# RECOMMENDATIONS FOR FURTHER EXPLORATION ON THE FRASERGOLD PROPERTY, SOUTH CENTRAL BRITISH COLUMBIA 

Prepared for: Mr. J.J. O'Neill

By: Alex Boronowski, P. Geo. and Chris Sebert, P. Eng.




$$
2 \text { of } 2
$$

## Summary

Mr. J.J. O'Neill of Eureka Resources Inc. requested the authors to examine previous reports prepared for the company to determine if there are identifiable structural, stratigraphic or other controls on gold mineralization and to outline additional exploration targets on the Frasergold property. A one-week examination of the key project reports and four selected cross-sections was conducted.

Scientists have classified the Frasergold property as a turbidite-hosted gold vein-type deposit. The Bendigo and Ballarat gold deposits of Australia and the Meguma district of Nova Scotia are quoted most often as examples of this deposit type.

Stratabound gold mineralization occurs on the Frasergold property within the Knotted Phyllite unit. It is believed that this unit is a more favourable host for gold mineralization due to its physical and chemical properties.

A preliminary study of the four cross-sections shows that the high-grade ( $>0.100$ ounces per ton) gold and anomalous gold zones intersected in the drill holes and mapped underground appear to be associated with quartz veins located predominantly along or sub parallel to steeply dipping faults and cleavage. Furthermore, these steeply dipping auriferous structures can be extrapolated along strike and dip on the sections examined. This interpretation varies from the interpretation of previous work.

Historically, the high-grade ( $>0.100$ opt.) gold mineralization was believed to be spatially related to the shallowly to moderately dipping auriferous horizons such as the 'A Horizon'. Mapping of the underground development and cross-section plots indicate that such horizons are more discontinuous along strike and dip, generally contain lower gold values and are not always associated with zones of higher quartz content.

It is recommended that a complete set of cross-sections be generated that contain the necessary data to continue the interpretation of geological information and to determine whether the steeply dipping auriferous veins continue to depth and/or are more concentrated in any specific area. It is not known whether such a study will improve upon the grade or tonnage of the resource calculated by previous studies; however, a new resource estimate cannot be completed before such a study has been executed.

Further exploration of the Frasergold property should initially concentrate on locating additional steeply dipping auriferous shear related structures and sediment-hosted synmetamorphic gold mineralization along the 12 kilometer long mineralized trend already identified by previous work and potential shear zones immediately adjacent to the trend.

Three such target areas have been identified for follow-up:

- To the southeast and south along the mineralized trend towards and including the hinge area of the Crooked Lake Syncline. The nose or axis of the fold possibly contains greater concentrations of steeply dipping auriferous structures.
- Parallel stratabound sediment-hosted gold-rich zones or shear related structures that may occur along the Eureka Thrust - MacKay River valley, which is believed to be the suture zone marking the collision between the Intermontane and Omineca belts. The suture zone may contain deep-seated structures favourable as a conduit and focus for gold-bearing solutions.
- Exploring the down dip extensions of the steeply dipping high-grade gold intersections outlined within the Historical Main Zone should only be considered after the cross-sectional interpretation has been completed

Other secondary exploration targets that could occur on the historical Frasergold property include:

- Other quartz veins or stockwork zones associated with faults and shears.
- Exhalative volcanogenic-related sulphide mineralization.
- Porphyry, epithermal and contact metamorphic-type mineralization associated with intrusive bodies. The linear airborne magnetic anomaly trending along the axis of the Crooked Lake Syncline may outline deeply buried intrusive bodies.

Claim tenure information indicates that assessment work is required on the existing property. It is recommended that an exploration program be initially conducted along the southern extension of the mineralized horizon to cover the nose of the Crooked Lake Syncline. A program consisting of line cutting, soil, stream sediment and rock sampling and geological mapping is recommended.

## TABLE OF CONTENTS

1.0 INTRODUCTION ..... 1
1.1 Geological Overview. ..... 1
1.2 Overview of the Gold Mineralization and Relation to Host Rocks and Structure. ..... 6
2.0 POTENTIAL EXPLORATION TARGETS ..... 8
2.1 Sediment-Hosted Gold Mineralization ..... 11
2.2 Other Exploration Targets ..... 12
3.0 EXPLORATION TECHNIQUES ..... 23
3.1 Geochemistry ..... 23
3.2 Geophysics ..... 24
3.3 Trenching ..... 24
3.4 Diamond Drilling ..... 24
4.0 ENGINEERING AND GRADE ASPECTS TO BE CONSIDERED FOR FURTHER ECONOMIC ASSESSMENT OF THE PROPERTY ..... 25
4.1 Objective ..... 25
4.2 Data Preparation ..... 25
4.3 Observations ..... 26
4.4 Engineering Conclusions ..... 28
4.5 Engineering Recommendations ..... 29
5.0 CONCLUSION AND RECOMMENDATIONS ..... 29
6.0 BIBLIOGRAPHY ..... 31

## LIST OF FIGURES

|  |  | Page |
| :---: | :---: | :---: |
| Figure 1 | Generalized geology of the Eureka Peak area - Bloodgood 1987. | 4 |
| Figure 2 | Schematic cross-section - Bloodgood 1987 | 5 |
| Figure 3 | Crooked Lake Syncline, Frasergold Project and Claims, 1:50,000 | Pocket |
| Figure 4 | Map 5238G MacKay River Airborne Magnetic Survey, ${ }^{\prime \prime}=1$ Mile | Pocket |
| Figure 5 | BCGS - Mineral Tenure Report | 9 |
| Figure 6 | BCGS - Frasergold - Claims and gold stream sediments, 1:50,000 | 10 |
| Figure 7 | BCGS - Claims and Geology | 14 |
| Figure 8 | BCGS - Claims and thrust planes | 15 |
| Figure 9 | BCGS - Stream Sediment Sample Locations | 16 |
| Figure 10 | BCGS - Gold Stream Sediments | 17 |
| Figure 11 | BCGS -- Silver Stream Sediments | 18 |
| Figure 12 | BCGS - Arsenic Stream Sediments | 19 |
| Figure 13 | BCGS - Copper Stream Sediments | 20 |
| Figure 14 | BCGS - Molybdenum Stream Sediments | 21 |
| Figure 15 | BCGS - Zinc Stream Sediments | 22 |
| Figure 16 | Frasergold Project - 1500 Level Plan - 54+00-55+00E | 32 |
| Figure 17 | Frasergold Project - Partial Interpretation, Cross-section 54+25E | 33 |
| Figure 18 | Frasergold Project - Partial Interpretation, Cross-section 54+75E | 34 |
| Figure 19 | Frasergold Project - Partial Interpretation, Cross-section 55+00E | 35 |


| Figure 20 | Frasergold Project - Partial Interpretation, Cross-section 58+50E | 36 <br> pocket |
| :--- | :--- | :---: |
| Figure 21 | Frasergold Project - Assays, Cross-section 54+25E | 37 |
| Figure 22 | Frasergold Project - Assays, Cross-section 54+75E | 37 |
| Figure 23 | Frasergold Project - Assays, Cross-section 55+00E | 39 |
|  |  |  |

### 1.0 INTRODUCTION

This report was prepared at the request of Mr. J.J. O'Neill. It is based on the authors' examination of previous reports and data collected and prepared for Eureka Resources Inc. and ASARCO Inc. by Kerr, Dawson and Associates Ltd., Amoco Canada Petroleum Company Ltd., Campbell and Associates, and John R. Kerr between 1981 and 1995. A list of references is presented in the Bibliography. The authors in preparing this report made no physical examination of the Frasergold property.

