORMATION: MIDDLE: light grey, mauve, or purple, thin to medium-bedded quartz arenite; quartz wacke; lesser grey siltstone and argillite; white quartzite interbeds
Granitic		Mp-Cu - green siltstone; black or purple argillite and siltstone.
——— Leaderlines		Mp-K - KITCHENER FORMATION: Undivided meta-sedimentary rocks: thin-bedded, brown-weathering dolomitic silt stone and green argillite.
Marker Approximate		Mp-Kl - KITCHENER FORMATION: LOWER: green and beige siltstone, dark grey argillite; dolomitic siltstone.
Marker Assumed		Mp-M - MOYIE INTRUSTIONS: "Moyie sills": dark-green to black, medium to fine-grained gabbro and hornblende quartz diorite sills and dikes; several to hundreds of metres thick.
<b>—</b> —— Matthew Creek Metamorphic		Mp-b - Post-Moyie Instrusions:(nicol creek feeders?) Mafic sills and rare dikes hosted in Kitchener Formation. Olive green, massive to plagioclase porphyritic.
Sullivan Ore Body		Qt-al - Unconsolidated sediments: alluvium; colluvium; diamictite
Sullivan Graben		
Tourmalinite		
Trench		
″×″×″×″× Unconformity		

## Brascan Gold Corp.

Vulcan Property Figure 4b - Geology Legend

stratiform and discordant matrix- and framework-supported fragmental rocks consisting

ds; lenticular bedding, ripples, cross-bedding, and mudcracks occur locally.

## 7.3 Mineralization

Mineralization seen in core at Vulcan consists primarily of fine disseminated pyrrhotite within all rock types. Millimetre to centimetre-wide quartz and/or calcite veins were common to all rock types, and generally carry minor pyrrhotite, locally with trace chalcopyrite, galena and sphalerite.

These stringers were also seen to host fine, acicular tourmaline needles to 0.5 centimeters in length. Minor pyrrhotite±chalcopyrite, pyrite stringers were also noted in all lithologies and in all holes, and appeared to show no preferred orientation.

The most significant form of mineralization to Sullivan-type exploration is the pyrrhotite-laminated wacke or pyrrhotitic CWL. This unit, located directly beneath the Lower-Middle Aldridge Contact (LMC), was noted in all completed West Basin holes (including 1991 drilling), and consists of stratacontrolled Fe±Ag-Pb-Zn sulfides hosted by a biotite-rich, locally albite-altered laminated wacke to subwacke. Pyrrhotite occurs in dark biotite-rich laminations which are usually 1.0-2.0 mm thick and are separated by several cm of massive wacke, subwacke and argillite. The pyrrhotite usually occurs as fine-grained disseminations within the dark laminations, and is clearly strata-controlled. This interval may be directly correlated with the sequence hosting stratiform mineralization at the Sullivan Mine. This mineral type is exposed at the Main Showing, where pyrrhotite-sphalerite-galena mineralization occurs over 7.5 meters, with values to 0.35 % Pb, 1.25 % Zn returned over 1.5 meters (previous Cominco sampling). McCartney collected several grab samples of this material in 1991, the best of which assayed 5.50 % Pb-Zn combined and 22.0 g/t Ag. Exploration activity elsewhere in the East Kootenay area has indicated that this anomalous horizon is widespread, and typical of the "Sullivan-Time" stratigraphic interval.

Skarn type mineralization has also been noted at the Hilo 4 occurrence adjacent to Jurak Lake. The showing was historically referred to as the "Old Workings" where massive concentrations of scheelite, pyrrhotite and chalcopyrite with lesser concentrations of arsenopyrite, pyrite, galena and sphalerite are hosted within veins and are selectively replacing diorite (gabbro). Tourmaline, garnet and actinolite alteration are associated with the mineralization (Minfile 082FNE102). The calc-silicate units as described above are suspected to be related to gabbro intrusion.

## **8.0 DEPOSIT TYPES**

Many different types of mineral deposits occur in SE British Columbia including Sedimentary Exhalative (Sullivan, Wilds Creek) deposits, manto (Blue Bell ) deposits, high grade silver veins (Slocan Camp), and gold porphyry systems (Keena). The most important of these is the Sullivan Mine, a classic sedimentary "exhalative" massive sulphide deposit; other deposit types in the region surrounding the Vulcan area include:

0	Sedimentary Exhalative deposits	(Sullivan)
0	Carbonate Replacement Ag, Pb, Zn, Cu	(Bluebell)
0	Epigenetic "replacement" silver-lead-zinc deposits	(Vine, St. Eugene)
0	Epigenetic quartz-siderite veins with copper-silver-(gold)	(Dibble)
0	Epigenetic quartz veins with lead-zinc-silver +/- copper	(Midway)
0	Orogenic gold deposits or stockworks	(Bull River)
0	Stratiform or stratabound copper deposits	(Troy)
0	Skarn copper deposits in Cambrian dolomite	(Jubilee)
0	Disseminated gold deposits	(Lookout)
0	Sedimentary gypsum deposits	(Coyote)
0	Replacement magnesite deposits	(Baymag)
0	Placer gold deposits.	(Moyie River)

The targets sought at Vulcan are the Sullivan sedimentary exhalative and possibly associated more epigenetic St. Eugene type lead-zinc deposits

#### 8.1 Sedimentary Exhalative Deposits

Lydon (1996) defined SedEx deposits as: "a sulphide deposit formed in a sedimentary basin by the submarine venting of hydrothermal fluids and whose principal ore minerals are sphalerite and galena." In addition to sphalerite and galena, other minerals that may be present in a SedEx deposit include silver, antimony, arsenic, bismuth, barite, chalcopyrite, pyrrhotite and tourmaline. Mineral concentration and deposit thickness of SedEx deposits tend to grade both in a lateral and vertical fashion from the vent. The zonation creates a lenticular deposit with thicknesses ranging from up to 50 or more metres near the vent, tapering to a negligible thickness. The age of known SedEx deposits range from the Middle Proterozoic to the present. The nearby Sullivan is dated as Middle Proterozoic.

