Report to:

**BRIGUS GOLD CORP.**

# Technical Report and Resource Estimate on the 147 and Contact Zones of the Black Fox Complex, Ontario, Canada

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# TECHNICAL REPORT AND RESOURCE ESTIMATE ON THE 147 AND CONTACT ZONES OF THE BLACK FOX COMPLEX, ONTARIO, CANADA

EFFECTIVE DATE: DECEMBER 15, 2011

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1188930600-REP-R0001-02

# TABLE OF CONTENTS

# APPENDICES



# LIST OF TABLES

# LIST OF FIGURES

# GLOSSARY

## UNITS OF MEASURE

| | |
|---|---|
| Above mean sea level | amsl |
| Acre | ac |
| Ampere | A |
| Annum (year) | a |
| Billion | B |
| Billion tonnes | Bt |
| Billion years ago | Ga |
| British thermal unit | BTU |
| Centimetre | cm |
| Cubic centimetre | $cm^3$ |
| Cubic feet per minute | cfm |
| Cubic feet per second | $ft^3/s$ |
| Cubic foot | $ft^3$ |
| Cubic inch | $in^3$ |
| Cubic metre | $m^3$ |
| Cubic yard | $yd^3$ |
| Coefficients of Variation | CVs |
| Day | d |
| Days per week | d/wk |
| Days per year (annum) | d/a |
| Dead weight tonnes | DWT |
| Decibel adjusted | dBa |
| Decibel | dB |
| Degree | ° |
| Degrees Celsius | °C |
| Diameter | ø |
| Dollar (American) | US$ |
| Dollar (Canadian) | Cdn$ |
| Dry metric ton | dmt |
| Foot | ft |
| Gallon | gal |
| Gallons per minute (US) | gpm |

| | |
|---|---|
| Gigajoule | GJ |
| Gigapascal | GPa |
| Gigawatt | GW |
| Gram | g |
| Grams per litre | g/L |
| Grams per tonne | g/t |
| Greater than | > |
| Hectare (10,000 $m^2$) | ha |
| Hertz | Hz |
| Horsepower | hp |
| Hour | h |
| Hours per day | h/d |
| Hours per week | h/wk |
| Hours per year | h/a |
| Inch | in. |
| Kilo (thousand) | k |
| Kilogram | kg |
| Kilograms per cubic metre | $kg/m^3$ |
| Kilograms per hour | kg/h |
| Kilograms per square metre | $kg/m^2$ |
| Kilometre | km |
| Kilometres per hour | km/h |
| Kilopascal | kPa |
| Kilotonne | kt |
| Kilovolt | kV |
| Kilovolt-ampere | kVA |
| Kilovolts | kV |
| Kilowatt | kW |
| Kilowatt hour | kWh |
| Kilowatt hours per tonne (metric ton) | kWh/t |
| Kilowatt hours per year | kWh/a |
| Less than | < |
| Litre | L |
| Litres per minute | L/m |
| Megabytes per second | Mb/s |
| Megapascal | MPa |
| Megavolt-ampere | MVA |
| Megawatt | MW |
| Metre | m |
| Metres above sea level | masl |
| Metres below sea level | mbsl |
| Metres per minute | m/min |
| Metres per second | m/s |
| Metric ton (tonne) | t |
| Microns | µm |
| Milligram | mg |

| | |
|---|---|
| Milligrams per litre | mg/L |
| Millilitre | mL |
| Millimetre | mm |
| Million | M |
| Million bank cubic metres | $Mbm^3$ |
| Million bank cubic metres per annum | $Mbm^3/a$ |
| Million tonnes | Mt |
| Minute (plane angle) | ' |
| Minute (time) | min |
| Month | mo |
| Ounce | oz |
| Pascal | Pa |
| Centipoise | mPa·s |
| Parts per million | ppm |
| Parts per billion | ppb |
| Percent | % |
| Pound(s) | lb |
| Pounds per square inch | psi |
| Revolutions per minute | rpm |
| Second (plane angle) | " |
| Second (time) | s |
| Specific gravity | SG |
| Square centimetre | $cm^2$ |
| Square foot | $ft^2$ |
| Square inch | $in^2$ |
| Square kilometre | $km^2$ |
| Square metre | $m^2$ |
| Thousand tonnes | kt |
| Three Dimensional | 3D |
| Three Dimensional Model | 3DM |
| Tonne (1,000 kg) | t |
| Tonnes per day | t/d |
| Tonnes per hour | t/h |
| Tonnes per year | t/a |
| Tonnes seconds per hour metre cubed | $ts/hm^3$ |
| Volt | V |
| Week | wk |
| Weight/weight | w/w |
| Wet metric ton | wmt |
| Year (annum) | a |

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| all-terrain vehicle | ATV |
| antimony | Sb |
| Black Fox Complex | the Project |

| | |
|---|---|
| Brigus Gold Corp. | Brigus Gold |
| Canadian Institute of Mining | CIM |
| copper | Cu |
| Destor Porcupine Deformation Zone | DPDZ |
| Gibson-Kelore Fault Zone | GKFZ |
| Global Positioning System | GPS |
| gold | Au |
| Hislop Fault | HF |
| induced polarization | IP |
| International Organization for Standardization | ISO |
| inverse distance weighted | IDW |
| iron | Fe |
| lead | Pb |
| magnesium | Mg |
| Ministry of Northern Development and Mines | MNDM |
| National Instrument 43-101 | NI 43-101 |
| National Topographic System | NTS |
| nearest neighbour | NN |
| net smelter return | NSR |
| New York Stock Exchange American Stock Exchange | NYSE Amex |
| North American Datum | NAD |
| ordinary kriging | OK |
| osmium | Os |
| quality assurance/quality control | QA/QC |
| rhodium | Rh |
| rock quality designation | RQD |
| Ross Mine Fault | RMF |
| selective mining unit | SMU |
| silver | Ag |
| Standard Reference Material | SRM |
| Toronto Stock Exchange | TSX |
| Universal Transverse Mercator | UTM |
| Wardrop, a Tetra Tech Company | Tetra Tech |
| zinc | Zn |

# 1.0 SUMMARY

Wardrop, a Tetra Tech Company (Tetra Tech) was retained by Brigus Gold Corp. (Brigus) to estimate a mineral resource in accordance with CIM Best Practices for the Contact and 147 zones of the Black Fox Complex (the Project), and disclose that estimate in a technical report, prepared in accordance with National Instrument 43-101 (NI 43-101) and Form 43-101F1.

## 1.1 PROPERTY DESCRIPTION

The Project includes approximately 2,425 ha of land. The project has a complicated land tenure combination, described in Figure 1.1 while Figure 4.1 lists the current land position for the Project.

## 1.2 GEOLOGY AND MINERALIZATION

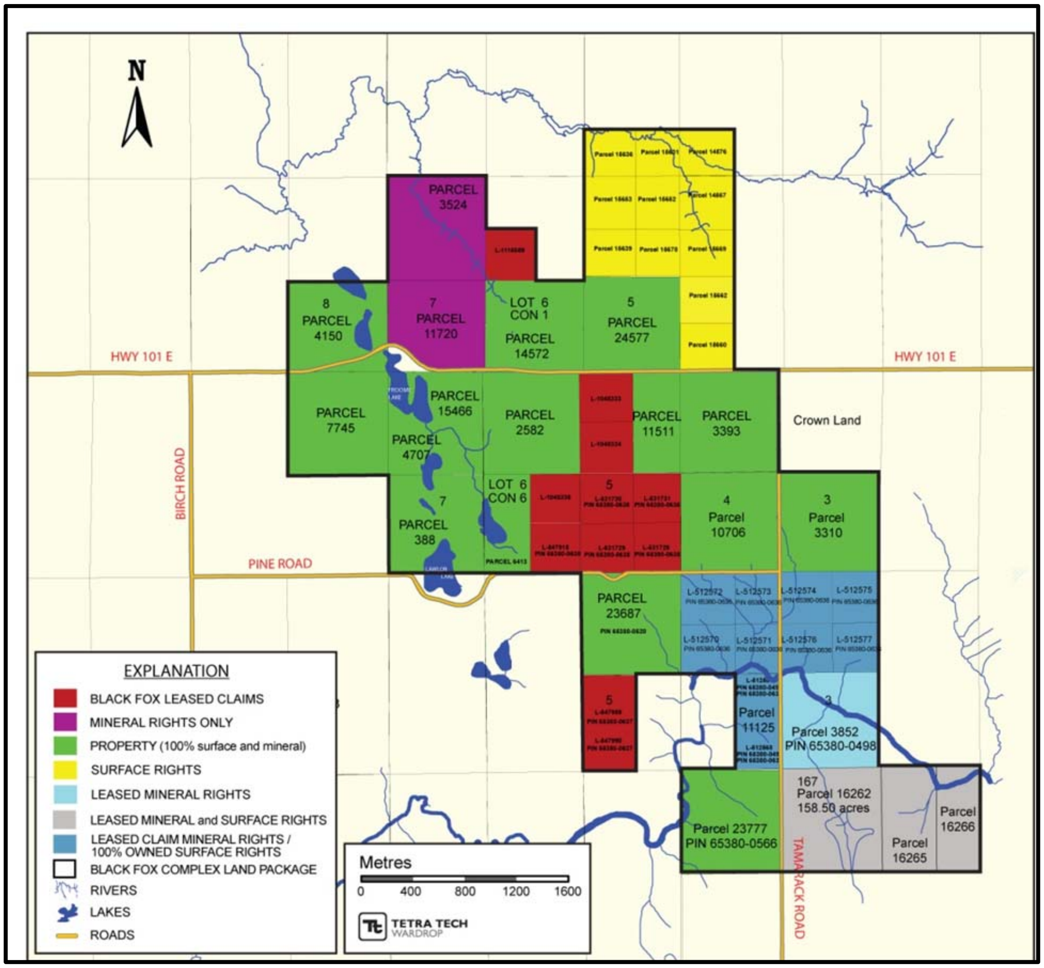
The Project is located within a district-wide, north-northwest trending, down-dropped block located in the north end of the Timiskaming Graben Structure. The down dropping accommodated thicker accumulations of Proterozoic and Paleozoic sediments thereby significantly reducing the exposure of Archean strata to erosion. This has resulted in the preservation of an unusually greater vertical extent of an Archean lode gold depositional system than normally encountered in the majority of Shield areas worldwide, and there are very few examples of these high-level gold deposits. The Contact and 147 Zones have characteristics of high-level, brittle-style mineralization, and similar geological features have also been noted at the former Ross Gold Mine nearby. The best documentation of mineralization classified as high-level, brittle-style elsewhere in an Archean Shield area, are the Wiluna deposits in the Norseman-Wiluna belt, Yilgarn block of Western Australia.

### *1.2.1 CONTACT ZONE MINERALIZATION*

The gold mineralization of the Contact Zone occurs dominantly in the brecciated zones above the sediment contacts. The higher grade appears as “free gold” in the silica and albite altered sections with late stage reddish-white calcite/ankerite veinlets containing 0.5 mm pyrite stringers (Di Prisco 1996).

Metallic mineralization of the Contact Zone is mainly pyrite. Di Prisco, in 1996 analyzed seven samples as thin sections and noted that minor amounts of arsenopyrite, chalcopyrite and pyrrhotite were intergrown with the pyrite. He also noted the pyrite formed as disseminated grains of subhedral to euhedral crystals along hairline fractures.

**Figure 1.1 Black Fox Complex Mineral Claims**




The brecciated quartz cement and veinlets were noted to be "peppered" with fine grain flakes and "rosettes" of molybdenite. One other note was that molybdenite was normally associated with the pyrite and observed to be locally overgrown by pyrite. Di Prisco concluded that there was a direct correlation between the gold precipitation and molybdenite occurrence, with or without pyrite.

### 1.2.2 147 ZONE MINERALIZATION

The gold mineralization known as the 147 Zone is located principally in areas of intense fracturing, microbrecciation, and brecciation, and where the fractures and breccia interstices are filled and cemented by bluish-gray, cherty, zoned, pyrite quartz stringers veinlets.

Veinlet frequency and particularly orientation is difficult to accurately determine in the drill core, however a limited number of oriented drillholes suggest networks or arrays of sub-parallel veinlets in the core area of the 147 Zone with a frequency of approximately two to four of the more wider veinlets per true width of one meter of core. The intervening rocks are intensely brecciated, and generally mineralized with finely disseminated and fracture pyrite within an assortment of variably altered fragments.

## 1.3 STATUS OF EXPLORATION

Brigus has performed aeromagnetic gradient surveys and Titan 24-Deep induced polarization (IP) geophysical surveys on the Project property. The majority of the work performed is in the form of drilling, a total of 247 drillholes were completed in 2011. Diamond drilling is ongoing at this time, the cut-off date for drillholes included in this resource estimate was November 24, 2011.

## 1.4 RESOURCE ESTIMATE

Tetra Tech completed the mineral resource estimation using Gemcom GEMS™ 6.3.1 Desktop software for the Project. Tim Maunula, P.Geo. of Tetra Tech was the QP responsible for the resource estimation of the 147 and Contact Zone deposits in the Black Fox Complex.

The resource database contained information from 327 complete drillholes totalling 107,343.9 m of drilling. A total of 34,304 records were contained in the assay table.

The Contact Zone and 147 Zone mineralization of the Black Fox Complex, as of November 30, 2011 is classified as Indicated and Inferred Resources. The classified mineral resources are shown in Table 1.1. The total Indicated Resource is 867,100 t at a capped grade of 4.180 g/t gold (Au). The total Inferred Resource is 5,464,500 t at a capped grade of 2.611 g/t Au.

**Table 1.1 Resource Statement, Contact and 147 Zones, Black Fox Complex**

| Resource Class | Cut-off Grade (g/t Au) | Potential Material | Tonnes | Capped Au (g/t) | Contained Au (oz) |
|---|---|---|---|---|---|
| Indicated | 2.63 | Underground | 323,800 | 6.991 | 72,890 |
| | 0.65 | Open Pit | 543,300 | 2.505 | 43,820 |
| | | **Total Indicated** | **867,100** | **4.180** | **116,710** |
| Inferred | 2.63 | Underground | 565,700 | 5.902 | 107,510 |
| | 0.65 | Open Pit | 4,898,800 | 2.231 | 351,910 |
| | | **Total Inferred** | **5,464,500** | **2.611** | **459,429** |

The mineral resource is reported at a 0.65 g/t Au cut-off grade for potential open pit material and at 2.63 g/t Au cut-off grade for the potential underground material. These cut-offs have been developed based on current costs experienced at the Black Fox Mine.

## 1.5 Conclusions and Recommendations

Tetra Tech recommends that Brigus continue with diamond drilling of the Contact and 147 Zones and proceed with an advanced exploration program and preliminary economic assessment.

### 1.5.1 *Phase I Recommendations*

Phase I recommendations include:

- conduct metallurgical test work on the various types of mineralization within the Contact and 147 Zones
- conduct infill drilling to upgrade resource classification from Inferred to Indicated
- conduct bulk density testing on the various types of mineralization within the Contact and 147 Zones
- conduct structural geological review.

### 1.5.2 *Phase II Recommendations*

Phase II recommendations include:

- develop an underground advanced exploration program to facilitate the assessment of the Contact Zone mineralization
- conduct a preliminary economic assessment to assess the Project economics
- update the resource estimation as drilling is completed on the Contact and 147 Zones.

### 1.5.3 *Other Recommendations*

Other recommendations include:

- diamond drill tables:
  - insert magnetic field readings into database when using magnetic Reflex instruments for downhole surveys to assist in later identification of questionable azimuth readings
  - do not average assay grades in database
  - record lower detection limits based on assaying methodology
- conduct assay checks for high-grade gold intersections
- improve the QA/QC program and make it more effective through:
  - timely monitoring of control samples

- review of assay methodologies
- consider use of second laboratory for pulp duplicates.

### 1.5.4 BUDGET

A preliminary budget for the recommended work is calculated in Table 1.2

**Table 1.2 Preliminary Budget**

| Phase | Description | Budget ($) |
|---|---|---|
| Phase I | Metallurgical Test Work | 75,000 |
| | Infill Drilling | 4,500,000 |
| | Bulk Density Test Work | 5,000 |
| | Structural Geology Review | 20,000 |
| | **Total Phase I** | **4,600,000** |
| Phase II | Advanced Exploration Program | 3,000,000 |
| | Preliminary Economic Assessment | 150,000 |
| | Update Resource Estimate | 50,000 |
| | **Total Phase II** | **3,200,000** |

Phase I is designed to reduce project risk:

- Infill Drilling upgrades resource classification from Inferred to Indicated Resource
- the metallurgical test work addresses recovery,
- the bulk density test work addresses tonnage of ore and waste
- the structural geology review addresses the geological interpretation.

Based on the results from Phase I, Phase II will be initiated to provide confirmation of mineability through the Advanced Exploration Program and to confirm project economics by the Preliminary Economic Assessment.

# 2.0 INTRODUCTION

Brigus is a Canadian-based and Canadian-registered resource company, based in Halifax, Nova Scotia, and is publicly listed as BRD on both the Toronto Stock Exchange (TSX) and the New York Stock Exchange American Stock Exchange (NYSE Amex). Brigus was formed in the summer of 2010 when Apollo Gold Corporation and Linear Gold Corporation merged (June 24 2010 press release). Brigus is a mid-tier gold producer with projects in Ontario, Saskatchewan, Mexico and the Dominican Republic.

The registered office of Brigus is located at Suite 2001, 1969 Upper Water Street, Purdy's Wharf Tower II, Halifax, Nova Scotia, B3J 3R7 and the principle technical office is located at Suite 700, 357 Bay Street, Toronto, Ontario, M5H 2T7.

This technical report and resource estimate are on the Contact and 147 Zones of the Black Fox Complex of northeastern Ontario, Canada, situated approximately 60 km east of Timmins, and 10 km east of Matheson.

## 2.1 TERMS OF REFERENCE AND PURPOSE OF REPORT

Tetra Tech was retained by Brigus to produce a resource estimate on the Contact and 147 Zones of the Black Fox Complex in accordance with CIM Best Practices, and to disclose it in a technical report prepared in accordance with NI 43-101 and Form 43-101F1.

The objective of this study is to:

- produce a current resource estimate and compile a NI 43-101 technical report on the Project, including a summary of land tenures, exploration history, geophysics, and drilling.
- provide recommendations and a budget for additional work on the Project.

The QPs responsible for this report are Tim Maunula, P.Geo., Tetra Tech Chief Geostatistician and Laura Karrei, P.Geo., Tetra Tech Geologist. Ms. Karrei conducted a site visit to the property between November 7 and 10, 2011.

### *2.1.1 UNITS OF MEASUREMENT*

All units of measurement used in this technical report and resource estimate are in metric, unless otherwise stated.

## 2.2 Information and Data Sources

All the data files reviewed for this study were provided by Brigus in the form of .pdf reports, .xls files, .jpeg files, and a Gemcom GEMS™ database. The exploration work completed by Brigus includes several years of historical data compilation, geophysical surveying, and drilling.

The main source of information in preparing this report is:

- Buss, L. 2010. 43-101 Mineral Resource Technical Report on the Grey Fox – Pike River Property of the Black Fox Complex Hislop Township Matheson, Ontario, Canada, for Brigus Gold Corporation. pp. 64.

A complete list of references is provided in Section 19 of this report.

# 3.0 RELIANCE ON OTHER EXPERTS

In preparation of this report, Tetra Tech has relied upon Brigus and others for information and for matters relating to property ownership, property titles, and environmental issues. The majority of the information has been sourced from Brigus internal reports, company press releases, and Buss (2010).

Tetra Tech is relying on reports, opinions, and statements from experts who are not QPs for information regarding legal, environmental, political, or other issues and factors relevant to the technical report. Neither Tetra Tech nor the Authors are qualified to provide extensive comment on legal issues, including tenure status associated with the Project, and ownership is provided for general purposes only.

Information from third party sources is referenced in Section 19. Tetra Tech used information from these sources under the assumption that the contents are accurate. Tetra Tech has not conducted an examination of land titles or mineral rights for the Project.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

## 4.1 LOCATION

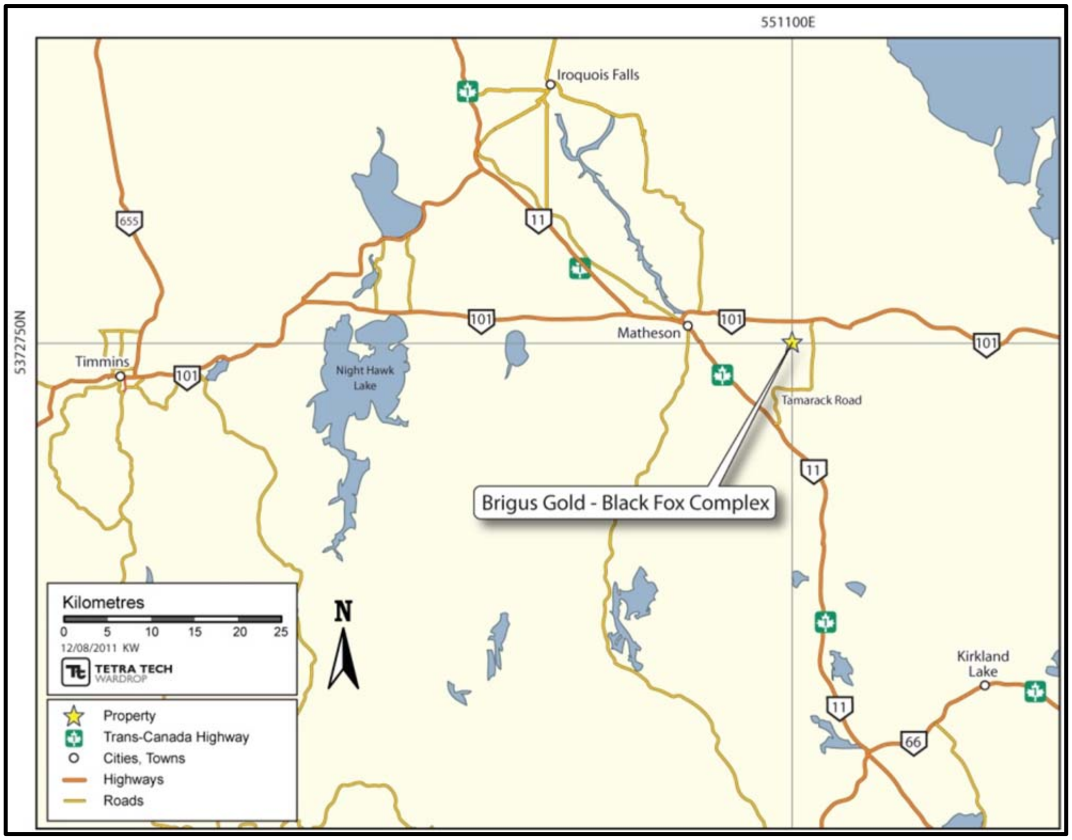
The Project is located:

- in Hislop Township, District of Cochrane, in the Kirkland Lake Mining Division 90
- at approximately N48° 30’ 25” latitude, W80° 18’ 30” longitude on National Topographic System (NTS) map 42–A-8, G plan G-3660
- Universal Transverse Mercator (UTM), North American Datum (NAD) 83 (Zone 17 N) location is 551100E and 5372750N at an elevation of approximately 291 masl
- 10 km east of Matheson, Ontario along Highway 101 and 3 km south of Highway 101 on Tamarack Road
- 6  km east of Timmins
- 55 km north of Kirkland Lake
- in the southeastern portion of the Black Fox Complex.

The Project is situated as shown in Figure 4.1 and Figure 4.2.

**Figure 4.1 General Property Location Map**

**Figure 4.2 Property Location Map of the Black Fox Complex**




## 4.2 PROPERTY DESCRIPTION

The Project property is comprised of 2,425 ha of land as summarized in Table 4.1 and illustrated in Figure 4.3. It is situated within the southeastern portion of the Project (Figure 4.3). The subject of this report is the Contact and 147 Zones contained within the southern portion of the Project.

**Table 4.1 Summary of the Black Fox Complex Mineral Claims**

| Township | Pin No. | Concession No. | Lot No. | Parcel | Hectares | Acreage | Status |
|---|---|---|---|---|---|---|---|
| **Surface and Mineral Rights Owned by Brigus** | | | | | | | |
| Beatty | 65366-0127 | 1 | 6 | 14572 | 61.43 | 151.67 | Surface and Mineral owned by Brigus |
| Beatty | 65366-0143 | 1 | 8 | 4150 | 63.18 | 156.0 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0531 | 6 | 4 | 10706 | 67.98 | 168.0 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0532 | 6 | 6 | 6413 | 32.60 | 80.5 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0552 | 6 | 8 | 7745 | 66.52 | 164.24 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0534 | 6 | 7 | 388 | 59.33 | 146.5 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0555 | 6 | 7 | 15466 | 39.28 | 96.98 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0556 | 6 | 6 | 23876 | 39.89 | 98.5 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0557 | 6 | 6 | 2582 | 62.78 | 155.0 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0558 | 6 | 5 | 11511 | 32.62 | 80.55 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0559 | 6 | 4 | 3393 | 62.87 | 155.238 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0553 | 6 | 7 | 4707 | 18.63 | 46.0 | Surface and Mineral owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 24577 | 233.83 | 577.353 | Surface and Mineral owned by Brigus |
| Beatty | 65366-0186 | 1 | 6 | 13005 | 1.94 | 4.78 | Surface and Mineral owned by Brigus |
| Hislop | 65380-0566 | 4 | 4 | 23777 | 64.60 | 159.5 | Surface and Mineral owned by Brigus |
| ***Total Brigus Owned Surface and Mineral Rights*** | | | | | ***907.47*** | ***2240.811*** | **-** |
| **Surface Rights Only Owned by Brigus** | | | | | | | |
| Beatty | 65366-0126 | 1 | 5 | 15639 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15653 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15636 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15651 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15652 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15670 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 14576 | 15.92 | 39.3 | Surface Rights owned by Brigus |

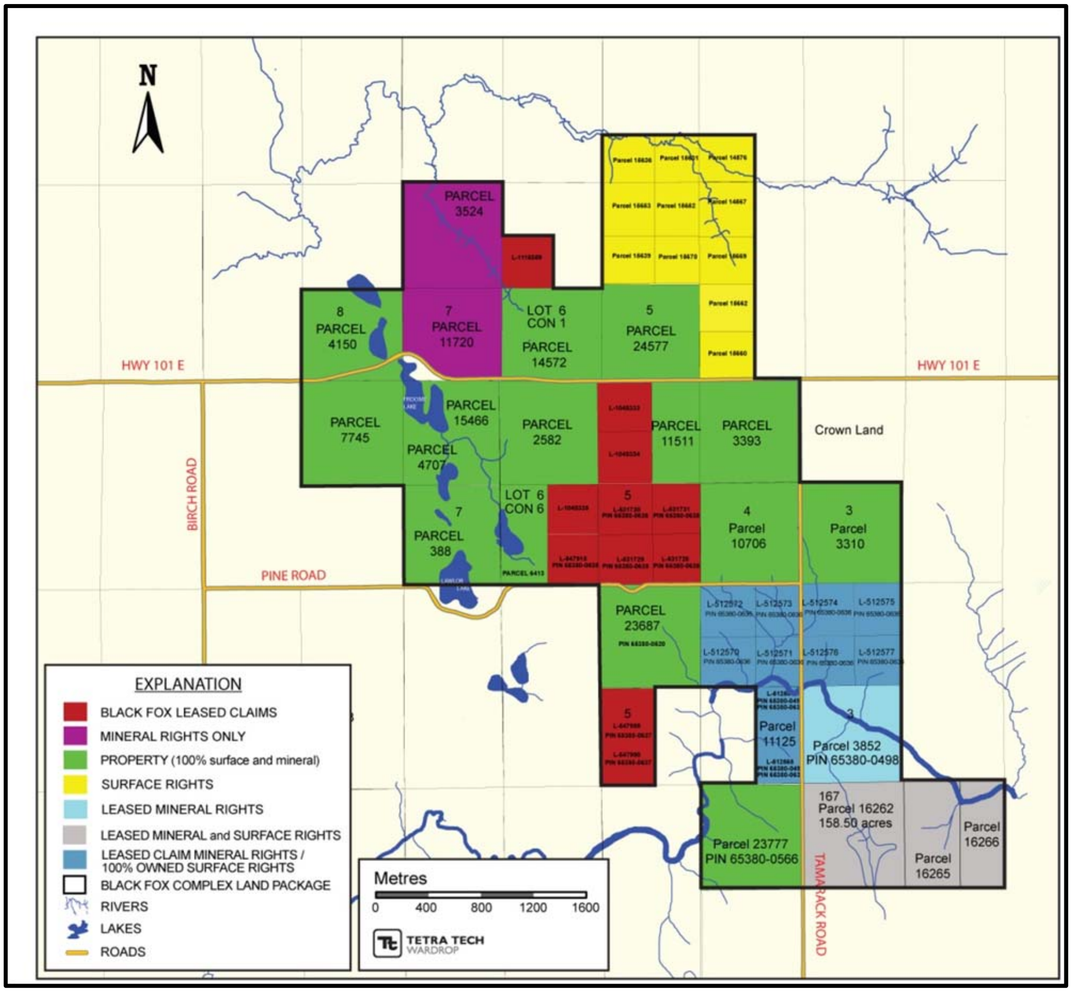
*table continues…*

| Township | Pin No. | Concession No. | Lot No. | Parcel | Hectares | Acreage | Status |
|---|---|---|---|---|---|---|---|
| Beatty | 65366-0126 | 1 | 5 | 14567 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15669 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15662 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Beatty | 65366-0126 | 1 | 5 | 15660 | 15.92 | 39.3 | Surface Rights owned by Brigus |
| Hislop | 65380-0521 | 5 | 4 | 24023 | 3.15 | 7.78 | Surface Rights owned by Brigus |
| Hislop | 65380-0525 | 5 | 3 | 10255 | 32.10 | 79.25 | Surface Rights owned by Brigus |
| Hislop | 65380-0499 | 5 | 4 | 11125 | 32.10 | 79.25 | Surface Rights owned by Brigus |
| Hislop | 65380-0520 | 5 | 4 | 23687 | 118.25 | 292.21 | Surface Rights owned by Brigus |
| ***Total Surface Rights Only Owned By Brigus*** | | | | | ***242.43*** | ***598.58*** | **-** |
| **Mineral Rights Only Owned by Brigus** | | | | | | | |
| Beatty | 65366-0129 | 1 | 7 | 23874 | 123.27 | 304.37 | Mineral Rights owned by Brigus |
| ***Total Mineral Rights Only Owned By Brigus*** | | | | | ***123.27*** | ***304.37*** | **-** |
| **Leased Mineral and Surface Rights by Brigus** | | | | | | | |
| Hislop | 65380-0489 | 4 | 3 | 16262 | 64.19 | 158.5 | Leased Mineral and Surface Rights |
| Hislop | 65380-0490 | 4 | 2 | 16265 | 32.50 | 80.25 | Leased Mineral and Surface Rights |
| Hislop | 65380-0491 | 4 | 2 | 16266 | 32.50 | 80.25 | Leased Mineral and Surface Rights |
| ***Total Leased Mineral and Surface Rights By Brigus*** | | | | | ***129.20*** | ***319.0*** | **-** |
| **Leased Mineral Rights by Brigus** | | | | | | | |
| Hislop | 65380-0498 | 5 | 3 | 3852 | 58.08 | 143.41 | Leased Mineral Rights Only |
| ***Total Leased Mineral Rights By Brigus*** | | | | | ***58.08*** | ***143.41*** | **-** |
| **Leased Mining Claims by Brigus** | | | | | | | |
| Beatty | 65366-0199 | 1 | 6 | L-1115059 | 16.22 | 40.8 | Leased Mineral Rights/Surface Rights Claims |
| Hislop | 65380-0636 | 5 | 4 | L-512572 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 4 | L-512573 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 4 | L-512570 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 4 | L-512571 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 3 | L-512574 | 16.52 | 40.8 | Leased Mineral Rights Claim |

*table continues…*

| Township | Pin No. | Concession No. | Lot No. | Parcel | Hectares | Acreage | Status |
|---|---|---|---|---|---|---|---|
| Hislop | 65380-0636 | 5 | 3 | L-512575 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 3 | L-512576 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 3 | L-512577 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 4 | L-512568 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0636 | 5 | 4 | L-512569 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0637 | 5 | 5 | L-547989 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0637 | 5 | 5 | L-547990 | 16.52 | 40.8 | Leased Mineral Rights Claim |
| Hislop | 65380-0638 | 6 | 6 | L-547915 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0638 | 6 | 5 | L-531728 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0638 | 6 | 5 | L-531729 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0638 | 6 | 5 | L-531730 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0638 | 6 | 5 | L-531731 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0670 | 6 | 5 | L-1048334 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0670 | 6 | 6 | L-1048335 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| Hislop | 65380-0671 | 6 | 7 | L-1113087 | 8.91 | 22.0 | Leased Mineral Rights Claim |
| Hislop | 65380-0676 | 6 | 5 | L-1048333 | 16.52 | 40.8 | Leased Mineral Rights/Surface Rights Claim |
| **Total Mining Claims Leased By Brigus** | | | | | **355.61** | **878.80** | **-** |

**Figure 4.3 Black Fox Complex Mineral Claims**




The above-mentioned mineral claims cover all of the known mineralized area within the Project described within this report, and contain sufficient land for exploration and development purposes.