The object of this study was:

1) to determine if there are identifiable structural, stratigraphic or other controls on gold mineralization;
2) to outline additional exploration targets on the property.

Results for these objectives are discussed in Section 1.2, Overview of the Gold Mineralization and Relation to Host Rocks and Structure, Section 2, Potential Exploration Targets and Section 4. Engineering and Grade Aspects to be Considered for Further Economic Assessment of the Property.

### 1.1 Geological Overview

The following section provides a brief review of the geology of the Frasergold property. It is based on more extensive descriptions provided by Belik (1981), Brown (1985) and Campbell et al. (1991). A more regional geologic perspective can be found in Bloodgood (1987 and 1988) and Struik (1986). The reader is referred to these earlier works should he require a more detailed synopsis.

Rocks of three distinct geologic terranes including the Quesnel, Slide Mountain and Barkerville terranes underlie the Frasergold property. The Quesnel and Slide Mountain terranes are part of the western Intermontane Belt, which has accreted eastward onto the Barkerville terrane, which is part of the Omineca Belt. The Eureka Thrust marks the major tectonic boundary between these two belts.

Oldest are the Proterozoic to Lower Paleozoic-aged metasedimentary rocks of the Kaza Group, which lie to the east of the MacKay River and are part of the Omineca belt. Younger mid-Paleozoic to Tertiary metasedimentary and metavolcanic rocks of Quesnel terrane lie to the west and contact the Kaza metasedimentary rocks along a major westdipping fault - the Eureka Thrust. The Slide Mountain terrane is represented by Mississippian-aged basic to intermediate volcanic rocks and minor ultramafic bodies, which overlie the Barkerville terrane and form the base of the Quesnel terrane.

The Frasergold property is located on the northeast limb and hinge of the Crooked Lake syncline, which plunges shallowly northwest (Figures 1, 2). Bedding on the property generally dips gently to the southwest but becomes steeper towards the hinge of the syncline to the southeast. The stratigraphy from lowest to highest (and from the edge to the core of the syncline) can be outlined as follows.
A) Kaza Group metasedimentary rocks belonging to the Barkerville terrane (Omineca Belt).
B) Basic to intermediate volcanic rocks and minor ultramafic rocks assigned to the Slide Mountain terrane. These form a layer $\sim 100 \mathrm{~m}$ thick on the northeast edge of the property (Intermontane Belt).
C) Black variably carbonaceous and calcareous phyllite with intercalated metasandstones, tuffs and limestone. This unit is on the order of 1500 m thick and is the dominant rock type on the property. It belongs to the Quesnel terrane Intermontane Belt) and contains the "Main Zone" gold mineralization previously delineated by Eureka Resources Inc.
D) A large up to 500 m thick plagioclase-pyroxene-rich mafic sill overlies the black phyllite.
E) A 300 m thick volcanic-sedimentary sequence of interbedded black phyllitic siltstones and green fragmental metavolcanic rocks.
F) An 1800 m thick sequence of Triassic to Jurassic-aged mafic to intermediate pyroxene-porphyry breccia, tuff and flows. These rocks have been assigned to the Takla Group (Bloodgood, 1987)
G) Stocks and dikes of diorite, granodiorite, monzonite and syenite, which intrude the mixed volcanic-sedimentary rocks ( E ).
H) Small remnants of Tertiary-aged basalt.

Structure plays an important role in understanding the nature of gold mineralization on the property. Campbell (1989) cites that understanding of the structural geology evolved slowly from 1984 onwards and he summarizes the structural features found in the phyllites in the northeast limb of the Crooked Lake Syncline as follows.

## Cleavages:

1) $S_{0}$ : Bedding in the phyllites is defined by narrow quartzite and siltite layers. Bedding attitudes are $130-140^{\circ} / 30-45^{\circ} \mathrm{SW}$.
2) $\mathrm{S}_{1}$ : The axial plane schistosity is defined by a micaceous cleavage and reflects the regional folding of the Crooked Lake Syncline. Attitude of the cleavage is generally $130^{\circ} / 55-60^{\circ} \mathrm{SW}$.
3) $\mathrm{S}_{2}$ : A crenulation cleavage developed sub parallel to $\mathrm{S}_{1}$. Attitude of the crenulation is sub parallel to $S_{1} 68-85^{\circ} \mathrm{SW}$.
4) $S_{3}$ : A coarsely spaced crenulation cleavage developed locally in the area of the Main Zone mineralization. Attitude of this cleavage is $160-170^{\circ} / 60-$ $70^{\circ} \mathrm{SW}$.
Folding:
5) Minor interfolial folds related to bedding transposition.
6) $F_{1}: Z$-shaped open to tight folds verging to the northeast. These structures are related to the mesoscopic folding of the Crooked Lake Syncline and the northeastward direction of movement and rotation of the strata. S1 forms the axial plane to these structures with fold axes plunging from $10^{\circ}$ to $310^{\circ}$.
7) Third phase folds of different varieties also exist. There are minor kink folds and warps of main phase ( $F_{1}$ ) folds. Campbell recognized quartz rolls and fold hinges developed about the steep crenulation cleavage ( $\mathrm{S}_{2}$ ) with axes oriented $10^{\circ}$ towards $290-300^{\circ}$. These may be equivalent to the F2 folds defined by Bloodgood (1987).

Faulting has also had an influence on the location of gold mineralization. The Eureka Thrust fault lies on the northeastern margin of the property. This is a major regional fault and represents the accretion boundary between the Quesnel and Barkerville terranes. Another large thrust fault separates the Takla volcanics from lower metasedimentary rocks (Bloodgood, 1987). Smaller parallel to sub parallel fault structures also ultimately related to the thrusting and folding of the strata on the property were developed along bedding planes, cleavage traces and fold limbs (Campbell, 1989 and Campbell et al., 1991).

Cross faults have been interpreted to cut the stratigraphy on the property but have not been identified in outcrop (Kerr, 1985). These structures may have recessive exposures and be covered by overburden


Figure 3-2-2: Generalized geology of the Eureka Peak area.




Figure 2

### 1.2 Overview of the Gold Mineralization and Relation to Host Rocks and Structure

Past exploration efforts on the Frasergold property have mainly concentrated on the delineation of sediment-hosted-type gold mineralization, within the northeast limb of the Crooked Lake syncline. This type of mineralization is hosted within a carbonate and quartz-vein-rich stratabound horizon in the black phyllite unit. A geochemical soil gold anomaly has outlined the mineralized horizon to the northwest and southeast for approximately 12 km along the east limb of the Crooked Lake Syncline. It has been extensively tested by drilling and from underground along an 800 meter section referred to as the "Historical Main Zone".

The gold mineralization is contained in a specific horizon of the black phyllite unit. This horizon has been distinguished for containing 5 to $40 \%$ patches (porphyroblasts) of ironrich carbonate 2 to 8 mm in size (Belik, 1981) and has been labelled the Knotted Phyllite by previous workers. It forms a northwest striking layer up to 300 m thick in the area of gold mineralization.

In the Historical Main Zone, elevated gold concentrations are spatially associated with areas rich in discontinuous lens-like to folded carbonate-quartz-rich veins and veinlets (Campbell, 1989). Quartz is the dominant gangue mineral in the veins with lesser amounts of iron-carbonate composed of dolomite and siderite. Coarse free gold occurs within and adjacent to these veins and lenses and individual assay results may exceed 1 opt. gold. Less frequently, gold has been found in carbonaceous phyllite lacking carbonate-quartz veining where it may be smeared along cleavage traces. Minor quantities ( $<10 \%$ ) of pyrite and pyrrhotite and trace galena, sphalerite and chalcopyrite also occur in and along the carbonate-quartz veins. Examination of samples taken in drill holes and underground have not revealed a consistent correlation between gold content and sulphide content nor between gold and other elements such as arsenic, lead, zinc.