Instability in the sedimentary pile caused by syn-sedimentary faulting and intrusive activity at depth resulted in formation of a sub-basin. Throughout the area of the sub-basin where the faulting resulted in topographic instability, over-steepened slopes failed producing slumps and pebble fragmental accumulations. Within the sub-basin overpressured sediments at depth were extruded and mud volcanos developed. These mud volcanos are also composed of pebble fragmentals and are visualized as a mound of pebble fragmental with feeders or roots of pebble fragmental extending to depth. The mound was about 1 kilometre across. The metals that formed Sullivan were expelled from hot springs that formed above the conduits of the mud volcano. The metals are believed to have combined with sulphur from seawater and precipitated either in plumes from the hot springs or in seeps around them

forming a brine pool directly. Very thin laminations of iron, lead and zinc sulphides blanketed the sea floor. Sulphide deposition was interrupted by slumps, debris flows and reflected beds that all suggest sediment flow down slope to the area where the orebody was accumulating as a local mound. About 2 metres of Carbonaceous Wacke Laminite (CWL) is eroded by the eastern portion of the collapsed portion of the mud volcano. CWL (possibly a total of 8 metres) is intercalated with laminated ore and with the reflected beds and related sediments that fill the sub-basin. About 10 metres of CWL caps the sequence over much of the orebody. Alteration associated with Sullivan overprints many of the features described in the central part of the deposit. Footwall alteration is dominated by a dense black rock called tourmalinite that faithfully preserves early sedimentary textures. Hanging wall alteration of albitite is believed to be associated with much later intrusion of gabbro that may or may not be intimately associated with the ore forming mechanism. Both tourmalinite and albitite areas approach 1 kilometre in area. A central zone of chlorite, pyrite, calcite and albite about 500 metres in diameter is surrounded by the orebody. Calc silicate alteration is common on the footwall adjacent to this central zone of alteration. Patches of carbonate, some reported as limestone, are probably precipitated and encapsulated zones that developed in high temperature environments of hydrothermal vents and conduits.

The Vulcan sulphide mineralization exhibits the characteristics consistent with SedEx style mineralization (Figure 5). The laminated pyrrhotite mineralization and presence of tourmaline relate strongly to a distal hydrothermal situation. The mineralized laminations also occur near the contact of the Lower and Middle Aldridge which was also the case at the Sullivan.

Similarities between the Vulcan property and the Sullivan deposit include:

- Vulcan and Sullivan are both positioned in the Aldridge Formation.
- Both occur at the contact between the Lower and Middle divisions of the Aldridge Formation, the LMC.
- Pebble fragmental, a product of penecontemporaneous faulting and mud volcanism, a key component of the geologic architecture adjacent to and beneath Sullivan, is found below the LMC at Vulcan.
- Carbonaceous Wacke Laminite (CWL) is present below and intercalated with all stratigraphic units associated with the Sullivan orebody, forming a cap horizon above the orebody, is a prominent sedimentary rock type at Vulcan.
- Vulcan, like Sullivan, is a lead-zinc occurrence.
- Lead isotope ages of Vulcan and Sullivan are similar.
- Tourmaline and silicification, and possibly albitite, alteration is present at both Vulcan and Sullivan.

#### Geophysical Signature

In terms of a geophysical signature, SedEx deposits often generate large positive gravity anomalies because of the high specific gravity of ore mineral (Pb, Zn) and associated pyrrhotite and Pyrite (Fe); however, it is difficult to gauge the thickness of the actual target. Although SedEx deposits are known to be a major source of zinc and lead, they are relatively rare. Ground based geophysics, in particular gravity, magnetics and electrical conductivity methods have been successfully implemented to target the pyrrhotite mineralization.

The author has not been able to independently verify the above information and the deposit information discussed above is not necessarily indicative of the mineralization on the Vulcan property which is the subject of this report.



*Figure 5: SedEx mineralization model of the Sullivan Deposit (Lydon et al. 2000)* 

## **9.0 2020 EXPLORATION**

Eagle Plains Resources completed a short prospecting program (5 person-days) in October 2020 that included the collection of rock and silt samples. The purpose of the field work was to investigate and ground-truth historic maps that identify a massive zone of Aldridge Formation fragmentals sitting stratigraphically below the economically important Lower-Middle Contact (LMC). In addition to the prospecting program and the diamond drill program (outlined in Section 10.0) Eagle Plains Resources contracted SJ Geophysics to complete a Borehole Electromagnetic Survey from DDH VU20001 and VU20002.

Total exploration expenditures incurred on the Vulcan Project in 2020 were approximately \$204,957.00

#### 9.1 2020 Borehole Electromagnetic Survey

#### Summarized from Visser, 2020

The 2020 borehole electromagnetic (EM) surveys of DDH VU20001 and -002 were completed by SJ Geophysics between June 6-10<sup>th</sup>, 2020. The survey included setting up two loops (Figure 6) around the boreholes which were surveyed independently. VU20001 was surveyed using an open-hole method using loops 1 and 2 after the drill rig has been removed from the drill pad. VU20002 was surveyed using a through the rod method using loop 2.

The results from VU20001 identified up to 6 conductive zones along the length of the boreholes ranging from weakly conductive (5-20 siemens) to significantly conductive (>100 siemens) (Figure 7). Conductors 1 and 2 are located between 130-160 m and logging provided no clear physical evidence of the conductors, the author suggests the results are consistent with a thin bed of pyrrhotite. Both are consistent with the bottom of a near-surface resistivity low suggesting the presence of disseminated sulphides.

Conductor 4 is located at a depth of approximately 330 m and sits atop of the main low resistivity area located between a depth of 330 and 400 m. It appears to be extensive, weakly conductive and cut by the borehole near its center. Conductor 4 also closely correlates with the top surface of a gabbro and a graphitic zone noted in the drill logs. Furthermore, it is associated with both a magnetic susceptibility high and a Fluxgate Magetometer (FGM) magnetic anomaly, therefore; it is not clear if the graphite can explain the entirety of the data or is there enough pyrrhotite in the system to account for it. There may also be an increase in magnetic at the gabbro contact however that is not noted in the logs of VU20001.

Conductor 5 is located at a depth of approximately 370 m and appears to be mainly an off-hole anomaly. Conductor 6 (located at a depth of about 390 m) along with five appears to be mainly located to the north east of the drill hole. The locations of Conductors 5 and 6 are difficult to accurately determine, especially strike and dip, since there appears to be multiple conductive layers within this zone (between 330 and 340 m), The modeled layers appear to have significantly different strikes and extents and require further investigation.

All six conductors correlate well with a previously identified resistivity lows from the 2019 IP survey. However, with the exception of Conductor 1 there is no chargeability response noted with these conductors. This is surprising as both graphite and sulphides typically have associated chargeability responses unless they are very massive. The data shows that Conductors 5 and 6 are strong conductors and are likely due to massive sulphides or a thick package of graphite (with no evidence of either feature observed in core). There is a magnetic anomaly associated with these conductors, which is most

likely due to increased concentrations of magnetite and/or pyrrhotite. If this was due to magnetite from gabbro layers, it would not be this conductive. There is also no evidence that the gabbro located at the bottom of the hole has any magnetic response; therefore, the gabbros likely do not contain much magnetite. The vast majority of the magnetic responses appears to correlate with the sediment, especially when in contact with gabbro. Although the borehole geological logs give no indication pyrrhotite in the system, the magnetic susceptibility logs do indicate pyrrhotite associated with susceptibility highs and there is only a very slight mention of magnetite.