The Project property is comprised of 715.93 ha of land occurring at the southeastern part of the total 2,425 ha owned by Brigus as part of the Project (Figure 4.3) (Buss 2010).

Of the 715.93 ha contained in the Project property, 182.28 ha are 100% owned mineral and surface rights by Brigus (Figure 4.3). Patented leased mineral and surface rights are another 129.00 ha. Leased mineral rights include 58.00 ha, while the leased mining claim rights are 280.00 ha. A total of 65.92 ha of the property is 100% surface rights only (Buss 2010).

All leases and claims were summarized in a report by Mr. John Huot, Barrister & Solicitor of Timmins, Ontario (Huot 2007). The summary includes the legal description, royalty holder and the financial obligations of Brigus in regards to the property. A property index map was also created showing the lots, claim numbers and plan numbers of the area recorded with the Ontario Ministry of Consumer and Business Services in the District of Cochrane – office 06. Within the Project, there are seven privately owned surveyed properties identified as plans 6R-4149, GR-2510 and GR-6577. A compensated working relationship exists between Brigus and the 6R-4149 property owners. The remainder of the property is surveyed in terms of lots and concessions, as originally laid out by the Government of Ontario in the 1900s.

## 4.3 Option Agreements

Battle Mountain Gold Company obtained the lease in 1996 and worked the property until 1999 in conjunction with Cameco Gold. The property was then transferred back to the Schumacher Estate until 2007. Brigus Gold acquired the property in 2007 with a net smelter return (NSR) and yearly payments option for the next 20 years (Buss 2010).

## 4.4 Environmental and Surface Rights

The decline entrance on the southeast corner of claim L512568 accessing the old Gibson West deposit has been backfilled with muck and site levelled. The main inclined ventilation raise to surface in the northwest corner of Parcel # 23777 for the Gibson West underground workings has been sealed with a cement cap. Both sites were previously inspected and approved by the Ministry of Northern Development and Mines (MNDM) (Garber 1997; Buss 2010).

Tetra Tech is not aware of any environmental or social issues regarding the property. All exploration activities conducted on the property are in compliance with relevant environmental permitting requirements. To Tetra Tech's knowledge, Brigus has obtained the appropriate permits to use the surface rights.

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

## 5.1 ACCESSIBILITY

The Project is located approximately 10 km east of Matheson, 55 km north of Kirkland Lake (population ~8,200) and 60 km east of Timmins (population ~43,000). Access to the Project area is via the gravel Tamarack Road which runs south from Highway 101. The nearest town is Holtyre, which is 5 km south of the property. The population of the Black River-Matheson Township, which includes the communities of Holtyre, Matheson, Ramore, Shillington, Val Gagné and Wavell, is approximately 2,600. Access within the property itself is achieved by various drill roads and all-terrain vehicle (ATV) trails.

## 5.2 CLIMATE AND PHYSIOGRAPHY

The minimum and maximum mean annual temperatures in the region are -4.8°C and 7°C, respectively. July and January average temperatures are 17.3°C and -17.3°C, respectively. The mean annual rainfall for the region is 857 mm (www.worldclimate.com).

Rapid melting of accumulated snowfall can produce local flooding on the property for short periods during the spring months. Average monthly wind speeds for the region are 11 to 15 km/h (Dyck 2007). Exploration activities may take place throughout the year.

The property is located in a Boreal Shield ecosystem. The topography is moderate and averages about 280 masl. Secondary growth forest covers about 75% of the property and rock outcrops are sparse, comprising only 5% of the property physiography. There is a thick clay rich overburden material throughout the property that is typically 20 to 30 m thick (Buss 2010).

## 5.3 LOCAL RESOURCES AND INFRASTRUCTURE

Supplies and services are available in Matheson or Timmins and can be delivered within a 12 h turnaround time. Forestry and mining are the primary industries, and the property is located within a well-established mining camp. Mining and exploration personnel as well as equipment can therefore be locally sourced.

Electrical power is readily available at the exploration site via power lines along Tamarack Road. Electrical services were historically available on the property during production of the Gibson West Mine during the late 1980s. The Brigus Black Fox mining facility, situated 3 km north of the property, is the closest infrastructure to the property. It contains the core logging and cutting amenities, offices, power substations and communication networks. The Brigus Black Fox ore is processed at their 100% owned mill in Stock Township located 30 km west of the mine site along Highway 101 towards Timmins (Buss 2010).

The only infrastructure on the Project property is a few buildings that used in the past for reject and core storage. A sealed underground ramp, with development and a capped ventilation raise are also located on the southwestern edge of the claim group. Hydro runs through the property along Tamarack Road (Buss 2010).

The decline entrance on the southeast corner of claim L512568 accessing the old Gibson West deposit has been backfilled with muck and site levelled. The main inclined ventilation raise to surface in the northwest corner of Parcel # 23777 for the Gibson West underground workings has been sealed with a cement cap. Both sites were previously inspected and approved by the MNDM (Garber 1997 and Buss 2010).

# 6.0 HISTORY

## 6.1 OWNERSHIP

The Project was first staked by Frederick Schumacher in the early 1900s. It was eventually patented and worked as farm land until 1992. No other ownership during this time is known and the majority of exploration efforts in the area were focused on adjacent properties (Buss 2010). In the early 1990s Noranda acquired the property and subsequently optioned it to Hemlo Gold Mines Inc. in 1995 (Kuehnbaum 2010). Battle Mountain Gold Company acquired the lease in 1996 and worked on the property until 1999, in conjunction with Cameco Gold. The Project claims were then transferred back to the Schumacher Estate until 2007, when it was acquired by Apollo Gold Corp. (which subsequently merged with Linear Metals Corp. to form Brigus) with a NSR and yearly payment options for the following 20 years (Buss 2010).

## 6.2 SUMMARY OF HISTORIC EXPLORATION ON THE BLACK FOX COMPLEX

The exploration history of the region dates back to the early 1900s, with the majority of the known work commencing in earnest in 1989. Table 6.1 summarizes the history of the property.

Table 6.1 discloses historical estimates using their original terminology. In each case, the source and date of the historical estimate is identified. These historical resources are considered relevant, but no comment is offered on their reliability. A QP has not completed sufficient work to classify the historical estimates as current mineral resources and the issuer is not treating the historical estimates as current mineral resources. The historical estimates should not be relied upon

No known development and/or production have been conducted on the Contact or 147 Zones.

**Table 6.1 Summary of Black Fox Complex History**

| Year | Company | Activity | Comments | Historical Resource Estimate* | Source of Information |
|---|---|---|---|---|---|
| Early 1900s | Frederick Schumacher | • staking | • property first staked by Frederick Schumacher | - | Buss 2010 |
| 1936 | E.S. Moore, Ontario Department of Mines | • mapping | • first time Hislop Township area was mapped | - | Buss 2010 |
| 1937-1989 | Schumacher Estate | • n/a | • property held privately by Schumacher Estate, no known exploration activities<br>• companies in area were generally focused on Gibson zone, Hislop gold zone, Exall-Glimmer Mine and the Ross Mine | - | Buss 2010 |
| 1989 | Goldpost Resources Inc. | • drilling, resource estimate | • unknown amount of holes drilled into contact/breccia zone with unspecified results, estimated tonnage eventually calculated | • first historical resource estimate on the Grey Fox Contact zone: 109,000 st at 0.18 oz/st | Atherton 1989 |
| 1993 | Noranda Exploration Company | • drilling | • north-south grid established, 14 diamond drillholes spaced 100 m apart, 4,870 m | - | Garber and Dahn 1997 |
| 1994 | Noranda Exploration Company | • magnetometer and IP resisitivity survey | • re-established north-south grid | - | Garber and Dahn 1997 |
| 1994 | Noranda Exploration Company | • drilling | • three drillholes, 200 m spacing, north end of Contact zone, 919 m, whole rock geochemistry | - | Garber and Dahn 1997 |

*table continues…*

| Year | Company | Activity | Comments | Historical Resource Estimate* | Source of Information |
|---|---|---|---|---|---|
| 1995 | Battle Mountain Gold Company | • drilling | • east-west grid established, seven drillholes on south end of Contact zone, 2,323 m, calculated estimated resource from previous drilling results | - | Buss 2010 |
| 1996 | Battle Mountain Gold Company and Cameco Gold | • drilling | • 16 drillholes on Contact zone | - | Buss 2010 |
| 1997 | Battle Mountain Gold Company and Cameco Gold | • drilling, resource estimate | • five drillholes, 2,331 m, south end of Contact zone, updated resource estimate | • Three separate estimations:<br>• initial estimate via a "Boreserve" computerized program produced a resource of 2.18 MT at 4.8 g/t Au, including 1.27 Mt at 7.0 g/t Au (Garber 1997)<br>• the second estimate, calculated from Gemcom software via polygonal method, 1,163,897 t at 6.4 g/t Au (Garber 1997).<br>• another estimate was noted in a 1998 Exall memorandum which stated there was an Indicated Resource of 1,541,000 t at 7.0 g/t Au, another 347,000 t at an unknown grade was estimated as an Inferred Resource (Trimble 1997). | Buss 2010 |
| 1997 | Battle Mountain Gold Company and Cameco Gold | • mineralogical examination | • seven drill core samples from 1996 program examined | - | Garber and Dahn 1997 |

*table continues…*

| Year | Company | Activity | Comments | Historical Resource Estimate* | Source of Information |
|---|---|---|---|---|---|
| 2002 | Unknown | • resource estimate | • written in a Newmont Prospectus | • 2.2 Mt at 4.8 g/t Au which included 1.16 Mt at 6.4 g/t Au | Buss 2010 |
| 2008 | Apollo Gold Corp.* | • drilling | • follow-up on historical holes, 16 drillholes, 3,715 m, southern extension of Contact zone, Hislop North, drilled by Norex drilling, NQ diameter core, typically Reflex instrument reading every 50 m for downhole surveying | - | Buss 2010 |
| 2008 | Apollo Gold Corp.* | • mineralogical examination | • four drill core samples from 2008 program examined | - | Buss 2010 |
| 2009 | Apollo Gold Corp.* | • drilling | • 53 drillholes, main portion of Contact zone, 9,961 m, drilled by Norex drilling, NQ diameter core, typically Reflex instrument reading every 50 m for downhole surveying | - | Buss 2010 |
| 2010 | Brigus, Jeff Choquette | • resource estimate | - | • 575,300 t at 4.24 g/t Au at a 1.0 g/t cut-off value for Measured and Indicated Resources<br>• at a 3.0 g/t cut-off value, the total was 269,200 t at 7.16 g/t Au<br>• total Inferred Resources amounted to 1,324,100 t at 2.62 g/t Au for a 1.0 g/t cut off and 333,500 t at 5.47 g/t Au for a 3.0 g/t cut-off | Buss 2010 |

Note: *in 2010, Linear purchased Apollo Gold and formed Brigus Gold Corp.

# 7.0 GEOLOGICAL SETTING AND MINERALIZATION

## 7.1 REGIONAL GEOLOGY

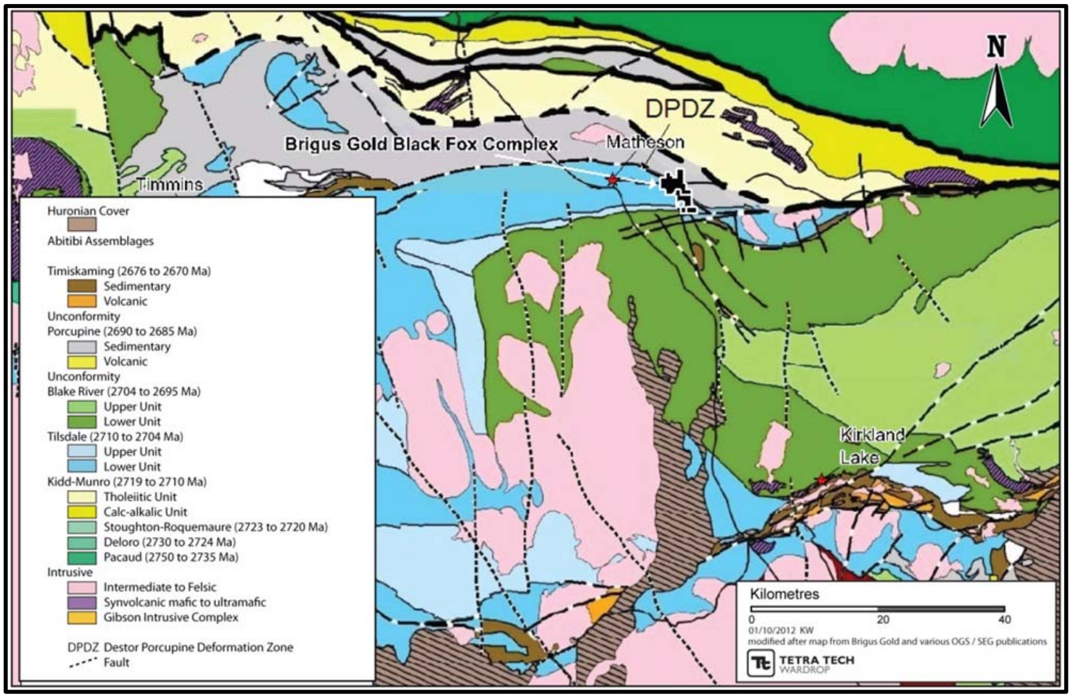
The 147 Gold Zone occurs in altered variolitic mafic volcanic rocks of the Tisdale assemblage and the Contact Gold Zone occurs at the contact between mafic volcanics (Tisdale Assemblage) and sediments (Timiskaming Assemblage) in brittle-style sturctures associated with the Matheson portion of the Destor Porcupine Deformation Zone (DPDZ).

During the past decade, the Abitibi Subprovince has been the focus of an extensive geoscience program, and the subsection on regional geology that follows draws extensively from the numerous publications that resulted from the Discover Abitibi Initiative.

The Abitibi Subprovince consists of the following seven major litho-tectonic volcanic assemblages (Figure 7.1):

- Pre-2750 Ma
- 2750 to 2735 Ma (Pacaud)
- 2734 to 2724 Ma (Deloro)
- 2723 to 2720 Ma (Stoughton-Roquemaure)
- 2719 to 2711 Ma (Kidd-Munro)
- 2710 to 2704 Ma (Tisdale)
- 2704 to 2695 Ma (Blake River).

**Figure 7.1 Regional Geology Map of the Abitibi Subprovince**




The volcanic assemblages are unconformably overlain by two dominantly sedimentary assemblages representing detritus derived from the volcanics in the form of turbidites, conglomerates and sandstones that overall, are generally more felsic than the volcanic assemblages. These basin forming assemblages are:

- 2690 to 2685 Ma (Porcupine)
- 2676 to 2670 Ma (Timiskaming).

Plutonic rocks form three distinct groups:

- 2745 to 2696 Ma (Synvolcanic) that are coeval with the main volcanic sequences and predate significant compressional strain
- 2695 to 2672 Ma (Syntectonic) that are coeval with the Porcupine or Timiskaming Assemblage and some of the deformational episodes in the region
- 2670 to 2660 Ma (Late Tectonic) that are typically massive batholiths.

An early episode of regional D1 deformation occurred during the early phases of syntectonic plutonism, and included the uplift and excision of upper Tisdale stratigraphy with formation of an angular unconformity pre-dating deposition of Porcupine assemblage at 2690 Ma.

The D2 event postdates the Porcupine Assemblage as it is deformed by it, but D2 structures are unconformably truncated by, and thus predate, the Timiskaming Assemblage. D2 resulted in localized folding and thrusting and early south-side up, dip-slip, ductile deformation on regional deformation zones. The DPDZ is characterized by a fault trace over 400 km long with generally steep structures.

The Timiskaming Assemblage consists of conglomerate and sandstone, locally with volcanic rocks. It was deposited with angular unconformity on the older volcanic and sedimentary assemblages, typically in long linear basins with unconformable contacts along the north margin and in faulted contact with the DPDZ. Facies studies indicate the basal portions were deposited subaerially and include alluvial–fluvial environments, whereas the upper portions are more typically deeper water sediments that include turbidites and iron-poor iron formation.

The supracrustal rocks are broadly coeval with small syntectonic alkalic intrusions, ranging from 2680 to 2672 Ma, also found in close proximity to the major deformation zones. The period during which the Timiskaming Assemblage formed is thought to represent extensional to transpressional tectonism associated with continental island arc magmatism and sedimentation in which the supracrustal units were unconformably deposited in subaerial alluvial fan and fluvial environments closely associated to regional scale faults.

Broadly synchronous with the syntectonic opening of Timiskaming basins in dilatational jogs, was D3 folding, only the late stages of which affected the assemblage. Left-lateral strike-slip movement along the DPDZ accompanied D3 and is interpreted to be associated with up to 13 km of sinistral offset of markers across the DPDZ in the Timmins area.

The D4 folding created synclines within the Timiskaming Assemblage rocks and right-lateral strike slip displacement along the DPDZ. A late tectonic magmatic event consists of granitic plutons, ranging in age from 2670 to 2660 Ma, postdates the Timiskaming Assemblage. These plutons occur both within the batholiths and the supracrustal rocks. They appear to be temporally associated with D4 folding.

The D4 to D5 events represents the final stage in transpressional deformation along the DPDZ in Timmins. These deformation events are associated with the generation of crenulation cleavages, minor folds and brittle faulting, but do not appear to be associated with regional scale folding.

The bulk of the gold mineralization in the Porcupine-Timmins Gold Camp is contained within mafic metavolcanic rocks primarily within the Tisdale Assemblage, an approximately 3 km thick tholeiitic suite of 2710 to 2704 Ma rocks consisting predominantly of metabasalts intercalated metakomatiites towards its base and intermediate and/or felsic rocks towards its top. Tisdale-age ultramafic and mafic sills have also been locally emplaced into the underlying and somewhat older, Kidd-Munro Assemblage 2719 to 2711 Ma.

Gold mineralizing episodes included an early, lower-grade gold event predating the Timiskaming unconformity that was probably synchronous with D2 thrusting and folding and early south over- north dip-slip movement on the DPDZ.

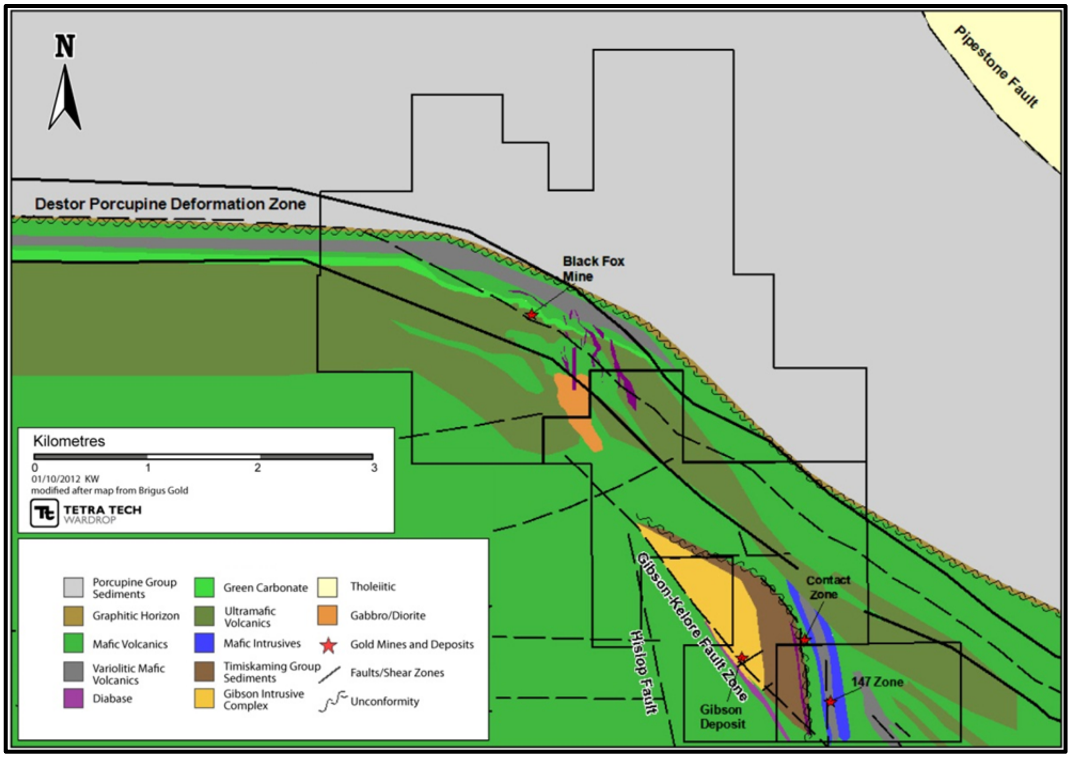
The main stage gold mineralization was associated with a protracted D3 event which coincided with the opening of the Timiskaming basin, but also overprinted the Timiskaming sediments. Rhodium-osmium (Rh-Os) geochronology on molybdenite associated with main-stage gold mineralization provide an age of 2672±7 Ma at the McIntyre Mine, and 2670±10 Ma at the Dome Mine.

The D4 folding and faulting that preserved Timiskaming Assemblages in synclines along the DPDZ is associated with a late-stage gold event along the Pamour Mine trend.

There is an important structural control on the gold mineralization and much of the Porcupine-Timmins ores are hosted in quartz-carbonate shear and extension veins in close proximity and structurally related to the DPDZ and its second order parallel shear zones. Within the framework of an Archean lode gold model, the vertical, (depth) extent of the Porcupine-Timmins ores span the middle to lower levels of the depositional system (i.e. from within the brittle-ductile transition and well into the ductile regime).

While the 147 and Contact Gold Zones share similarities with the Porcupine-Timmins Gold Camp with a Tisdale assemblage and proximity to DPDZ related structures, they differ from the latter in that they are a high-level, brittle-style gold deposit with an apparent absence of well-defined ductile shear zones.

**Figure 7.2 District Geology and Gold Mines and Deposits**




## 7.2 PROPERTY GEOLOGY

### 7.2.1 INTRODUCTION

The 147 and Contact Zones are located within the Grey Fox-Pike River project area which essentially forms the southeast-half of the greater Brigus Black Fox Mine Property. The geology of the Brigus Black Fox Mine located in the northwest-half of the property has been described in detail in a report already on file with SEDAR:

- Apollo Gold - Black Fox Mine Geological Staff. 2007. Black Fox Project: Update on the Local Geology of the Black Fox Project May, 2007, 45 p.

The primary focus of this report is the 147 and Contact Zones located approximately 3.5 to 4.0 km to the southeast of the mining operations. As no formal geological studies have been completed on this portion of the property, all of the descriptive geological data herein are derived from visual notations made during the course of routine core logging, and should be regarded as preliminary.

The 147 and Contact Zones occurs approximately 1200 m to 1400 m southwest of the DPDZ, 5 km north-northwest of the former Ross Gold Mine at the village of Holtyre, and approximately 11 km east of the town of Matheson.

Regional studies have indicated that the property is located within a district-wide, north-northwest trending, down-dropped crustal block located in the far northward extremities of the Timiskaming Graben Structure. The down dropping accommodated thicker accumulations of Proterozoic and Paleozoic sediments thereby significantly reducing the exposure of Archean strata to erosion. This has resulted in the preservation of an unusually greater vertical extent of an Archean lode gold depositional system than normally encountered in the majority of Shield areas worldwide, and there are very few examples of these high-level gold deposits. The 147 and Contact Zone has the characteristics of high-level, brittle-style mineralization, and similar geological features have also been noted at the former Ross Gold Mine nearby. The best documentation of mineralization classified as high-level, brittle-style elsewhere in an Archean Shield area, are the Wiluna deposits in the Norseman-Wiluna belt, Yilgarn block of Western Australia.

### *7.2.2 LITHOLOGIES*

The property is largely underlain by the Lower Unit of the Tisdale assemblage, a south-west to west topping assemblage of basal ultramafic-mafic volcanics, grading upward into a dominantly iron (Fe)-and magnesium (Mg)-tholeiitic sequence of pillowed, massive and variolitic mafic volcanics. Both magnetite-bearing and non-magnetic units have been noted. Some of the more distinctly massive, fine to medium grained mafic units appear to have been emplaced as sills, and tentatively have been designated as gabbros. Flow episodes in the dominantly mafic portion of the assemblage may be marked by the development of flow breccias, and/or thin, but mappable, units of pyritic, argillaceous and/or cherty interflow sediments. All units are extensively altered to a lower greenschist assemblage as described in the subsection on regional metamorphism.

Remnants of pre-glacial, deep weathering (oxidation) were frequently encountered in the drilling. Patches and intervals of reddish-brown oxidized iron appear to have developed primarily in the upper 10 to 20 m, within and marginal to breccias, and networks of joint and fractures. Several pockets of oxidation were occasionally encountered as far down as 30 to 40 m.

From east to west in the immediate vicinity of the 147 and Contact Zones, the 300 to 400 m thick sequence of north trending and steeply east-dipping, thus slightly overturned, Tisdale rocks, consist of massive flows marked by brecciated flow tops, gabbro, the 147 Zone variolitic host unit, gabbro, pyritic, interflow sediments, and pillowed and amygdaloidal basalt. Further to the west at the Contact Zone, this sequence of Tisdale rocks is in major fault contact with a north-south trending wedge of Timiskaming Assemblage siliceous, pyritic, metasediments. To the east, this dominantly mafic sequence descends lower into the Tisdale stratigraphy and includes ultramafic units.

The massive mafic flows are generally aphanitic and dark to medium green. Both magnetite-bearing and non-magnetic units have been mapped. Flow breccias fragments often appear paler grey green than the massive intervals, but is likely the result of pervasive carbonate alteration penetrating inward from the breccia interstices rather than primary compositional differences. Minor pyrite has occasionally been noted in matrix and as fragments.

Well-preserved pillow lavas were extensively observed in drill core and are characterized by 1 to 2 cm wide, dark green chloritic selvages that are commonly calcitic and extensively epidotized. They are commonly amygdaloidal towards the pillows margins with small (2 to 3 mm) calcite- or chlorite-filled amygdales. Amygdaloidal areas in non- pillowed intervals do not appear to be extensive, however when present tend to be larger, up to a centimetre in diameter of either calcite or milky quartz, and appear more spherical.

The gabbro units are generally massive, fine to medium grained, sparsely jointed, are commonly leucoxene-bearing, and locally may be extensively epidotized. Both magnetite-bearing and non-magnetic units have been mapped.

While foliation fabric is rarely observed, brittle deformation is wide-spread. Fracturing and zones of brecciation are particularly well developed in the siliceous metasediments and in variolitic and massive volcanic units, and to a much lesser extent in the gabbros. Excluding the areas of mineralization, the most common form of brittle deformation in lavas is widespread, irregular to regular fracturing in many directions, that is marked by <1 to 5 mm wide calcite and white quartz/calcite veinlets, that locally may impart a pseudo-marbled look to the core.

The basal Tisdale assemblage is shown on government maps to be unconformably bounded to the north by the metasedimentary Porcupine Assemblage.

As previously mentioned, a north-south trending wedge of Timiskaming Assemblage siliceous metasediments, dominantly sandstones with subordinate greywacke and thinly bedded chert, marks the upper extent of the Tisdale Assemblage (Contact Zone) to the west in this area of the property. In turn, the west contact of the metasedimentary wedge is marked by the northwest trending Gibson-Kelore Fault Zone in the south, and the Gibson Intrusive Complex in the north.

The Gibson Intrusive Complex was emplaced along a portion of the eastern margin of the Gibson-Kelore Fault Zone. Despite being pervasively altered (hematized, sausseritized, silicified, pyritized), and locally subjected to intense brittle deformation, two distinct phases, a medium grained (hornblende) diorite, and a plagioclase feldspar porphyry, have been recognized.

Narrow, subordinate, feldspar porphyry, lamprophyre, aplite and felsite dykes were also noted in recent drilling.

A cluster of younger diabase (Matachewan) dykes trend northward through the central part of the property and were observed in drill core to cut through both the Tisdale and Timiskaming assemblages.

### 7.2.3 *Regional Metamorphism*

Regional metamorphism is lower greenschist (or perhaps even prehnite-pumpellyite as per D.G. Troop 1988), that in the mafic volcanic and intrusive rocks, has resulted in an assemblage of epidote-albite-calcite-hornblende-chlorite (+leucoxene).

Wide-spread sausseritization of the plagioclase feldspars is readily evident with the sodic component forming albite, and the calcic component giving rise to an assemblage of epidote, calcite and zoisite. Simultaneous with this process is the formation of hornblende after augite, and the subsequent chloritization of hornblende.

The ultramafic rocks are generally dark waxy green where serpentinized, or buff-coloured where carbonatized, and also commonly magnetic.

### 7.2.4 *Principal Structures*

The Brigus Black Fox Mine Property is somewhat unique with respect to the DPDZ in that the DPDZ segment located across the northeastern portion of the property ceases following its predominantly east-west trend along the Tisdale-Porcupine assemblages contact. The DPDZ segment on the property trends southeastward, and somewhat obliquely up-section through the Tisdale stratigraphy. A few kilometers southeast and off-property in Guibord Township, the DPDZ reaches the lower contact of the Blake River assemblage and returns to its normal eastward trend following along the Tisdale-Blake River assemblage contact.

Southwest of the DPDZ, and likely connected at depth, is a 2$^{nd}$-order structure, the Gibson-Kelore Fault Zone (GKFZ), that sub-parallels the former approximately 800 to 1,600 m south-west. The north-northwest trending Hislop Fault (HF), that for the most part lies immediately outside the west boundary, is another second order structure that appears to merge with the GKFZ in the central part of the property. Both the GKFZ and HF are known to be associated either directly or indirectly with gold mineralization along their extents either on- or off-property.

An east-west trending, but off-property structure, the Arrow Fault, cuts across both the HF and GKFZ at locations approximately 100 to 200 m south of the south property boundary, thereby forming a triangular wedge with the aforementioned second order structures.

Another seemingly related second order structure, but also off-property and to the south-east, is the north trending and west dipping Ross Mine Fault (RMF) that appears to merge with the GKFZ at its north end.

Carbonatization appears to be the dominant alteration type associated with these structures, with ankerite dominating the core area of zones, and calcite-dolomite towards the margins. Hematization is also quite common, particularly in association with quartz-poor intrusive rocks which may have an alkaline affinity, but this remains unconfirmed. As a result of the brittle nature of the deformation, hematization occurs both as fracture-controlled specularite coatings and pervasively as hematite dust (inclusions) in feldspars.

The 147 and Contact Zones appear to be located approximately on north to northwest trending splays (third order structure?) off the GKFZ, and all of the more significant gold mineralization in this portion of the Matheson district have at least a spatial, and most likely a structural link, with one of the principal strike-slip faults.