Overall, high gold grades remain localized and reflect the discontinuous nature of the veining. Larger sample widths in drill holes and underground channel and bulk samples are considerably lower in grade. For example, a global estimate of the drill indicated grade of a section of the Historical Main Zone (strike length 800 m ) is on the order of 0.05 opt. using a $0.3 \mathrm{oz} /$ ton cutting factor (Kerr, 1995).

Structural features including bedding, cleavage and faults control the character and geometry of the carbonate-quartz veins and sediment-hosted gold mineralization in the Historical Main Zone and its lateral extension. Campbell (1989) and Campbell et al. (1991) have effectively outlined these structural controls and the character of the various carbonate-quartz veins; this is summarized below.

## Vein Types:

1) Bedding parallel veins. These are usually $<5 \mathrm{~cm}$ wide.
2) Veins parallel to the $S_{1}$ cleavage, which are up to 20 cm wide.
3) Folded, boudinaged and sheared ribbon veins. These vary from several cm wide to $>30 \mathrm{~cm}$ where paralleled by shearing.
4) Wide $>30 \mathrm{~cm}$ (up to 70 cm ) wide bowed veins that have a near vertical attitude.
5) Narrow vertical veins ranging in width from 1 to 20 cm .

The earliest veins developed along the bedding plane and $\mathrm{S}_{1}$ cleavage. These tend to be relatively poor in sulphides or carbonate (Campbell et al. 1991). These earlier veins were then deformed by continuing flattening and flexural strain as folding progressed.

Shearing and faulting parallel and sub parallel to the $S_{2}$ cleavage also developed as deformation progressed. Later vein sets may be folded and/or sheared. They tend to have a more ribboned appearance and are relatively richer in carbonate and in sulphide minerals. There are many cases of folded quartz veins axial planar with the $\mathrm{S}_{2}$ cleavage. The overturned limb of the folded vein may be parallel to steeply dipping reverse faults developed parallel and sub parallel to $S_{2}$ (Campbell et al., 1991).

The near-vertical bowed veins are interpreted as dilational veins and usually strike at an acute angle to the reverse faults and adjacent ribboned veins. They contain ghost structures reminiscent of Knotted Phyllite inclusions and appear to have developed at the expense of adjoining ribbon veins. The bowed veins may have siderite and sulphide-rich margins up to 20 cm wide. The narrow vertical veins are similar in attitude to the bowed veins and also appear to post-date the ribbon veins. They are usually banded and have siderite and sulphide-rich margins and/or cores (Campbell et al., 1991). Campbell et al. (1991) estimate that the ribbon and bowed veins make-up greater than $95 \%$ of the veins exposed in the underground workings on the Historical Main Zone.

In 1991 samples were taken of individual veins to determine their average grade. The narrow vertical veins and bowed dilational veins were found to contain higher gold contents than the ribboned veins (Campbell et al., 1991).

Previous workers (e.g. Belik, 1981 and Kerr and Campbell, 1990) have postulated somewhat diverging theories as to the origin of the mineralization. Kerr and Campbell (1990) favour a tectono-metamorphic origin for this mineralization whereby Au was remobilized by deformation and metamorphism of metasedimentary rocks and redeposited within the discontinuous carbonate-quartz-rich veins and veinlets developed in the layer of Knotted Phyllite. The veins and veinlets may have been produced by progressive shearing and folding of the phyllitic host rocks in response to fold development and movement along the Eureka Thrust lying immediately to the east of the MacKay River. In contrast with the above, Belik (1981) suggested that the Au was originally syngenetic - of exhalative origin - deposited along with iron carbonates by hydrothermal fluids related to volcanism. The gold was then subsequently reconcentrated by regional metamorphism and deformation.

Overall, deformation appears to have progressed from a more ductile phase of folding and cleavage development to a more ductile-brittle regime in which both folding and the development of faults and spaced cleavage occurred. Gold grades increase in the
younger dilational veins and in the banded vertical veins where greater amounts of fluids may have been channelled. These later more gold-rich veins are spatially related to faults developed parallel and sub parallel to the $S_{2}$ cleavage (Campbell et al., 1991).

It is not apparent at this stage why the Knotted Phyllite was the site for vein development and gold deposition. It may have been more siliceous originally and slightly more competent than the phyllites lying below or above. Chemical whole rock examinations of the Knotted Phyllite indicate that the phyllite next to the veins is more $\mathrm{Al}_{2} \mathrm{O}_{3}$-rich and poorer in $\mathrm{SiO}_{2}, \mathrm{MgO}, \mathrm{FeO}$ and CaO than phyllite samples taken further away from the veins. This suggests that these elements were extracted from the host rock by the mineralizing process (Campbell et al., 1991). There appears to have been some sulphide deposition accompanying the gold at the margins or cores of the veins. Sulphur may have been scavenged by the metamorphism and breakdown of included evaporite (such as anhydrite) in the phyllite unit. Sulphur could also have been obtained from the metamorphism of pyrite and its conversion to pyrrhotite.

### 2.0 POTENTIAL EXPLORATION TARGETS

The Frasergold property has been reduced in size due to claims lapsing. Mineral tenure information obtained through an Internet Mineral Titles search (Figures $5 \& 6$ ) indicate that 5 of the remaining 9 claims are due to expire in December 1, 2003. Two claims have been staked recently and are outlined in red on Figure 3. It was not within the scope of this report to verify claim tenure information.

## Mineral Tenure Report

Click on Tenure Number link for current details!

|  |  |  |  |  ( n 解 |
| :---: | :---: | :---: | :---: | :---: |
| , | KAY \#9 | MATS CONVERSION | $\underline{204327}$ | 20031201 |
|  | KAY \#10 | MATS CONVERSION | $\underline{204347}$ | 20051201 |
| ᄂ | KAY \#11 | MATS CONVERSION | 204348 | 20041201 |
|  | MAC | MATS CONVERSION | $\underline{204214}$ | 20031201 |
| $\pm$ | MAC 9 FR. | MATS CONVERSION | $\underline{204887}$ | 20031201 |
|  | MAC 11 FR | MATS CONVERSION | $\underline{204896}$ | 20031201 |
| Ld | ARCHIMEDES \#2 FR. | MATS CONVERSION | $\underline{204829}$ | 20041122 |
|  | ARCHIMEDES \#1 FR. | MATS CONVERSION | $\underline{204835}$ | 20041122 |
|  | L-1 | KERR, JOHN REYNOLDS | 378209 | 20031201 |

British Columbia Ministry of Energy and Mines<br>Geological Survev Branch Mineral Titles Search \& Statistics

RGS - Gold by FA (<1.2M)

- 50th Percentile
- 70th Percentile
- 90th Percentile

95th Percentile
Greater than 95th Percentile

- All Others

RGS - Gold by NA ( $<1.2 \mathrm{M}$ )

- 50th Percentile
- 70th Percentile

90th Percentile
95th Percentile

- Greater than 95th Percentile
- All Others


4 Topographic Layers
Roads 1:250K (<2M)


L

Outlined below are potential exploration targets.

### 2.1 Sediment-Hosted Gold Mineralization

There is potential for discovering more sediment-hosted-type gold mineralization such as that already delineated in the Historical Main Zone. Potential areas of exploration interest include the following listed in order of importance.
A) To the southeast and south including the hinge area of the Crooked Lake Syncline. This area has been only cursorily examined and drilled in past exploration efforts (by Getchel and Nucrown Resources) but lies within the present boundaries of the property. Assessment reports regarding this exploration program have not been reviewed, but should be prior to commencing an exploration program.