The results from VU20002 indicated there are no strong conductors along the borehole. A very weak conductor along with susceptibility highs and FGM anomalies was identified near the bottom of the borehole that may be an extension of the anomalies (Conductor 3) located in middle portion of borehole VU20001. There is a high likelihood that there is a conductive body below or to the side of the borehole giving a strong background response. The 2019 IP resistivity data indicates that there is a low resistivity zone to the northwest of the borehole and one below it. The resistivity low to the northwest appears to be dipping in the opposite direction of the main conductors and geology. One possibility is a conductive shear of a local fault zone further increasing the background response in the borehole. This resistivity low could also be a number of weakly conductive strike limited plates with the same attitude as the geology but with this interpretation you would not expect it to be limited in depth extent and there should be more indications of it in the borehole.

The EM plates modelled from the borehole EM responses of VU20001 and -002 correlate well with IP/MT low resistivity anomalies identified in the 2019 survey. They also correlate well with UTEM data collected in 1986 by Cominco. While there is graphite noted in the borehole that correlates with the main deep conductors (Conductor 4, 330 m in VU20001), it is not clear if this is the main source of the strong off-hole anomaly due to correlated magnetic responses. The magnetic response could be due to additional magnetite grains associated with the contact zones of the gabbros or fine grained pyrrhotite. The conductor(s) is strong enough that the graphite zone (only about 20 centimetres) seen in the core would have to be significantly thicker to cause the observations and therefore, there is a possibly that this large high conductivity zone may not be due to graphite. The low resistivity with associated chargeability high to the north west of VU20002 is also not explained by the 2020 drilling.

A compilation of all historic and modern geophysical surveys on the Vulcan property can be referenced in Figure 8.



Figure 6: Borehole EM Loop Layout.



Figure 7: Borehole EM results showing magnetic susceptibility, FGM, early and late time EM profiles. A) Results from DDH VU20001 showing 6 conductors along the borehole. B) Results from DDH VU20002 showing no recognized conductors along the borehole.



#### 9.2 2020 Rock Samples

A total of 30 rock samples were collected during the 2020 field program (Figures 9a and 9b). 29 samples were sent to Bureau Veritas, located at 9050 Shaughnessy St, Vancouver, BC, for assay. An additional 1 sample was sent for thin section preparation and petrographic description by Vancouver Petrographics at 8080 Glover Rd, Langley, BC.

The rock samples collected for assay can be separated into two categories: Aldridge Formation sediments and Moyie Sill gabbros with variably mineralized quartz  $\pm$  carbonate veins. Of the Aldridge Formation sediments only 2 samples returned anomalous results. Sample TTVUR001 was a grab sample collected along the top contact of a fragmental at the inferred LMC and returned 932.3 ppm Pb. Sample TTVUR003 (float sample of quartz vein material, unclear if hosted in Aldridge or Moyie Sills) returned 19.2 g/t Ag and 215.7 ppm Pb. Further sampling is recommended along the inferred LMC to refine the mineralization potential at "Sullivan Time".

Several anomalous results are reported from the Moyie Sill grab and float samples. Sample JCVUR006 (float sample of galena mineralized quartz vein hosted in gabbro) returned 88.6 ppm Ag, and 1.8% Pb. Sample BRVUR002 (grab sample of gabbro hosted quartz vein) returned 0.7 g/t Au. Sample TTVUR007 (float sampled of galena-sphalerite mineralized quartz-carbonate vein hosted in gabbro) returned 286 g/t Ag, 5.2% Pb, 0.7% Zn and >100 ppm W. Samples TTVUR015 and 017 (quartz vein material hosted in gabbro) returned 3331 ppm Zn and 2108 ppm Cu respectively. Results from the mineralized quartz  $\pm$  carbonate veins hosted in the Moyie Sills indicate there is potential for economic mineralization. Further prospecting and mapping are recommended to determine the in-situ position of mineralized float samples and assess the continuity of mineralized veins.

A single sample (TTVUR018) was collected for petrographic analysis. The purpose of the petrographic sample was to characterized the alteration of Middle Aldridge sediments directly overlying the inferred LMC and determine if the albite alteration was indicative of proximal SedEx style mineralization. Petrographic interpretation, provided by Craig Leitch, PhD, PGeo, suggests that the observed albite alteration of the sample is likely the result of contact alteration associated with the intrusion of gabbro sills and is not consistent with the albite cap observed at the Sullivan deposit (Leitch, 2020).

#### 9.3 2020 Silt Sampling

A total of 6 silt samples were collected during the 2020 field programs (Figures 10a, 10b). The samples were submitted to Bureau Veritas, located at 9050 Shaughnessy St, Vancouver, BC, for analysis. At the time of this report the sample results had not been returned.

#### 9.4 2020 Soil Sampling

A total of 4 soil sample were collected during the 2020 field program (Figures 10a, 10b). He samples were submitted to Bureau Veritas, location at 9050 Shaughnessy St, Vancouver, BC, for analysis. At the time of this report the sample results had not been returned.









## **10.0 DRILLING**

There has been a total of 4100.4 meters of historic core drilling in 16 holes completed on the Vulcan property.

Table 2: Historical Drillhole Summary

HOLE ID	DEPTH
VU-79-1	187.00
VU-84-1	123.20
VU-84-2	122.30
VU-84-3	117.10
VU-84-4	147.00
VU-85-1	461.20
VU-85-2	114.00
VU-91-1	60.98
VU-91-2	227.13
VU-91-3	276.52
VU-91-4	279.57
VU-91-5	158.84
VU-92-1	331.00
VU-92-2	684.60
VU-92-3	519.40
VU-92-4	290.80
Total:	4100.64

The most recent drilling was in 2020 when Eagle Plains Resources completed two NQ2 drillholes totaling 976.5 linear meters (Figure 4a). Drilling operations were completed by CoreWest Diamond Drilling based out of Saskatoon, Saskatchewan. Field supervision, core logging, geotechnical data collection and sample processing were completed by TerraLogic Exploration Inc. employees Kerry Bates, P.Geo and James Reilly, BSc. Geology. Additional geologic support and supervision was provided by Paul Ransom, P.Geo, independent contractor. Upon completion of the program all drill core was stored at a permanent storage facility at the TerraLogic Crew House located at 2779 13th St S, Cranbrook, BC.