### 7.2.5 ALTERATION OVERPRINTS

In addition, to the assemblage of alteration minerals considered as part of greenschist grade of regional metamorphism, many of the rocks encountered in the drilling were noted to be partially, or intensely overprinted by one, or a combination of the following alteration types:

#### HEMATIZATION

In the past, a variety of lithologies in the district and elsewhere on the property that appeared with a pervasive pinkish to rosy cast were mistakenly identified as "syenite", "hornblende syenite", or "syenitized" volcanics. For the most part, the reddish colour was the effects of hematization, and to a much lesser extent, anhydritization. Often, intrusive features such as chilled margins or contact aureoles were not evident. In many cases, the "syenitization colour effect" was gradational, but sharper contacts have been noted.

With the possible exception of the ultramafic units, hematization derived from the alteration of the ferromagnesian minerals, is fairly common in the region, and to some degree affects all Tisdale, Timiskaming and Gibson Intrusive Complex lithologies on the property. Depending on the composition of the protolith and the intensity level of the overprint, the result can range from a slight pinkish tinge, through bright brick red, to deep burgundy, to a mauve-purple hue. In some cases, as for example for the Gibson Intrusive Complex, the degree of overprint can be visually separated and alteration subdivided into domains based on colour.

It can also be quite pervasive and extensive over several hundred meters such in contacts areas within the Gibson Intrusive Complex, or more patchy and fracture controlled as noted in throughout Tisdale and Timiskaming Assemblage lithologies. While quite dominant in portions of the variolitic basalt unit, it occurs in smaller, isolated portions of the gabbros, and in generally proximal to the contacts with the flows. Microscopically, the hematite has been reported to occur as minute red flakes disseminated through the altered groundmass, or as powdery coatings on other minerals. In intense, pervasively hematized areas, specular hematite fracture-fillings, and even semi-massive, centimetre -wide bands, are common.

If hematization is accompanied by some form of an overlapping carbonate alteration, (siderite, ankerite, dolomite), the reddish colour in these areas drops in intensity to a more pinky-creamy-beige colour, and the unit takes on a “patchy” or “mottled” appearance.

On a property scale, hematization appears patchy and discontinuous, however it is regularly noted to occur outward and marginal to the principal (second order) structures, and often dominates minor structures. Examples of these are the Gibson Intrusive Complex which lies along marginal to the GKFZ, and the major zone of faulting and brecciation that marks the contact area between in the Timiskaming and Tisdale Assemblages.

#### ANHYDRITIZATION

While the occurrence of anhydritization has not been positively identified in the logging to date, based on descriptions of anhydrite at the nearby Ross Mine, some of the massive pink veinlets logged as pink calcite, and patches of a purple mineral resembling amethyst, could be anhydrite.

### CARBONATIZATION (BLEACHING)

While some form of carbonate, most commonly calcite, occurs throughout all of the rock units and most structures, the focus in this subsection is on the types (ankerite, dolomite), and forms (pervasive and fracture-filling veinlet) that are regarded of more economic significance.

Pervasive carbonate alteration as fine disseminations is often accompanied by fracture filling veinlet carbonate, and is most readily recognized in the drill core as ranging from a faint creamy-brown tinge to more pronounced, irregular, brownish patches. With increased alteration intensity, primary textures particularly in the mafic volcanics become progressively less recognizable to nearly obliterated within patches of intense bleaching. Patchy and mottled creamy-reddish-grey-green rocks result when there is a partial or incomplete overprint of carbonate alteration within previously hematite or hematite-chlorite, or chlorite altered domains.

Owing to the extensively fractured nature of many of the mafic volcanic rocks on the property, carbonate occurs as a dominant fracture-fill constituent in these brittle deformation systems. However, there has been no systematic division or correlation of carbonate types to fracture veinlet systems in the core logging carried out to date.

Brittle deformation (i.e. brecciation) has resulted in carbonatized ultramafic units, whereas ductile (i.e. intense schistosity) is well-developed in areas where hydrous assemblages are dominant.

Carbonatization effects on Gibson Intrusive Complex rocks, particularly where they are hematized, is readily apparent as a pronounced loss of red colour that results in patchy bleaching of fractured intervals, brecciated contact areas, and the development of narrow bands of bleaching marginally outward along joint sets.

While carbonate alteration is also extensively developed in the Timiskaming Assemblage metasedimentary rocks, owing to their more siliceous and brittle nature, the visual effect is less pronounced.

### SILICIFICATION (BLEACHING)

Silicification, either as pervasive or more commonly as fracture-filling veinlet, is less widespread than carbonatization, however when present, is generally closely allied with the latter, most notably in the mineralized areas.

Pervasively bleached areas appear patchy light grey-white with a slight creamy carbonate tinge, and are generally extensively fractured or brecciated, with numerous quartz veinlets. Although several generations of quartz veinlets have been recognized in the core, excluding the bluish-gray, cherty, pyritic variety, there has been no systematic division or correlation of the other quartz types to specific veinlet systems at this time.

It is important to note that in some cases, the quartz veinlet networks within pervasively bleached areas, including those of the bluish-gray, cherty, zoned, pyritic variety, are not always restricted to the core alteration area, but may also extend uninterrupted into the adjoining carbonate-chlorite altered domains where primary textures generally remain preserved.

### BLUISH-GRAY CHERTY, ZONED, PYRITIC QUARTZ VEINLETS

Quartz veinlets of this type are of economic significance in the 147 Zone. They generally range in width from less than 1 mm to 5 to 10 mm, but occasionally can reach a maximum of 5 cm. They can range in colour from a bluish-gray, through varying shades of light to dark gray, to creamy and black, but are commonly a cherty light gray.

Except for the very narrowest veinlets which appear singly layered, most are very thinly, rhythmically banded, or zoned. While dominantly composed of silica, some veinlets also include creamy bands, patches, or streaks of carbonate. Some of the silica layers may have a chalcedonic appearance, and upwards of 8 to 10 individual layers including those of very fine pyrite were noted. Chalcedonic brecciated layers in some of the more wider, 2 to 5 cm, veinlets are characterized by a variety of sizes of angular silica fragments ranging up to 6 to 7 mm in longest dimension. The rhythmic layering/zoning suggests multiple pulses of silica into slightly open fractures.

Most veinlets are variably pyritic, containing several percent commonly as very fine disseminations, hair-thin fracture fillings and along veinlet margins.

Visible gold in the 147 Zone is generally restricted to the bluish-gray cherty, zoned pyritic veinlets where it can occur ranging from single, tiny flecks, to clusters of fine grains, to coarse streaks, and clusters of streaks, preferentially along the veinlet contacts, or in micro-fractures.

SULPHIDATION (PYRITIZATION)

Pyrite is by far the dominant metallic mineral. It most commonly occurs as less than 1 to 3 mm granular or cubic disseminations, as trails of disseminations along fractures and micro-fractures, as aggregates of fine disseminations or as thin, irregular, fracture and micro-fracture-filling veinlets. While rarely exceeding a few per cent, semi-massive bands or aggregates have been observed to occur locally over several centimetres.

Chalcopyrite is generally rare, but has been noted to be hosted in thin white or pinkish vuggy calcite veinlets. It appears to be more frequent in the Gibson Intrusive Complex than in the other lithologies, and while commonly found as fine and medium blebs, occurrences of semi-massive chalcopyrite veinlets have also been noted.

## 7.3 MINERALIZATION

Mineralization within the Contact Zone occurs at or near the contact of Tisdale Assemblage mafic volcanic rocks and adjacent Timiskaming Assemblage clastic sedimentary rocks. The gold mineralization of the Contact Zone occurs dominantly in the brecciated zones above the sediment contacts. The higher grade appears to "free gold" in the silica and albite altered sections with late stage reddish-white calcite/ankerite veinlets containing 0.5 mm pyrite stringers.

Mineralization within the 147 Zone occurs preferentially within and in association with a variolitic mafic volcanic horizon located approximately 150 to 300 m east of the Timiskaming/Tisdale Assemblage contact (Contact Zone). Mineralization occurs in association with quartz-carbonate veins, which are often sheeted. Veins often have thin margins of crustiform banded quartz, then crustiform quartz matrix breccia overgrowing these, and later cores of fine-grained, matrix supported quartz-carbonate matrix lithified vein breccia which contain fragments of earlier quartz phases. These veins also often have dark green-grey, thin breccia selvages with abundant disseminated pyrite and which petrography indicates are carbon-bearing. Visible gold is commonly-observed in these dark pyritic rims.

## 7.4 147 ZONE

### *7.4.1 INTRODUCTION*

The 147 Zone (Figure 7.2) is hosted by a north trending, steeply east dipping variolitic basalt (Tisdale Assemblage). The core zone of gold mineralization occurs over an approximate 275 m north-south direction strike length and dips at approximately 75° to the east. The mineralized zone has been traced from the top of the bedrock to a drilled vertical depth of at least 400 m. The overburden cover in the area varies from approximately 5 to 15 m thick. The mineralization occurs in association with breccia veins, crustiform veining and thin quartz-carbonate matrix cataclastic-hydrothermal breccias. Overall mineralization style is brittle compared to other deposits in the region, and the crustiform textures are reminiscent of high level epithermal mineralization.

### 7.4.2 *Host Lithology*

The principal host lithology for the 147 Zone is a north trending, steeply east dipping variolitic basalt unit (Figure 7.3). While dominantly characterized by tightly packed, oval to spherical varioles, subordinate bands of massive lava, several decimeters to meters in core width, occur particularly toward the stratigraphic top of the unit. With progressive alteration, variolite boundaries become increasingly obliterated resulting in moderately to strongly bleached intervals or patches.

The variolitic basalt unit is bounded on both the footwall and hanging wall by massive, medium to fine grained, generally, leucoxene-bearing, mafic units, that in the absence of flow features, have been tentatively interpreted as gabbroic sills. The eastern, or, hanging wall gabbro unit tends to be more magnetic than the western, or footwall unit.

While a discrete zoning pattern of hematization with respect to the 147 Zone has not been determined at this time, it is important to note that the portions of the host variolitic basalt unit are intensely hematized to deep brick-red and mauve-purple hues. Hematization in the adjoining gabbros has been relatively minor with only small portions affected, and generally proximal to the contact areas.

### 7.4.3 *Structure, Alteration and Mineralization*

During deformation, a structurally favourable environment, or corridor, for subsequent hydrothermal alteration and gold deposition was developed within the variolitic unit, mainly as a result of the competency contrast between it and the enclosing massive gabbro units.

Deformation within the structural corridor is dominated by a range of brittle structures including wider zones of intense fracturing and micro-brecciation, and narrower intervals of non-cohesive fault breccia and gouge, along with the occasional centimetre-wide band of mylonite.

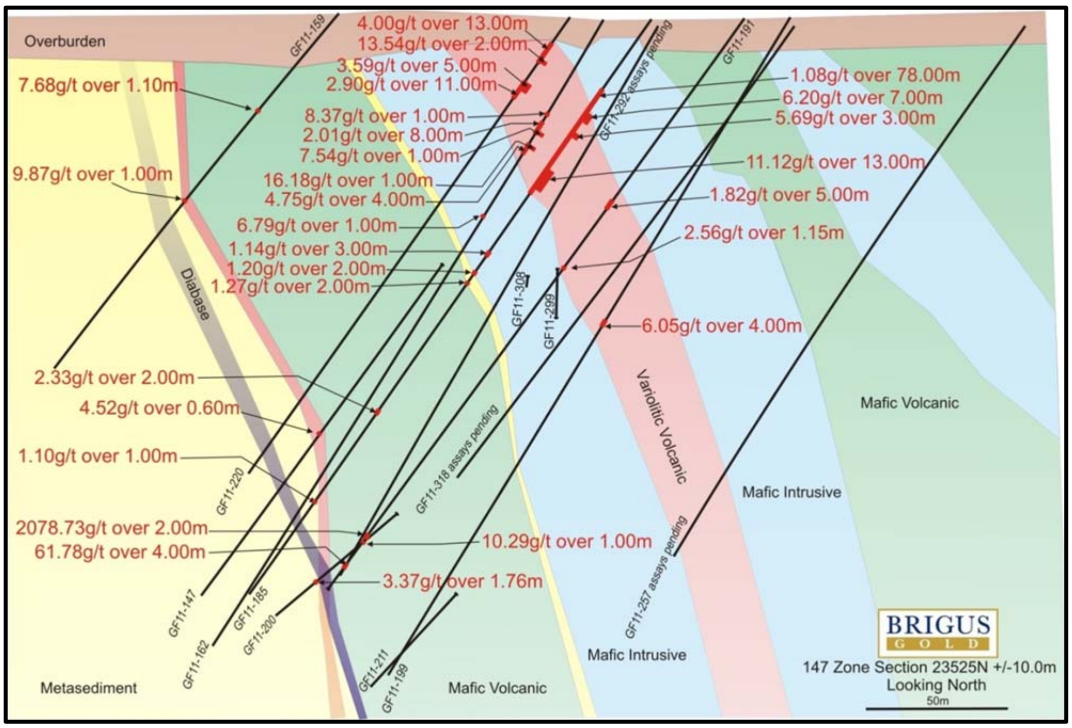
Hydrothermal alteration within the structural corridor is dominated by an inner bleached zone of carbonatization with variably pyritic pervasive and fracture silicification, and an outer zone of patchy, intermittent hematization overprinting portions of variably chloritized variolitic basalt.

The gold mineralization within this “alteration and structural corridor” is located principally in areas of intense fracturing, microbrecciation, and brecciation, and where the fractures and breccia interstices are filled and cemented by bluish-gray, cherty, zoned, pyrite quartz stringers veinlets, as previously described.

Veinlet frequency and particularly orientation is difficult to accurately determine in the drill core, however a limited number of oriented drillholes suggest networks or arrays of sub-parallel veinlets in the core area of the 147 Zone with a frequency of approximately 2 to 4 of the more wider veinlets per true width of one meter of core. The intervening rocks are intensely brecciated, and generally mineralized with finely disseminated and fracture pyrite within an assortment of variably altered fragments.

While the geometry and controls for the wider distribution of the veinlets has not been fully established at this time, the geometry of the 147 Gold Zone based on the veinlet network, mineralization and enclosing wallrocks suggests a series of steeply northerly plunging shoots.

**Figure 7.3 147 Zone Typical Cross Section**




## 7.5 CONTACT ZONE

### 7.5.1 INTRODUCTION

The Contact Zone (Figure 7.4) area is a steeply dipping fault contact zone located between the north-south trending argillaceous sediments and tuffs (Timiskaming Assemblage), in contact with mafic volcanics (Tisdale Assemblage). The Contact Zone extends from the southern Grey Fox claim boundary northwards for at least

1,200 m with an average strike of 350° azimuth. However, the core of gold mineralization is approximately 450 m in strike length and remains open to the north. The general dip of the feature is 78° to the east with horizontal widths varying from 3.5 to 35 m (Figure 7.4). The overburden cover in the area varies from 25 to 35 m thick. The mineralized lens has been traced from the top of the bedrock to a drilled vertical depth of at least 300 m.

#### 7.5.2 STRATIGRAPHY

The lithology within the Contact Zone area primarily consists of mafic volcanics (Tisdale Assemblage) in major fault contact with a north-south trending wedge of Timiskaming Assemblage siliceous, pyritic, metasediments (figure 7.4). The hanging-wall mafic volcanic unit is mostly massive and rarely pillowed. When mineralized, the mafic is a breccia with semi-rounded fragments from 0.5 to 2.5 cm in diameter. The extreme hanging-wall lithology of the zone is an ultramafic unit while the extreme footwall unit is a syenitic intrusive. Minor diabase occurs on the footwall side in the sediments.

#### 7.5.3 ALTERATION TYPES

There are abundant types and degrees of alteration throughout the Contact Zone. The most dominate type is a hematite alteration which appears to be pervasive throughout the zone, especially in the upper reaches. Other major pervasive types of alterations scattered throughout the Contact Zone are chlorite and carbonate. They vary from weak to strong intensity in more localized areas. All the above alteration types appear to straddle the lithological units.

Epidote alteration, with or without sericite, is dominate in the mafic and tuff units. Albite and ankerite alteration is concentrated around the quartz-carbonate veining within the breccia zones. Silicification is localized and appears to be associated with the various intensities of faulting.

The footwall sedimentary unit was logged mainly as an argillite unit that is sometimes layered, but generally foliated in appearance. A thin section analysis by Dr. Scott in 2009 observed that the footwall argillites were, in fact, completely albitized tuff beds which had been sericitized and weakly chloritized after albite alteration.

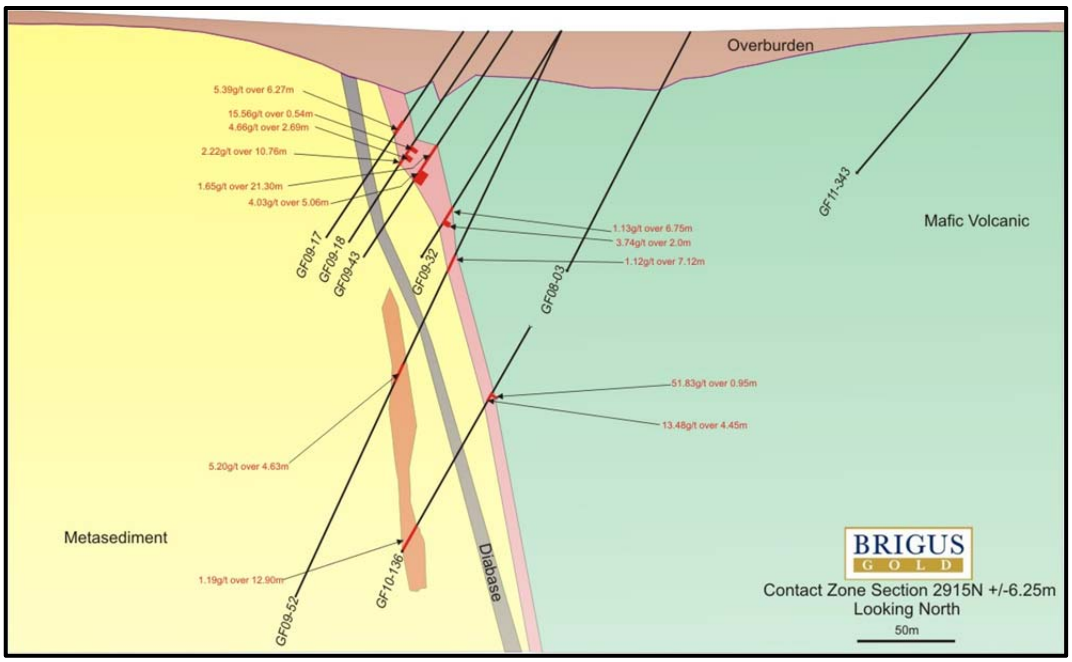
#### 7.5.4 GOLD MINERALIZATION

The gold mineralization of the Contact Zone occurs dominantly in the brecciated zones above the sediment contacts. The higher grade appears to “free gold” in the silica and albite altered sections with late stage reddish-white calcite/ankerite veinlets containing 0.5 mm pyrite stringers (Di Prisco 1996). The reddish tinge is from ragged grains of hematite in a groundmass of ankerite. From thin section analysis of the veinlets, the groundmass is mostly composed of fine grain ankerite and quartz. The ankerite minerals are crosscut by abundant chlorite veinlets (Christman 2010). Hematite and magnetite were found to be commonly associated with the sulphides.

Metallic mineralization of the Contact Zone is mainly pyrite. Di Prisco, in 1996 analyzed seven samples as thin sections and noted that minor amounts of arsenopyrite, chalcopyrite and pyrrhotite were intergrown with the pyrite. He also noted the pyrite formed as disseminated grains of subhedral to euhedral crystals along hairline fractures.

The brecciated quartz cement and veinlets were noted to be “peppered” with fine grain flakes and “rosettes” of molybdenite. One other note was that molybdenite was normally associated with the pyrite and observed to be locally overgrown by pyrite. Di Prisco concluded that there was a direct correlation between the gold precipitation and molybdenite occurrence, with or without pyrite. Dr. Douglas Scott analyzed four samples from hole GF08-10 in 2009 as thin/polished sections and also concluded that “the majority of gold may not in fact be more than coincidently associated with the pyrite in the ore zone”.

**Figure 7.4 Contact Zone Typical Cross Section**



# 8.0 DEPOSIT TYPES

Figure 8.1, is a vertical section of an idealized composite of an Archean lode gold system that is taken directly from Ontario Geological Survey (OGS) publication MP 139, Archean Lode Gold Deposits in Ontario.

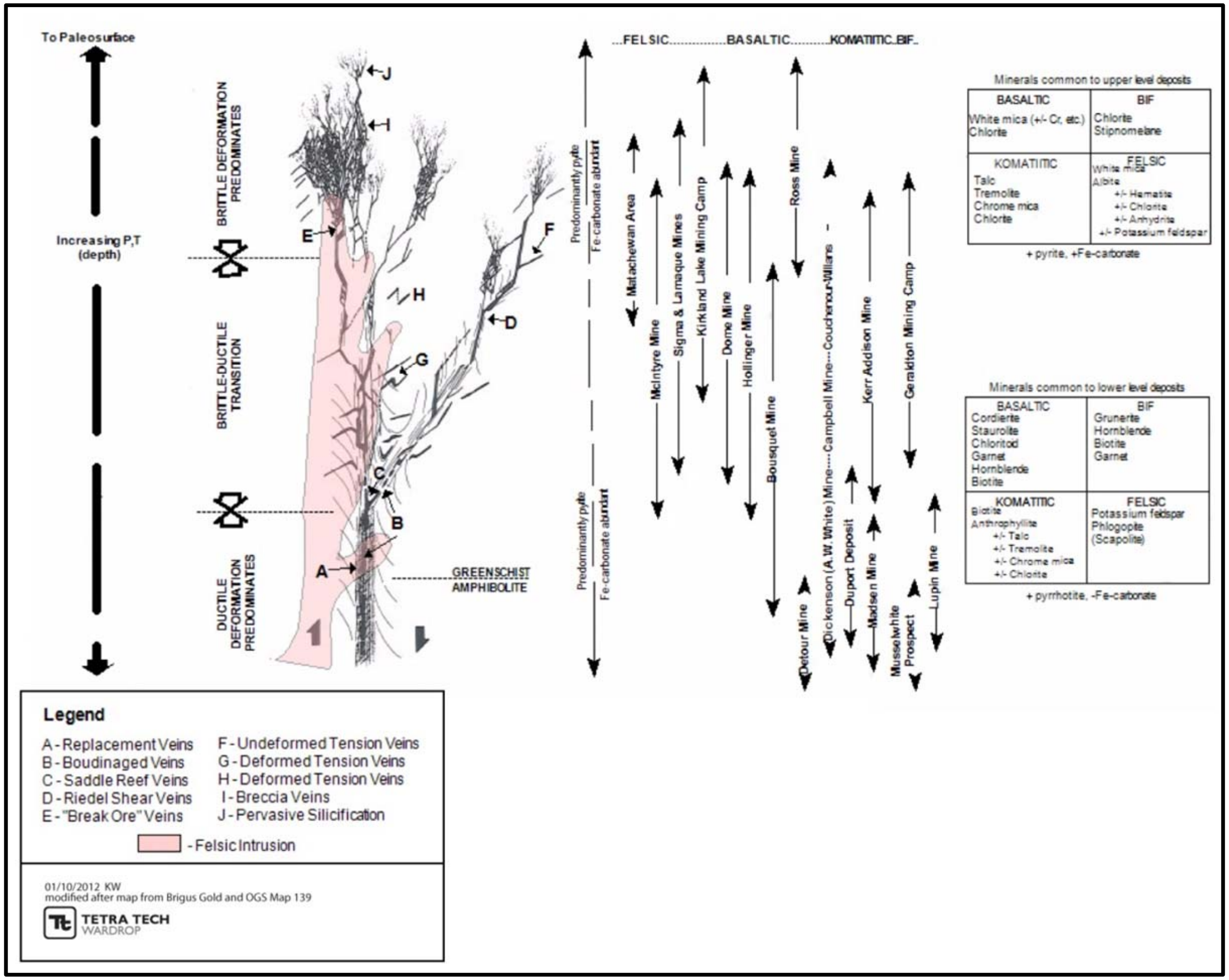
As depicted by Figure 8.1, these gold deposits represent a continuum in terms of deformation style (brittle to ductile) and metamorphic grade of the host rocks (greenschist to amphibolite). Although vertical scale is not defined, it can be inferred from the vertical range shown for the individual deposits. A composite vertical range of greater than 5 km but less than 10 km is implied, depending on the thermal gradient during mineralization. The depth of the deposits beneath the palaeosurface cannot be defined, however, evidence for lower confining pressures in the deposits interpreted to represent the highest exposed level of the system, indicates that it was influenced by approaching to surface. A minimum burial depth of 2 to 4 km is consistent with geobarometric fluid inclusion data. Present day erosional surfaces expose all levels of the system as indicated by the upper depth range of individual deposits.

The ambient pressure and temperature during mineralization exert the strongest overall control on the mineralizing process. This is manifested in the variable styles of mineralization and alteration that are indicated on Figure 8.1. At progressively higher levels, mineralization changes from shear-parallel without prominent veining, through systematic dilatant vein arrays, to pervasive breccia-style mineralization.

The breccia zones depicted on Figure 8.1 represent the highest identified level of the gold system within deposits in the Superior Province in Canada. These least-eroded areas are characterized by sub-greenschist facies which indicate original burial depths of approximately 2 km. Intuitively, breccia zones might be expected to change progressively into broader and pervasive mineralized and altered zones with decreasing confining pressures; boiling of fluids may also have occurred as the palaeosurface during mineralization is interpreted to have been subaerial.

While not included on Figure 8.1, studies of the Wiluna gold deposits in the northern part of the Norseman-Wiluna belt, Western Australia, have extended this range of metamorphic setting into the upper crustal-level prehnite-pumpellyite facies, and as such, are considered to be the highest crustal-level end-members of the crustal continuum model for Late Archean lode gold deposits. Mineralization in the high-level, brittle-style Wiluna deposits is hosted in mafic and ultramafic lavas, and occurs in hydrothermal breccias, shear veins, and veins with comb-and cockade-textured quartz.

**Figure 8.1 Vertical Section of an Idealized Composite of an Archean Lode Gold System**



At district and local scales, the deposit characteristics tend to be strongly affected by a host rock control rather than overall depth zonation. More competent lithologies will host discrete vein arrays which may pinch out in adjacent less competent units. Competent units such as iron-rich differentiated tholeiitic gabbroic sills and granitoid intrusions are common hosts, however, there are generally district-specific lithological associations acting as chemical and/or structural traps for the mineralizing fluids as illustrated by tholeiitic basalts and flow contacts within the Tisdale Assemblage in Timmins.

Competent units such as felsic intrusions are continuous over a large vertical range, retain a brittle response to deformation to deeper levels in the system and as such may represent the most favourable conduit for hydrothermal fluid ascent form depth. In contrast, less competent units such as altered ultramafic rocks, display a ductile response even at higher levels. Pre-existing, oxidized mineral species, such as hematite and sulphate, could react with later auriferous hydrothermal fluids, resulting in the precipitation of gold.

## 8.1 Ross Mine: a High-level Brittle-style Deposit

It should be noted on Figure 8.1, that the former Ross Mine, that is located approximately 3 km south-southeast of the Brigus property, and 3 km south of the DPDZ, is the type example of a high-level, brittle-style gold deposit in the Superior Province that is hosted in mafic volcanic rocks. Mineralization at the Ross Mine consisted of approximately 20 ore zones, or systems, that primarily occur in three distinct configurations. The lateral separation between some of the systems is often only 10s to 100s of meters, and some systems even appear to coalesce with depth. Of particular significance are the changes in deformational regime with increasing vertical extent in some of the ore systems from predominantly brittle type near surface, to increasingly ductile with depth.

The ore type of particular relevance for the geological understanding and future exploration of the 147 Zone are the Ross Mine Stringers Ores, as both share similar key features. For this reason, selective features of the Ross Mine as described in a series of detailed studies carried out by D. G. Troop of the OGS, are presented in the summary that follows. Additional data on the structural, alteration and mineralization complexities of the Ross Mine are also contained in Section 15.

### *8.1.1 Ross Mine Stringer (Au-Cu) Ores*

The No. 2/2B Ore Zone was the most persistent and vertically extensive mineralized structure in the Ross Mine. It is characterized by extensive networks of vertical, blue-grey quartz-pyrite-chalcopyrite veinlets that are in turn confined to near-vertical, westerly plunging, cylindrical to ellipsoidal, pipe-like structures within a heavily brecciated and altered zone.

The stringer networks (or “A” veins in Mine terminology) are characterized by sub-parallel, en echelon, blue-grey, quartz veinlets. The veinlets vary from less than

1 cm to up to 10 cm in width, and show some evidence of fracturing and stretching and boudinage. Minute aggregates of pyrite, lesser chalcopyrite, and minor bornite, occur along the veinlet margins, and microscopic free gold is associated with the sulphide minerals.

Predominant, north-trending, brittle faults bound the roughly cylindrical ore pipes on the upper levels, but with depth are responsible for increasing fragmentation of pipes into irregular blocks. As well, these pipe-like structures became more elongate in plan with depth, and became confined to east to northeast striking ductile shear zones.

Albeit limited in surface area, the No. 2/2B Ore Zone was mined from surface to at least the -3,150 ft Level, and is open at depth. Drilling from the lower levels indicated mineralization to at least -5,175 ft Level. A very consistent gold grade of 0.14 oz/st Au has been recorded in this vein system throughout its production history.

### 8.1.2 *Ross Mine Narrow Vein (Ag-Au-Pb-Zn-Cu-Sb) Ores*

The narrow vein ores are characterized by simple quartz-carbonate-sulphide veins (or "B" veins in Mine terminology). The veins (i.e. No. 3-9, No. 14-17, No. 19) tend to pinch and swell considerably, with widths varying from 0.20 to 1.0 m. The metal character is predominantly silver (Ag)-Au-lead (Pb)-zinc (Zn). Sulphide pods and bands consisting of galena, sphalerite and tennantite commonly occur within a massive white quartz vein with lesser white to pink carbonate. Silver sulfosalts, notable proustite (light ruby silver, $Ag_3AsS_3$) have been noted.

Most of the dozen, northwest-southeast trending, steeply southwest dipping, ore veins are confined within a northwest trending area of 350 to 400 m by 200 m. They are fairly persistent in strike and dip extensions, but are located primarily from surface down to about the -1,500 ft Level. The hanging wall contact appears sharp along the controlling brittle shear while a somewhat more diffuse and flexure contact with the wall rocks is exhibited on the footwall side.

The gold recovered from these veins was at an overall average grade of 0.211 oz/st Au, and contributed approximately 20% of the overall Ross Mine production of approximately 1 Moz. While exact silver production figures are not available, at least twice as many ounces of silver as gold were reported to have been recovered from the narrow vein ores. There is no mention of any recovery of any zinc or lead.

### 8.1.3 *Ross Mine Breccia and Breccia Vein Ores (No. 10/12, No. 13/14 and No. 1 Vein System)*

D. G. Troop recognized breccia vein lodes as a third type of mineralization, most notably in the No. 10/12 and the No. 13/14 Vein Systems, and probably also in the No. 1 Vein System. The No. 1 Vein System is unusual in that in combines both stringer ore (A-veins) and narrow vein (B-veins) types of mineralization. At the very least, the lower portion of the No. 1 System is a breccia that may have experienced left-lateral separation along a major N-S brittle fault.  A major post-ore Carbonate Vein Complex which follows this fault is intimately associated with the breccia ores on the upper levels, and especially in the area of the No. 13/14 Vein System located 150 m to the SSW of the No. 1 System.

The Breccia Ores were the richest in the Ross Mine, with gold grades up to 0.30 oz/st Au and similarly high silver values.