If the Historical Main Zone on the Frasergold property is developed along a northwest-southeast-trending zone of shearing and parasitic folding in phyllite it is possible that this zone may eventually crosscut bedding near the fold hinge. This may take the form of fault structures that would provide a better focus for mineralizing fluids and potentially contain higher gold grades.

Alternately the gold-bearing horizon may swing around the fold axis and contain larger sized and more voluminous carbonate-quartz veins due to the greater flexural strain in the hinge versus limbs of the fold. Greater flexural strain results in greater potential for forming extension veins especially in areas containing beds of different competencies.

Analogies for both these scenarios are found in other sediment-hosted gold districts. For example, the Bendigo Gold Field, in Australia contains a succession of bedding-parallel, cleavage-parallel, dilational and fault controlled veins, which developed in a folded succession of Ordovician-aged quartz-rich turbiditic sandstones and shales (Schaubs and Wilson, 2002). Vein development at Bendigo was initially related to folding with the formation of bedding-parallel, cleavage parallel and dilational (spur-type veins). Saddle reef-type veins were developed in the hinges of anticlinal folds at the contact between sandy and mud-rich metasedimentary beds. As folding progressed faults developed along bedding planes as a result of flexural slip and eventually cut the hinge area of the fold as fold flattening continued. Fault parallel veins developed and these were generally larger in size and more gold-rich than the earlier saddle reefs or other vein sets (Schaubs and Wilson, 2002).

In the area to the south and southeast, BC Geological Survey (BCGS) Stream Sediment Survey results indicate anomalous values for gold, silver, arsenic, copper, moly and zinc in the Frasergold Creek drainage. The creek immediately to the south of Frasergold Creek has not been sampled, but drainage along strike and draining southward to Crooked Lake contains anomalous stream sediment values (Figures 7 through 15).
B) Additional parallel stratabound sediment-hosted gold-rich zones may be present on and in the area outside the property. Parallel gold-rich zones may occur closer to the Eureka Thrust towards the east where greater levels of tectonic strain are likely. This area, which lies along MacKay Creek, is probably covered by thick overburden and potential mineralization there is less likely to give a geochemical or geophysical response. Leach-type methods of geochemical soil sampling should be considered in this area and is discussed in Section 3.1.
C) The present Historical Main Zone mineralization may extend to greater depths. At present the gold grades do not warrant an underground operation and the previously proposed open pit mining plans (James Askew and Associates, 1991) were restricted to about 100 m depth. However, a few deep diamond drill holes on the Historical Main Zone should be eventually considered after a thorough study of drill sections and other related data has been completed.

### 2.2 Other Exploration Targets

There are suggestions in some of the previous collected data that there may be other types of mineralization on the property. As exploration ventures these targets are more speculative in character but should be considered in any renewed exploration effort in the property. Other types of mineralization to be considered may include those below.
A) Quartz veins or stockwork zones in faults and shears. There remains the possibility of finding larger more continuous veins along fault zones or shears. These may be best developed in more competent lithologies such as the Takla and Slide Mountain volcanic rocks but they may also be present within the black phyllites and provide additional sites for sediment-hosted gold mineralization.

Potential locations for such structures would include areas nearer the Eureka Thrust zone separating the Quesnel and Slide Mountain Terrane rocks of the Intermontane Belt in the west from the older Kaza Group rocks of the Omineca Belt in the east.

Large displacements have occurred along the Eureka Thrust, which may translate into increased strain levels and the possibility for parallel or en-echelon-style veining developing at or near its boundaries. Such mineralized structures could potentially be located along the MacKay River. There they wouldn't be associated with extensive soil anomalies, as they would tend to be recessive and covered by thicker overburden and less amenable to discovery by standard soil sampling techniques.

There is also pulential for veining to develop along fault structures cross cutting stratigraphy. Cross cutting fault structures have been interpreted to offset the known stratabound mineralized zone but have not been identified in the field (Kerr, 1985). Kerr (1985) mentions that one interpreted cross fault is associated
with a geochemical anomaly and was detected by an IP survey. Otherwise no significant geochemical anomalies have been linked to these structures.
B) Exhalative volcanogenic-related sulphide mineralization. Other authors have speculated on the possibility of an exhalative origin for the gold in the Main Zone because of its stratabound character. Also disseminated sulphides (up to $30 \%$ volume) in some siliceous sedimentary layers contained within the carbonaceous phyllite unit may be products of sea-floor hydrothermal activity.

There is also potential for exhalative sulphide mineralization within the metavolcanic and meta-sedimentary rocks of the Triassic-Jurassic-aged Takla Group volcanics and in the Mississippian-age Slide Mountain terrane.
C) Porphyry and contact metamorphic-type mineralization. Stocks and dikes of diorite and syenite within the core of the Crooked Lake Syncline have been reported to contain and be associated with $\mathrm{Cu}-\mathrm{Au}$ bearing mineral showings (Belik, 1981 and 1982).

The mineralization in the Eureka Peak Zone may be genetically related to nearby intrusions (Campbell, 1989). This zone is located to the northwest of the Main Zone in overlying Takla volcanic rocks, which consist of metabasalt breccias, tuffs and flows. Mineralization consists of pyritic and pyrrhotite-rich disseminations in the metatuffs. Thin bands and lamina of carbonate are reported to be associated with higher gold grades. The mineralization appears to be stratabound within the metatuffs and there has been speculation if it may have had a volcanogenic exhalative rather than an intrusive origin (Campbell, 1989). Up to $0.2 \% \mathrm{Cu}$ has been reported from chip samples and gold grades of 0.2 to $0.4 \mathrm{oz} /$ ton were encountered in 2 drill holes SEP88-05 \& 06 (Campbell, 1989 and Kerr and Campbell, 1990). The structure and origin of the Eureka Peak Zone remains poorly understood and it constitutes a viable target for future exploration (Kerr and Campbell, 1990).

The contact area of the mafic sill lying above the black phyllite and Main Zone is also a potential exploration target. Anomalous levels of copper ( $>250 \mathrm{ppm}$ ), arsenic ( $>150 \mathrm{ppm}$ ), lead ( $>30 \mathrm{ppm}$ ) and zinc ( $>150 \mathrm{ppm}$ ) have been noted in soil samples near the margins of the mafic sill (Belik 1981). Sporadic elevated gold is also reported in soil samples near and above the sill including one exceptionally high ( $>7000 \mathrm{ppb}$ gold) result; rock samples taken of phyllites near the mafic sill contained sporadic elevated gold of up to 300 ppb (Belik, 1982).

The airborne magnetic survey (figure 4) shows magnetic highs lying along the axis of the syncline. It is possible that these represent deep intrusive bodies. The BCGS Strean Sediment Survey results (Figures $/ /-15$ ) indicate geochemical signatures, which could be related potentially to intrusives. The spatial relationship of potential mineralized intrusions with the mineralization in the knotted phyllites could be an intriguing and very viable target.


Clains and Thrust Planes



Gold Stream Sediments


Silver Stream Sediments


Arsenic Stream Sediments
 $\square$ http


Molybdenum Stream Sediments


Zinc Stream Sediments

### 3.0 EXPLORATION TECHNIQUES

### 3.1 Geochemistry

## Soil Surveys

Standard soil sampling techniques sampling mostly the $B$ (and sometimes the $C$ horizon where soil was poorly developed) were conducted in the early 1980 and 1981 exploration programmes (Belik. 1981 and 1982). A total of 2513 samples were taken in these programmes and this method was quite successful in outlining the main zone of gold mineralization. A soil profiling programme at the end of the 1981 exploration season found that gold occurred throughout the overburden column to 1.5 m depth in areas above the main zone mineralization (Belik, 1982). The soil profile in this area was generally only 0.5 to 2.0 m thick (Kerr, 1985). Given its successful result this methodology can be employed in future exploration programmes with the following reservation.