DDH VU20001 reached a final depth of 578.2 m (99.4% total core recovery) and was designed to intersect coincident geophysical (historic UTEM and HLEM and modern IP) anomalies sitting stratigraphically below the interpreted Lower-Middle Contact (LMC) of the Aldridge Formation. The also tested the theory that the sulphide bands seen in Vu-84-4 and Vu-85-1 are stratiform in nature.

DDH VU20002 reached a final depth of 398.3 m (98.0% total core recovery) and intersected a stratigraphic horizon interpreted to be the LMC. Downhole surveys were collected every 90 feet (27.4 m) to monitor hole deviation using a Reflex EZ-TRAC, multi-shot survey instrument.

	UT	Μ	Elev.			Depth	Start Date	End Date
Hole ID	Northing (m)	Easting (m)	(m)	Az.	Dip	(m)	dd/mm/yyyy	dd/mm/yyyy
VU20001	5511600.2	544759.4	1190.2	143°	-57 °	578.2	28/05/2020	04/06/2020
VU20002	5511272.8	544898.1	1192.4	140°	-50 °	398.3	04/06/2020	09/06/2020

10010 J. 2020 Drunnole Dula	Table	3:	2020	Drill	hole	Data
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No drilling, sampling or recovery factors are known that could materially impact the accuracy and reliability of the results. The following geologic descriptions were completed using a siliciclastic classification scheme that is consistent with historic work completed by Cominco.

DDH VU20001 was collared in the Lower Aldridge Formation. At this location the Lower Aldridge is comprised of variably altered and metamorphosed interbedded argillite, very fine to medium grained wackes, laminites (including carbonaceous wacke laminite "CWL") and fine grained to medium grained quartzites (Figures 4a, 11). Common sedimentary textures include grading upward bedding that range from thin bedded (3.0-10.0 cm) to thick bedded (30.0-100.0 cm). The Lower Aldridge interval is cut by numerous Moyie Sills (subparallel to bedding). The sills are comprised of fine to coarsely crystalline gabbros (holocrystalline quartz-feldspar-pyroxene-amphibole-biotite) with moderate to intense chlorite-biotite alteration of mafic minerals. The sills in VU20001 range from 0.2 to 127.0 m thick (drill thickness). Underlying a thick gabbro interval (318.7-348.5m) is a zone of granofels (348.5-375.0) alteration. Granofels is white and black speckled in appearance and visually very similar to the medium-coarse grained gabbro sills but are mineralogically distinct. The granofels unit is comprised entirely of quartz-biotite, lacking the mafic minerals of the typical Moyie Sill gabbros. It is unclear if the granofels is a metamorphic product of a sedimentary (Aldridge Formation) or intrusive (Moyie Sill) protolith (leucogabbro). Underlying the broad zone of gabbro and granofels is a zone partially recrystallized Lower Aldridge sediments (561.4-578.2 m) comprised of interlaminated wacke, CWL and argillite. The hole also crossed the projection of the sulphide bands seen in Vu-84-4 and Vu-85-1, located approximately 1 km north of the VU20001 collar. No mineralization was noted at the projected depth.

In VU20001 the alteration of the Lower Aldridge sedimentary package typically weak and dominated by regional scale chlorite-biotite alteration assemblage. In this hole the sediment matrix is pervasively chlorite altered with patchy to pervasive biotite alteration defining cleavage. Biotite alteration of the Lower Aldridge was observed to increase in intensity proximal to the contact with sills. Silica alteration halos are also observed at the sill contacts. There is a notable increase in disseminated pyrrhotite associated with increased pervasive-patchy biotite alteration. Sericite alteration halos (mm-scale) are common around quartz veins. Alteration of the gabbro sills is dominated by pervasive moderate to intense chlorite alteration of primary biotite, pyroxene and amphibole.

Mineralization in DDH VU20001 is dominated by disseminated pyrrhotite  $\pm$  pyrite that typically infills fractures, voids and preferentially infills cleavage planes (up to 0.5% of rock volume). Two discrete zones of disseminated sphalerite mineralization (visual estimates up to 0.5%) along bedding contacts were observed from 45.0-47.2 m and 76.3-76.7 m. Samples VU20001-003 (44.3-45.2 m) and -004 (46.0-47.0 m) were collected through the sphalerite mineralization and returned 268.0 ppm and 153.0

mm Zn respectively. Sample VU20001-003 also returned weakly anomalous Pb concentration of 111.0 Pb. Samples VU20001-007 to -010 were collected between 73.0-77.0 m and returned results ranging from 194.0-374.0 ppm Zn, 9.6-131.4 ppm Pb. Anomalous Cu values were reported in VU20001-022 (325.0-326.1m) of 481.3 ppm and VU20001-024 (356.0-357.0 m) and VU20001-025 (379.0-380.0m) reported 226.1 ppm Cu and 137.8 ppm Cu respectively. The anomalous Cu samples were collected from chalcopyrite-bearing quartz-carbonate veins hosted in gabbro sills. While several samples reported anomalous results for base-metals none are considered to be economically significant.

DDH VU20002 was collared in a gabbro sill interval (13.7-38.4 m) which intrudes the Middle Aldridge Formation. In this hole the Middle Aldridge is defined by thin to thick normally graded beds of wacke, subwacke and argillite, typical turbidite deposits of the Aldridge Formation (Figures 4a, 11). Bedding in this zone is structurally deformed and attenuated with weak to moderate preservation of primary sedimentary textures. From 49.6-55.9 m the interval is defined by massive wacke which transitions into an underlying zone laminites. The transition from massive wacke to laminites is interpreted to represent a transition from the Middle to Lower Member of the Aldridge Formation (49.6-55.9 m), defining the LMC, a stratigraphic horizon with high economic potential in SedEx exploration of the Aldridge Formation. Underlying the LMC is the Lower Aldridge Formation (55.9-392.0 m). The Lower Aldridge is defined by thin to medium bedded wacke, subwacke and argillite with variable concentrations of carbonaceous wacke laminites (CWL). Similar to the previous hole the Aldridge Formation is cut by numerous Moyie Sills, ranging from 1.0 to 24.6 m thick (drill thickness). The sills intersected in this hole include medium grained gabbros with chloritized amphiboles and biotite, quartz and feldspar with scattered dark accessory minerals and very fine grained diabase defined by intense chlorite-biotite alteration. Petrographic descriptions of the diabase (Sample VU20002-TS-011 and -012) show relict plagioclase (with weak clay-sericite alteration) and mafic crystal sites replaced by biotite-chloriteepidote-amphibole-carbonate-pyrrhotite±sphene/ilmenite and local garnet.