The No. 10/12 Breccia and Breccia Vein Ores consist primarily of simple mineralized, quartz-carbonate veins which have been fractured within a matrix of extensively milled and broken altered rock.  It appear that this ore type  resulted from extensive brecciation and re-cementation of vein fragments of original Narrow Vein Ores (i.e. “B” veins mineralized with massive bands and pods of galena-sphalerite-chalcopyrite and lesser tennantite), during a period of predominantly brittle deformation (manifested locally as north-trending faults) subsequent to vein formation.

The ores are characterized by angular chunks of quartz-carbonate or sulphide mineralized vein material within a milled, siliceous, chloritic host rock.  A weak northwest trending schistosity is present.  On the -2,850 ft Level, the lateral separation of the No. 10/12 Vein System from the No. 2B stringer ores is only on the order of 20 to 40 m.

In the No. 13/14 Vein System, the No. 14 Vein is a simple Narrow Vein which has not suffered the degree of brittle deformation evident in the No. 13 Vein area.  The No. 13 Breccia Vein ore is composed of blocks of irregular, angular, white quartz-carbonate and galena-sphalerite-chalcopyrite fragments, which before brecciation probably resembled the now competent No. 14 Vein.  Some banded, disseminated pyrite is present in and around the fragments, and within the hosting coarse breccia, which is historically referred to as the “Mottled Mafic Breccia”.  This unit is composed of dark green, irregular to somewhat elongate, pyrite impregnated chlorite “fragments” within a siliceous green-grey matrix.  The Mottled Mafic Breccia unit is extensively and spectacularly veined, with white and pink banded carbonate veins ranging from several cm to more than 5 m across.  It appears that the emplacement of this post-ore Carbonate Vein Complex has occurred along a major north-south fault in areas of pre-existing intense fracturing and brittle failure.

# 9.0 EXPLORATION

Brigus has performed several geophysical surveys on the Project property, and each is discussed in this section. The majority of the work performed is in the form of diamond drilling, which is addressed in Section 10.

## 9.1 2010 EXPLORATION

### 9.1.1 AEROMAGNETIC GRADIENT SURVEY

In September 2010, Scott Hogg & Associates Ltd. was commissioned to perform a helicopter-towed aeromagnetic gradient survey over the Black Fox Mine Block, which included the Project area, and the Black Fox Mill Block. The survey was performed on September 10 and 11, 2010, utilizing a Wisk Air Bell 206 LR helicopter and a total of 1,074 line km of data was collected. Of this, 490 km were from the Black Fox Mine Block, and 584 km were from the Black Fox Mill Block (Scott Hogg and Associates Ltd. 2010).

For the Black Fox Mine Block, the traverse line direction was UTM 40˚ to 220˚, traverse line spacing was 75 m, control line direction was UTM 130˚ to 310˚, control ling spacing was 2,000 m, and the terrain clearance for the sensors was 30 m (Scott Hogg and Associates Ltd. 2010).

The survey distinctly defined the key gold-bearing Contact Zone and Gibson Shear linear structures, as well as numerous untested linear targets (November 30 2011 press release).

### 9.1.2 TITAN 24-DEEP IP SURVEY

A Quantec Titan 24-Deep IP ground based geophysical program was completed over the Black Fox Complex with 22 lines, spaced 200 m apart. The survey, which is designed to detect conductive mineralization, disseminated mineralization, alteration, structure and geology (November 30 2011 press release), generated 12 high priority drill targets and 14 secondary targets. As of the beginning of December 2011, only one of these has been drilled, and additional drilling of these targets is being planned (November 29 2011 press release). A total of 38.9 line kilometers were completed between September 26 and October 22, 2010.

## 9.2 2011 EXPLORATION

No exploration work other than diamond drilling was conducted in 2011.

# 10.0 DRILLING

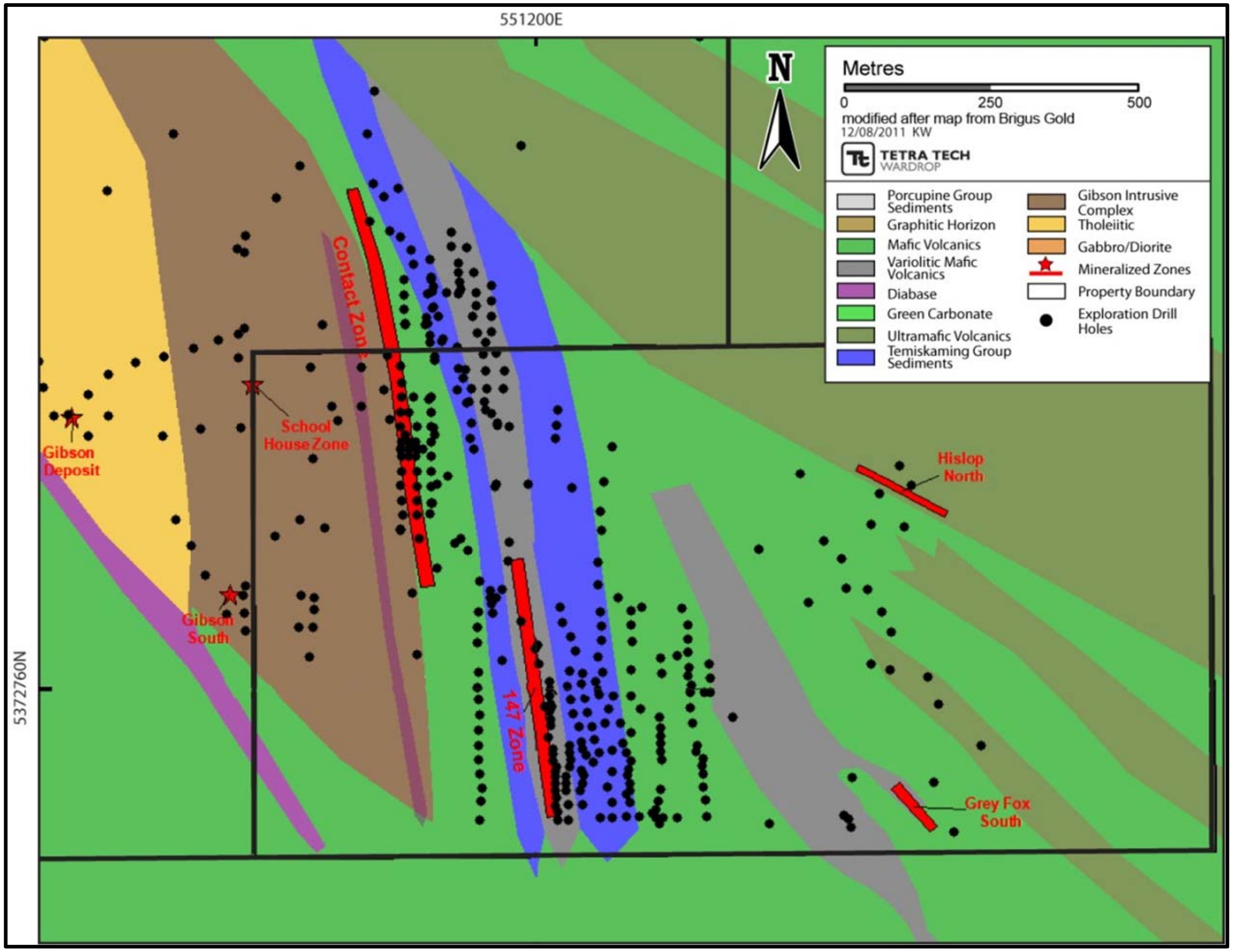
Brigus has performed drilling on the Contact Zone, Gibson, Grey Fox South, Hislop North, and 147 Zone targets of the Project. In 2010, Apollo Gold and Linear Metals merged to form Brigus and drilling prior to this event was performed by Apollo Gold, and is therefore included in Section 6.0. Table 10.1 summarizes the Project drilling activities by year and target in terms of number of drillholes and total lengths. Drilling is ongoing, and this tabulation therefore includes statistics for drilling performed between 2008 and November 24, 2011. Figure 10.1 illustrates the collars of the drillholes included in the resource estimate along with the target areas.

**Table 10.1 Summary of Brigus Gold Drilling of by Year and Target**

| Year | Number of Diamond Drillholes | Length (m) | Target |
|---|---|---|---|
| 2008 | 14 | 3,063.00 | Contact Zone |
| | 2 | 652.00 | Hislop North |
| **Subtotal** | **16** | **3,715.00** | **-** |
| 2009 | 53 | 9,961.00 | Contact Zone |
| **Subtotal** | **53** | **9,961.00** | **-** |
| 2010 | 34 | 12,703.78 | Contact Zone |
| | 14 | 5,123.35 | Gibson |
| | 3 | 1,503.00 | Grey Fox South |
| | 11 | 4,336.36 | Hislop North |
| | 7 | 3,139.00 | 147 Zone |
| **Subtotal** | **69** | **26,805.49** | **-** |
| 2011 | 79 | 27,881.40 | Contact Zone |
| | 28 | 8,798.55 | Gibson |
| | 2 | 883.00 | Grey Fox South |
| | 138 | 54,710.68 | 147 Zone |
| **Subtotal** | **247** | **92,273.63** | **-** |
| **Total** | **385** | **132,755.12** | **-** |

Note: Gibson includes Gibson Shear and Gibson South, Contact Zone includes Contact Zone Footwall, 2011 statistics current as of November 24, 2011 (cut-off date for resource estimate data)

**Figure 10.1 Drillhole Location Map**



## 10.1 2010 DRILLING

The 2010 drilling program followed-up on historical data and also tested new gold occurrences with the Project. Three drill rigs were used to explore the Contact Zone, Gibson, Grey Fox South, Hislop North, and 147 Zone targets. Drilling was performed by Norex Drilling and the core was of NQ diameter. A total of 69 drillholes, amounting to 26,805.49 m was completed on the Project property in 2010. During April 2010, a certified land survey company called Talbot Surveys based in Timmins, surveyed all of the 2008, 2009 and historic drillhole collars. Talbot surveys used a Trimble Global Positioning System (GPS) with base station.

### *10.1.1 CONTACT ZONE*

In 2010, the Contact Zone program concentrated on testing the continuity of the gold mineralization down-dip and along strike of the 2008 and 2009 drillholes (November 30 2010 press release). Thirty-four drillholes, totalling 12,703.78 m were completed and were generally orientated 270°/-50°. Table 10.2 highlights select mineralized intervals from the Contact Zone.

**Table 10.2 Summary of 2010 Drilling Highlights on Contact Zone**

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF10-90 | 2.41 | 14.92 | November 30, 2010 |
| and | 3.58 | 14.88 | November 30, 2010 |
| GF10-94 | 6.34 | 7.05 | November 30, 2010 |
| including | 3.62 | 10.22 | November 30, 2010 |
| and | 1.13 | 25.78 | November 30, 2010 |
| and | 2.11 | 10.47 | November 30, 2010 |
| GF10-98 | 4.26 | 2.03 | November 30, 2010 |
| and | 8.89 | 3.68 | November 30, 2010 |
| including | 3.17 | 6.67 | November 30, 2010 |
| GF10-106 | 3.99 | 8.40 | January 12, 2011 |
| including | 4.23 | 3.08 | January 12, 2011 |
| GF10-114 | 12.27 | 12.10 | January 12, 2011 |
| including | 0.81 | 168.65 | January 12, 2011 |
| GF10-116 | 4.30 | 4.40 | February 28, 2011 |
| GF10-125 | 15.21 | 3.26 | January 12, 2011 |
| including | 3.03 | 5.28 | January 12, 2011 |
| including | 3.75 | 7.19 | January 12, 2011 |
| GF10-131 | 7.40 | 2.97 | February 28, 2011 |
| including | 2.23 | 6.45 | February 28, 2011 |
| GF10-133 | 9.75 | 12.60 | February 28, 2011 |
| including | 3.43 | 20.43 | February 28, 2011 |

*table continues…*

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF10-136 | 5.52 | 11.80 | February 28, 2011 |
| including | 2.57 | 24.16 | February 28, 2011 |

Note: Drill intercepts do not represent true widths, true widths will be shorter intervals dependent upon the dip of the drillhole.

### 10.1.2 GIBSON

In 2010, 14 drillholes, totalling 5,123.35 m were completed on the Gibson target. Holes were generally drilled with orientations of 270°/-50°. Drilling results from the Gibson Shear were encouraging and the best intersections were in GF10-92, which was drilled into the southern portion of the Gibson Shear (Gibson South) (November 30 2010 press release). Table 10.3 highlights select mineralized intervals from the Gibson target.

**Table 10.3 Summary of 2010 Drilling Highlights on Gibson Shear**

| Hole ID | Interval (m) | Gold (g/t) | Source |
|---|---|---|---|
| GF10-88 | 3.00 | 5.45 | November 30, 2010 |
| GF10-92 | 41.80 | 2.02 | November 30, 2010 |
| including | 12.00 | 4.04 | November 30, 2010 |

Note: Drill intercepts do not represent true widths, true widths will be shorter intervals dependent upon the dip of the drillhole.

### 10.1.3 GREY FOX SOUTH

In 2010, three drillholes, totalling 1,503.00 m were completed on the newly discovered Grey Fox South target. Holes were drilled with an orientation of either 055°/-55° or 090°/-60°. Table 10.4 highlights select mineralized intervals from the Grey Fox South target.

**Table 10.4 Summary of 2010 Drilling Highlights on Grey Fox South**

| Hole ID | Interval (m) | Gold (g/t) | Source |
|---|---|---|---|
| GF10-115 | 6 | 10.65 | January 12, 2011 |
| including | 1 | 23.32 | January 12, 2011 |
| including | 1 | 16.12 | January 12, 2011 |
| including | 1 | 18.84 | January 12, 2011 |

Note: Drill intercepts do not represent true widths, true widths will be shorter intervals dependent upon the dip of the drillhole.

### 10.1.4 HISLOP NORTH AND 147 ZONE

In 2010, 11 drillholes, totalling 4,336.36 m were completed on the Hislop North target. Holes were generally drilled with orientations of 40°/-55°.

Seven holes, totalling 3,139.00 m were drilled into the 147 Zone in 2010. Holes were generally drilled with orientations of 270°/-55. The 147 Zone was previously referred to as the "Hanging Wall" of the Contact Zone, and was subsequently re-named in 2011 as the "147 Zone", in reference to the first drillhole confirming the potential of the discovery (April 27 2011 press release).

## 10.2 2011 DRILLING

During the 2011 drill program, two drill rigs were used for infill drilling and testing along strike and down-dip on the Contact Zone. Two or three other drill rigs were used to expand the 147 Zone, and one drill rig was used to test other known gold-bearing structures and targets that were identified from the induced polarization and magnetic geophysical survey (November 29 2011 press release, September 7 2011 press release). Drilling was conducted by Norex Drilling and Laframboise Drilling Inc. All work was supervised by the Brigus exploration team (November 29 2011 press release). All core was of NQ diameter.

### 10.2.1 CONTACT ZONE

In 2011, 79 drillholes, totalling 27,881.40 m were completed and were generally orientated 270°/-50°. Highlights from 2011 drilling of the Contact Zone are provided in Table 10.5.

**Table 10.5 Summary of 2011 Drilling Highlights on Contact Zone**

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF11-140 | 10.84 | 3.14 | February 28, 2011 |
| including | 3.99 | 7.36 | February 28, 2011 |
| GF11-147 | 18.00 | 9.04 | February 28, 2011 |
| including | 7.00 | 19.27 | February 28, 2011 |
| and | 9.70 | 3.10 | February 28, 2011 |
| including | 3.00 | 5.32 | February 28, 2011 |
| GF11-154 | 3.03 | 6.09 | September 7, 2011 |
| and | 4.04 | 3.32 | September 7, 2011 |
| and | 12.94 | 2.19 | September 7, 2011 |
| GF11-234 | 4.11 | 6.95 | September 7, 2011 |
| including | 1.46 | 11.75 | September 7, 2011 |
| GF11-236 | 3.51 | 3.89 | September 7, 2011 |
| and | 1.76 | 7.75 | September 7, 2011 |

*table continues…*

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF11-238 | 11.32 | 3.54 | November 29, 2011 |
| including | 3.00 | 7.15 | November 29, 2011 |
| and | 1.00 | 7.75 | November 29, 2011 |
| GF11-241 | 4.55 | 2.91 | November 29, 2011 |
| and | 3.20 | 10.65 | November 29, 2011 |
| and | 1.80 | 18.29 | November 29, 2011 |
| and | 7.50 | 7.19 | November 29, 2011 |
| GF11-243 | 6.00 | 2.95 | November 29, 2011 |
| including | 3.00 | 5.23 | November 29, 2011 |
| GF11-245 | 4.50 | 16.18 | September 7, 2011 |
| including | 0.75 | 83.04 | September 7, 2011 |
| and | 11.70 | 1.30 | September 7, 2011 |
| including | 3.00 | 2.57 | September 7, 2011 |
| GF11-259 | 12.00 | 3.31 | November 29, 2011 |
| including | 4.00 | 5.85 | November 29, 2011 |
| and | 3.00 | 4.02 | November 29, 2011 |
| GF11-261 | 2.30 | 20.55 | November 29, 2011 |
| GF11-264 | 0.50 | 46.36 | November 29, 2011 |
| and | 8.20 | 4.53 | November 29, 2011 |
| including | 3.00 | 8.60 | November 29, 2011 |
| GF11-265 | 2.00 | 36.45 | November 29, 2011 |
| including | 1.00 | 69.19 | November 29, 2011 |
| and | 16.00 | 4.25 | November 29, 2011 |
| including | 3.00 | 12.21 | November 29, 2011 |
| GF11-316 | 14.00 | 1.87 | November 29, 2011 |
| and | 72.90 | 1.77 | November 29, 2011 |
| including | 18.00 | 3.54 | November 29, 2011 |

Note: Drill intercepts do not represent true widths, true widths will be shorter intervals dependent upon the dip of the drillhole.

To date, Brigus has outlined an area of mineralization that is 400 m long in strike at the Contact Zone. It remains open along strike to the north and open at depth (November 29 2011 press release).

### 10.2.2 GIBSON AND GREY FOX SOUTH

In 2011, 28 drillholes, totalling 8,798.55 m were completed on the Gibson target. Azimuths were variable (typically between 133 and 270°) and dips were generally between -50 and -60°. Two drillholes, totalling 883.00 m were completed on the Grey Fox South target and had orientation of 065°/-55° and 061°/-55°.

### 10.2.3 147 ZONE

The name, “147 Zone”, is in reference to the first drillhole confirming the potential of the discovery (April 27 2011 press release). Prior to intersecting the mineralization encountered in drillhole GF11-147, the 147 Zone was previously referred to as the “Hanging Wall” of the Contact Zone. In 2011, 138 drillholes, totalling 54,710.68 m were completed on the zone and were generally orientated 270°/-55°. Highlights from 2011 drilling of the 147 Zone are provided in Table 10.6 and a plan map is shown in Figure 10.1.

**Table 10.6 Summary of 2011 Drilling Highlights on 147 Zone**

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF10-165 | 20.00 | 1.46 | May 16, 2011 |
| and | 14.00 | 1.24 | May 16, 2011 |
| GF11-173 | 50.95 | 1.01 | June 1, 2011 |
| including | 3.25 | 8.29 | June 1, 2011 |
| GF11-174 | 16.00 | 1.32 | May 16, 2011 |
| and | 20.40 | 10.82 | May 16, 2011 |
| and | 9.75 | 1.11 | May 16, 2011 |
| GF11-177 | 29.40 | 4.40 | June 1, 2011 |
| including | 16.30 | 6.80 | June 1, 2011 |
| GF11-179 | 26.50 | 3.26 | May 16, 2011 |
| including | 5.00 | 11.51 | May 16, 2011 |
| and | 4.60 | 5.54 | May 16, 2011 |
| GF11-181 | 41.00 | 2.68 | June 1, 2011 |
| including | 24.00 | 3.53 | June 1, 2011 |
| including | 10.00 | 4.46 | June 1, 2011 |
| GF11-182 | 46.20 | 0.92 | June 20, 2011 |
| including | 15.00 | 2.23 | June 20, 2011 |
| GF11-184 | 78.00 | 1.08 | June 1, 2011 |
| including | 9.50 | 2.65 | June 1, 2011 |
| GF11-185 | 73.58 | 3.36 | June 1, 2011 |
| including | 7.00 | 6.20 | June 1, 2011 |
| including | 3.00 | 5.69 | June 1, 2011 |
| including | 13.00 | 11.12 | June 1, 2011 |
| GF11-191 | 2.00 | 2078.73 | June 20, 2011 |
| including | 1.00 | 4165.15 | June 20, 2011 |
| and | 4.00 | 61.78 | June 20, 2011 |
| including | 1.00 | 243.43 | June 20, 2011 |
| GF11-192 | 17.00 | 3.59 | June 20, 2011 |
| including | 7.00 | 5.42 | June 20, 2011 |
| and | 11.00 | 3.34 | June 20, 2011 |

*table continues…*

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| including | 6.00 | 5.60 | June 20, 2011 |
| GF11-194 | 50.00 | 3.96 | June 20, 2011 |
| including | 20.00 | 6.82 | June 20, 2011 |
| GF11-195 | 21.78 | 1.72 | July 6, 2011 |
| including | 8.00 | 3.34 | July 6, 2011 |
| GF11-198 | 6.00 | 6.31 | July 6, 2011 |
| including | 3.00 | 10.00 | July 6, 2011 |
| GF11-199 | 4.00 | 6.05 | July 28, 2011 |
| GF11-201 | 4.00 | 8.81 | July 28, 2011 |
| and | 14.00 | 2.99 | July 28, 2011 |
| including | 12.00 | 5.37 | July 28, 2011 |
| GF11-206 | 24.20 | 3.94 | July 6, 2011 |
| including | 11.77 | 6.86 | July 6, 2011 |
| GF11-207 | 9.95 | 2.51 | July 28, 2011 |
| and | 25.50 | 3.84 | July 28, 2011 |
| including | 5.00 | 14.38 | July 28, 2011 |
| GF11-213 | 7.00 | 7.90 | November 7, 2011 |
| including | 4.00 | 13.50 | November 7, 2011 |
| GF11-220 | 13.00 | 4.00 | July 6, 2011 |
| including | 2.00 | 13.54 | July 6, 2011 |
| and | 11.00 | 2.90 | July 6, 2011 |
| including | 5.00 | 3.95 | July 6, 2011 |
| GF11-229 | 7.00 | 5.39 | November 7, 2011 |
| GF11-230 | 13.23 | 6.02 | November 7, 2011 |
| including | 1.00 | 21.63 | November 7, 2011 |
| including | 6.00 | 8.87 | November 7, 2011 |
| and | 6.00 | 6.14 | November 7, 2011 |
| GF11-235 | 11.00 | 6.64 | November 7, 2011 |
| including | 6.00 | 10.30 | November 7, 2011 |
| GF11-244 | 16.00 | 20.11 | November 7, 2011 |
| and | 5.00 | 16.02 | November 7, 2011 |
| including | 2.00 | 39.26 | November 7, 2011 |
| GF11-270 | 6.00 | 3.36 | November 7, 2011 |
| and | 3.37 | 13.25 | November 7, 2011 |
| and | 8.00 | 4.31 | November 7, 2011 |
| including | 2.00 | 14.33 | November 7, 2011 |
| GF11-284 | 5.75 | 9.49 | November 7, 2011 |
| including | 2.00 | 20.35 | November 7, 2011 |
| and | 22.10 | 7.78 | November 7, 2011 |
| including | 7.10 | 21.40 | November 7, 2011 |

Note: Drill intercepts do not represent true widths, true widths will be shorter intervals dependent upon the dip of the drillhole.

The 147 Zone now extends to a vertical depth of 280 m below surface and remains open at depth (November 7 2011 press release).

### 10.2.4 *WHISKEY JACK ZONE*

The Whiskey Jack Zone is located approximately 200 m to the north of the Contact Zone was made by the drilling of GF11-337. The gold mineralization discovered in this drillholes was the result of testing underneath a distinct linear topographic low structure. At the time of writing this report (cut-off date for resource data of November 24 2011), this was the only hole that assay results had been received for that area. Further drill testing of the area occurred later in December. The mineralized intercept is highly brecciated with abundant quartz veins and fine grained pyrite hosted in mafic volcanics (November 29, 2011 press release).

**Table 10.7 Summary of 2011 Drilling Highlights on New Unnamed Discovery**

| Hole ID | Interval (m) | Gold (g/t) | Source (press release) |
|---|---|---|---|
| GF11-337 | 9.00 | 3.59 | November 29, 2011 |
| including | 1.00 | 10.63 | November 29, 2011 |
| and | 1.00 | 6.86 | November 29, 2011 |

### 10.2.5 *SURVEY METHODS*

Drillhole collar locations, since October 2010, are surveyed by the Black Fox Mine survey crew using a Trimble GPS unit with base station.

Downhole surveys are based on a Reflex Single Shot. Readings are taken every 50 m down hole.

# 11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

## 11.1 2008 AND 2009

All holes drilled by Apollo Gold on the Contact Zone were logged and samples in 0.5 to 1.5 m intervals over the length of the hole. The entire hole was labelled and digitally photographed prior to logging. Two electric core saws were used to half cut the core and sample lengths were typically 0.9 to 1.5 m long. All boxes were tagged with the hole number, box number, metreage, and then stored in core racks at the Black Fox Mine site. Many samples cross lithological boundaries, and sample intervals were often rounded to the nearest decimetre, rather than the nearest centimetre. Mid-way through the program, all samples greater than 1.0 g/t Au were re-assayed and averaged as a final assay value. Where recognized, sulphides and veining was documented in the logs. Re-logging of some holes noted that varying degrees of alteration extended over greater than 1.0 m length. Similarly, breccia zones were observed to be recorded as both a breccia tuff and a brecciated mafic. The tuff unit was not entered into the logs at all (Buss 2010).

Previously released Brigus drill results were released as uncut, with true widths and a weighted average grade. The true width values were based upon a dip of -75°, and calculated via an Microsoft Excel™ spreadsheet formula. The intercepts were not defined as to representing the hanging wall, main or footwall lens of the zone (Buss 2010).

The core was logged by geologist into spreadsheets, and the sample intervals were marked on the rocks. Core samplers sawed the core, stapled the sample bags and sorted the samples for shipping, under the supervision of a geologist. All sample pulps and rejects were returned to Brigus and stored in a locked warehouse building in the town of Matheson, Ontario.

The general recovery of the drillhole data is considered to be favourable with a recovery averaging in the 85 to 95% range. As the rock units are fairly competent, the rock quality designation (RQD) of the core is moderate to high. The weaker zones of the hematite altered breccia zones still had an excellent recovery rate. However, faulting is prevalent within the Contact Zone and was mostly confined to the lithological contacts. The faults were rarely greater than 0.25 m in thickness and appear to have near vertical core angles. Basic logging and sampling procedures for diamond drillholes appeared to be followed by most of the previous site geologists. The lithological distances on the logs appeared to be rounded off to the nearest decimeter rather than the characteristic centimeter. A few sample intervals were noted to cross lithological boundaries. From the drill logs it was noted that a majority of the sample intervals were 0.90 and 1.5 m in length. Apparently, the larger sample intervals were for waste samples, while the smaller intervals were mostly in the mineralized zones. The results of the sample analysis are considered to be accurate. The data is considered to be accurate in terms of sample values and being representative. In 2009, all samples greater than 1.0 g/t were re-assayed by the assay laboratory and averaged as a final assay value. Prior to this time period, no re-assays were conducted on the samples (Buss 2010).

The initial phase of samples from the 2008 program were transported by the site Geologist to Swastika Laboratories in Swastika, Ontario. The first half of 2009 drill program had core samples shipped by Manitoulin Transport to SPJ Laboratories in Sudbury, Ontario. In the latter half of the drilling program, personnel from Polymet Laboratories in Cobalt Ontario picked up the samples on site with chain of custody sheets. All samples were analyzed by fire assay analysis for gold and reported in grams per tonne (Buss 2010).

Only three of the 348 blank samples were over 0.03 g/t Au for 0.86% failure rate. This is considered to be well within the allowable limits of statistics for accuracy of analysis. The two types of standards used in the sampling program also showed little variation within the samples and the laboratories. Only two samples out of the 360 total samples had a variance of over 0.70 g/t Au (Buss 2010).

As mentioned above, no duplicate samples of core (i.e. quartered) were done during the drilling program. As such, no comparison was possible between the values of two different laboratories. However, the assay laboratory in house quality assurance and quality control analysis as well as their accreditation suggested that all laboratories used in the drilling program produced credible results (Buss 2010).

## 11.2 2010 AND 2011

Brigus used two laboratories for assaying during 2010 and 2011: Polymet Labs and SGS, both of which are International Organization for Standardization (ISO) accredited facilities. Polymet Labs of Cobalt, Ontario comes to site to pick up the samples. Samples are shrink wrapped on a pallet and shipped to SGS via Manitoulin Transport to the preparation facility in Sudbury and forwarded by them to their assay laboratory in Toronto. Chain of custody is maintained by assay requisition sheets along with subsequent return of pulps and rejects identified by sample number and certificate of analysis.

Samples are taken within portions of the core that show signs of mineralization, normally 1 m intervals are taken but samples can be as short as 30 cm and as long as 1.5 m. Samples are not collected across lithological boundaries. A numbered sample tag is placed at the start of each sample interval and once logging is completed the core is taken to the cutting room. Samples are sawn using a Vancon core saw. The sample tag is stapled into the core box at the start of the interval, a second piece of the same tag is placed in a plastic sample bag bearing the same number written in permanent marker. Half of the sawn core is placed in the core box such that a continuous length of core is present. The plastic sample bag containing the sample is stapled shut and placed in a larger rice bag for shipping. A total of ten samples are placed in each rice bag and the rice bag is numbered and labelled for shipment to the analytical laboratory.

Within each set of twenty samples there is one blank, one standard and one duplicate randomly placed within the sequence. The blank material BL116 (Table 11.1) is purchased from WCM Minerals in Burnaby BC. The reference material is Rocklabs Reference Material Si54 with a reported grade of 1.780 ppm. The duplicate is made by quartering the remaining split core.

**Table 11.1 Blank Material (BL116)**

| Metal | Grade |
|---|---|
| Pb | <0.001% |
| Zn | <0.01% |
| Cu | <0.005% |
| Ag | <0.3 g/t |
| Au | <0.01 g/t |

The Standard Reference Materials (SRM) used during the 2010 and 2011 are summarized in Table 11.2.

**Table 11.2 Standard Reference Material**

| Description | | Recommended Value (g/t Au) |
|---|---|---|
| Ore Research & Exploration Pty Ltd. | OREAS 10Pb | 7.15 |
| Rocklabs | Si42 | 1.761 |
| Rocklabs | Si54 | 1.780 |
| Rocklabs | Sn50 | 8.685 |

## 11.3 Review of Quality Assurance/Quality Control

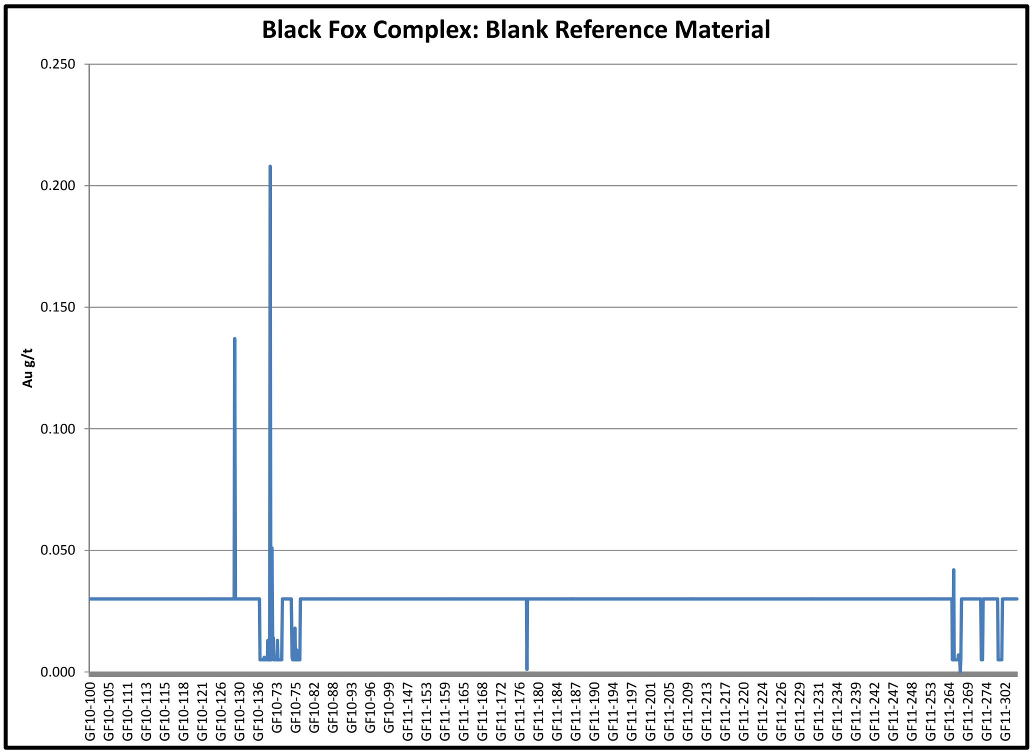
Quality assurance/quality control (QA/QC) data was reviewed for 2010 and 2011 diamond drill programs. A total of 4,617 quality control samples were inserted in a total of 30,164 assays. The insertion rate during those years is summarized in Table 11.3. A 5% rate approximates inserting 1 in 20 control samples.