In areas of deeper overburden, potentially those in the area of the Eureka Thrust, soil surveys based on leach methods may be considered. These methods may possibly prove more adept at detecting deeply buried targets. However, these methods should only be applied after a proper orientation survey has been performed in areas containing known mineralization in order to confirm their effectiveness.

## Stream Sediment Surveys

The BCGS Stream Sediment Survey is a useful exploration tool. A similar survey to the south of Frasergold Creek could be a cost effective and efficient method of evaluating the area and identifying target areas.

## Rock Geochemistry

Whole rock and trace geochemical analyses may prove useful in distinguishing subtle chemical variations between individual beds within the black phyllite unit and in other rock sequences. Analytical efforts have been made to define the chemistry of the mineralogy in the main zone and compare this to its host rock (Campbell et al., 1991). However no effort has been made to systematically compare the chemistry of the Knotted Phyllite with other phyllite or sediment layers within the black phyllite sequence. Such a study might give indications as to the source of the gold in the main zone and potential chemical factors that influenced the development of gold rich mineralization in the phyllite unit.

Whole rock and trace element geochemistry would be especially useful in defining the presence of potential exhalative alteration and mineralization within the sedimentary and volcanic stratigraphy as mentioned in Section 2.2 B above. It should be applied in conjunction with detailed examination of outcrop and thin section work in order to better define the potential for volcanogenic-style sulphide mineralization on the property.

## Assay Techniques

Campbell (1989) cites that comparisons of grades between conventional fire assays and metallic fire assay in the main zone indicate that conventional fire assays in the range of 0.025 to $0.125 \mathrm{oz} /$ ton underestimate the gold content by 20 to $40 \%$. Therefore future samples taken of mineralization should be assayed utilizing a 1 -assay ton sample and high-grade results which potentially contain coarse-grained gold should be analyzed by metallics fire assay techniques.

### 3.2 Geophysics

Of the geophysical techniques previously employed on the Frasergold property it appears that IP provided meaningful results (Kerr, 1985). An IP survey conducted over six lines covering the mineralized zone and its northwest extension revealed a resistivity contrast between the Knotted Phyllite and more graphitic, banded phyllite lying below. Therefore IP may prove to be a useful technique in tracing the Knotted Phyllite outward into new unexplored areas.

Magnetometer surveys could be useful to separate volcanic stratigraphy from metasedimentary rocks. Regional airbome magnetometer survey data from 1967 displays a prominent response over the Takla volcanic rocks and intrusive rocks in the core and from Slide Mountain volcanic rocks at the edge of the Crooked Lake Syncline.

Brown (1985) discusses ground magnetometer survey results and mentions that the Knotted Phyllite, which contains the gold mineralization, appears to give a lower magnetic response than the banded phyllite unit lying below. Brown attributes this to the greater pyrrhotite content found in the banded phyllite, however the overall contrast was small and therefore magnetics is probably a marginal tool for separating individual units in the phyllitic sequence.

### 3.3 Trenching

Trenching is an effective and cost effective exploration tool in areas of moderate ( $<8 \mathrm{~m}$ ) overburden depth.

### 3.4 Diamond Drilling

Initial exploration efforts by soil geochemistry, geophysics, and trenching can then be followed-up by diamond drilling if warranted. Percussion drilling should not be considered uutil a firm geologic interpretation and outline of new mineralization has been established. Large diameter core systems should be utilized. The "Digger" reverse circulation drill system has proven to yield reliable samples, if further percussion drilling proves necessary.

### 4.0 ENGINEERING AND GRADE ASPECTS TO BE CONSIDERED FOR FURTHER ECONOMIC ASSESSMENT OF THE PROPERTY

Any renewed exploration effort on the Frasergold property must involve a re-assessment of the grades and economic potential of the Historical Main Zone and possibly the remainder of the anomalous gold mineralized trend defined to date.

### 4.1 Objective

A preliminary study of three sections within the Historical Main Zone (Sections 54+25E, $54+75 \mathrm{E}, 55+00 \mathrm{E}$ ) and one section containing the deepest hole on the property (Section $58+50 \mathrm{E}$ ) was conducted to determine whether there are identifiable structural, stratigraphic or other controls on the gold mineralization (Figures 17-20).

### 4.2 Data Preparation

In order to conduct this study the available sections were partially modified to include additional information required for interpreting process. In future the following data should be shown on sections in order to conduct useful interpretations:

- Surveyed underground working
- Proposed pit outline
- Along the drill hole trace - faults, drill trace centers and pierce points
- Along the right side of the drill hole trace - assays greater than $0.001 \mathrm{oz} /$ ton (opt), colour in red any intersections assaying greater than 0.1 opt., significant composite assays.
- Along the left side of the drill hole trace - rock types, quartz content bar graphs, alteration.

Once the sections were modified, then interpreting the data commenced and this processes included reviewing the underground geology, level plans, sampling results and drill logs for pertinent geological, mineralogical, structural and alteration information need for the interpretation.

Structures were extrapolated onto adjacent sections to determine validity and continuity of interpretation and observations from section to section. The observations made follow below.

### 4.3 Observations

## Section $54+25 \mathrm{E}$ (Figures 17.21)

Underground mapping has shown that the dilatant faults filled with narrow high-grade gold ( $>0.1$ opt.) occupy simple shear related $\mathrm{S}_{1}, \mathrm{~S}_{2}$ and $\mathrm{F}_{2}$ structures. Refer to Campbell 1991 and the inset on Figure 17, Section 58+50E, which outlines a simple shear regime and associated structures.

These structures, for example numbers 1 and 2 on cross-section, appear to be traceable down dip and along strike suggesting that there is only minor displacement along the faults.

Results from the underground sampling within the section indicate that the muck and chip channel sample gold grades range from 0.019 to 0.097 opt. and 0.020 to 0.169 opt. gold, respectively. Individual dilatant quartz structures have been mapped but not sampled and therefore pin pointing high gold values is not possible. However, geological mapping has shown fault structures dipping $60^{\circ}$ and $80^{\circ}$. Extrapolating these structures down dip intersects zones of high quartz content with appreciable gold value.

Structures numbered 3 and 4, if having similar orientation, would intersect zones of appreciable gold and quartz content.

All of the significant intersections on this section are associated with higher quartz content and within the knotted phyllite unit.

This study is only preliminary; however, individual horizons such as 'A Horizon' are not believed to be as significant a controlling factor for higher grade gold mineralization as the vertical dilatant structures.

Structures numbered 3 and 4 appear to be traceable along strike to Section $54+75 \mathrm{E}$.

Section 54+75E (Figures 18, 22)
Mapping of the crosscut showed quartz bearing fault structures dipping $36^{\circ}$ to $83^{\circ}$ south. Chip channel sampling of the backs across these structures yielded assays ranging from 0.001 opt. gold to 0.010 opt. gold. The higher values are believed to be associated with the $50^{\circ}$ and $80^{\circ}$ dipping structures and possibly the quartz within a minor synform.

The 'A Horizon' as mapped in the back of the crosscut lies below the 'A Horizon' drawn on section. This discrepancy could be due to folding, faulting or it demonstrates that the 'A Horizon' is more discontinuous than previously believed.

Structure number 3, mapped in the crosscut intersects hole 174 in quartz rich, anomalous gold zone. This intersection lies immediately up dip of a Knotted Phyllite/Limestone bed (KP/Lmst), which is believed to be equivalent to a KP/Lmst bed located down dip in hole 185. If this is a continuation of the bed, then there is very little displacement along the structures.