Alteration in the Lower Aldridge Formation is dominated by pervasive chlorite. A zone of laminae selective silica-albite alteration was intersected between 73.2-110.0 m, decreasing in intensity downhole. Petrographic samples VU20002-TS-002 (100.0m) to VU20002-TS-005 (110.3m) report moderate albite-KSpar-sericite-biotite-pyrrhotite-tourmaline-sphene alteration of primary detrital quartz framework grains (grain replacement and/or recrystallization). Petrographic analysis supports the interpretation that increased alteration zone in this zone may be indicative an exhalate horizon that is a favourable alteration feature in SedEx exploration. The petrographic interpretation indicates that the Albite alteration is reminiscent of, but less intensely developed that the albitite at the Sullivan deposit (Leitch, 2020).

No significant mineralization was reported in VU20002.



## **11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY**

Rock samples from the 2020 prospecting program were collected by TerraLogic Exploration and Eagle Plains Resources field crews. All rock samples were collected in poly sample bags and labelled with a distinct sample ID. Location data was collected using handheld GPS's and sample descriptions were collected in field notebooks and later entered into a Microsoft Office Database. The samples were transported by TerraLogic to the company's field house in Cranbrook, British Columbia, and arranged in numerical order. Samples that were damaged or had unclear labels were re-bagged and labelled and placed back into order. The personnel responsible for the shipping print off a list of all the samples collected from the current field program from the geochemical database and cross referencing to make sure all samples are accounted for. The poly bags are placed in rice bags, zip tied and labelled with the shipment number and shipping/receiving addresses. The samples were then delivered to Overland West Shipping in Cranbrook British Columbia and shipped directly to Bureau Veritas Laboratory at 2050 Shaughnessy St, Vancouver, BC, V6P 6E5. Bureau Veritas prepared the rock samples by crushing the sample to  $\geq$ 70% passing 2 mm, pulverize 250 g to  $\geq$ 85% passing 75µm (PRP270-50). The requested analyses for base metals included 33 element aqua-regia digestion with ICP-ES/MS finish (AQ200). Over limit analysis was requested using 23 element aqua-regia digestion with ICP-ES finish (AQ370; overlimit triggered if  $\geq 1\%$  Pb and Zn). Precious metal analysis included 30 g lead collection fire assay fusion with AAS finish (FA430).

#### **2020 Drilling**

TerraLogic Exploration Inc. conducted the 2020 diamond drilling program. Each collar location was marked using a handheld GPS and the drill was aligned using a handheld compass by the supervising geologist. Both holes were drilled using NQ2 core diameter. Core from DDH VU20001 was transported from the drill pads to an on-site secure logging location with 24/7 supervision by TerraLogic Exploration personnel. Core from DDH VU20002 was transported to a secure logging facility in Cranbrook, BC for detailed logging.

The following data was collected for the drill hole and recorded into a digital Microsoft Access database:

- Depth and Recovery log
- Sample log
- Rock Quality Designation (RQD)
- Geology log
- Digital photographs
- pXRF analysis
- Magnetic susceptibility

A total of 28 drill core samples and 2 QAQC samples were sent for geochemical analysis by Bureau Veritas, Vancouver for the following analyses: Preparation by crushing 1 kg to  $\geq$ 70% passing 2 mm, pulverize 250 g to  $\geq$ 85% passing 75µm (PRP270-50) and 33 element aqua-regia digestion with ICP-ES/MS finish (AQ200). Over limit analysis was requested using 23 element aqua-regia digestion with ICP-ES finish (AQ370; overlimit triggered if  $\geq$ 1% Pb and Zn). The drill holes were selectively sampled at the discretion of the logging geologist. All sample intervals ranged from 0.54-1.33 m drill length.

![](_page_53_Figure_0.jpeg)

Figure 12: Certified Reference Material PM 129 vs Bureau Veritas analytical results for a standard inserted into the 2020 Vulcan DDH core shipment.

## **12.0 DATA VERIFICATION**

Author Kenwood visited the Vulcan property by helicopter along with Terralogic's Kerry Bates on January 28, 2021; the property was completely covered in waist deep snow at the time of the visit. The helicopter was able to land at the VU20001 drill site but we were unable to find the drill collar. The author also visited Terralogic's core logging facility in Cranbrook on January 28<sup>th</sup> and viewed core from holes VU84-4, VU20001, and VU20002.

Due to the accumulation of snow on the property, no verification samples were taken by the author on the property but three, 2 metre long XRF scans from hole VU20-002 were done by Terralogic on the day of the visit. Results from the XRF scans (Table 4) were consistent with results from scans done on the core in 2020.

Although quality control measures used in historic work on the Vulcan Project are not known to the author, the methodologies and measures undertaken more recently by Eagle Plains and Terralogic Exploration are described above.

The author has reviewed all of the assay certificates from the 2020 exploration work that was undertaken on the Vulcan Property and is of the opinion that the data presented in this report can be relied upon and is more than adequate for the purposes used in this report.

Scan Type	Original	Check	Original	Check	Original	Check
From	52.84	52.84	54.84	54.84	56.84	56.84
То	54.84	54.84	56.84	56.84	58.84	58.84
ag_ppm	1.13	2.37	0.90	1.20	0.78	1.45
as_ppm	3.07	2.67	1.77	0.70	3.48	3.53
ba_ppm	598.00	510.33	518.67	580.50	746.25	649.25
bi_ppm	4.33	4.67	7.67	4.50	5.50	5.00
ca_pct	2.56	2.04	2.01	2.33	1.51	1.61
cd_ppm	1.47	1.53	0.73	1.30	0.33	1.85
ce_ppm	65.33	52.67	100.67	83.50	76.50	98.25
cl_ppm	169.67	143.67	172.33	276.00	95.00	312.00
co_ppm	0.00	86.67	0.00	80.50	0.00	77.25
cr_ppm	16.00	23.67	16.33	18.50	11.00	36.75
cu_ppm	3.33	4.67	0.00	9.50	3.00	4.75
fe_pct	2.56	1.78	2.20	2.10	1.80	2.01
hg_ppm	5.67	5.00	6.33	3.30	7.50	4.58
k_pct	2.99	2.13	2.61	2.20	3.15	3.02
la_ppm	48.33	21.67	39.67	44.50	38.50	43.75
mn_ppm	265.00	210.33	307.67	272.50	179.25	197.25
mo_ppm	2.60	4.40	3.77	1.50	3.85	2.55
nb_ppm	16.27	11.63	13.13	11.60	16.73	12.08
ni_ppm	24.67	10.00	24.00	12.50	24.50	6.75
p_pct	0.30	0.49	0.45	0.43	0.37	0.29