**Table 11.3 QA/QC Insertion Rate**

| Material | Rate (%) |
|---|---|
| Blank Material | 5.1 |
| Duplicates | 5.0 |
| SRM | 5.2 |

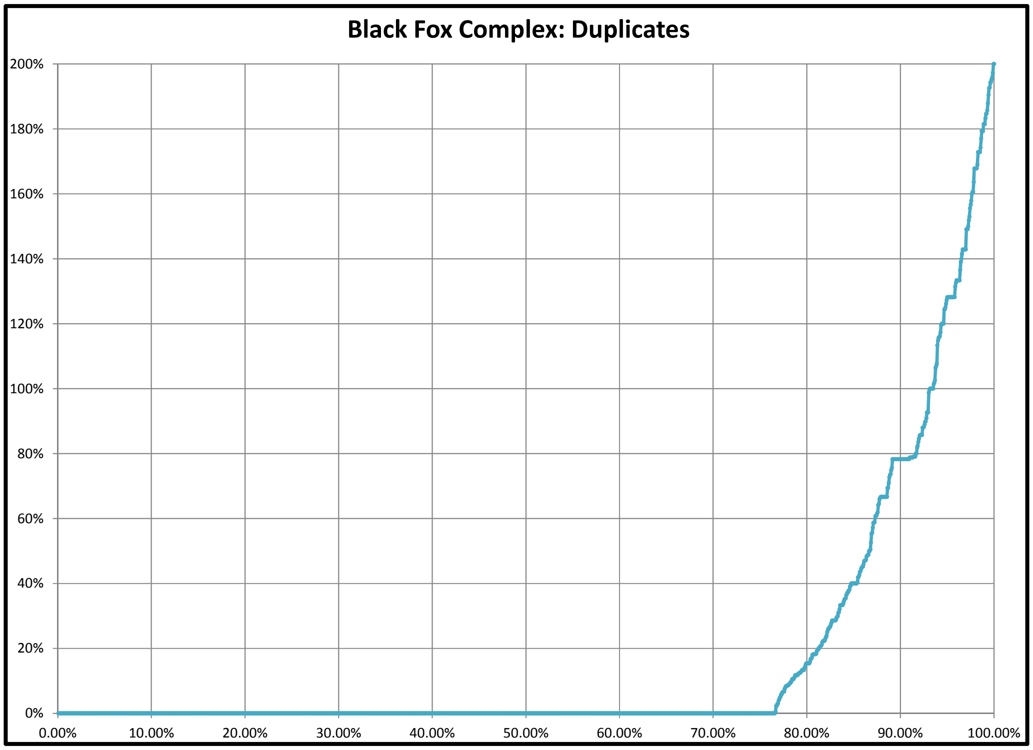
Blank material control samples contained only four over limit values (0.26%). Checks are recommended to ensure that samples were correctly inserted. Figure 11.1 illustrates the performance of the Blank Reference Material.

**Figure 11.1 Blank Reference Material**



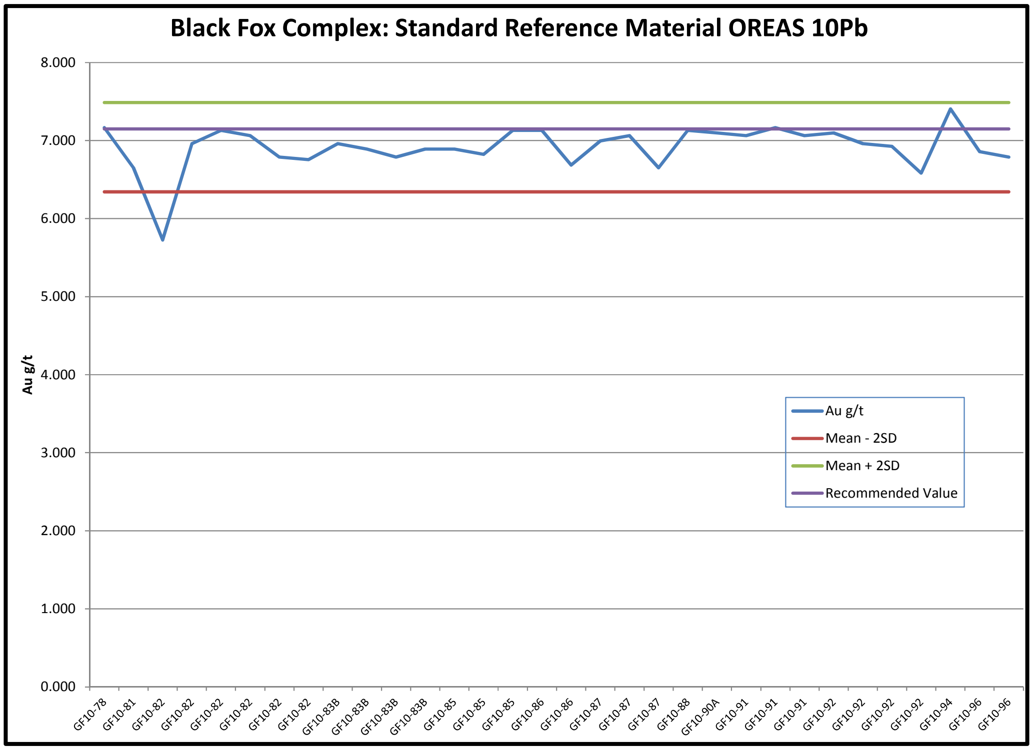

Duplicate samples showed that approximately 82% were less than 20% relative difference between samples. The majority of the samples were at the lower detection limit. The duplicates were up to 200% different which illustrates the nuggety nature of the deposit. Figure 11.2 is a graph of the duplicates.

**Figure 11.2 Duplicates**




The SRM performed well within two standard deviations of the assayed samples. The SRM did not meet the 95% confidence limit included in the Certificate of Analysis for each SRM. The Brigus assay mean was lower than the recommended value for all four standards. No trends or systematic bias was detected in the control charts. Four samples were identified which could be errors due to sample mix up. The fail rate within two standard deviations was less than 5%. Control charts for OREAS 10 Pb, Si42, Si54 and Sn50 are shown in Figure 11.3, Figure 11.4, Figure 11.5, and Figure 11.6, respectively.

## Figure 11.3 Standard Reference Material OREAS 10Pb




## Figure 11.4 Standard Reference Material Si42

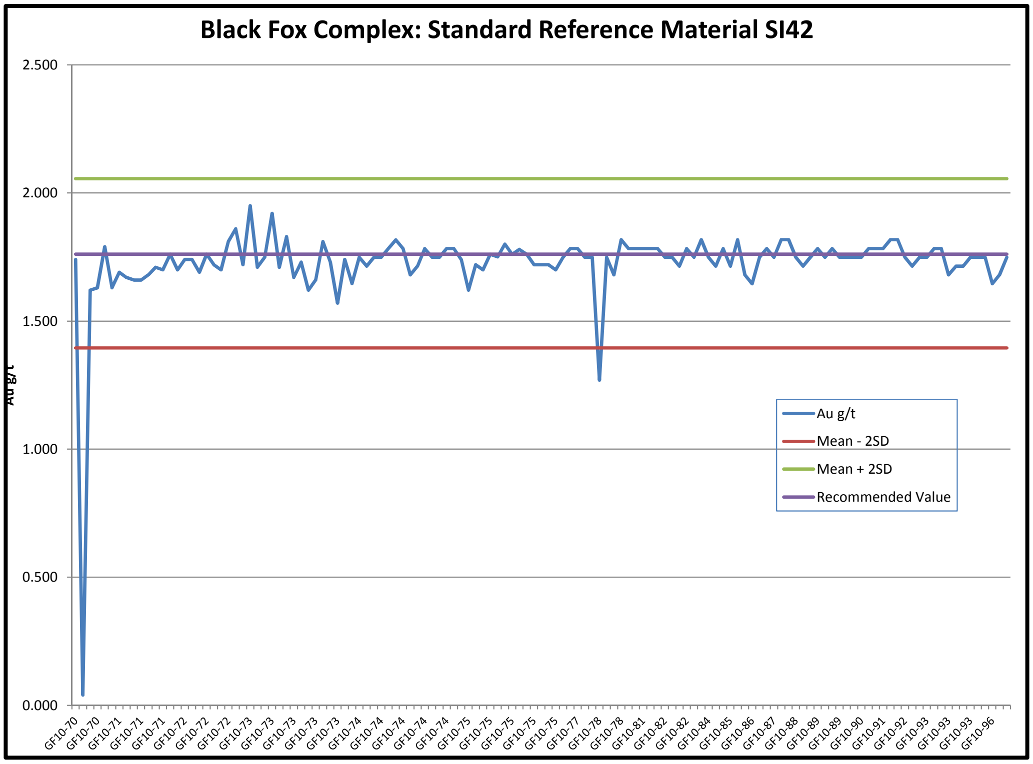


**Figure 11.5 Standard Reference Material Si54**

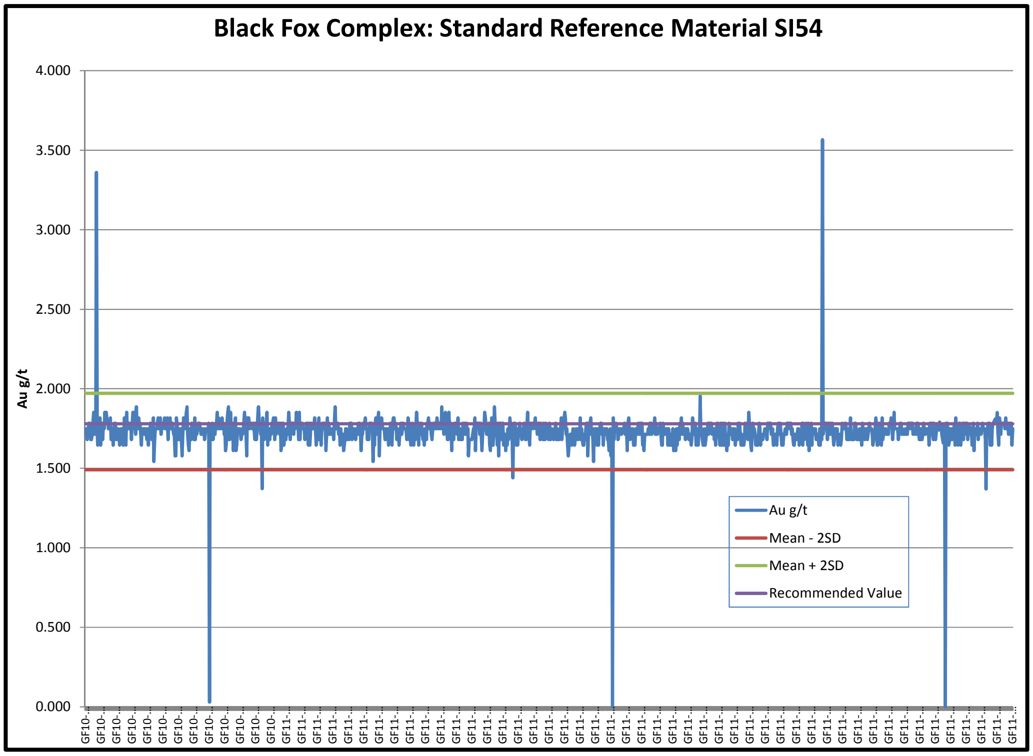
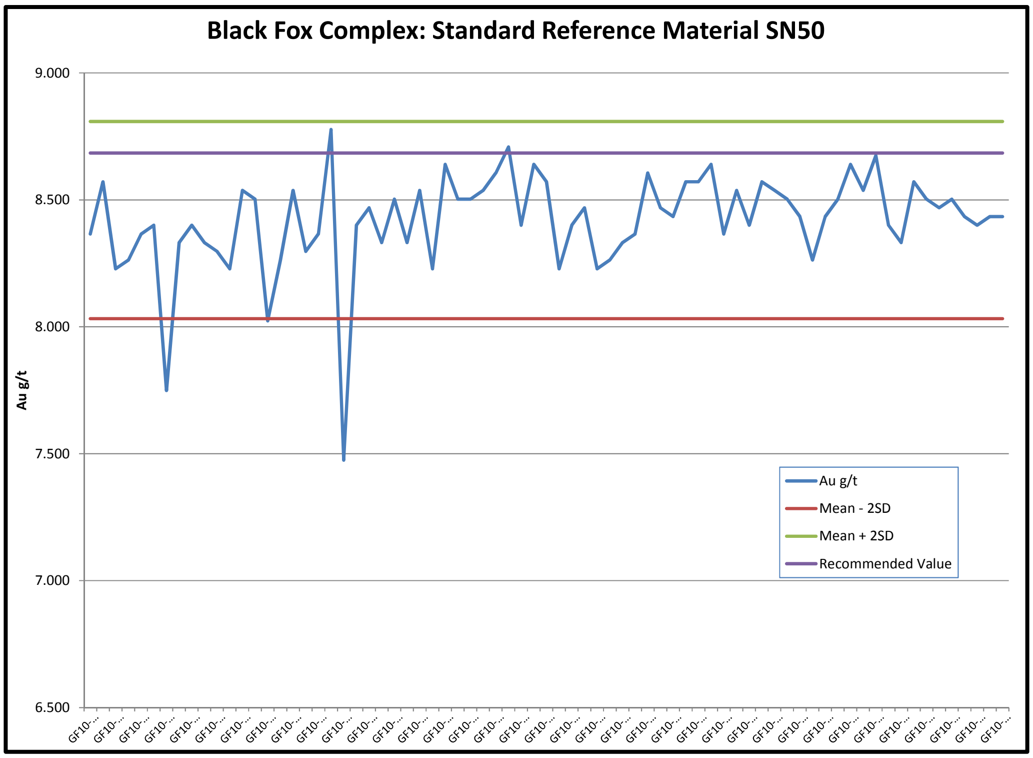



**Figure 11.6 Standard Reference Material Sn50**



Tetra Tech believes the sampling practices of Brigus meet industry guidelines. The following recommendations are provided to potentially improve the QA/QC program and make it more effective:

- timely monitoring of control samples
- review of assay methodologies
- consider use of second laboratory for pulp duplicates.

# 12.0 DATA VERIFICATION

## 12.1 HISTORIC DATABASE VERIFICATION

Buss (2010) verified the dataset used in sample processing and reporting, and stated that the dataset was within acceptable standards as dictated by NI 43-101. Details of the verification process were not provided.

## 12.2 TETRA TECH DATABASE VERIFICATION

Tetra Tech performed an internal verification process of the Project database against the original logs and laboratory-issued assay certificates. The validation of the data was completed on 23 of the 449 drillholes, accounting for approximately 5% of the overall dataset.

The data verification process examined the collars (easting, northing, elevation, length), lithologies (intervals, rock type), survey (depth, azimuth, dip) and assays (sample number, gold grade). Drillholes included in the verification process are as follows: GF-08-01, GF-08-04, GF08-06, GF08-09, GF08-12, GF09-25, GF09-27, GF09-34, GF09-46, GF09-56, GF09-60, GF09-65, GF10-116, GF10-119, GF10-129, GF10-131, GF10-70, GF11-147, GF11-165, GF11-173, GF11-194, GF11-207, and GF11-223.

### *12.2.1 COLLARS*

For the collars, discrepancies between the database and original logs varied by up to 1.12 m for the easting, 0.18 m for the northing, and 8.54 m for the elevation. Since these discrepancies were due to later re-surveying of the collars with a more accurate GPS unit, they were not considered to be errors in the database. The collar locations for 2011 drillholes and for GF09-65 were not recorded in the original logs and a comparison therefore could not be performed. While the northing in the log for GF10-119 was incorrect by 30 m, it was correct in the database. No collar location errors were discovered in the database.

Within the original drill logs themselves, there are occasional discrepancies regarding the final length of the hole. The length noted on the header page of the log does not always match the ending depth of the final lithology or the “end of hole” noted depth at the end of the log. For example, the last lithology for GF10-129 ends at 347.4 m, whereas the “end of hole” note states it should be 350 m. Similarly, the last lithology for GF11-147 ends at 391.75 , whereas the “end of hole” note states it should be 392 m. These occurrences are rare, are typically less than 1 m, and since the database matched at least one of the entries in the logs, they were not counted as errors within the database.

There was only one minor discrepancy in hole length that was counted as an error in the collar table of the database, and it is summarized in Table 12.1. This accounted for approximately 0.2% of the collar dataset.

**Table 12.1 Correction made to collar table in database.**

| Hole ID | Database Length (m) | Original Log Length (m) | Comment |
|---|---|---|---|
| GF11-223 | 555 | 554 | Correct end-of-hole of 554 m |

### 12.2.2 *LITHOLOGIES*

For the lithologies, the intervals and rock types were verified. It was observed that some lithologies in the logs were often recorded under a different rock name than that which was entered into the database. This typically occurred for rocks that are similar in nature and/or appearance. For example, the rock type entered in the log was frequently 'mafic volcanic' and input into the database as 'diabase'. Similarly, 'argillite' and 'tuff' in the logs were frequently entered as 'sediment' in the database. On occasion, a brecciated mafic volcanic, which was not noted in the log, was extracted from a mafic volcanic unit in the database. There are also occasional additional entries in the database which are not recorded in the logs. As an example, the quartz vein from 117.00 to 117.50 m in GF09-56 in the database is not recorded in the log. These discrepancies are attributed to later re-interpretation of the geology, and are not counted as errors in the database. Due to the various very gradational contacts, any intervals discrepancies less than 5 cm were not counted as errors either.

There were, however, six entries, accounting for approximately 0.05% of the lithological dataset that contained errors in the database. Table 12.2 summarizes these items, which were addressed in the database.

**Table 12.2 Corrections Made to Lithology Table in Database**

| Hole ID | Database | | | Original Logs | | | Comments |
|---|---|---|---|---|---|---|---|
| | From (m) | To (m) | Rock Type | From (m) | To (m) | Rock Type | |
| GF08-09 | 33.80 | 36.00 | SHTF | 33.80 | 36.00 | FI | Discrepancy in lithology |
| GF09-27 | 89.00 | 101.10 | MV | 89.00 | 101.00 | MV | Discrepancy in "to" value |
| GF09-27 | 101.10 | 113.00 | BXMV | 101.00 | 113.00 | BXMV | Discrepancy in "from" value |
| GF09-60 | 39.00 | 39.70 | SED | 39.00 | 39.70 | FI | Discrepancy in lithology |
| GF11-207 | 271.20 | 280.00 | BXMV | 271.20 | 281.00 | BXMV | Discrepancy in "to" value |
| GF11-207 | 280.00 | 287.00 | MV | 281.00 | 287.00 | MV | Discrepancy in "from" value |

### 12.2.3 SURVEYS

For the downhole directional surveys, the depth, azimuth and dip were verified. Directional downhole survey results were not entered into the 2010 and 2011 logs, and the original records are in the form of individual sheets for each station reading. A check on the surveys for those holes was therefore not performed.

A total of five errors, accounting for approximately 0.2% of the dataset were found to contain discrepancies. Where possible, these were verified against the original downhole survey documentation, and the corrections were made to the database. Corrections are shown in Table 12.3.

**Table 12.3 Corrections Made to Survey Table in Database**

| Hole ID | Database | | | Original Logs | | |
|---|---|---|---|---|---|---|
| | Distance (m) | Azimuth (°) | Dip (°) | Distance (m) | Azimuth (°) | Dip (°) |
| GF08-06 | 50.00 | 273.5 | -56.0 | 50 | 273.5 | -56.5 |
| GF08-12 | 0.00 | 270.0 | -51.5 | 0 | 270 | -52 |
| GF09-25 | 0.00 | 270.0 | -59.5 | 0 | 270 | -61 |
| GF09-25 | 275.00 | 275.6 | -61.0 | 275 | 275.6 | -61.2 |
| GF09-56 | 0.00 | 270.0 | -71.0 | 0 | 270 | -72 |

### 12.2.4 ASSAYS

The sample numbers and gold grades were verified against the assay certificates. Assay certificates are stored in binders in the exploration office and contain certificates from various laboratories such Accurassay Laboratories, PolyMet Labs, Swastika Laboratories Ltd., and SGS Canada Inc. They span a time period from at least 2008 to present. Digital copies of these certificates are available in the form of Microsoft Excel™ files, for all holes drilled since 2009. Assay certificates from historic holes drilled in the 1990s were not available.

The verification process on the assays using the digital files was performed on drillholes GF09-25, GF09-27, GF09-34, GF09-46, GF09-56, GF09-60, GF09-65, GF10-116, GF10-119, GF10-129, GF10-131, GF10-70, GF11-147, GF11-165, GF11-173, GF11-194, GF11-207, and GF11-223. No errors in sample numbers were discovered, however rare assay grade entry errors were found. Table 12.4 outlines all corrections pertaining to the assays that were made to the database. These represent only 0.01%% of the entire assay dataset.

**Table 12.4 Corrections Made to Assay Table in Database**

| Hole ID | From (m) | To (m) | Length (m) | Sample Number | Certificate Number | Database Au (g/t) | Assay Certificate Au (g/t) |
|---|---|---|---|---|---|---|---|
| GF09-56 | 131.50 | 133.00 | 1.50 | 1552 | PolyMet 6769 | 0.14 | <.03 |
| GF10-131 | 148.50 | 149.00 | 0.50 | 16125 | PolyMet 9538 | 0.03 | 1.029 |
| GF10-131 | 149.00 | 149.64 | 0.64 | 16126 | PolyMet 9538 | 1.03 | <.03 |

Supplementary to the assay verification against the Microsoft Excel™ files, assays for drillhole GF10-83b and additional spot checks on randomly chosen sample numbers that were taken prior to 2009 were performed on the paper copies of the assay certificates during the site visit. All of these values matched the database.

Over the years, various assaying laboratories, which each have a different lower detection limit for gold, have been used for analyzing the Project samples. When an assay result was below the lower detection limit value, the majority of such samples prior to 2009 were entered into the database as the absolute value of the corresponding detection limit. For samples analyzed at Swastika Labs, the value entered was '0' since the assay certificate stated 'NIL'. Common practice later became to enter a default value of 0.03 g/t, which is the lower detection limit for gold at PolyMet Labs, into the database when the assay is below detection limit. Currently, this continues to be the practice even when results are from SGS which has a much lower detection limit value of 0.005 g/t. This results in a value of 0.03 g/t being entered into the database when the known value is less than 0.005 g/t. This is not considered to be conforming to the Canadian Institute of Mining (CIM) exploration best practice guidelines, and it is recommended that half of the value of the lower detection limit specific to each lab be entered into the database when the grade is less than detection limit. Nonetheless, these occurrences were not considered to be errors in the database, and due to the cut-off grade, did not affect the accompanying resource estimate calculations.

### 12.2.5 OTHER

The database is maintained within Gemcom GEMS™ software, which has a routine that checks for duplicate intervals, overlapping intervals, and intervals beyond the length of the hole. No errors were identified within the routine.

There were however, supplementary errors that were discovered within the database regarding azimuth, sample widths, rock codes and a missing assay value. In the survey tab at 0 m distance for drillhole PR93-7, the azimuth was entered as 400°. This was corrected to 40°. Various samples had incorrect widths and/or interval values and were corrected in the database (Table 12.5 ). Additionally, two intervals were missing rock codes (Table 12.6), and a sample number was missing a known assay value (Table 12.7).

**Table 12.5 Corrected Sample Widths in Database**

| Hole ID | From (m) | To (m) | Au (g/t) | Width (m) | Corrected Width (m) | Comment |
|---|---|---|---|---|---|---|
| GF11-211 | 349.60 | 350.70 | 0.03 | 101.10 | 1.10 | width re-calculated |
| GF11-207 | 267.45 | 268.50 | 7.75 | 101.05 | 1.05 | width re-calculated |
| GF10-76 | 65.00 | 66.50 | 0.03 | 66.50 | 1.50 | width re-calculated |
| GF11-218 | 446.00 | 479.56 | 0.03 | 33.56 | 33.56 | width re-calculated and "to" value corrected to 447.00 m |
| GF10-130 | 284.85 | 285.45 | 0.34 | 31.00 | 0.60 | width re-calculated |
| GF11-207 | 391.00 | 392.00 | 0.03 | 31.00 | 1.00 | width re-calculated |
| GF11-310 | 144.35 | 145.35 | 0.03 | 21.00 | 1.00 | width re-calculated |
| GF10-78 | 113.65 | 113.99 | 1.03 | 20.34 | 0.34 | width re-calculated |

**Table 12.6 Missing Rock Codes**

| Hole ID | From (m) | To (m) | Rock Type |
|---|---|---|---|
| GF11-210 | 398.00 | 401.28 | BXMV |
| GF11-137 | 154.30 | 166.80 | VIV |

**Table 12.7 Missing Assay Value**

| Hole ID | From (m) | To (m) | Missing Assay Value (g/t) |
|---|---|---|---|
| GF10-94 | 272 | 273 | 0.03 |

All of the above corrections were made to the database prior to the calculation of the resource estimate.

## 12.3 TETRA TECH SITE VISIT

The Tetra Tech site visit was conducted by Laura Karrei, P.Geo., Geologist, from November 7 to 11, 2011. During the site visit, the Project property, and the core shack and core storage facility, which are located at the Brigus Gold Black Fox Mine site, were visited.

### 12.3.1 COLLAR LOCATION VERIFICATION

From the Black Fox Mine site, access to the Project property is granted by driving east for approximately 2 km along Highway 101 and then south for approximately 3 km on Tamarack gravel road (formerly called Hislop Road 2).

The property (Figure 12.1 and Figure 12.2) was visited during the mornings of November 8 and 9, 2011 with Graeme Roper of Brigus. Various collar locations were checked in the field and compared to the database records (Table 12.8). Outcrops on the property were noted to be very rare and no surface samples were collected.

**Figure 12.1 Photo of a Drill Rig on the Grey Fox Property**

### Figure 12.2 Photo of the Grey Fox 147 Zone on Surface

Note: Wooden pickets mark various collar locations from the 20011 drilling campaign.

### Table 12.8 Verified Collars Coordinates

| Diamond Drillhole | Brigus | | | Tetra Tech | | |
|---|---|---|---|---|---|---|
| | Easting (m) | Northing (m) | Elevation (masl) | Easting (m) | Northing (m) | Elevation (masl) |
| PR95-27 | 550961.96 | 5372948.22 | 293.42 | 550956 | 5372954 | 298 |
| PR95-33* | 551233.17 | 5372939.55 | 290.96 | 551234 | 5372938 | 294 |
| PR96-40 | 551001.99 | 5373038.17 | 291.80 | 551001 | 5373042 | 303 |
| PR96-45 | 551221.95 | 5372958.91 | 290.74 | 551221 | 5372962 | 294 |
| GF08-09 | 551049.85 | 5372950.22 | 291.83 | 551046 | 5372951 | 292 |
| GF08-10 | 551069.56 | 5372899.83 | 291.89 | 551068 | 5372908 | 293 |
| GF09-19 | 551082.48 | 5372900.11 | 291.74 | 551080 | 5372904 | 296 |
| GF09-29 | 551069.54 | 5372962.63 | 290.84 | 551071 | 5372953 | 298 |
| GF09-30 | 551069.76 | 5372987.48 | 290.51 | 551070 | 5372985 | 298 |
| GF09-33 | 551083.66 | 5372962.04 | 289.95 | 551086 | 5372960 | 299 |
| GF09-62 | 551047.03 | 5373058.49 | 290.92 | 551042 | 5373059 | 295 |
| GF09-63 | 551047.58 | 5373058.47 | 291.00 | 551042 | 5373059 | 295 |
| GF10-94 | 551184.50 | 5372980.00 | 290.22 | 551182 | 5372987 | 286 |
| GF10-98 | 551131.80 | 5373124.00 | 290.44 | 551120 | 5373121 | 288 |
| GF10-99 | 551132.30 | 5373124.00 | 290.46 | 551120 | 5373121 | 288 |
| GF10-103 | 551164.63 | 5373071.20 | 290.93 | 551156 | 5373078 | 293 |
| GF10-106 | 551188.40 | 5372943.44 | 291.07 | 551189 | 5372934 | 292 |
| GF10-116 | 551357.10 | 5372475.38 | 293.18 | 551350 | 5372473 | 297 |

*table continues…*

| Diamond Drillhole | Brigus | | | Tetra Tech | | |
|---|---|---|---|---|---|---|
| | Easting (m) | Northing (m) | Elevation (masl) | Easting (m) | Northing (m) | Elevation (masl) |
| GF10-125 | 551118.24 | 5373078.57 | 290.07 | 551117 | 5373075 | 297 |
| GF11-147 | 551355.87 | 5372374.08 | 293.63 | 551355 | 5372374 | 297 |
| GF11-154 | 551233.00 | 5372943.00 | 290.00 | 551236 | 5372938 | 291 |
| GF11-160 | 551233.00 | 5372943.00 | 290.00 | 551236 | 5372938 | 291 |
| GF11-170 | 551342.70 | 5372605.30 | 294.40 | 551344 | 5372603 | 292 |
| GF11-172 | 551376.20 | 5372521.00 | 292.60 | 551370 | 5372525 | 295 |
| GF11-188 | 551425.60 | 5372390.00 | 294.54 | 551426 | 5372390 | 298 |
| GF11-243 | 551076.00 | 5372923.90 | 293.00 | 551076 | 5372924 | 292 |
| GF11-244 | 551327.30 | 5372372.60 | 294.20 | 551328 | 5372375 | 298 |
| GF11-252 | 551127.00 | 5373055.00 | 290.00 | 551125 | 5373065 | 289 |
| GF11-264 | 551114.70 | 5373111.70 | 293.80 | 551109 | 5373106 | 292 |
| GF11-282 | 551175.00 | 5373020.00 | 290.00 | 551172 | 5373017 | 292 |
| GF11-299 | 551324.00 | 5372465.00 | 292.00 | 551320 | 5372461 | 298 |
| GF11-348 | 551509.00 | 5372545.00 | 290.00 | 551506 | 5372544 | 298 |
| GF11-365 | 551181.00 | 5372977.00 | 290.00 | 551178 | 5372988 | 277 |
| EH11-06 | n/a | n/a | n/a | 551042 | 5372947 | 300 |

Note: UTM NAD 83, Zone 17N, collar locations verified with Garmin hand-held device (Etrex Legend)
*no casing or collar cap for PR95-33 was seen, but a wooden picket marked the location and the lack of any nearby large trees indicated it to have been a former drill site.

Collars for 29 diamond drillholes spanning the northern to the southern regions of the property were visited. Water well EH10-06 was also visited. Collar locations were verified using a hand-held Garmin Etrex Legend GPS and within the acceptable margin of GPS unit accuracy, all checked collar locations were found to be consistent with the database. The collar locations were generally marked by a wooden picket with spray paint or flagging tape and an affixed aluminum tag noted the drillhole name and orientation (Figure 12.3 and Figure 12.4). The casings of all visited collars were observed to be capped.