Structure number 4 dips at approximately $65^{\circ}$ and is believed to intersect anomalous gold values ( 0.045 and 0.209 opt.), which occur within zones of high quartz content. The zones of high quartz content can be extrapolated along steeply dipping structures more easily than along shallow!y dipping horizons, such as 'A Horizon'. However, more detail interpreting of cross-sections and possibly mapping is required to verify this observation.

Structures numbered 3,4 and 5 can be extrapolated to section $55+00 \mathrm{E}$.

## Section 55 +00 E (Figures 19. 23)

Correlating the mapped geology of the crosscut to the drill holes is a challenge on this section.

The extremely high-grade section in hole 50 beneath the crosscut does not appear to extend into the crosscut. This may be due to the structure being terminated in barren quartz mapped within a synform. The $60^{\circ}$ dipping structure containing the high-grade intersection in hole 50 is extrapolated down dip to a caved zone within hole 167.

It is believed that the $60^{\circ}$ dipping structure numbered 3 , which is mapped in the back of the crosscut intersects a high-grade ( $>0.100$ opt.) gold intersection in hole 168 . Further down dip this structure intersects an anomalous quartz and gold zone in hole 50 and a high-grade gold zone in hole 167. All of the zones containing appreciable gold values are associated with anomalous quartz content.

Structure number 4 is believed to be the ' $K$ ' structure identified in the crosscut. The chip channel sample from this area assayed 0.079 opt. gold. The $60^{\circ}$ dipping structure can be extrapolated down dip and up dip to anomalous and high-grade gold-quartz intersections.

## Section $58+50 \mathrm{E}$ (Figures 20, 24)

A very cursory examination of this section was made because hole 11 is presently the deepest hole drilled on the property.

Briefly, the first gold anomaly ( 0.031 opt. gold) intersected in the hole is believed to occur at the upper contact of the auriferous Knotted Phyllite along the thrust shear plane.

The high-grade gold zone at approximately 285 m depth is located immediately above the shear plane separating the auriferous Knotted Phyllite from barren metasediments below. The metasediments below the auriferous Knotted Phyllite have been tested to a drill depth
of 412 meters. No gold values above 0.001 opt. were encountered beneath the shear plane contact. Therefore, it can be concluded that:

- Steeply dipping anomalous gold structures intersected in drill holes to the east of hole 11 do not appear to continue down dip beneath the shear plane separating the auriferous Knotted Phyllite and barren metasediments.
- The best auriferous targets appear to be along strike within the Knotted Phyllite, such as the Historical Main Zone or along strike towards the hinge zone of the Crooked Lake syncline where deep seated structure may have supplied gold bearing solutions to the Knotted Phyllite horizon.
- The MacKay River valley, which is believed to contain the Eureka Thrust, marks the suture between the Intermontane and Omineca Belts and therefore may contain similar deep-seated structures, which could have supplied gold bearing solutions to the Knotted Phyllite.


### 4.4 Engineering Conclusions

- The auriferous Knotted (ankerite/siderite) Phyllite unit is believed to be a more favourable unit for hosting gold mineralization due to its chemical and physical properties.
- The physical properties of the unit resulted in dilatant structures being developed during simple shearing and associated ductile and brittle rock interaction.
- The simple shear regime was developed as a consequence of thrusting and folding during accretion of the Intermontane Belt eastward onto the Omineca Belt.
- The steeply dipping dilatant cleavage/fault structures ( $\mathrm{S}_{2}$ and $\mathrm{F}_{2}$ ) and possibly schistosity structures ( $\mathrm{S}_{1}$ ), host narrow high-grade ( $>0.100 \mathrm{opt}$.) gold quartz veins, which can be extrapolated from section to section and along dip.
- The steeply dipping narrow high-grade and anomalous gold in quartz veins are associated with zones containing high silica (quartz) content.
- Quartz veins along bedding planes ( $\mathrm{S}_{0}$ ) appear to be more discontinuous and of lower grade gold than the steeply dipping veins.
- Chemical properties of the Knotted (ankerite/siderite) Phyllite unit, which make the unit a more favourable host for gold bearing solutions are the elevated carbonaceous content and siderite/ankerite knots (porphyroblasts) which are believed to represent originally evaporite (anhydrite) beds. The evaporite beds


### 5.0 CONCLUSION AND RECOMMENDATIONS

Stratabound gold mineralization occurs within the Knotted Phyllite (KP). The unit is believed to be a more favourable unit for hosting gold mineralization due to its physical and chemical properties.

The physical properties of the unit resulted in dilatant structures being developed during simple shearing and associated ductile and brittle rock interaction.

The simple shear regime was developed as a consequence of thrusting and folding during accretion of the Intermontane Belt eastward onto the Omineca Belt. The Eureka thrust which is believed to represent a deep seated structure lies approximately along MacKay Creek and marks the suture between the two belts.

The knots (porphyroblasts) are composed of ankerite/siderite. It is believed that the reduced sulphur required by the gold bearing solutions could have been derived from porphyroblasts, which may represent original evaporite lenses/beds within the sediments. Carbonaceous content is generally higher within the K.P.

The high-grade ( $>0.100$ opt.) and anomalous gold zones intersected in the drill holes and mapped underground are associated with quartz veins located predominantly along steeply dipping $F_{2}$ faults and $S_{2}$ cleavage.

The steeply dipping auriferous structures can be extrapolated along strike and dip and are associated with zones of higher silica (quartz) content.

The shallowly to moderately dipping auriferous horizons such as the 'A Horizon' are more discontinuous along strike and dip, generally contain lower gold values and are not always associated with zones of higher silica content.

Further exploration of the Frasergold property should initially concentrate on locating additional sediment-hosted symmetamorphic gold mineralization along the 12 kilometer long mineralized trend already identified by previous work.

Three such target areas have been identified for follow-up:

- To the southeast and south including the hinge area of the Crooked Lake Syncline.
- Parallei stratabound sediment-hosted gold-rich zones or shear related structures that may occur along the Eureka Thrust - MacKay River valley.
- Down dip extensions of the high-grade gold intersections outlined within the Historical Main Zone.

Other exploration targets have been identified and include:

- Other quartz veins or stockwork zones in faults and shears.
- Exhalative volcanogenic-related sulphide mineralization.
- Porphyry, Epithermal and contact metamorphic-type mineralization.

Claim tenure indicates that assessment work is required on the existing property. It is recommended that an exploration program be conducted along the southern extension of the mineralized horizon to cover the nose of the Crooked Lake Syncline. A program consisting of line cutting, soil, stream sediment and rock sampling and geological mapping is recommended.

An engineering study consisting of generating detail cross-sections, examining pertinent data and interpreting associated information is warranted in order to identify controls on the gold mineralization and define additional targets.

## BIBLIOGRAPHY

## References reviewed and quoted that deal with previous work on the Frasergold property

Belik, G.D., 1981. Geological and Geochemical Report on the Frasergold Property, Caribou Mining Division, British Columbia N.T.S. 93A/7E Report from Kerr-Dawson \& Associates.

Belik, G.D., 1982. Summary Report on the Frasergold Property, Cariboo Mining Division, British Columbia, N.T.S. 93A/7E. Report prepared for Eureka Resources Inc.

Brown, P., 1985. Frasergold Project. Property Evaluation and Diamond Drilling Report 1984. Company Report: Amoco Canada Petroleum Company Ltd.

Campbell, K.V., 1989. Summary Report on the Frasergold Project, McKay River Area, Cariboo Mining Division, British Columbia. Report prepared for Eureka Resources Inc.