 Table 4: Data Verification Samples

2021 Technical Report for the Vulcan Property

pb_ppm	4.80	3.30	4.70	5.25	3.98	3.63
rb_ppm	153.03	117.70	146.60	129.35	146.45	144.13
s_pct	0.65	0.35	0.16	0.14	0.48	0.67
sb_ppm	2.67	3.00	3.33	4.00	4.00	2.75
se_ppm	0.70	0.37	0.40	0.25	0.73	0.93
sn_ppm	24.67	16.00	26.33	17.50	24.25	16.50
sr_ppm	95.33	112.67	110.07	126.00	87.05	86.93
ta_ppm	8.70	9.73	9.20	10.00	8.48	10.98
th_ppm	24.00	18.67	21.00	16.50	23.00	17.50
u_ppm	6.67	4.00	5.90	4.50	8.00	5.25
v_ppm	82.00	66.67	79.00	78.50	87.00	84.75
w_ppm	0.00	7.67	0.00	7.00	1.50	4.75
y_ppm	26.40	21.70	25.63	22.35	27.80	25.60
zn_ppm	34.07	26.23	34.87	42.40	22.78	25.25
zr_ppm	290.33	247.00	303.00	273.00	302.25	276.50

## **13.0 MINERAL PROCESSING AND METALLURGICAL TESTING**

As of the date of this report, Brascan has not done any mineral processing or metallurgical testing on samples from the Vulcan property.

## **14.0 MINERAL RESOURCE ESTIMATES**

As of the date of this report, there are no mineral resource estimates on the Vulcan property.

## **15.0 MINERAL RESERVE ESTIMATES**

As of the date of this report, there are no mineral reserve estimates on the Vulcan property.

## **16.0 MINING METHODS**

As the Vulcan is considered to be an early-stage exploration project, there is no applicable disclosure under Section 16.0.

## **17.0 RECOVERY METHODS**

As the Vulcan is considered to be an early-stage exploration project, there is no applicable disclosure under Section 17.0.

## **18.0 PROJECT INFRASTRUCTURE**

As the Vulcan is considered to be an early-stage exploration project, there is no applicable disclosure under Section 18.0.

## **19.0 MARKET STUDIES AND CONTRACTS**

As the Vulcan is considered to be an early-stage exploration project, there is no applicable disclosure under Section 19.0.

## 20.0 Environmental Studies, Permitting and Social or Community Impact

The Author has not identified any comprehensive historical environmental studies or any history of social or community impacts related to historical work on the Vulcan project.

The Vulcan project is located on Crown Land within an area identified as the traditional territory of the St. Mary's Indian Band or Aq'am, a member of the Ktunaxa FN. In 2017, a part of the MYAB permit application process, Eagle Plains commissioned Tipi Mountain Eco-Cultural Services to undertake an Archeological Desktop Review and provide an archeological overview assessment of the Vulcan project area. The study did not identify any archeological sites within the proposed permit boundaries. Eagle Plains has provided the St. Mary's Band with maps and information regarding the work proposed on the Vulcan property and participated in direct engagement with the band before the 2020 drill program.

Exploration in British Columbia is governed by the Mines Act; a permit under the Mines Act is required for exploration activities involving mechanical disturbance. The application is referred to as a Notice of Work. Eagle Plains Resources Ltd. has taken out a Notice of Work Permit, MX-5-803, dated May 31, 2017 that covers the following activities on the Vulcan Property: access roads, trails, heli pads,; application for timber cutting authorization; exploration surface drilling; and water supply/use. Conditions of the Permit include:

1. An Annual Summary of Exploration Activities (ASEA) and a Multi-Year Area Based (MYAB) Update shall be submitted concurrently to the Inspector of Mines. These annual reports shall be submitted at least 30 days prior to commencement of exploration activities in a new calendar year or no later than the end of March of every year the MYAB approval is in effect. Work cannot commence until these forms have been accepted by the Inspector.

2. Progressive reclamation must be carried out, sites must be freed of debris, all sumps must be filled, and both the drilling pads and the sumps must be recontoured and seeded with an appropriate mixture for the area on completion of each drilling hole;

3. All drill casings shall be removed or cut off a minimum of 1metre below ground level prior to removal of equipment off the site;

4. All fuel and lubricants must be stored in an impermeable containment, and barrels must be removed from the sites at the end of each field campaign;

5. An emergency spill kit shall be available on site;

6. Staging areas must be maintained clean at all time and all equipment, core and core boxes, garbage, must be removed from site at the end of each field campaign;

7. Trails that are not to be further used must be deactivated and reclaimed at the end of the field campaigns;

8. No drilling fluid is allowed to flow freely on terrain surface, enter into a creek or water body, and must be contained in sumps;

9. Drilling holes that have intercepted mineralization and have artesian water must be cemented to prevent ARD;

Eagle Plains has posted a reclamation bond in the amount of \$12,176 for the Vulcan project. The

current permit expires on December 31, 2021 and the Author does not anticipate any undue delay in either extending the current permit through a Deemed Authorization notice or obtaining any future permits.

## **21.0** CAPITAL AND OPERATING COSTS

As the Vulcan is considered to be an early-stage exploration project, there is no applicable disclosure under Section 21.

## **22.0 ECONOMIC ANALYSES**

As the Vulcan is considered to be an early stage exploration project, there is no applicable disclosure under Section 22.

## **23.0 ADJACENT PROPERTIES**

The Vulcan property is contiguous with Eagle Plains Resources K9 project. The K9 claims contain a steeply-dipping package of Middle Proterozoic rocks striking north intersecting the White Creek Batholith. A number of thick gabbroic sills are present, and may be related to the K9 Shear Zone that dominates the center of the property. Rocks underlying the Great Dane Adit have been deformed by at least two periods of folding which obliterated the primary sedimentary structures. This fold pattern exists along the entire length of the "K9 Shear Zone" and falls on-strike with nearly all of the mineral showings found to date.

The K9 is characterized by three zones of mineralization:

The K9 Shear Zone is structurally controlled vein and replacement Cu-Ag-Pb-Zn mineralization hosted within quartzites of the Creston Formation.

Mineralization at the Great Dane Showing consists of vein pods and stringers of massive chalcopyrite, pyrite, galena, and sphalerite hosted in Creston Formation phyllitic quartzites. A 2 m chip sample returned metal values of 62 g/t Ag, 2.6% Cu, 9% Zn and 14.0% Pb.

The Purina is a 2.7 m wide pyrrhotite-chalcopyrite quartz replacement zone, with significant associated chalcopyrite and pyrrhotite mineralization and minor galena.