**Figure 12.3 Photo of Drill Collar GF08-10**

**Figure 12.4 Photo of Drill Collar GF08-09**

When initially visited by Tetra Tech on November 8, collar locations for drillholes PR96-40, PR96-45, GF08-09, GF09-19, GF11-282, GF09-62 and GF09-63 were noted to be different from the database records by up to approximately 20 m. This discrepancy was due to cloud cover, resulting in intermittent poor satellite coverage. Due to this inaccuracy, the collars were re-visited the following day on November 9, 2011, when the GPS accuracy was within the well accepted range of accuracy. All Tetra Tech records for these holes are included in Table 12.8, and no collar location discrepancies were found within the database.

### 12.3.2 *DRILL CORE EXAMINATION*

With the exception of some historic drillholes, all drillcore is stored outdoors in core racks and in cross piles at the exploration section of the Black Fox mine site (Figure 12.5). There is a core shack on site with three core cutting saws (Figure 12.6 and Figure 12.7).

**Figure 12.5 Photos of Core Stored in Racks and in Cross Piles**

**Figure 12.6 Photo of Core Shack**

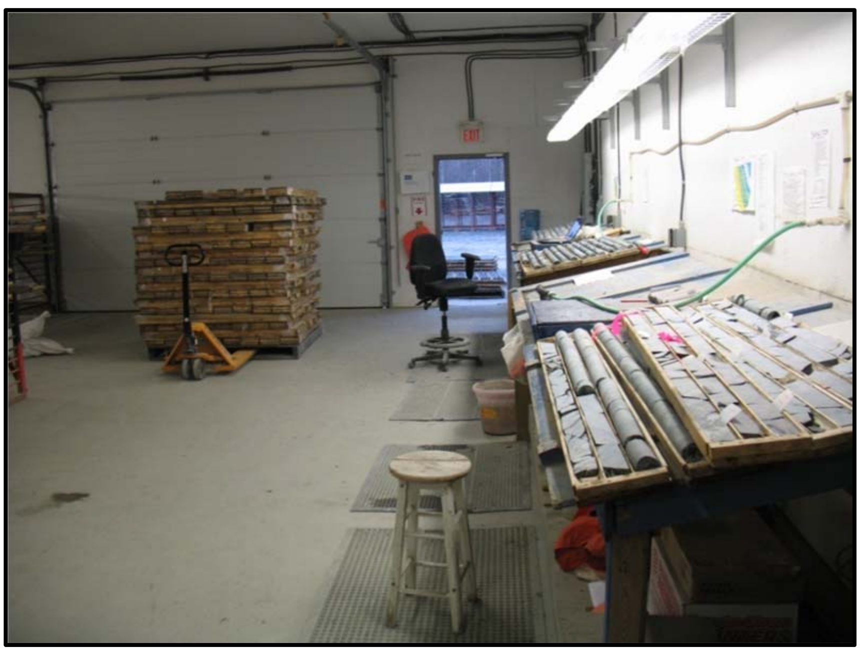


**Figure 12.7 Photo of Core Cutting Saws**

All core from drillhole GF11-201 and selected intervals containing representative mineralization of the Contact and 147 Zones were examined. Checked intervals, which are listed in Table 12.9, were verified against the original logs and various check samples were collected for assaying. Check samples containing average gold grades were collected from drill core that intersected the Contact and 147 Zones, spanning the northern to southern areas of the Project (Table 12.10). The half core was quarter split and half was placed back in the core box for future reference, and the other half was taken for check-assaying. Since core from holes drilled prior to 2008 were cross piled, resulting in more difficult accessibility, they were not examined.

**Table 12.9 Intervals of Examined Drill Core During Tetra Tech Site Visit**

| Diamond Drillhole | From (m) | To (m) | Zone |
|---|---|---|---|
| GF08-09 | 27 | 37 | Contact Zone |
| GF09-30 | 57 | 70 | Contact Zone |
| GF10-90 | 133 | 142 | Contact Zone - Hanging Wall |
| | 170 | 182 | Contact Zone |
| GF10-106 | 193 | 206 | Contact Zone |
| | 281 | 291 | Contact Zone - Footwall |
| GF10-125 | 119 | 145 | Contact Zone |
| GF11-192 | 137 | 158 | 147 Zone |
| GF11-201 | 0 | 401 | 147 Zone, Contact Zone |
| GF11-230 | 31 | 45 | 147 Zone |
| GF11-284 | 299 | 311 | 147 Zone |
| | 350 | 362 | 147 Zone - Footwall |

**Table 12.10 Check Samples Summary – Brigus and Tetra Tech Results**

| Diamond Drillhole | From (m) | To (m) | Length (m) | Brigus Sample Number | Brigus Au (g/t) | Tetra Tech Sample Number | Tetra Tech Au (g/t) | Comments | Absolute Difference (g/t) | Percent Difference (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| GF11-201 | 103.00 | 104.00 | 1.00 | 26246 | 17.55 | LGB06101 | 3.10 | 147 zone, VIV unit, various hues of light to dark green with patches of hematization, mottled texture, various magnetite patches, abundant calcite in matrix and in veins, overall trace pyrite but locally up to 5% concentrated in patches and along magnetite contacts | -14.45 | -466.13 |
| GF11-201 | 124.00 | 125.00 | 1.00 | 26271 | 3.29 | LGB06102 | 3.64 | 147 zone, VIV unit, variably medium to dark green, abundant calcite in matrix and veins, dark red/maroon hematization, off-white veinlets oriented at a low degree to core axis, weakly to moderately magnetic, locally up to 5% disseminated and blebby pyrite | 0.35 | 9.62 |
| GF11-201 | 137.00 | 138.00 | 1.00 | 26287 | 3.91 | LGB06103 | 3.11 | 147 zone, BVIV unit, grey to buff-coloured with hues of green, mottled texture, abundant calcite in matrix, patches of hematization | -0.80 | -25.72 |
| GF11-201 | 142.00 | 143.00 | 1.00 | 26293 | 8.30 | LGB06104 | 7.71 | 147 zone, BVIV unit, grey to buff-coloured with hues of green, mottled texture, abundant calcite in matrix, rare hematization | -0.59 | -7.65 |
| GF11-201 | 343.00 | 344.10 | 1.10 | 26316 | 6.72 | LGB06105 | 5.68 | Contact zone, BXMV unit, variably light to dark green, annealed breccia?, patchy pyrite throughout but locally up to 5%, lowe angle to core axis quartz-carbonate veins, abundant calcite throughout | -1.04 | -18.31 |

*table continues…*

| Diamond Drillhole | From (m) | To (m) | Length (m) | Brigus Sample Number | Brigus Au (g/t) | Tetra Tech Sample Number | Tetra Tech Au (g/t) | Comments | Absolute Difference (g/t) | Percent Difference (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| GF11-201 | 341.00 | 342.00 | 1.00 | 26313 | 1.71 | LGB06106 | 1.15 | Contact zone, BXMV unit, variably light to dark green, annealed breccia?, patchy pyrite throughout but locally up to 5%, lowe angle to core axis quartz-carbonate veins, abundant calcite throughout, suspect trace chalcopyrite | -0.56 | -48.70 |
| GF11-284 | 301.25 | 302.25 | 1.00 | 44558 | 25.03 | LGB06107 | 15.00 | 147 Zone, VIV, fine grained, grey-green, locally bleached, some brecciation, non to very weakly magnetic, quartz stringers and patches of random orientation, abundant calcite throughout, 2-3% disseminated and blebby pyrite but locally up to 5% | -10.03 | -66.86 |
| GF11-284 | 357.73 | 358.73 | 1.00 | 44595 | 11.31 | LGB06108 | 9.24 | 147 Zone, BXMI, brecciated MI, grey, abundant calcite, overall ~1% pyrite, locally up to 8% pyrite, fine grained to disseminated coarse grained cubic pyrite, non-magnetic | -2.07 | -22.45 |
| GF11-230 | 42.77 | 43.77 | 1.00 | 38589 | 39.29 | LGB06109 | 11.60 | 147 Zone, BVIV, bleached variolitic, green-grey, abundant quartz-carbonate, visible gold, locally up to 5% pyrite, brecciated | -27.69 | -238.72 |
| GF11-192 | 146.00 | 147.00 | 1.00 | 30940 | 2.13 | LGB06110 | 3.45 | 147 Zone, mottled texture, non-magnetic, trace to 1% disseminated pyrite generally throughout, some brecciation, grey-green, silicified | 1.32 | 38.26 |
| GF10-90 | 140.00 | 140.72 | 0.72 | 14373 | 1.44 | LGB06111 | 1.62 | Contact Zone, MV, medium to dark green, abundant carbonate, trace pyrite stringers, rare chalcopyrite stringers in calcite veinlets, non-magnetic | 0.18 | 11.11 |

*table continues…*

| Diamond Drillhole | From (m) | To (m) | Length (m) | Brigus Sample Number | Brigus Au (g/t) | Tetra Tech Sample Number | Tetra Tech Au (g/t) | Comments | Absolute Difference (g/t) | Percent Difference (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| GF10-90 | 172.87 | 173.50 | 0.63 | OO8877 | 8.23 | LGB06112 | 6.05 | BXMV, variably light to dark green and deep red/maroon (hematization), disseminated pyrite, abundant calcite, very rare chalcopyrite | -2.18 | -36.03 |
| GF09-30 | 62.40 | 63.40 | 1.00 | 265068 | 5.07 | LGB06113 | 3.97 | BX, variably green and deep red/maroon (hematization), rare patches of pyrite, locally up to 5% pyrite, mottled texture, abundant calcite in matrix, non-magnetic | -1.10 | -27.71 |
| GF08-09 | 29.00 | 30.00 | 1.00 | 263003 | 1.51 | LGB06114 | 1.43 | Contact Zone, MV, grey-green with deep red hematization, abundant calcite throughout, non-magnetic, trace pyrite throughout | -0.08 | -5.59 |
| GF10-106 | 198.80 | 199.50 | 0.70 | 13234 | 37.78 | LGB06115 | 32.60 | Contact Zone, SHTF, grey to brown, strongly brecciated, abundant calcite throughout, quartz-carbonate veining, trace to locally 5% pyrite | -5.18 | -15.89 |
| GF10-106 | 284.00 | 285.00 | 1.00 | 13276 | 2.74 | LGB06116 | 2.76 | Contact Zone, BXTUFF, light green with quartz veinlets stockwork, very rare calcite, non-magnetic, brecciated, epidotized | 0.02 | 0.72 |
| GF10-125 | 137.29 | 138.00 | 0.71 | 15376 | 1.37 | LGB06117 | 1.19 | Contact Zone, SITF, brown-grey, silicified, up to 5% pyrite in annealed fractures, trace chalcopyrite | -0.18 | -15.13 |

Some of these samples have spurious check assays and such results could form a bias for the high grade population of the deposit. It is suggested that more extensive high-grade check assays are taken to confirm if a systemic bias is present throughout the deposit. However, this does not appear to be a concern for the lower grade samples, and it should be noted that the number of samples taken during the site visit may be insufficient for these check assays to be truly representative of the entire dataset.

Core boxes are labelled with aluminum tags that are indented with the drillhole name, box number and the contained interval (Figure 12.8 ). Corresponding to sampled intervals, sample tags are stapled in the box. Core recovery is generally good and where broken ground was intersected, core loss was noted in the logs. Pink flagging tape was often stapled to the end of a core box if visible gold was observed. Sampled intervals were typically approximately 1 m long and often crossed gradational lithological contacts.

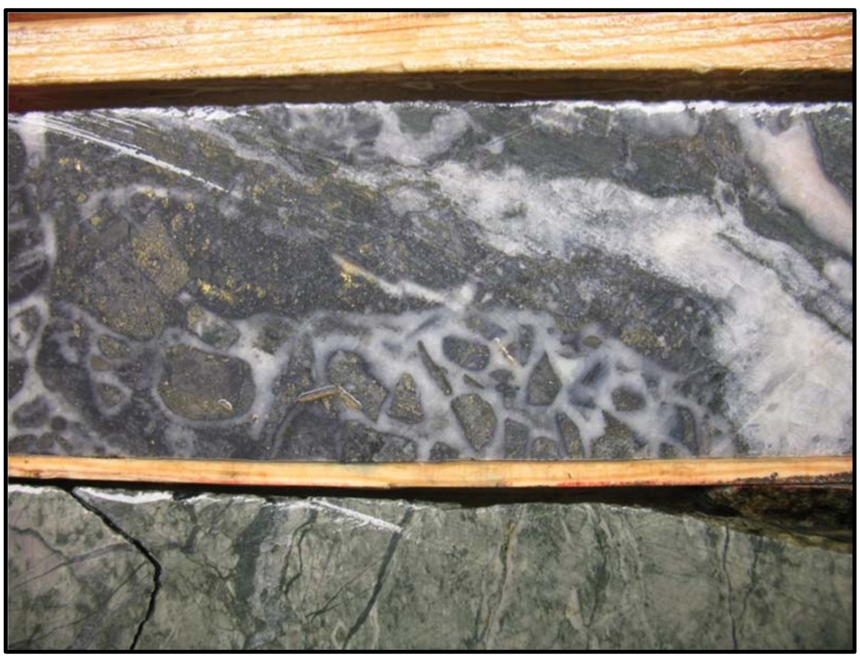
**Figure 12.8 Photo of Labelled Core Boxes**

Photos of Tetra Tech samples LGB06106 and LGB06109 are provided in Figure 12.9 and Figure 12.10. Figure 12.11 is a photo containing visible gold from drillhole GF11-284.

**Figure 12.9 Photo of Tetra Tech Sample LGB06106**

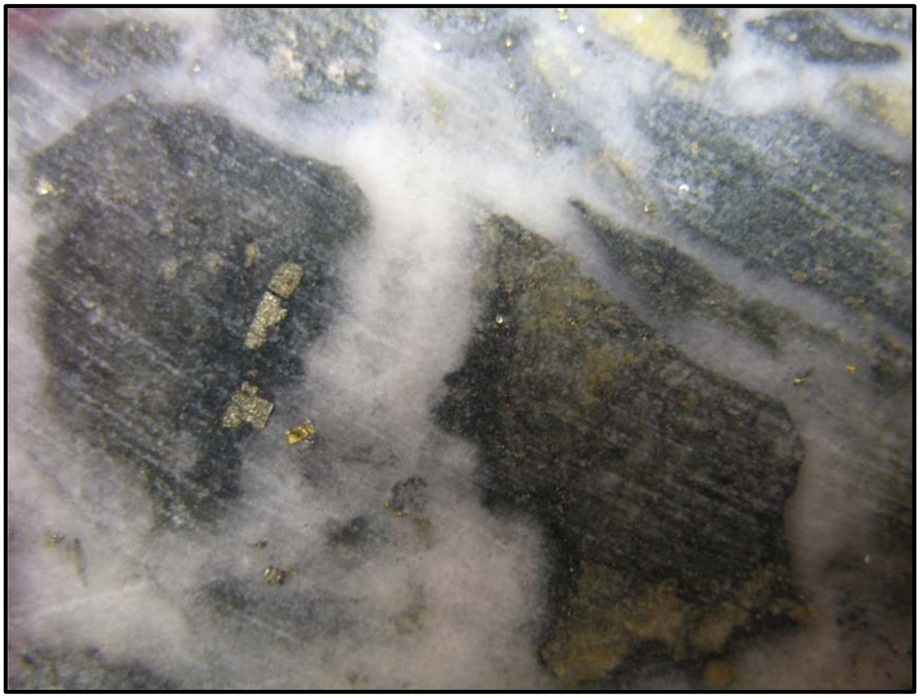
Note: Core is of NQ size.

**Figure 12.10 Photo of Tetra Tech Sample LGB06109**



Note: Core is of NQ size. Visible gold in left half of photo.

**Figure 12.11 Visible Gold in GF11-284 at 357.40 m Depth**



Note: Height of photo represents approximately 4 cm.

All samples from the Tetra Tech site visit were delivered from the exploration and mine site to the Tetra Tech office in Toronto and then subsequently to Actlabs in Ancaster via Purolator. Samples were analyzed by fire assay. A copy of the Actlabs assay certificate for these check samples is provided in Appendix A.

# 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

No mineral processing and metallurgical testing has been carried out of material from the property.

# 14.0 MINERAL RESOURCE ESTIMATES

Tetra Tech completed the mineral resource estimation using Gemcom GEMS™ 6.3.1 Desktop software for the Project. Tim Maunula, P.Geo. of Tetra Tech was the QP responsible for the resource estimation of the 147 and Contact Zone deposits in the Black Fox Complex. All references to the Project within this section will refer only to these two zones.

## 14.1 DRILLHOLE DATABASE

The drillhole sample database was compiled by Brigus and reviewed by Tetra Tech, as described in Section 12. Tetra Tech reports the database is acceptable for use in the resource estimation.

The Microsoft Access™ database contains collar locations, drillhole orientations with down hole deviation surveys, assay intervals with results, geologic logs and geotechnical logs.

The resource database contained information from 327 complete drillholes totalling 107,343.9 m of drilling. The maximum drillhole length is 891.0 m and the average length is 328.3 m. A total of 34,304 records were contained in the assay table and 71,753 records in the composite table.

## 14.2 MODEL LIMITS

The Project was modeled only for gold content. The block model was developed based on the selective mining unit (SMU) for an underground operation using a block size 3 m wide x 3 m long using a bench height of 3 m. The block model origin, in UTM coordinates, was 550,420 m east, 5,372,230 m north and -352 m elevation. The block model size is tabulated in Table 14.1.

**Table 14.1 Black Fox Complex Model Limits**

| Block Model | Direction | Minimum (m) | Maximum (m) |
|---|---|---|---|
| GF_dec11 | Easting | 550,420 | 551,620 |
| | Northing | 5,372,230 | |
| | Elevation | -352 | 320 |

## 14.3 GEOLOGIC MODEL

Interpretations were developed by Brigus on east-west sections as 3D rings honouring the drillhole lithologies. Solids were created using these sectional interpretations which were joined using tie lines in Gemcom GEMS™. The geological domains along with their associated block model code are listed in Table 14.2.

**Table 14.2 Geological Domains**

| Rock Code | Block Model Code | Description |
|---|---|---|
| CONTACT | 100 | Contact Zone – Brecciated Mafic Volcanic |
| DIA | 101 | Diabase |
| SED | 102 | Silicified Cherty Tuff/Metasediment |
| MIFW | 103 | Mafic Intrusive – Footwall |
| MV | 104 | Mafic Volcanic |
| VIV | 105 | 147 Zone – Variolitic Intrusive Volcanic |
| MIHW | 106 | Mafic Intrusive – Hanging-wall |
| OB | 201 | Overburden |

Figure 14.1 illustrates a typical Contact Zone geological section with accompanying assay intersections. Figure 14.2 provides a similar figure for the 147 Zone.

**Figure 14.1 Geological Section, Contact Zone**

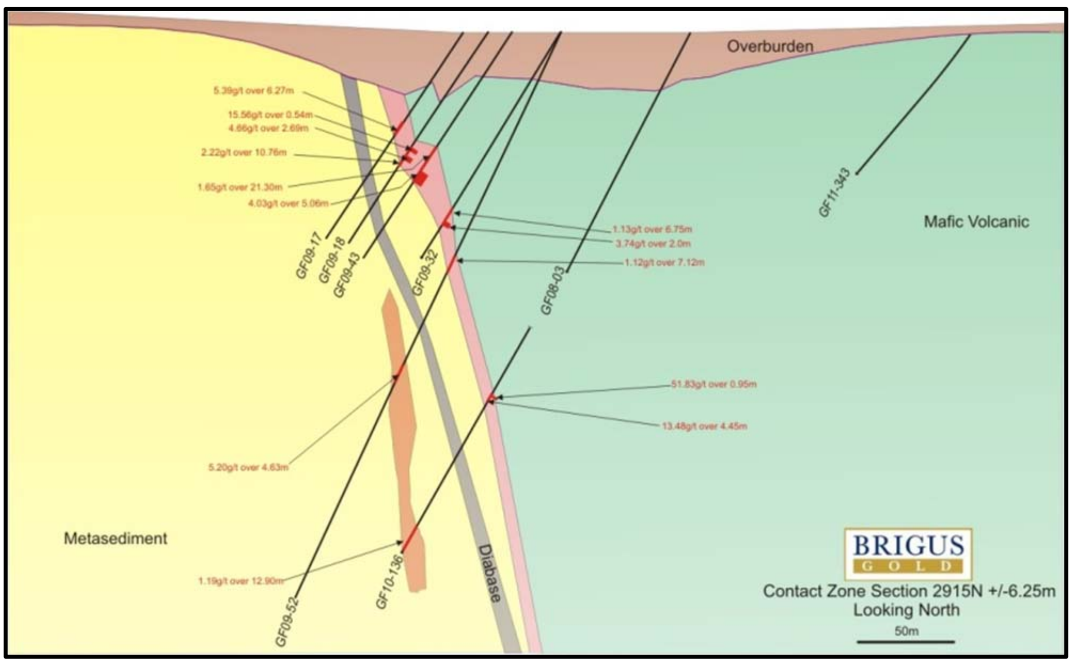
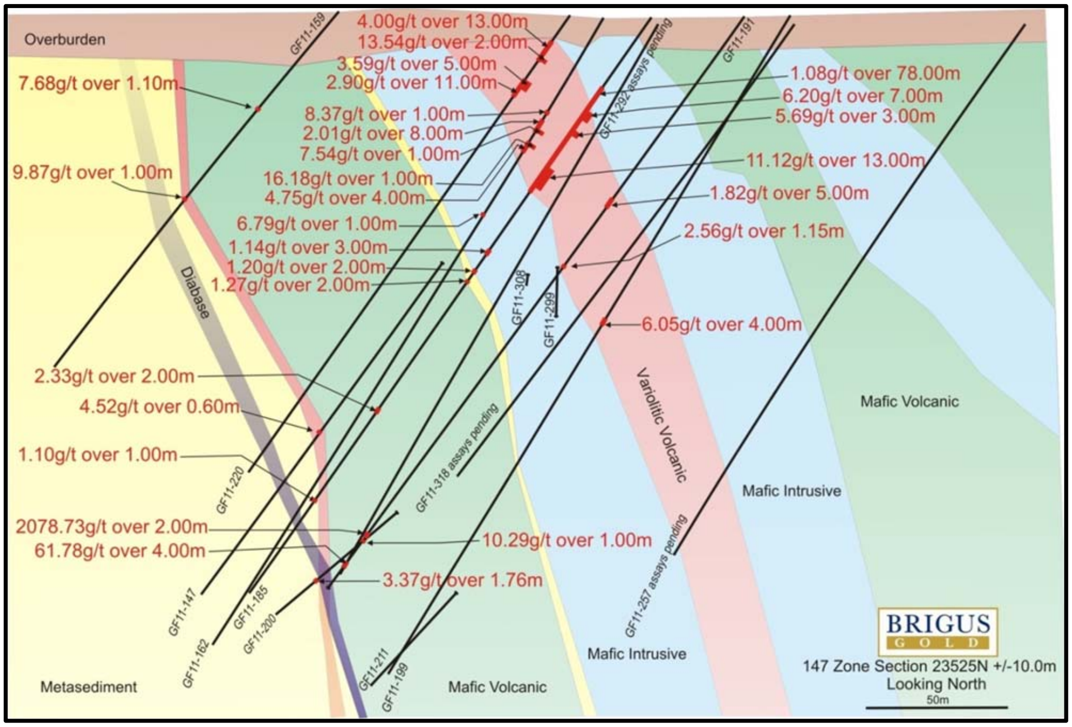


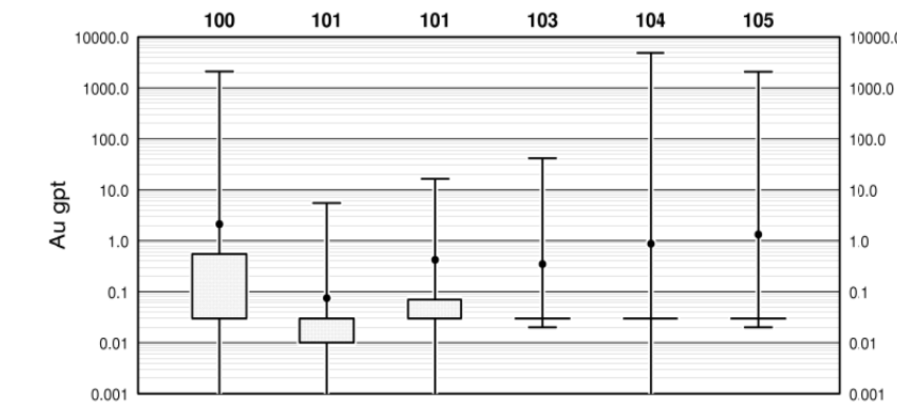
**Figure 14.2 Geological Section, 147 Zone**




## 14.4 ASSAY STATISTICS

The assay data was first evaluated based on the geological domains (as defined in Table 14.2) using boxplots. Figure 14.3 illustrates the grade distribution by block model code as originally logged by the geologist. The CONTACT and 147 (VIV) units, codes 100 and 105 respectively, are the primary units containing gold mineralization.

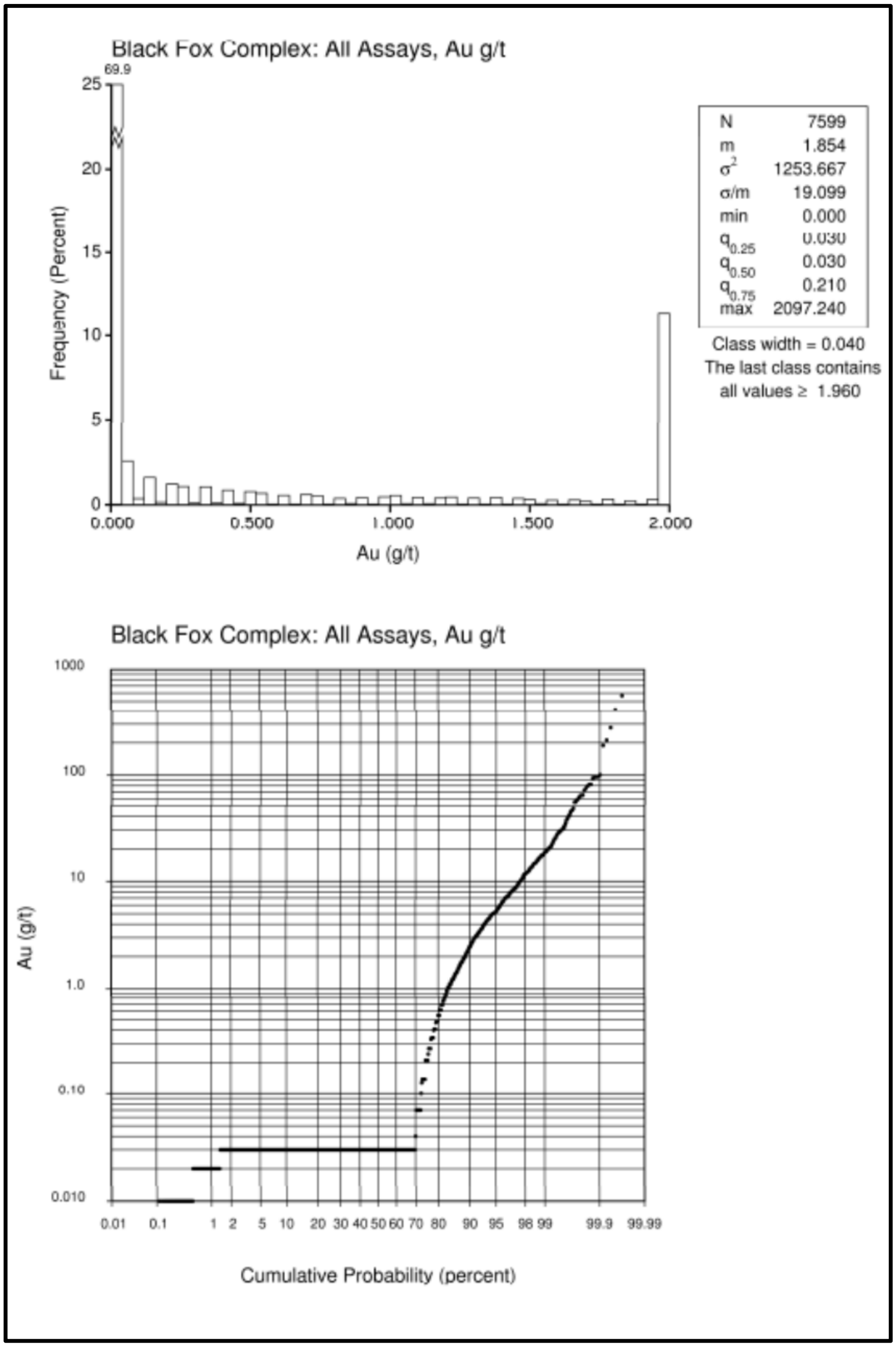
**Figure 14.3 Assay Grade Boxplot by Block Model Code**




| | 100 | 101 | 101 | 103 | 104 | 105 | |
|---|---|---|---|---|---|---|---|
| Number of data | 3509 | 394 | 498 | 1463 | 9488 | 5433 | Number of data |
| Mean | 2.117 | 0.075 | 0.423 | 0.348 | 0.874 | 1.331 | Mean |
| Maximum | 2097.24 | 5.49 | 16.46 | 41.69 | 4892.89 | 2079.51 | Maximum |
| Upper quartile | 0.55 | 0.03 | 0.07 | 0.03 | 0.03 | 0.03 | Upper quartile |
| Median | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | Median |
| Lower quartile | 0.03 | 0.01 | 0.03 | 0.03 | 0.03 | 0.03 | Lower quartile |
| Minimum | 0.0 | 0.0 | 0.0 | 0.02 | 0.0 | 0.02 | Minimum |
| Variance | 1445.36 | 0.1439 | 2.3572 | 4.1304 | 2541.49 | 821.679 | Variance |
| CV | 17.962 | 5.087 | 3.627 | 5.84 | 57.652 | 21.535 | CV |
| Skewness | 49.172 | 10.966 | 6.111 | 14.898 | 96.331 | 70.236 | Skewness |

The gold assay data was also plotted on histogram and probability graphs (Figure 14.4) to understand the basic statistical distribution of the raw data. The histogram plots show a strong positive skewness and the probability plot illustrates a continuous population set with no major changes in slope within the main data population. The probability plot does show outlier data values at the upper end of the grade distribution (above 100 g/t Au) with a break in the distribution.