Campbell, K.V., and Kerr, J.R., 1990. Results of 1990 Exploration Program and Proposal for Further Exploration and Development. Report prepared for ASARCO Inc. and Eureka Resources Inc.

Campbell, K.V., Gruenwald, W., Walters, L., and Schatten, M., 1991. Frasergold Project. Results of 1991 Exploration Program. Report prepared for ASARCO Inc. and Eureka Resources Inc.

James Askew and Associates, 1991. Updated 1991 Pre-feasibility Study. Report prepared for ASARCO Inc.

Kerr, J.R., 1985. Summary Report Frasergold Property. Company Report - Eureka Resources

Kerr, J.R., 1995. Summary Frasergold Property. Company Report - Eureka Resources inc.

## Other references cited

Bloodgood, M. A., 1987. Geology of the Triassic Black Phyllite in the Eureka Peak Area Central British Columbia (93A/7). British Columbia Ministry of Mines and Petroleum Resources, Geological Fieldwork, 1986, Paper 1987-1.

Schaubs, P.M. and Wilson, C.J.L., 2002. The Relative Roles of Folding and Faulting in Controlling Gold Mineralization along the Deborah Anticline, Bendigo, Victoria, Australia. Economic Geology, vol. 97, pp. 351-370.

Struik, L.C., 1986. Imbricated terranes of the Cariboo gold belt with correlations and implications for tectonics in southeastern British Columbia. Can. J. Earth Sci. 23, 1047 1066.





[^0]







November 14, 2003

## FRASERGOLD PROPERTY

The following technical work was completed during the period of May 5 to October 15, 2003, and encompassed the following claims:

Kay 9, 10,11,10,11
We list below expenses incurred:

## Boronowski Report

(which report led to the acquisition of new claims Kay 10, and Kay 11, which then led to the soil sampling project.)

| SabreX Contracting | $\mathbf{\$ 1 2 , 6 2 1 . 2 5}$ |
| :--- | :--- |
| Arduini Helicopters | $\mathbf{8 8 , 9 7 8 . 6 8}$ |

Arduini Helicopters
(helicopters required to access the site for soil sediment and rock sampling project.)

Acme Analytical Laboratories
(to analyze samples from above project and produce report)
for a total of
\$30,251.29

J. J. O'Neill

President



GROUP 10X - 0.50 GM SAMPLE LEACHED WITH 3 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 10 ML, ANALYSED BY ICP-MS. UPPER LIMITS - AG, AU, HG, $W=100 \mathrm{PPM}$; MO, $C O, C D, S B, B I, T H, U \& B=2,000 \mathrm{PPM} ; C U, P B, Z N, N 1, M N, A S, V, L A, C R=10,000 P P M$. - SAMPLE TYPE: ROCK R150 60C AU** GROUP 3B-30.00 GM SAMPLE ANALYSIS BY FA/ICP DATE RECEIVED: OCT 282003 DATE REPORT MAILED: $N 0 \vee 7 / 03$

SIGNED BY

D. TOME, C.LEONG, J. WANG; CERTIFIED B.C. ASSAYERS Assay recommend for $\mathrm{Cu}>1 \%$

##  <br> 




GROUP ID X - 0.50 GM SAMPLE LEACHED WITH $3 \mathrm{ML} 2-2-2$ HCL-HNO3-H20 AT 95 DEG. $C$ FOR ONE HOUR, DILUTED TO $10 \mathrm{ML}, \mathrm{ANALYSED}$ BY ICP-MS.
UPPER LIMITS - AG, AU, HG, $W=100 \mathrm{PPM} ; \mathrm{MO}, \mathrm{CO}, \mathrm{CD}, \mathrm{SB}, \mathrm{BI}, \mathrm{TH}, \mathrm{U} \& \mathrm{~B}=2,000 \mathrm{PPM} ; \mathrm{CU}, \mathrm{PB}, \mathrm{ZN}, \mathrm{NI}, \mathrm{MN}, \mathrm{AS}, \mathrm{V}, \mathrm{LA}, \mathrm{CR}=10,000 \mathrm{PPM}$. - SAMPLE TYPE: ROCK R150 60C AU** GROUP $3 \mathrm{~B}^{\prime}$ - 30.00 GM SAMPLE ANALYSIS BY FA/ICP. date received: oct 82003 date report mailed: $0424 / 2003$ signed by 40 . . 20 . tope, c.leong, j. wang; certified bic. assayers

##  <br> 




GROUP 1DX - 15.0 GM SAMPLE LEACHED WITH $90 \mathrm{ML} 2-2-2$ HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML , ANALYSED BY ICP-MS.
UPPER LIMITS - AG, $A U, H G, W=100 \mathrm{PPM}$; MO, $C O, C D, S 8, B I, T H, U \& B=2,000 P P M ; C U, P B, Z N, N I, M N, A S, V, L A, C R=10,000 P P M$.

- SAMPLE TYPE: SOIL SS80 60C Samples beginning' 'RE' are Reruns and 'RRE' are Reject Reruns.



Sample type: SOIL SS80 60C. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.


Sample type: SOIL $\$ 580600$. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.


[^1]$\square$

G-1
3225
3225
3226
3227
3228
3229
3230

| 3230 |  |
| :--- | :--- |
| 3231 | 1 |

3231 1

3233
3234
3235


$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrr}1.7 & 2.4 & 2.6 & 45 & <.1 & 4.5 & 4.3 & 533 & 2.10 & .5 & 2.1 & <.5 & 4.7 & 97 & <.1 & <.1 & .1 & 37 & .60 & .087 & 10 & 14.9 & .54 & 228 & .144\end{array}$










$$
\left.\begin{array}{lllllllll}
7.6 & 45.0 & 16.5 & 135 & .3 & 31.3 & 20.5 & 3897 & 3.08 \\
2
\end{array}\right) .93 .1<5
$$

$$
\begin{array}{rrrrrrrrrrrrrrrr}
2 & 19 & 3.6 & .2 & .4 & 32.21 & .109 & 22 & 22.4 & .30 & 154 & .014 & <1 & .85 & .008 \\
3 & 10 & .5 & .1 & .3 & 40 & .13 & .047 & 8 & 15.5 & .17 & 97 & .024 & <1 & .47 & .006
\end{array}
$$

$$
\begin{array}{rrrrrrrrrrrr}
7.6 & 45.0 & 16.5 & 135 & .3 & 31.3 & 20.5 & 3897 & 3.08 & 2.9 & 3.1 & <.5 \\
4.6 & 21.6 & 12.4 & 51 & .2 & 13.2 & 7.2 & 768 & 1.85 & 2.5 & .7 & <.5
\end{array}
$$

$$
\begin{array}{rrr}
.2 & 19 & 3.6 \\
.3 & 10 & .5
\end{array}
$$

$$
\begin{array}{lllllllllll}
4.6 & 21.6 & 12.4 & 51 & .2 & 13.2 & 1.2 & 108 & 1.85 & 2.5 & .1 \\
2.3 & 22.1 & 10.6 & 56 & .4 & 19.5 & 6.6 & 324 & 2.44 & 1.5 & 1.0
\end{array}<-5
$$ $.014<1$

$.024<1$
$.038<1$ 85
.47 .006
1.27 .008
1.20 .007 $\begin{array}{lll}.06 & .1 \\ .06 & .1\end{array}$
$\begin{array}{ll}.09 & .7 \\ 03 & 8\end{array}$
.3 .10 51.6
$4<.5$ $\begin{array}{llllllllllllll}.7 & 6 & .3 & .1 & .3 & 38 & .10 & .050 & 10 & 29.2 & .45 & 94 & .037\end{array}$