The Author has been unable to verify the information on the K9 property and the information is not necessarily indicative of the mineralization on the Vulcan Property.

## 24.0 OTHER RELEVANT DATA AND INFORMATION

As of the date of this report, there is no other relevant data or information on the Vulcan property.

## **25.0 INTERPRETATION AND CONCLUSIONS**

The Vulcan Property is considered highly prospective for SedEx style Pb-Zn±Ag mineralization but remains in the early stages of exploration. The rock formations within the property boundaries are stratigraphically equivalent to the world-class Sullivan Deposit, located only 28 km east of the property. The property is road-accessible with an extensive network of forest service roads and is within a reasonable distance from high-voltage hydro-electric lines. The nearest rail lines are located 50 km southeast of the property. Historic work completed on the property has shown several key features that are consistent with SedEx style mineralization including: surface exposure of the Lower-Middle Contact "LMC" of the Aldridge Formation, stratiform lead-zinc mineralization, and tourmaline/albite alteration within favourable stratigraphy.

The 2020 work program was completed in two phases. The initial phase included diamond drilling totaling 976.5 meters from two boreholes, DDH VU20001 (578.2 m) and VU20002 (398.3 m). DDH VU20001 was designed to test overlapping geophysical anomalies for sulphide mineralization potential. Detailed logging of VU20001 has shown that the geology is consistent with turbidite deposits of the Lower Aldridge Formation. Alteration is dominated by chlorite-biotite alteration of the Lower Aldridge sediments and intruding Moyie Sills interpreted to be the result of regional metamorphism. A broad zone of granofels alteration was intersected between 348.5-375.0 m. While the granofels is not considered economically significant it does have a known spatial relationship to the ore-body at the Sullivan deposit. Assay results from VU20001 indicate that several thin zones of anomalous Zn mineralization were intersected ranging from 153.0-268.0 ppm. These zones are not considered economically significant. Several thin zones of vein-hosted pyrrhotite mineralization and thin, cmscale, graphitic horizons were identified within the Moyie Sills. These zones correlated well with historic (UTEM and HLEM) and modern (IP and MT) geophysical anomalies and are interpreted to be the source of the targeted IP and MT geophysical anomalies identified during the 2019 work program. The author believes that the anomalies were adequately tested in this drill hole and no further drilling is recommended.

DDH VU20002 successfully tested the LMC for mineralization potential and confirmed the position of the economically important contact. Prior to drilling position of the LMC in this area of the property was inferred from historic surficial geochemical results and property-scale mapping. Detailed logging indicates that the LMC was intersected between 49.6-55.9 m and is defined by a zone of massive wacke transitioning into underlying laminites, marking the top of the Lower Aldridge Formation. The intersection of the LMC at this depth is consistent with the inferred position of the contact at surface. A thin zone of moderate silica-albite alteration was intersected between 73.2-110.0 m. Petrographic analysis of the silica-albite alteration zone suggests that the alteration is reminiscent (but less intensely developed) of the albitite zone at the Sullivan deposit. No economically significant mineralization was intersected in VU20002.

A Borehole EM survey of each hole was completed by SJ Geophysics using two EM loops. The survey confirmed that several of the targeted anomalies were the result of thin bands of pyrrhotite and graphite hosted within the diabase and gabbros of the Moyie Sills. Geophysical interpretation has also identified several off-hole anomalies suggesting that the main source of the conductors was potentially missed by VU20001. Geophysical interpretations also suggest that DDH VU20002 may have been shut down short of a conductor. These interpretations require more significant geological modelling as "off-hole" conductors would indicate a possibility of discrete (no lateral continuity) stratabound mineralization.

Results from the 2020 diamond drilling program indicate that the targeted overlapping geophysics

anomalies (historic UTEM and HLEM with modern IP and MT) are not the result of SedEx style mineralization but correlated well with pyrrhotite mineralization and graphitic bands hosted within Moyie Sills. While the 2020 Borehole EM survey suggests the potential for off-hole anomalies the geologic observations indicate that the anomalies are the result of the previously described sulphide mineralization and graphite formation in the sills and do not represent near-surface base-metal mineralization.

The second phase of the 2020 field program consisted of 5 person days of prospecting. The purpose of the prospecting program was to collect surface samples along the LMC and ground-truth historic mapping to confirm the presence of Aldridge Formation Fragmentals sitting stratigraphically below the LMC. Results from the prospecting campaign confirmed the position of the fragmentals but were unable to identify any mineralization associated with the LMC. Several grab and float samples were collected from mineralized quartz-carbonate veins hosted within the Moyie Sill gabbros that returned highly anomalous results including up to 286 g/t Ag, 5.2% Pb and 0.7% Zn (sample TTVUR007). This sample is not considered to be representative of the vein-hosted mineralization but outlines the potential for base and precious metal mineralization.

At the Vulcan, the styles of mineralization, host rocks and alteration share strong similarities to the geology of the Sullivan deposit. The best sulfide mineralization at Vulcan is exposed in a surface showing. Stratiform pyrrhotite-galena-sphalerite mineralization occurs on the "Sullivan Horizon" in a 7.5 meter thick zone which includes 1.5 meters averaging 1.6% combined Pb-Zn. Grab samples of this zone assay up to 5.5% Pb-Zn and 22 gpt Ag. Outside of the Sullivan deposit, this type of occurrence is very rare in the Aldridge Basin.

In 1984-1985 Cominco completed five drillholes to test UTEM and HLEM geophysical anomalies coincident with the inferred trace of the LMC. All holes with the exception of Vu-85-1 were entirely within the Lower Aldridge, and the anomalies were found to be caused by graphite and pyrrhotite (±chalcopyrite) mineralization. Relogging of the drillholes by Eagle Plains and Terralogic identified thin bands of massive sulphide, mainly pyrrhotite with trace amounts of galena, sphalerite and chalcopyrite, in Holes Vu-84-4 and Vu-85-1. The sulphides occur in the Lower Aldridge formation, below the inferred trace of the LMC. The relationships between the two occurrences are enigmatic and it is not known if they represent vein occurrences or a lower mineralized stratigraphic horizon. The LMC remains untested in this area.

## **26.0 RECOMMENDATIONS**

Further exploration is warranted to advance the Vulcan property.

Additional follow up prospecting and mapping should be carried out in the area of 2020 prospecting. Objectives should include:

- determining the structural relationships between fragmental bodies, the Moyie sills and the host Aldridge formation sediments
- determining the exact location of the Lower Middle Aldridge contact
- classifying the nature of the sulphide vein mineralization to determine if it is related to the intrusive sills or if it represents a distal expression of a larger mineralized system
- additional prospecting along the northern contact between the White Creek Batholith and the Aldridge sediments in the north Basin area to assess the possibility of remobilized

mineralization along the contact zone

- Airborne Magnetic Geophysics drone survey in southeast corner of the property
- Full LiDAR survey covering the current extent of the property.