**Figure 14.4 All Zones, Au Assays**

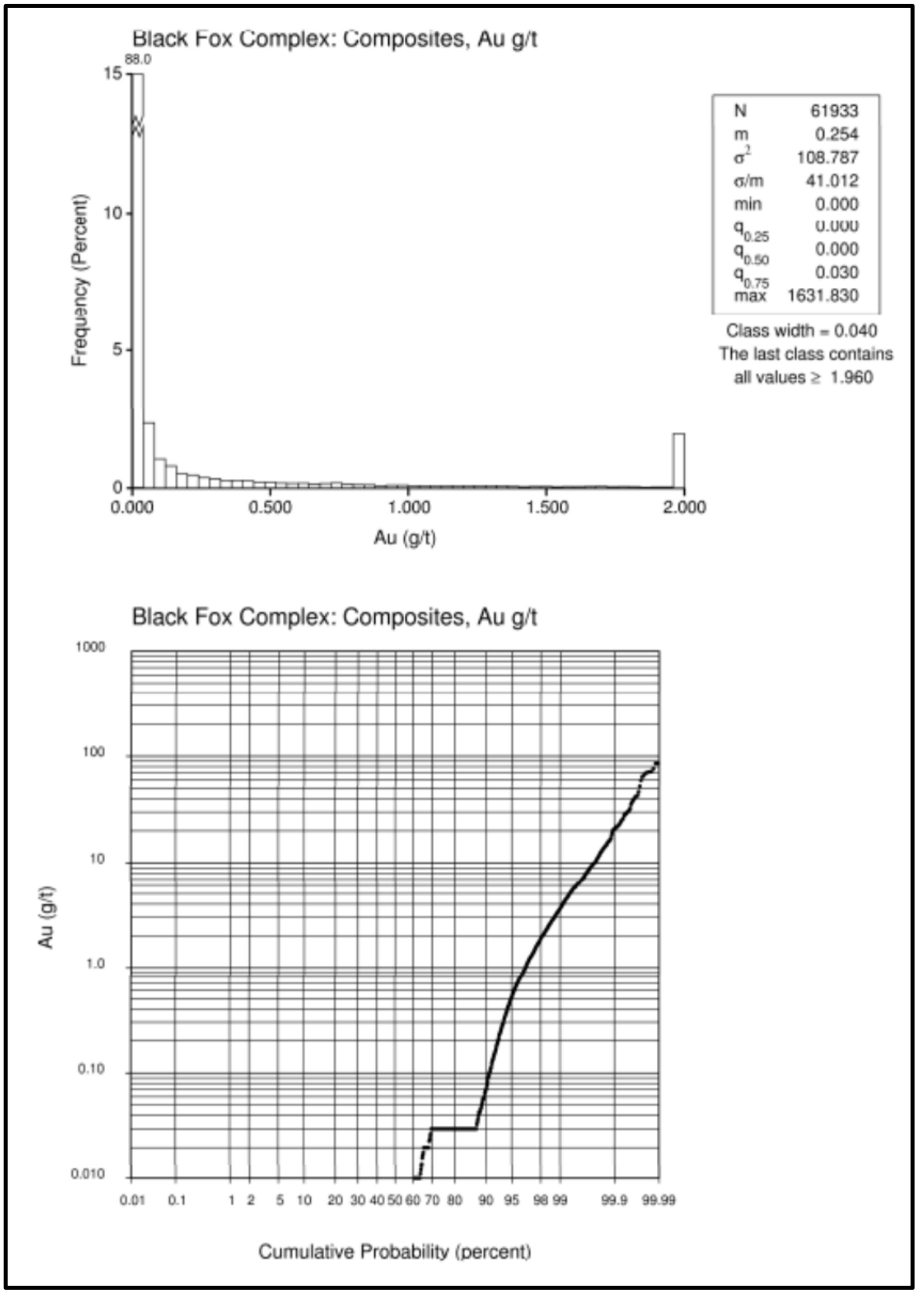



## 14.5 COMPOSITING

The raw drill data was composited into 1.5 m intervals starting at the collar and continuing to the bottom of the hole. The appropriate codes for missing samples and no recovery were used during the compositing procedures.

The composites were plotted on histogram and probability plots for comparison to the raw assay data (Figure 14.5).

**Figure 14.5 Au 1.5 m Composites**




## 14.6 CAPPING

In mineral deposits having skewed distributions (typically with coefficient of variation greater than 1.0), a few high-grade assays can represent a large portion of the metal content.  Often there is little continuity demonstrated by these assays.  In other words, it can be assumed they occur at random within the deposit[1].

Review of the probability plot gold assays (Figure 14.4) showed a fairly continuous distribution of gold values up to about the 100 g/t Au level.  Based on this outlier nature of the composites, the gold values were capped at 100 g/t Au before compositing.  This resulted in thirteen assays being capped, five in the Contact Zone, three in the 147 Zone and five assays in the remaining zones.

Figure 14.6, Figure 14.7 and Figure 14.8 illustrate the capped statistics for composites.

[1] Detailed sampling will undoubtedly show short-scale geological controls which are responsible for the high grades observed and therefore the non-randomness of the high-grade occurrence.  At the exploration stage, this short-scale information is not available and there is no apparent pattern to the occurrence of high-grade samples.  Hence follows the assumption of a random spatial distribution.

**Figure 14.6 Capped Au 1.5m Composites**

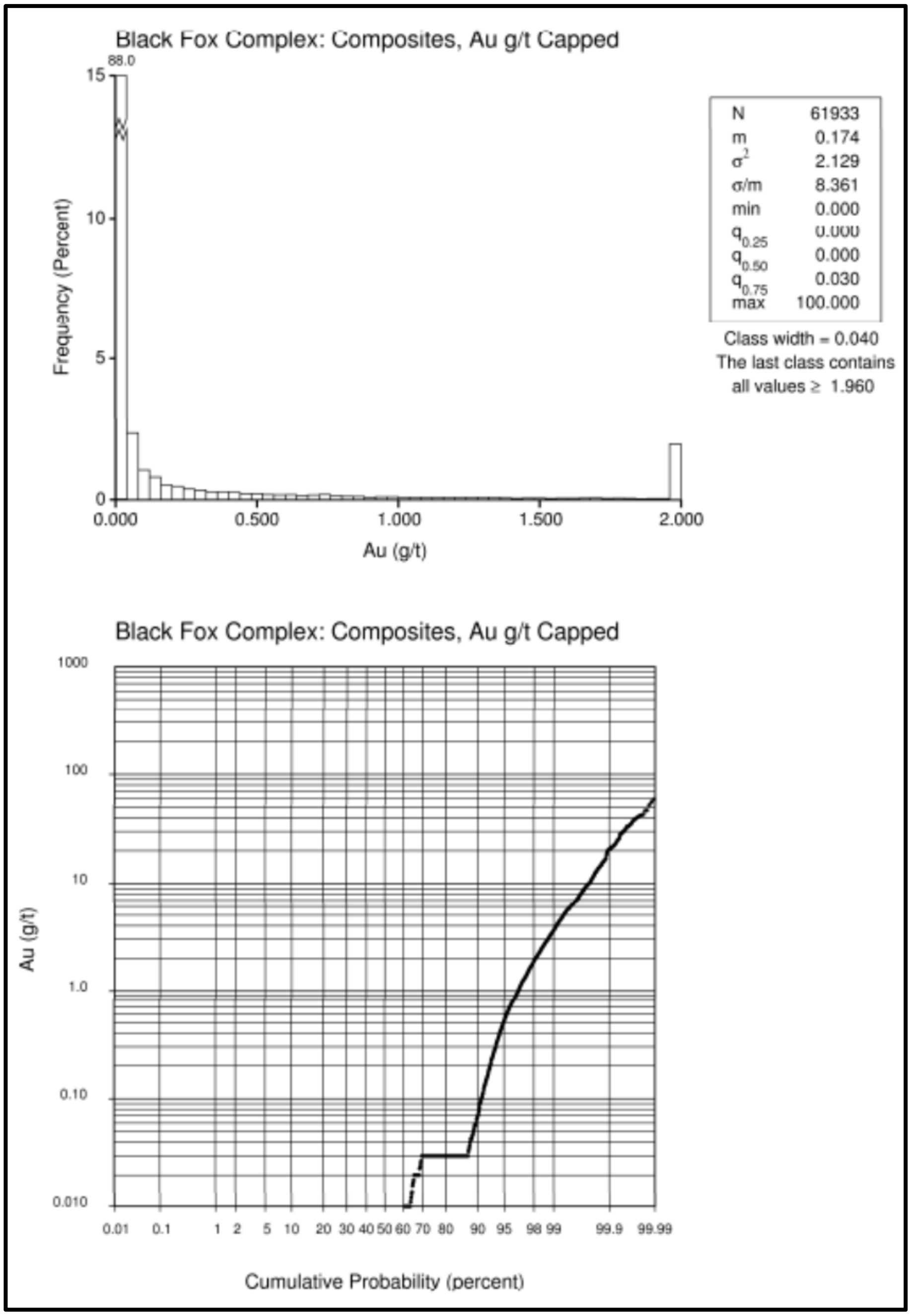


**Figure 14.7 Capped Au 1.5m Composites, Contact Zone**

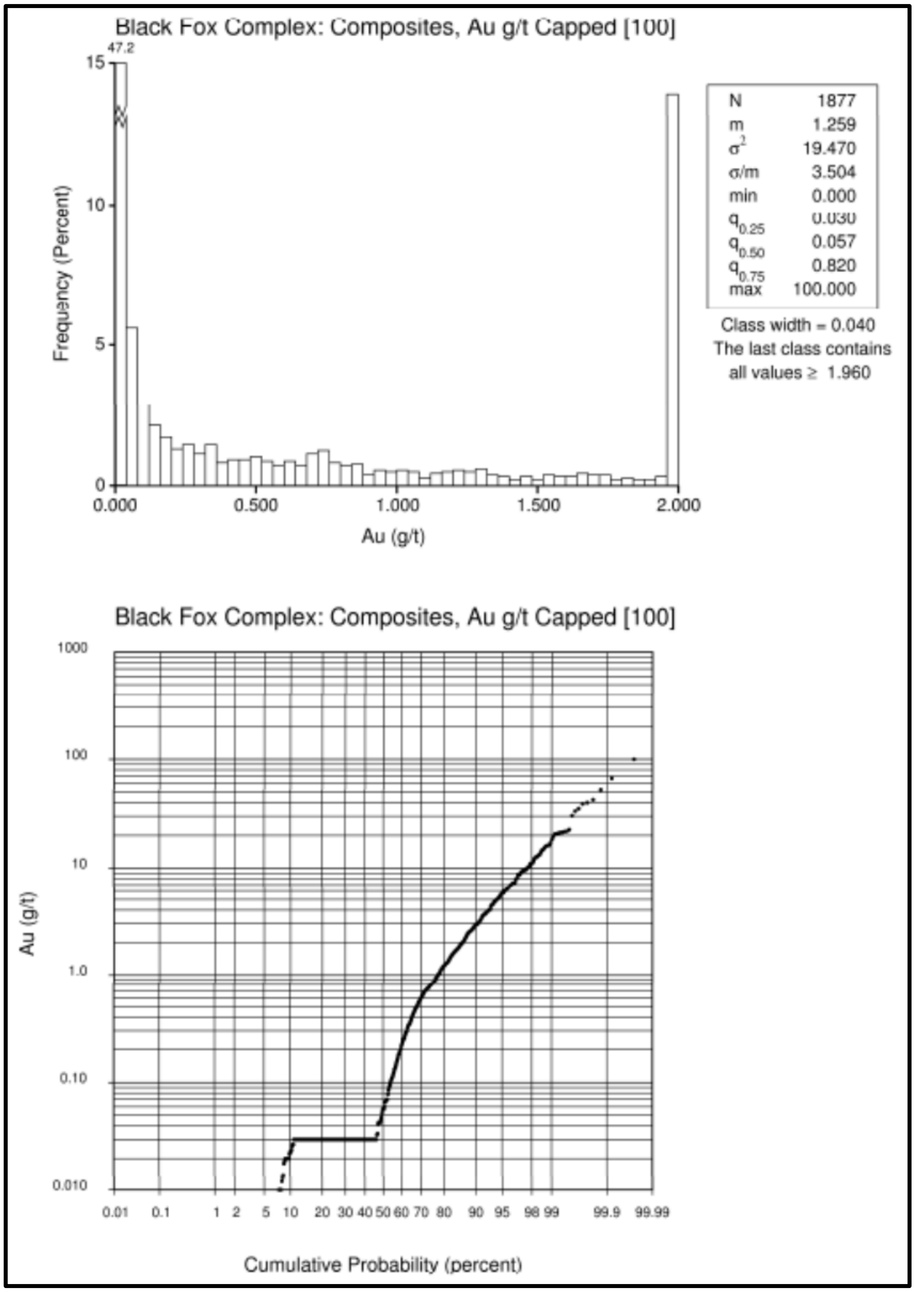
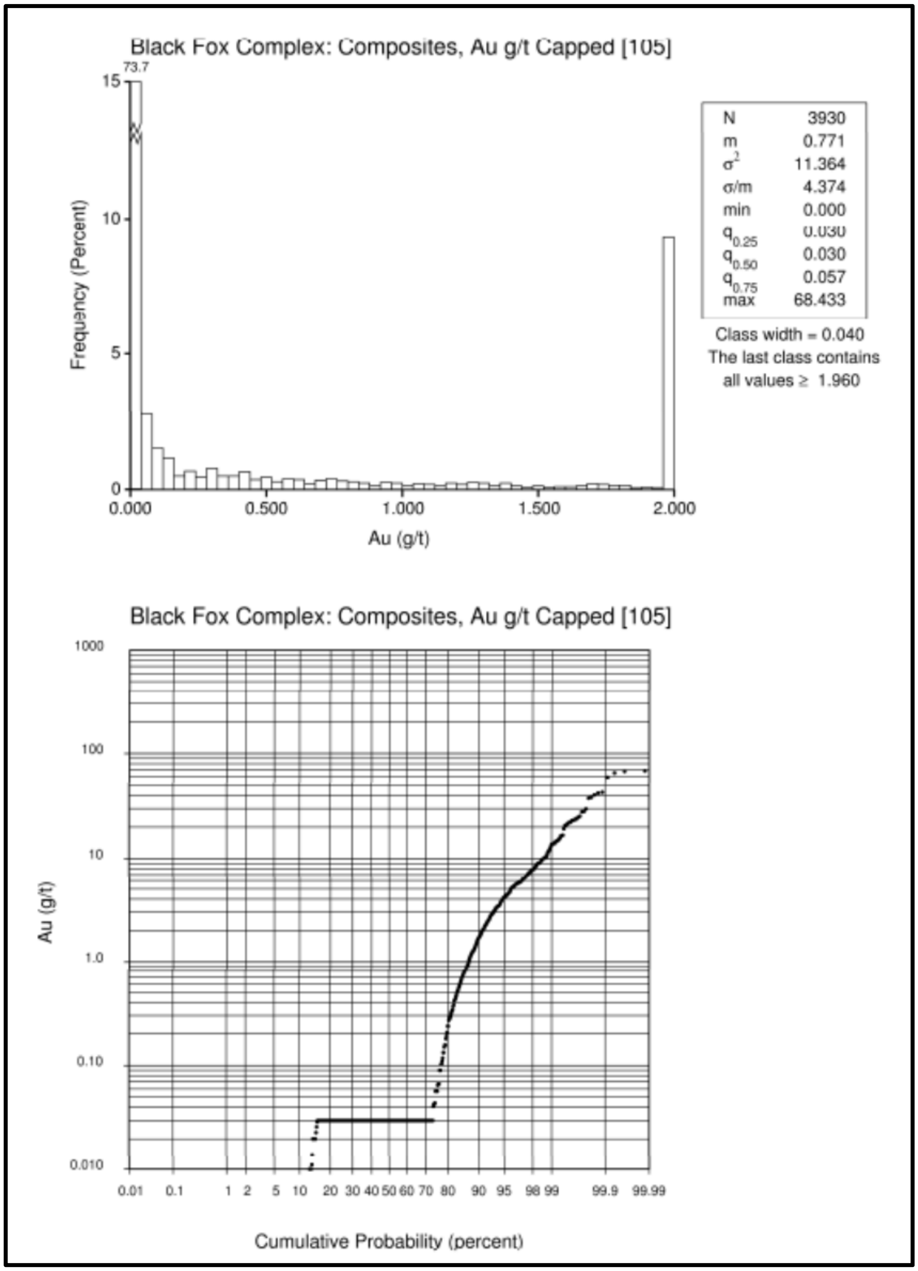


**Figure 14.8 Capped Au 1.5m Composites, 147 Zone**




## 14.7 SPECIFIC GRAVITY

Limited specific gravity testing has been carried out by Brigus. Swastika Laboratories processed 34 samples of drill core, which yielded an average density of 2.92 g/cm$^3$ and a range from 2.76 to 3.36 g/cm$^3$. On this basis, a 2.90 g/cm$^3$ was used for all material in this resource estimate. Tetra Tech recommends further analysis by rock types and mineralization styles to confirm whether one value is appropriate.

## 14.8 VARIOGRAM ANALYSIS

Geostatisticians use a variety of tools to describe the pattern of spatial continuity or strength of the spatial similarity of a variable with separation distance and direction. One of these is the correlogram, which measures the correlation between data values as a function of their separation distance and direction. If we compare samples that are close together, it is common to observe that their values are quite similar and the correlation coefficient for closely spaced samples is near 1.0. As the separation between samples increases, there is likely to be less similarity in the values and the correlogram tends to decrease toward 0.0. The distance at which the correlogram reaches zero is called the "range of correlation" or simply the range. The range of the correlogram corresponds roughly to the more qualitative notion of the "range of influence" of a sample; it is the distance over which sample values show some persistence or correlation. The shape of the correlogram describes the pattern of spatial continuity. A very rapid decrease near the origin is indicative of short scale variability. A more gradual decrease moving away from the origin suggests more short scale continuity. A plot of 1-correlation is made so the result looks like the more familiar variogram plot.

Another tool for describing spatial correlation is the indicator variogram. Correlograms show the decrease in the strength of the relationship between grades by distance and direction. Conversely, variograms show the increase in dissimilarity with distance and direction. In the same way that correlograms tend to decrease toward zero, the variogram tends to increase toward a sill or the overall variance of the variable of interest. The indicator is simply a value of 0 or 1 that is assigned to a data location according to whether the grade exceeds some threshold value. The indicator variogram is the variogram calculated using the indicator data. Indicator variograms are useful in describing the spatial continuity of different segments of the grade distribution. They are most useful in examining properties of spatial continuity in the higher-grade samples. Tetra Tech employed this method to define the High Grade Indicator Zone.

The approach to develop the variogram models used Sage™ software. Directional sample correlograms were calculated along horizontal azimuths of 0, 30, 60, 120, 150, 180, 210, 240, 270, 300, and 330°. For each azimuth, sample correlograms were also calculated at dips of 30 and 60° in addition to horizontally. Lastly, a correlogram was calculated in the vertical direction. Using the thirty-seven sample correlograms an algorithm determined the best-fit model nugget effect and two-nested structure variance contributions. After fitting the variance parameters the algorithm then fitted an ellipsoid to the thirty-seven ranges from the directional models for each structure. The anisotropy of the correlation was given by the range along the major, semi-major, and minor axes of the ellipsoids and the orientations of these axes for each structure.

### 14.8.1 GOLD GRADE CORRELOGRAM

Variogram analysis for the gold grade was conducted using 2 and 3 m composites. Variograms were constructed using Sage™ software as discuss in Section 14.8. summarizes the variogram structures, rotations and ranges for the 1.5 m composites by mineralization domain. The models were all exponential models and used the ZYZ-RRR Gemcom™ rotation convention.

**Table 14.3 1.5 m Composite Gold Grade Correlogram Models**

| Domain | Nugget | Sill | Rot. Z | Rot. Y | Rot. Z | Range X | Range Y | Range Z |
|---|---|---|---|---|---|---|---|---|
| 100 | 0.300 | 0.686 | 21 | 71 | -78 | 76.0 | 2.0 | 2.0 |
| | | 0.014 | -57 | -7 | 58 | 44.5 | 300.0 | 300.0 |
| 105 | 0.500 | 0.489 | -199 | 50 | -92 | 2.0 | 2.0 | 55.0 |
| | | 0.011 | 12 | -36 | 55 | 143.9 | 100.0 | 160.0 |

## 14.9 GRADE INTERPOLATION

Geologic wireframes were used to code the geological model using the domains defined in Table 14.2. Figure 14.9 illustrates a typical block model section. The brown blocks are the Contact Zone and the blue blocks are 147 Zone, the colors and corresponding geological domains are listed in Table 14.4.

Modelling consisted of grade interpolation by ordinary kriging (OK), nearest neighbour (NN) and inversed distance weighted (IDW) grades were also determined for validation purposes. The grade interpolation used search ellipses as defined in Table 14.6. These parameters were based on the geological interpretation and variogram analysis. A three-pass strategy was used estimate grade in the workspace GF_Dec11.

**Figure 14.9 Gemcom Block Model Section (Looking North)**

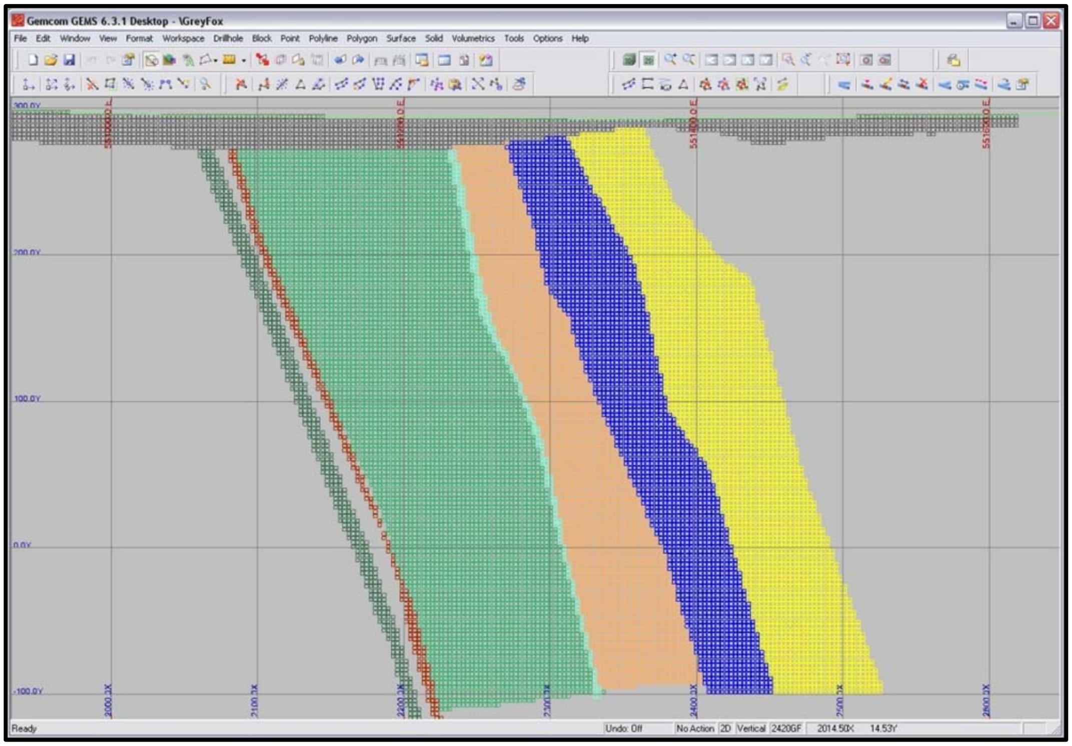



**Table 14.4 Geological Domains**

| Rock Code | Block Model Code | Color |
|---|---|---|
| CONTACT | 100 | Dark Brown |
| DIA | 101 | Aquamarine |
| SED | 102 | Light Green |
| MIFW | 103 | Tan |
| MV | 104 | Cyan |
| VIV | 105 | Dark Blue |
| MIHW | 106 | Yellow |
| OB | 201 | Grey |

The number of composites used in estimating a model block grade followed a strategy that matched composite values and model blocks sharing the same ore code or domain during all passes for rock codes 100 (Contact Zone) and 105 (147 Zone). For the other rock codes, they were grouped under a common code 111 for grade estimation. For the first pass, composites from at least three drillholes were used, for the second pass at least two drillholes and for the third pass a minimum of one drillholes was allowed (increasing longer search distances). Further details are found in Table 14.5.

**Table 14.5 Interpolation Parameters for Open Pit Model**

| Block Model | Point Area | Grade Field | Interpolation Profile | Maximum No. of Comp./Drillhole | Minimum No. of Comp. | Maximum No. of Comp. |
|---|---|---|---|---|---|---|
| GF_dec11 | Topcut90 | AUCAP | AUCOK1/AUCID1 | 2 | 5 | 16 |
| | | | AUCOK2/AUCID2 | 2 | 3 | 16 |
| | | | AUCOK3/AUCID3 | 2 | 1 | 16 |
| | | | AUCNN | 1 | 1 | 1 |
| | | AU | AUOK1/AUID1 | 2 | 5 | 16 |
| | | | AUOK2/AUID2 | 2 | 3 | 16 |
| | | | AUOK3/AUID3 | 2 | 1 | 16 |
| | | | AUNN | 1 | 1 | 1 |

The three-pass ellipsoidal search strategy was based on ZYZ rotation. The search ellipses are summarized in Table 14.6.

**Table 14.6 Search Ellipses**

| Profile | Rotation about Z | Rotation about Y | Rotation about Z | Anisotropy X | Anisotropy Y | Anisotropy Z |
|---|---|---|---|---|---|---|
| CZP1 | 12.5 | 70 | 0 | 30 | 20 | 5 |
| CZP2 | 12.5 | 70 | 0 | 60 | 40 | 10 |
| CZP3 | 12.5 | 70 | 0 | 120 | 80 | 20 |
| 147P1 | 0 | 70 | 0 | 20 | 30 | 5 |
| 147P2 | 0 | 70 | 0 | 40 | 60 | 10 |
| 147P3 | 0 | 70 | 0 | 80 | 120 | 20 |

## 14.10 BLOCK MODEL VALIDATION

Tetra Tech distinguishes between verification from validation as follows:

- Verification is a manual (e.g. visual inspection) or quasi-manual (e.g. spreadsheet) check of the actual procedure used.
- Validation is a test for reasonableness using a parallel procedure, which may be either manual or (but is usually) a computer-based procedure.

### 14.10.1 VISUAL CHECKS

Interpolated block grades, resource classification, geological interpretation outlines and drillhole composite intersections were verified on screen for plan and section. Based on visual inspection by Tetra Tech, the block model grades appeared to honour the data well. The estimated grades exhibit a satisfactory consistency with the drillhole composites.

Representative plot files are included in Appendix B.

### 14.10.2 GLOBAL COMPARISON

Tetra Tech verified the block model estimates for global bias by comparing the average gold grades (with no cut-off) from the model (OK) using NN estimates. The NN estimator produces a theoretically unbiased estimate of the average value when no cut-off grade is imposed and is a good basis for checking the performance of different estimation methods. The results (Table 14.7) show no evidence of bias in the estimate. Slight smoothing is present using inverse distance weighting.

**Table 14.7 Global Comparison**

| Block Model | Grade Item | Au (g/t) |
|---|---|---|
| GF_dec11 | AUCID | 2.352 |
| | AUCNN | 2.477 |

Histogram and probability plots were created of the block model data and reviewed with respect to the corresponding composite plots. No apparent bias was noted. Table 14.8 summarizes the composite versus block model statistics. Figure 14.8 and Figure 14.9 illustrate the grade distribution through histogram and probability plots.

**Table 14.8 Composite versus Block Model Statistics**

| Domain | Grade Item | | Mean Grade | Standard Deviation | Coefficient of Variation |
|---|---|---|---|---|---|
| Contact Zone [100] | AUCAP | Composite | 1.259 | 19.470 | 3.504 |
| | AUCID | Block Model | 0.644 | 3.277 | 2.812 |
| 147 Zone [105] | AUCAP | Composite | 0.771 | 11.364 | 4.374 |
| | AUCID | Block Model | 0.268 | 1.005 | 3.735 |

### 14.10.3 ADEQUACY OF RESOURCE ESTIMATION METHODS

The Black Fox Complex has been estimated using modern block modeling techniques in Gemcom GEMS™ 6.3.1. This included proper geologic input, appropriate block model cell sizes, grade capping, assay compositing and reasonable interpolation parameters. The results have been verified by visual review and statistical comparisons between the estimated block grades and the composites used to assign them. The inverse distance squared model has also been validated with alternate estimation methods: NN and OK. No biases have been identified in the model.

**Figure 14.10 Capped Au Block Model, Contact Zone**

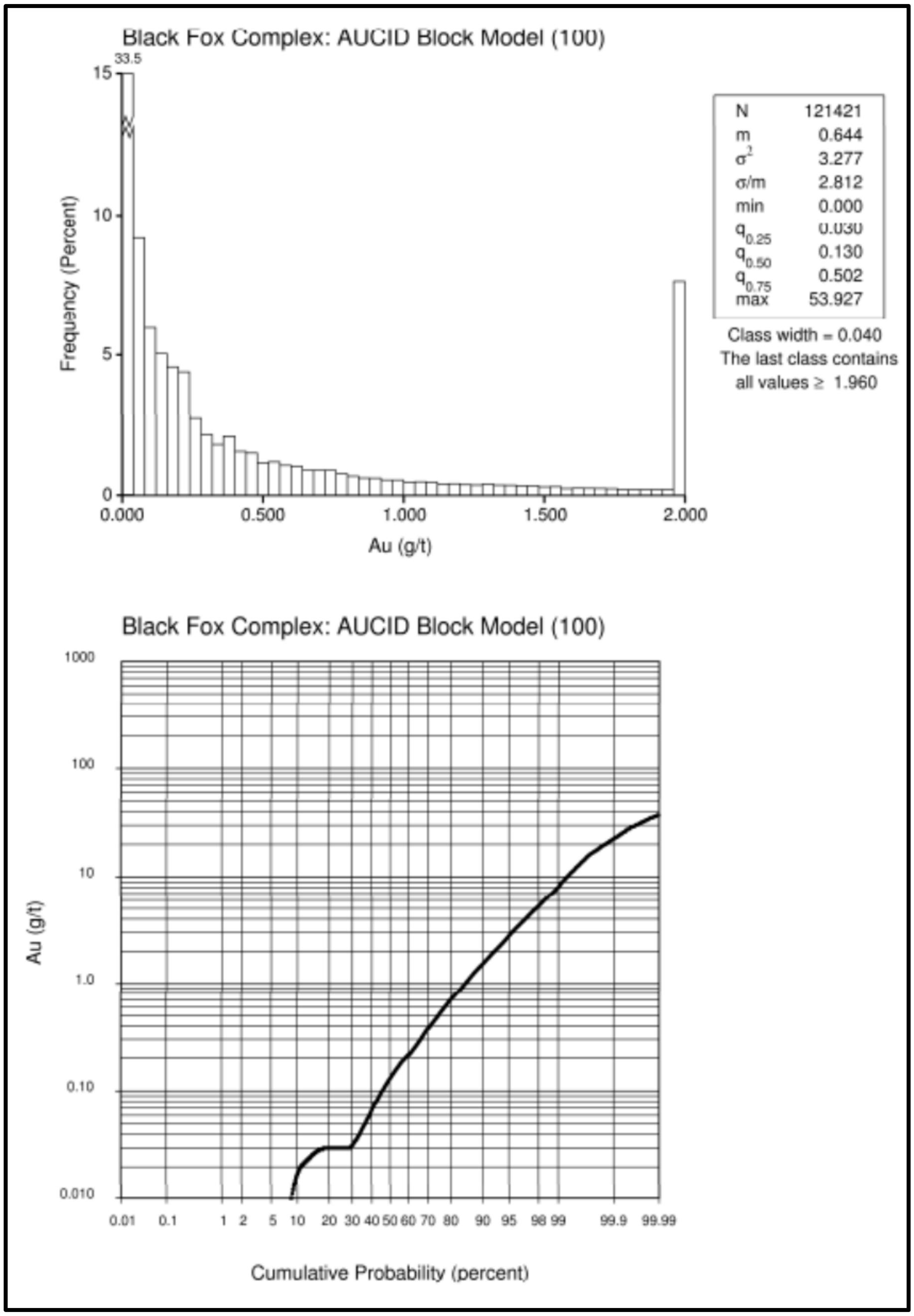
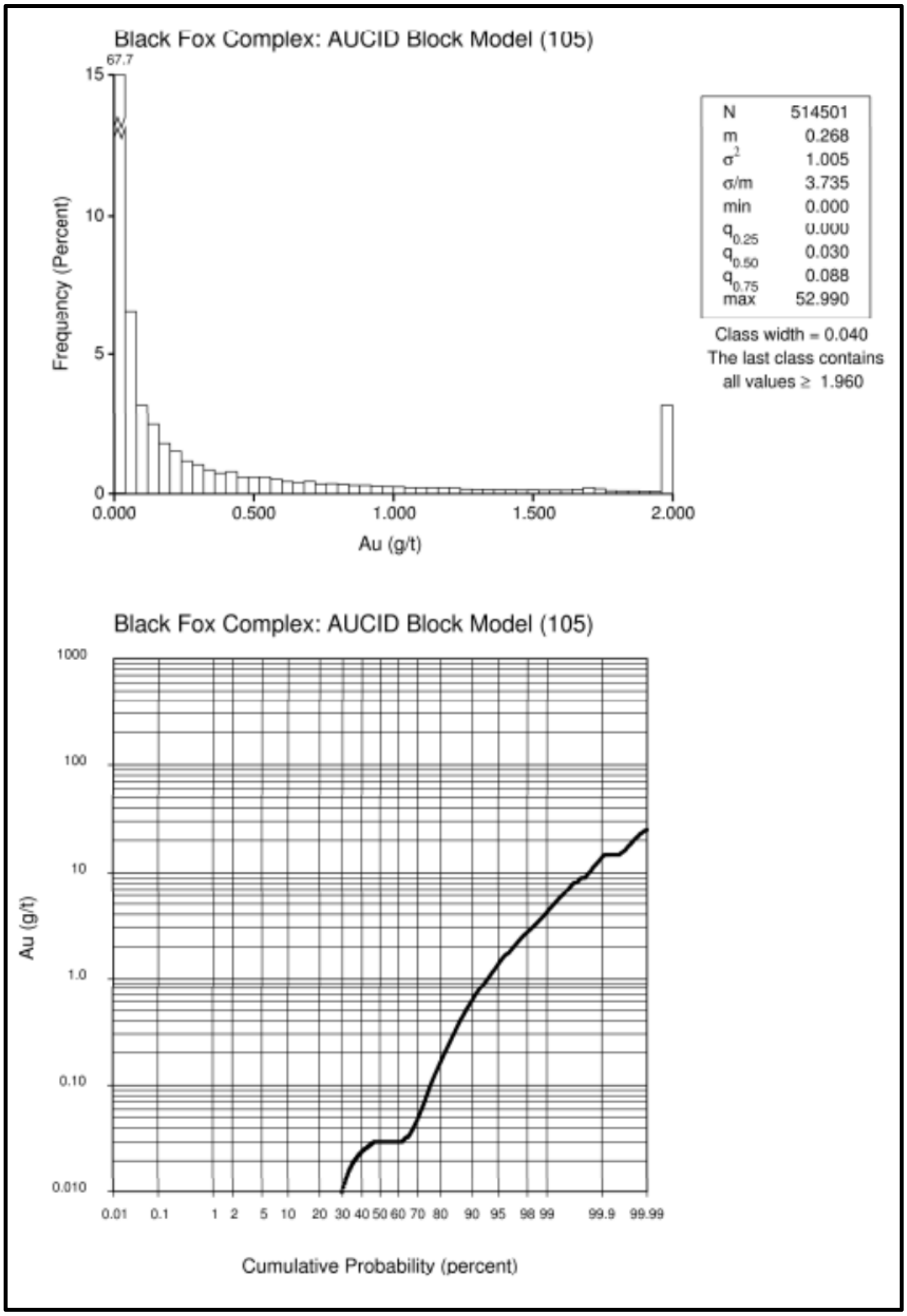


**Figure 14.11 Capped Au Block Model, Contact Zone**



# 14.11 MINERAL RESOURCE CLASSIFICATION AND RESOURCE STATEMENT

## 14.11.1 *RESOURCE CLASSIFICATION*

The mineral resources are classified under the categories of Measured, Indicated and Inferred Mineral Resources, in accordance with CIM Definition Standards. Classification of the resources reflects confidence of grade continuity, as a function of many factors including primarily; assay data quality, QA/QC procedures, quality of density data, and sample spacing relative to geological and geo-statistical observations regarding the continuity of mineralization.