1 1.20.007. 11
$\square$
$\begin{array}{llll}1 & .07 & 1.1 & .06 \\ 1 & 1.1\end{array}$ <. 05
$1<.05$ $4<.5$
5 15.0
15.0

$$
\begin{array}{ccccccccccc}
2.3 & 22.1 & 10.6 & 56 & .4 & 19.5 & 6.6 & 324 & 2.44 & 1.5 & 1.0 \\
2.0 & 16.7 & 10.2 & 60 & .3 & 19.0 & 8.1 & 487 & 2.53 & 1.6 & .7
\end{array}<.5
$$

$$
\begin{array}{rrrrrrrrrr}
2.0 & 16.7 & 10.2 & 60 & .3 & 19.0 & 8.1 & 487 & 2.53 & 1.6 \\
4.0 & 7.3 & 10.5 & 14 & .3 & 4.3 & 5.1 & 153 & 1.29 & 2.0 \\
4.6 & <.5
\end{array}
$$ $\begin{array}{rrrrrrrrrrr}.2 & 4 & .2 & <.1 & .3 & 26 & .04 & .027 & 8 & 13.6 & .15 \\ 34 & .029\end{array}$ . 62.006 .03 . 1.05

$$
\begin{array}{lll}
.84 .007 .0 \\
. & .008 & 0
\end{array}
$$

$$
\begin{array}{r}
.94 .008 \\
.93 .08
\end{array}
$$

$$
\begin{array}{llll}
<1 & .93 & .008 \\
<1 & 1.38 & .016 & .1
\end{array}
$$

| $<1$ | 1.29 | .008 | .17 |
| :--- | :--- | :--- | :--- |

$<11.07 .008$. <1 1.07 .008. 21.60 .007 .16 $\begin{array}{cccc}<1 & 1.40 & .008 & .21 \\ 1 & .39 & .005 & .06\end{array}$ $<1$
$\begin{array}{llllll}1 & .03 & .7 & .2<.05 & 6<.5 & 15.0\end{array}$
$\begin{array}{lll}2 & .08 \\ 2 & .08 & 1 \\ 2 & .07 \\ 3 & .02 \\ 2 & .03 \\ 3 & .04 \\ 2 & .10 \\ 2 & .09 \\ 1 & .01 \\ 1 & .03\end{array}$ $\begin{array}{r}.6 \\ 1.0 \\ 1.1 \\ 2.2 \\ 1.6 \\ \hline \\ 1.6 \\ 1.2 \\ 1.3 \\ 1.3 \\ 1 \\ \hline 03\end{array}$ . 2.08 4.08
4.08
5.42 5.42
4.14 . 14
$51.6 \quad 15.0$ $62.1 \quad 15$. $52.4 \quad 15$. $34.7 \quad 15.0$ $\begin{array}{lll}34.7 & 15.0 \\ 3 & 4.6 & 15.0\end{array}$
$\begin{array}{llllllllllllllllllllllllllllll}1.0 & 11.1 & 9.6 & 30 & .1 & 12.1 & 4.0 & 110 & 2.50 & 1.0 & .9 & .6 & 1.7 & 5 & .1 & <.1 & .3 & 36 & .04 & .021 & 18 & 29.0 & .43 & 66 & .057 & \end{array}$ $\begin{array}{lllllllllllllllllllllllllllllll}4.8 & 41.8 & 8.4 & 94 & .3 & 53.3 & 15.6 & 570 & 2.97 & 3.0 & 1.4 & .9 & 6.2 & 15 & .8 & .1 & .2 & 31 & .24 & .077 & 28 & 41.2 & .75 & 57 & .044\end{array}$ $\begin{array}{llllllllllllllllllllllllllllllllll}7.1 & 62.5 & 11.3 & 134 & .2 & 75.0 & 21.0 & 845 & 3.82 & 3.3 & 1.3 & 2.1 & 10.9 & 21 & 1.1 & .1 & .4 & 38 & .29 & .089 & 35 & 47.6 & .97 & 92 & .025\end{array}$ $\begin{array}{llllllllllllllllllllllllllllll}6.1 & 55.7 & 8.9 & 118 & .2 & 65.2 & 17.5 & 632 & 3.61 & 3.2 & 1.3 & 1.6 & 7.4 & 15 & .6 & .1 & .3 & 33 & .22 & .085 & 32 & 41.0 & .75 & 57 & .028\end{array}$

 | 1 | 1.65 | 010 | 12 |
| :--- | :--- | :--- | :--- | $\begin{array}{lllllllll}1 & 1.65 & .010 & .12 & .1 & .01 & 3 & 5 & .1<.05 \\ & 4 & .8 & 15.0 & 5 & 9 & 15\end{array}$ 11.46 . $005.06 \quad 1 \quad 023.1 \quad 1<.05 \quad 4 \quad 9 \quad 15.0$ $\begin{array}{lllllllllllllllllllllllllllllllll}1.5 & 21.4 & 4.8 & 73 & .2 & 27.7 & 9.7 & 268 & 2.06 & 2.5 & 1.1 & 1.1 & 5.2 & 13 & .6 & .1 & .2 & 28 & .26 & .074 & 20 & 27.4 & .55 & 74 & .081 \\ 2.1 & 23.3 & 6.0 & 78 & 3 & 32.1 & 11 & 0 & 303 & 2.45 & 4.7 & 8 & 7 & 3 & 8 & 8 & 5 & 1 & 2 & 36 & .15 & 082 & 13 & 33.4 & 58 & 67 & .055\end{array}$ $\begin{array}{lllllllllllllllllllllllllllllll}2.1 & 23.3 & 6.0 & 78 & .3 & 32.1 & 11.0 & 303 & 2.45 & 4.7 & .8 & .7 & 3.8 & 8 & .5 & .1 & .2 & 36 & .15 & .082 & 13 & 33.4 & .58 & 67 & .055\end{array}$ $\begin{array}{lllllllllllllllllllllllllll}2.0 & 19.6 & 3.7 & 54 & .1 & 25.8 & 7.7 & 194 & 1.70 & 3.4 & .7 & .8 & 4.0 & 8 & .4 & .1 & .2 & 22 & .22 & .075 & 14 & 21.6 & .37 & 36 & .040\end{array}$ $\begin{array}{llllllllllllllllllllllllllll}2.3 & 28.1 & 5.6 & 76 & .2 & 34.2 & 11.4 & 271 & 2.29 & 4.8 & .8 & 1.0 & 4.9 & 9 & .6 & .1 & .2 & 33 & .20 & .073 & 16 & 31.5 & .60 & 55 & .057 \\ 2.8 & 32.2 & 6.0 & 63 & .5 & 36.2 & 10.6 & 228 & 2.29 & 6.3 & 9 & 23.5 & 6.7 & 8 & 5 & 1 & 3 & 32 & 17 & 067 & 14 & 33 & 3 & 55 & 58 & .054\end{array}$

\subsection*{11.22 .009 .19} .19 . 1 | 1 | .79 | .006 |
| :--- | ---: | ---: |
| 1 | 1.24 | .008 | <1 1.24.008. 15




[^2]

[^3]

Sample type: SOIL $\$ \$ 8060 C$. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.


[^4]

Sample type: SOIL SS80 60C. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

# GEOLOGICAL SURVEY BRANCH <br> ASSESGMQTE RESET? 

27,269


[^0]:    K K.V. Camobell \& Associates Lta. (604) 9854588

[^1]:    Sample type: SOIL $5 S 8060 C$. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

[^2]:    Sample type: SOIL SS80 60C. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

[^3]:    Sample type: SOIL SS80 60C. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

[^4]:    Sample type: SOIL SS80 60C. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