There should also be mapping and prospecting carried out in the southern part of the property in the area of recent logging.

Additional ground based MT and 3DIP geophysics should be completed in the area of the 1984-85 Cominco drillholes where the LMC remains untested.

All geological information including geochemistry, geological mapping, geophysics, and drill hole data should be compiled and input into Leapfrog software to construct a geological model. The objectives would be to correlate geological mapping, known markers and drill hole geology to locate areas where the LMC has not been adequately tested.

A two phase program is recommended with the second phase work contingent on results from Phase 1. Phase 2 would include diamond drilling of targets identified in Phase 1. The budget for the recommended Phase 1 program is CAD \$100,000.00 dollars.

## Table 5: Exploration Budget

# Phase 1 Exploration budget

Geological Fieldwork		
Prospecting, Mapping		
Personnel		
4 person crew x 5 days x \$2500/day		\$12,500
Geochemical Analyses		\$2,000
Transportation / Accommodation / Meals		\$10,000
Helicopter Charter		\$15,000
Geophysics		
MT / 3DIP		\$45,500
Data Compilation and Geological Modelling		\$10,000
Contingency		\$5,000
	TOTAL:	\$100,000

## Phase 2 Diamond Drilling Program

Personnel			
Project Geologist	50 days x \$800/day		\$40,000
Technicians (2)	40 days x \$350/day x 2 people		\$28,000
Accommodation / Meals			\$20,000
Transportation 4WD Trucks / ATV Airfare	″'s		\$10,000 \$5,000
Aircraft Charter Helicopter support to changes 100 hours x \$2000 /	for drill moves, crew /hour		\$200,000
Geophysical Surveys interpretation) Borehole EM	(includes data		\$100,000
Diamond Drilling 2500 meters, 5 hole \$200/meter	S X		\$500,000
Analytical Drillcore / Rock	200 samples x \$50 / sample		\$10,000
Contingency		TOTAL:	\$87,000 <b>\$1,000,000</b>

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#### Appendix I Statement of Qualifications

I, P.W. Ransom, Geologist, with business address and residential address of 9452 Clearview Road, Cranbrook, B.C., V1C 7E2, hereby certify that:

- I am a graduate in Geological Sciences with a B.Sc. (1966) from McGill University.
- I was employed by Cominco Ltd from 1966 to 1999 and was continuously engaged in mining and exploration geology during that time.
- I have worked as a contract geologist, consultant or advisor for several clients since 1999, including Teck, Stikine Gold Corporation, Roca, Apex Geoscience, Gravitas Metals Corp, Omineca Mining and Metals, Santa Fe Metals Corp, Kootenay Zinc Corp, Braveheart Resources and Terra Logic.
- I was Project Manager for the Sullivan Deeps drilling project of Stikine Gold Corporation from the spring of 2003 until June 2007, and was directly involved in planning the drilling, coordinating and supervising contractors, monitoring results including logging and sampling of core.
- I am a partner in the Sully property near Fort Steele, BC, where I have conducted geological mapping as well as provided guidance and assistance in several geophysical surveys. I managed drill programs on Sully from 2012 to 2018.
- I own claims in the Mount Evans (Meahen Creek) area where I have carried out basic mapping. These claims are approximately 6 km southeast of the Vulcan Property and have no association with Brascan Gold Corp. or Eagle Plains Resources Ltd. Further, the Vulcan Property and my claims are on opposite sides of the Hall Lake Fault, one of the major regional structural breaks.
- For the purposes of this Technical Report, titled NI 43-101 Technical Report, Vulcan Property for Brascan Gold Corp. ("Brascan"), dated February 1, 2021, I am a Qualified Person as defined in National Instrument 43-101. I am responsible for Item 7 in this technical report. I have read the Instrument (NI 43-101) and this report is prepared in compliance with its provisions.
- I am not an employee, insider, director or partner of Brascan Gold Corp. and do not hold, directly or indirectly, any securities in Brascan or any related company to Brascan, nor do I intend to acquire any such securities in Brascan or any related company. I also have no direct or indirect interest in the property which is the subject of this report, and have no interest, directly or indirectly, in Eagle Plains Resources Ltd., the vendor of the property, in full compliance with all provisions of Section 1.5 of National Instrument 43-101.
- I am a member of the Association of Professional Engineers and Geoscientists of BC (2005) License # 29629.

Dated at Cranbrook, B.C. this February 1, 2021 (Effective Date)

Signed: "P.W. Ransom"

P.W. Ransom, P. Geo

#### Appendix I Statement of Qualifications

#### **CERTIFICATE OF QUALIFIED PERSON**

I, Stephen Kenwood, P.Geo., hereby certify that:

I am an independent Consulting Geologist and Professional Geoscientist residing at 13629 Marine Drive, White Rock, B.C. V4B 1A3

I graduated from the University of British Columbia, Vancouver B.C. in 1987 with a Bachelor's Degree in Science (B.Sc.) in the field of Geology. I have practiced my profession continuously since graduation. I have experience in advanced exploration and development of both precious and base metal projects in British Columbia, Panama, and China and am currently employed by Majestic Gold Corp.

I am registered as a Professional Geoscientist in the Province of British Columbia (No. 20477).

I have prepared this report, titled NI 43-101 Technical Report, Vulcan Property for Brascan Gold Corp. ("Brascan"), dated February 1, 2021, based on a visit to the subject property on January 28, 2021 and a review of all available data concerning the subject property.

For the purposes of this Technical Report I am a Qualified Person as defined in National Instrument 43-101. I am responsible for all the Items in this technical report, with the exception being Item 7. I have read the Instrument (NI 43-101) and this report is prepared in compliance with its provisions.

I am not an employee, insider, director or partner of Brascan or any related party to Brascan, and do not hold, directly or indirectly, any securities in Brascan or any related company to Brascan, nor do I intend to acquire any such securities in Brascan or any related company. I also have no direct or indirect interest in the property which is the subject of this report, and have no interest, directly or indirectly, in Eagle Plains Resources Ltd., the vendor of the property, in full compliance with all provisions of Section 1.5 of National Instrument 43-101.

I have no prior involvement with the Vulcan Property, the subject of this technical report.

At the effective date of this technical report, to the best of the qualified person's knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated at White Rock, B.C. this February 1, 2021 (Effective Date)

Respectfully submitted,

S P. KENWOOD

Stephen Kenwood, P.Geo., Qualified Person