Tetra Tech is not aware of any environmental, permitting, legal, title, taxation, socioeconomic, marketing or other relevant issues are known to that may affect the estimate of mineral resources at this time.

The resource model blocks were classified into Indicated and Inferred categories based on the level of confidence in the grade estimate for each block. This was accomplished with a combination of two main criteria: the number of drillholes (which in part reflects the number of samples used) and the distance to the nearest of the sample points.

Indicated Resources were categorized based on a minimum of three drillholes when the nearest sample point was less than or equal to 20 m. The remaining blocks were classified as Inferred Resources. No blocks were categorized as Measured.

## 14.11.2 *MINERAL RESOURCE STATEMENT*

The Contact Zone and 147 Zone mineralization of the Project, as of November 30, 2011 comprises Indicated and Inferred Resources. The classified mineral resources are shown in Table 14.9. The total Indicated Resource is 867,100 t at a capped grade of 4.180 g/t Au. The total Inferred Resource is 5,464,500 t at a capped grade of 2.611 g/t Au.

**Table 14.9 Resource Statement, Contact and 147 Zones of Black Fox Complex**

| Resource Class | Cut-off Grade (g/t Au) | Potential Material | Tonnes | Capped Au (g/t) | Contained Au (oz) |
|---|---|---|---|---|---|
| Indicated | 2.63 | Underground | 323,800 | 6.991 | 72,890 |
| | 0.65 | Open Pit | 543,300 | 2.505 | 43,820 |
| | | **Total Indicated** | **867,100** | **4.180** | **116,710** |
| Inferred | 2.63 | Underground | 565,700 | 5.902 | 107,510 |
| | 0.65 | Open Pit | 4,898,800 | 2.231 | 351,910 |
| | | **Total Inferred** | **5,464,500** | **2.611** | **459,429** |

The mineral resource is reported at a 0.65 g/t Au cut-off grade for potential open pit material and at 2.63 g/t Au cut-off grade for the potential underground material. These cut-offs have been developed based on current costs experienced at the Black Fox Mine. The near surface mineralization along with the width of mineralization at the 147 Zone presents an opportunity for open pit extraction, so this material has been reported based upon the open pit cut-offs. The narrower width of mineralization along with the depths extent make the Contact Zone more conducive to underground mine extraction and therefore this material has been reported using the higher cut-off grades.

# 15.0 ADJACENT PROPERTIES

## 15.1 INTRODUCTION

Figure 15.1 is a map showing the distribution of gold mines and deposits located mainly to the south or southeast along trend from the Project, which collectively form a semi-oval area of approximately 3 km in longest dimension. The gold mineralization is either directly with the DPDZ as is the case for the former Gold Pike Mine, or spatially related to principal structures associated with the DPDZ as listed below:

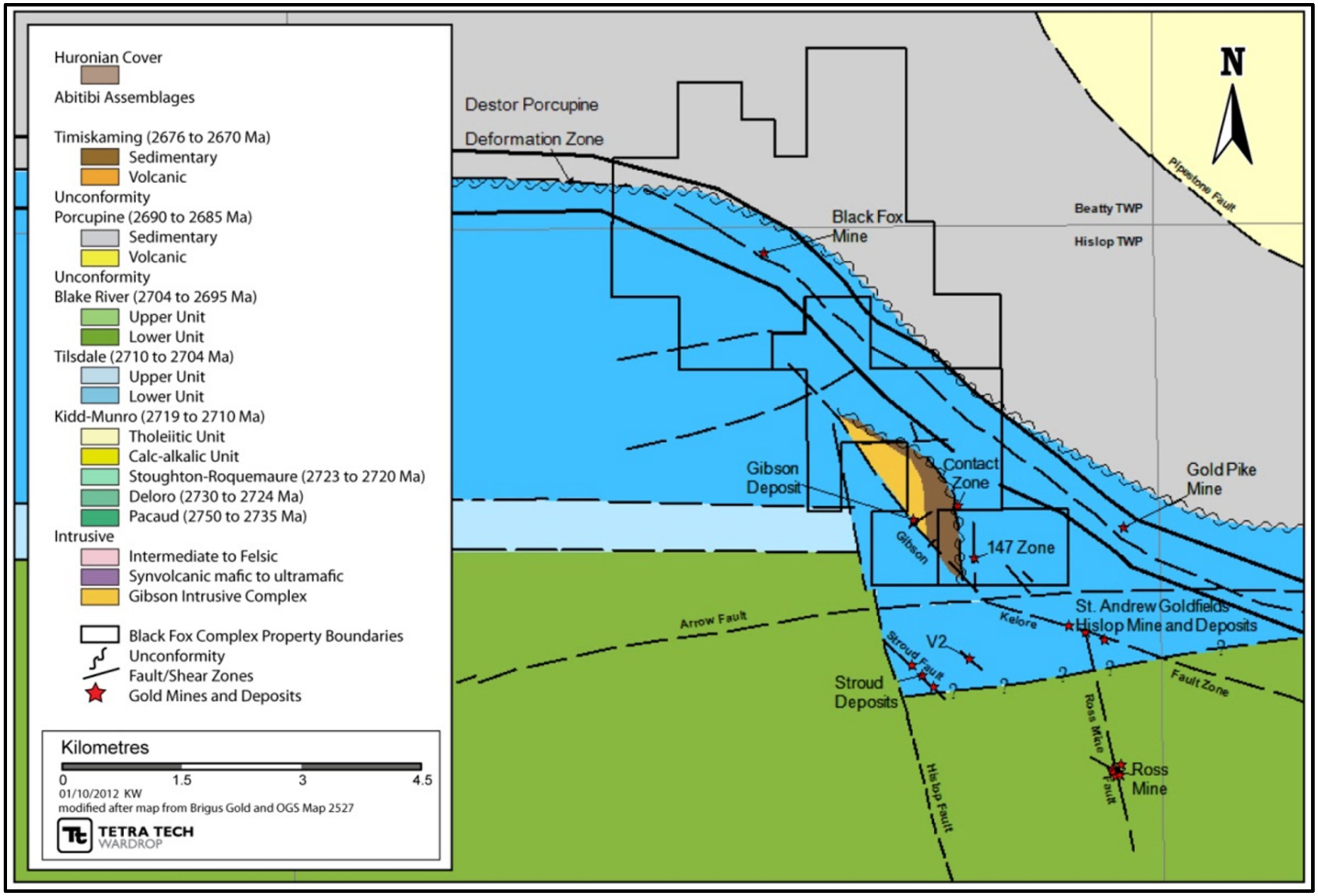
- Ross Mine Fault:
  - the former Ross Au-Ag-Cu Mine
- Gibson-Kelore Fault Zone:
  - St. Andrew Goldfields Limited Hislop Mine and other deposits
- Stroud Fault:
  - Stroud Resources Limited Creek, Creek Extension and Main deposits

The St. Andrew Goldfields Limited Hislop Mine and deposits are located nearest the Project, and share similar Tisdale Assemblage stratigraphy and principal structures. However, as the style and geometry of the principal ore type at the former Ross Mine shares similarities with the 147 Zone, the Ross Mine data are presented first.

TETRA TECH WARDROP

BRIGUS GOLD

**Figure 15.1 Adjacent Properties Map**



## 15.2 Ross Mine

### 15.2.1 Summary

The Ross Mine is a past producer (1936 to1989) of greater than 1 Moz gold and 1.6 Moz of silver (Berger 2002). The mine is located some 3 km southeast along trend from the Brigus 147 Zone and 3 km southwest of the DPDZ in south central Hislop Township.

It is hosted in a down-dropped block east of the Hislop Fault and is the type example of a high-level, brittle-style gold deposit in the Superior Province within the crustal continuum model for Late Archean Lode Gold Deposits. Production data for its continuous 53-year mine life are summarized in Table 15.1.

**Table 15.1 Summary of Ross Mine Production (1936 to 1989)**

| Ross Mine (1936-1989) | Tonnage | Recovered Grades |
|---|---|---|
| Tons Milled | 7,249,377 st | |
| Gold Recovered | 1,027,224 oz | 0.145 oz/st Au |
| Silver Recovered | 1,639,122 oz | 0.242 oz/st Ag |
| Copper Recovered | 2,537 st | 0.108% |

The mine was operated by Hollinger Consolidated Gold Mines Limited and Hollinger Mines Limited until June 1976, by Pamour Porcupine Mines Limited and Pamour Inc. until March 1987, and by Giant Yellowknife Mines Limited until November 15, 1989. Shortly thereafter, the mine was purchased by the Preston Electrical and Mechanical Limited of Timmins, Ontario.

Mining was by a three compartment No. 1 Shaft (-90) to a vertical depth of 3,300 ft., and two internal shafts, the two compartment No. 2 Winze (-90) from 291 ft to 1,580 ft. There were 22 levels at 150 ft spacing from the 150 ft level to the 3,150 ft level. A ramp extends from the bottom of the No. 1 Shaft to the 3,375 ft level. In addition, the No. 1 Orebody was mined to surface with an open stope and the crown pillar of the No. 2 Orebody was removed in a small open pit.

The milling rate progressively increased from 80 t/d at start-up to 650 t/d by mine end.

The deepest mining level was the 3,150 ft level, and resources are indicated to continue to at least a depth of 5,175 ft. As of December 31, 1988 “reserves” were estimated at 1,005,000 st of material averaging 0.125 oz/st Au, or 131,875 oz Au insitu (CMH 1989 to 1990). The reliability of this estimate is somewhat uncertain as some amount of this material would have been mined during the 10.5 months between December 31, 1988 and closure on November 15 1989.

Mineralization consisted of approximately 20 ore zones, or systems, distributed over a roughly circular area with a surface diameter of approximately 500 to 600 m. The 20 ore zones (or systems), occur primarily in three distinct configurations:

- Stringer Quartz (gold-copper (Cu)) Ores contained in steeply west plunging pipe-like zones
- Breccia and Breccia Vein Ores hosted in north trending brittle structures
- Narrow Vein (silver-gold-lead-zinc-copper-antimony (Sb)) Ores hosted in north and northwest trending brittle structures

## 15.3 St. Andrew Goldfields Ltd. (SAS) Hislop Mine and Deposits

### 15.3.1 *Summary*

The SAS Property adjoins the Brigus Gold Project area to the south. Segments of the DPDZ and the GKFZ trend south-east diagonally across the property.

The principal gold mineralization (West, Shaft, South deposits) is stretched out along, or marginal to, a 1,300 m strike length of the GKFZ, and there may be more than one zone of mineralization in some localities.

Exploration on the Hislop Mine property dates from 1934 with initial underground production from some deposits beginning in 1939. The property has changed ownership several times and there have been numerous diamond drilling campaigns conducted. In 1990 and 1991, the property was operated as a joint venture with Goldpost Resources Inc. and SAS during which underground drilling was followed by some underground mining.

In 1993, St Andrew Goldfields Ltd. purchased the remaining interest in the property, and subsequent underground mining was conducted from 1993 to the end of 1994 with milling continuing until early 1995.

SAS began open-pit mining of the West Zone in 1999, but operations were placed on care and maintenance in late 2000 because of low gold prices. A small amount of mining was also carried out in 2006 to 2007, and open pit mining resumed in mid-2010. During the first nine months of 2011, a total of 15,381 oz Au were recovered from 339, 293 t and the mine is expected to produce between 18,000 to 21,000 oz of gold in 2011.

**Table 15.2 Summary of Reported Production (1990 to 2011) – Hislop Mine Property**

| Years | Type and Zones Mined | Tonnes Milled (t) | Ounces Recovered (oz) | Recovered Grade |
|---|---|---|---|---|
| 1990 to 1991<br>1993 to 1995 | Underground in Shaft & South Area | 245,099 | 39,367 | 4.99 g/t/0.145 oz/st |
| 1999 to 2000<br>2006 to 2007 | West Zone Open Pit | 201,937 | 19,334.45 | 2.98 g/t/0.0868 oz/st |
| 2010 | East Open Pit -Shaft and South | 264,850 | 10,952 | 1.29 g.t/0.0375 oz/st |
| 2011<br>(9 months) | East Open Pit -Shaft and South | 339,293 | 15,381 | - |
| **Totals** | **-** | **1,051,179** | **85,034** | **-** |

### 15.3.2 GEOLOGY AND ORE ZONES

Much, but not all, of the following data are taken from the following two NI 43-101 reports prepared for St. Andrew Goldfields Ltd.:

- Valiant, W.W. and R.D. Bergen. 2009. Technical Report on the Hislop Project, Ontario, Canada, Scott Wilson Roscoe Postle Assoc. Inc., Aug. 6, 2009 Scott Wilson Roscoe Postle Assoc. Inc.
- R.D. Bergen and W.W. Valiant. 2009. Technical Report on a Preliminary Feasibility Study of the Hislop Project, Ontario, Canada, Sept. 28, 2009, Scott Wilson Roscoe Postle Assoc. Inc.

Several mineralized zones occur on the SAS Hislop property. The mineralized zones occur along a strike length of approximately 1,200 m, following the fault contact (GKFZ) between mafic flows to the north and ultramafic rocks to the south. Gold is associated with the margins of feldspar porphyritic syenite dikes that have intruded the mafic and ultramafic rocks. The dikes are generally conformable to the contact between the mafic and ultramafic rocks striking west to northwest and dipping steeply to the north. From west to east, the three principal mineralized areas have been named, the West Zone, Shaft Zone and the South Area.

### 15.3.3 MINERALIZATION

Two settings and styles of gold mineralization are present at the Hislop property.

Gold occurs on the south side of the syenite dike complex in the carbonate and carbonate breccia rock which separates the syenite dikes from the less altered ultramafic volcanic rocks to the south side. Gold also occurs on the north contact of the syenite dike complex in quartz veinlets, stockworks, and fractures in hematite altered and syenitized mafic metavolcanic rocks.

The rocks and the associated mineralization strike northwest-southeast and dip steeply north to vertically. Later cross faults trend both east-west and northeast to southwest, and are steeply to vertically dipping. Gold mineralization occurs along the length of the syenite dike complex, but the gold-bearing zones tend to be wider and higher in grade where associated with these cross faults. The minor off setting along these faults causes the mineralized zones to have an irregular appearance in detail.

Previous reports have described several zones of gold mineralization occurring in three main mineralized areas along a strike length of 1,100 m, centred on the original shaft. These include the Shaft Area, the South Area, and the West Area.

**Table 15.3 SAS Hislop Mine Internal Resource & Reserve Data as of Dec 31, 2010**

| | Tonnes (t) | Au (g/t) | Insitu (oz Au) |
|---|---|---|---|
| Measured and Indicated (M+I) Resources | 6,230,000 | 1.98 | 395,000 |
| Inferred Resources | 5,338,000 | 1.80 | 309,000 |
| Proven and Probable Reserves (within the M+I Resources stated above) | 2,108,000 | 2.05 | 139,000 |

It should be noted that the estimates are as of year-end 2010, need to be revised to reflect mining and exploration during 2011.

## 15.4 STROUD RESOURCES LTD. DEPOSITS

The Stroud Resources Ltd. group of deposits are located 1.5 km souh of the Brigus Grey Fox Project area, and 3 km northwest of the former Ross Gold Mine. Much, but not all, of the following data are taken from a NI 43-101 technical report by D. Wetmore, (Behre Dolbear & Company Ltd.) Hislop Twp. Gold Project Matheson Area, Ontario, PROJECT: 03-033 October 25, 2004, for Stroud Resources Ltd.

Exploration since the 1940s has included over 52,000 m of core drilling with the most comprehensive and meaningful exploration done by Chevron in the late 1980s. This work resulted in the partial delineation of three zones of gold mineralization known as the Creek, Creek Extension and Stroud Main Zones along a 650 m strike extent of a structural/alteration corridor known as the Stroud Fault. Drillhole intersections extended to a vertical depth of 400 m. The V2 Zone is a separate zone of mineralization in a sub-parallel structure located 600 m to the northeast.

The Stroud Fault appears to be a splay, southeastward from the north-northwest trending Hislop Fault, or else is simply cut off by the latter. The Hislop Fault is a prominent principal structure that continues northward from the Stroud property and has been interpreted to pass just west of the Gibson claim boundary that is part of the Brigus Project, but further north, appears to merge with the Gibson-Kelore Fault Zone in the central part of the Brigus Black Fox Mine Property.

The dominant lithologies consist of a sequence of massive tholeiites and pillow lavas cut by an ultramafic body which in turn, is possibly cut by feldspar porphyry. The lithologies trend approximately 315 and dip some 45 to 70° grid south.

Alteration assemblages include pyrite, hematite, silica, carbonate (dolomite) and sericite. Various groupings of these minerals constitute readily recognizable alteration haloes associated with gold mineralization. Structural elements such as shearing and fracturing define the broad structural corridor (Stroud Fault) some 50 m thick (true thickness) within which mineralized sequences are located. Within the Stroud Fault, shear intensities vary from weakly sheared rocks which show strain but little penetrative fabric, to schistose shear zones with intense penetrative fabric developed commonly in sericitic-carbonate slip planes. Both in plan and section, shear zones are thought to form an anastomosing structural network containing mineralized lenses.

The structural/alteration corridor (i.e. Stroud Fault) some 50 m true thickness, between the ultramafic and the footwall shear, hosts most of the significant mineralized shoots and lenses identified to date within the Creek Zone. Occasional gold values have been noted in the hanging wall above the ultramafic and below the Footwall Shear. The 'Footwall' Shear, a sericite schist zone within the Creek Zone, is thought to have been active post mineralization and appears to dip slightly flatter than the mineralized zone.

This mineralized system primarily consists of a bi-furcating system of quartz veins, trending northwest with a central vein system dipping approximately 70° south. Specifically, the auriferous mineralization is closely associated with “grey veins”, which in turn are associated with multiple silica events carrying fine grained pyrite and cutting previous or closely coincident quartz veins, silicified feldspar porphyry or silicified volcanics. Feldspar porphyry and quartz veins show a broad anastomosing pattern in both plan and section but with reasonable continuity.

In plan and section, mineralized veins occur as discrete silicified lenses and shoots. The ore shoots appear to be similar to the geometry of the Ross Mine ore shoots; however, mineralized zones on the Stroud property appear more tabular than the Ross Mine Stringer Ores. On these sections, individual “shoots” or ”lenses” are observed to narrow to 0.1 m or less, and then thicken to more than 5 m. The company concluded that because of this style of occurrence, any portion of the vein system encountered within the Creek Zone has the potential for thickening.

Based on the Chevron drill core analytical database, Behre-Dolbear & Co., on behalf of Stroud Resources Inc., released a resource estimate in 2004 and under NI 43-101 of Indicated Resources for the Creek and Main Zones, and additional Inferred Resources for all three zones over a total strike extent of 600 m and to a vertical depth of 225 m, as:

- Indicated Resources:
  - 483,500 t at 6.61 g/t Au (102,750 oz Au insitu)
- Inferred Resources:
  - 367,700 t at 5.90 g/t Au (69,700 oz Au insitu)

In 2006 to 2007, Stroud completed an 8,000 m drill program of 25 drillholes, but did not revise the 2004 resource estimate.

On April 29, 2011, St Andrew Goldfields Ltd. was granted the right by Stroud to earn up to a 60% interest in the project, and in June commenced with a 10,000 m drilling program in approximately 25 boreholes. An exploration update on November 11, 2011 reported that drill program had substantially been completed and in light of the results received to date, the Company is in discussion with Stroud Resources to develop a plan for further exploration efforts.

## 15.5 GOLD PIKE MINE PROPERTY

Gold Pike Mine Property (also known as the Hislop Gold Mine) of Matachewan Consolidated Mines Limited, is located a few kilometers along geological trend (both structurally and lithologically) eastward of the Brigus Black Fox Mine property. The property straddles the northern flank of the Porcupine Destor Fault Zone trending through the Lower Unit of the Tisdale Assemblage, and extends northward to the contact with the metasediments of the Porcupine Assemblage.

During the mid and late 1930s, the property was explored by Hislop Gold Mines Ltd., Ventures Limited, and Mining Corporation of Canada. Surface drilling was followed-up with limited amount of underground development involving two shallow shafts, underground drilling and some lateral development. The results were inconclusive and there is no record of any gold production.

Noranda Exploration Limited with Alban Exploration Limited optioned the property from Matachewan Consolidated Mines Ltd. during 1988 to 1990 and explored the property with approximately 40 drillholes. Several gold-bearing intersections were reported including 0.112 oz/st Au/54.4 core ft. and 0.248 oz/st Au/7.9 core ft near the old No. 2 shaft (Western Area). The mineralization is primarily hosted in a narrow band or slice of mafic volcanics wedged between altered ultramafic units. In 1992, the OGS reported a small resource of 93,000 st at 0.11 oz/st Au (insitu: 10,230 oz Au) for the Matachewan Cons. Hislop Twp. Property.

During 1993 and 1994, Royal Oak Mines Inc. extracted a 25,000 st bulk sample, from near the old No. 2 shaft (Western Area), and in 1995 mined a total of 43,308 st of ore via an open pit. The ore yielded 4,171 oz of gold, or equivalent of a recovered grade of 0.096 oz/st Au.

On July 7, 2011, Victory Gold Mines Inc. announced commencing a minimum 2,000 m drill program on the property renamed as the Gold Pike Mine property. The following details regarding the geology are taken from the company website:

*Gold mineralization was outlined on the Gold Pike Mine Property by Noranda during the 1980's and Royal Oak Mines Inc. initiated production from an open pit mine in the early 1990's, shipping approximately 100,000 tons grading 3.4 grams per tonne for milling (Source: Resident Geologist) when the gold price averaged $366 per oz.*

*The Noranda drilling outlined a mineralized zone over a strike length of 400 m to a depth of 250 m below surface. The zone remains open both along plunge and up/down dip.*

*The geology of the property is characterized by mafic to ultramafic volcanics that are strongly foliated to schistose and display intense carbonatization, sericitization (green mica), pervasive and vein silicification and abundant disseminated pyrite (locally up to 30% of the rock). Visible gold is contained in discontinuous quartz stringers, striking approximately 025° and dipping 75° east, that are located along both contacts between the basalt flow and ultramafic volcanic rocks. These veins are tensional features and emphasize the importance of searching for mineralization orthogonal to the main trend of the PDFZ.*

# 16.0 OTHER RELEVANT DATA AND INFORMATION

Hydrogeological studies and waste rock characterization work commenced in September on the 147 Zone and Contact Zone area in order to facilitate a possible production decision on the Project in early 2012 (November 7 2011 press release). No results are available at this time.

# 17.0 INTERPRETATION AND CONCLUSIONS

Numerous diamond drilling and geophysical programs have been completed since the discovery of anomalous gold at the property in the early 1900s. Information collected from these past programs resulted in the discovery of two zones of mineralization Detailed drilling by Brigus has confirmed the continuity and extents of the Contact and 147 Zones. Further drilling is warranted to delineate the mineralization and update the resource classification. Other targets are currently being drilled and may be included in future resource models.

## 17.1 GEOLOGICAL RESOURCE

The Contact Zone and 147 Zone mineralization of the Project, as of November 30, 2011 is classified as Indicated and Inferred Resources. The total Indicated Resource is 867,100 t at a capped grade of 4.180 g/t Au. The total Inferred Resource is 5,464,500 t at a capped grade of 2.611 g/t Au.

The mineral resource is reported at a 0.65 g/t Au cut-off grade for potential open pit material and at 2.63 g/t Au cut-off grade for the potential underground material. These cut-offs have been developed based on current costs experienced at the Black Fox Mine.

# 18.0 RECOMMENDATIONS

Tetra Tech recommends that Brigus continue with diamond drilling of the Contact and 147 Zones and proceed with an advanced exploration program and preliminary economic assessment.

## 18.1 PHASE I RECOMMENDATIONS

Phase I recommendations include:

- conduct metallurgical test work on the various types of mineralization within the Contact and 147 Zones
- conduct infill drilling to upgrade resource classification from Inferred to Indicated
- conduct bulk density testing on the various types of mineralization within the Contact and 147 Zones
- conduct structural geological review.

## 18.2 PHASE II RECOMMENDATIONS

Phase II recommendations include:

- develop an underground advanced exploration program to facilitate the assessment of the Contact Zone mineralization
- conduct a preliminary economic assessment to assess the Project economics
- update the resource estimation as drilling is completed on the Contact and 147 Zones.

## 18.3 OTHER RECOMMENDATIONS

Other recommendations include:

- diamond drill tables:
  - insert magnetic field readings into database when using magnetic Reflex instruments for downhole surveys to assist in later identification of questionable azimuth readings
  - do not average assay grades in database
  - record lower detection limits based on assaying methodology

- conduct assay checks for high-grade gold intersections
- improve the QA/QC program and make it more effective through:
  - timely monitoring of control samples
  - review of assay methodologies
  - consider use of second laboratory for pulp duplicates.

## 18.4 BUDGET

A preliminary budget for the recommended work is calculated in Table 18.1

**Table 18.1 Preliminary Budget**

| Phase | Description | Budget ($) |
|---|---|---|
| Phase I | Metallurgical Test Work | 75,000 |
| | Infill Drilling | 4,500,000 |
| | Bulk Density Test Work | 5,000 |
| | Structural Geology Review | 20,000 |
| | **Total Phase I** | **4,600,000** |
| Phase II | Advanced Exploration Program | 3,000,000 |
| | Preliminary Economic Assessment | 150,000 |
| | Update Resource Estimate | 50,000 |
| | **Total Phase II** | **3,200,000** |

Phase I is designed to reduce project risk:

- Infill Drilling upgrades resource classification from Inferred to Indicated Resource
- the metallurgical test work addresses recovery,
- the bulk density test work addresses tonnage of ore and waste
- the structural geology review addresses the geological interpretation.

Based on the results from Phase I, Phase II will be initiated to provide confirmation of mineability through the Advanced Exploration Program and to confirm project economics by the Preliminary Economic Assessment.

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### WEBSITES

www.worldclimate.com

www.brigusgold.com

# 20.0 CERTIFICATE OF QUALIFIED PERSON

### TIM MAUNULA, P.GEO.

I, Tim Maunula, P.Geo., of Oakville, Ontario, do hereby certify:

- I am a Chief Geostatistiican with Tetra Tech WEI Inc. with a business address at 900-330 Bay Street, Toronto, Ontario, M5H 2S8.
- This certificate applies to the technical report entitled “Technical Report and Resource Estimate on the 147 and Contact Zones of the Black Fox Complex, Ontario, Canada”, dated December 15, 2012 (the “Technical Report”).
- I am a graduate of Lakehead University, (B.Sc. Honours, 1979). I am a member in good standing of the Association of Professional Geoscientists of Ontario (License #1115). My relevant experience with respect to geology includes over 25 years of exploration, operations and consulting experience. I am a “Qualified Person” for purposes of National Instrument 43-101 (the “Instrument”).
- I am responsible for Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, and 20 of the Technical Report.
- I am independent of Brigus Gold Corp. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report. I am the QP for the current published resource and technical report for the Black Fox Mine.
- I have read the Instrument and the parts of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 15th day of December, 2011 at Toronto, Ontario.

*“Original document signed and sealed by Tim Maunula, P.Geo.”*

Timothy Maunula, P.Geo.
Chief Geostatician
Tetra Tech WEI Inc,

## LAURA KARREI, P.GEO.

I, Laura Inara Karrei, P.Geo., of Toronto, Ontario, do hereby certify:

- I am a Geologist with Tetra Tech WEI Inc., with a business address at 900-330 Bay Street, Toronto, Ontario, M5H 2S8.
- This certificate applies to the technical report entitled "Technical Report and Resource Estimate on the 147 and Contact Zones of the Black Fox Complex, Ontario, Canada", dated December 15, 2011 (the "Technical Report").
- I am a graduate of Carleton University (B.Sc. 2007) and the University of Toronto (M.Sc. 2008). I am a member in good standing of the Association of Professional Geoscientists of Ontario (#1972) since 2011. My relevant experience with respect to mineral exploration includes approximately three years as Project Geologist with Noront Resources Ltd. for their Ring of Fire projects in the James Bay Lowlands of northern Ontario. I have planned and executed early-stage and advanced-stage exploration programs on shear-hosted gold, magmatic massive sulphides, massive chromite, U-REE carbonatite and V-Ti ferrogabbro projects. I also worked as an Assistant Underground Production Geologist for Goldcorp Inc. at the Red Lake Gold Mine. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- My most recent personal inspection of the Property was on November 7, 2011 for four days.
- I am responsible for Section 12 and 20 of the Technical Report.
- I am independent of Brigus Gold Corp., as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the parts of the Technical Report that I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 15th of December, 2011 at Toronto, Ontario

*"Original signed and sealed by*
*Laura Inara Karrei, M.Sc., P.Geo."*

Laura Inara Karrei, M.Sc., P.Geo.
Geologist
Tetra Tech WEI Inc.