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# A REVIEW OF HISTORICAL DATA ON EL TORO CLAIMS OF THE RESOURCE GROUP, 093L/5, 6, 11, TELKWA, B.C.

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## 1. SUMMARY

- A review of historical data related to El Toro claim block south of Telkwa, British Columbia showed that the area contains over 40 significant polymetallic Au, Ag vein deposits, four of which previously produced. Several significant past producing vein deposits occur in the Smithers Map-Area.
- The potential for discovery of an economic deposit of this type, that would require underground mining, is rated at only Moderate, due to the narrow widths, short and discontinuous lengths, and inconsistent grades of known deposits.
- The potential for discovery of an economic porphyry-type Mo or Cu, Mo deposit is rated High. Whereas only two modest porphyry-type occurrences are known at El Toro, several significant porphyry Cu and Mo deposits occur in the immediate area, plutons of the porphyry-related Nanika and Bulkley Suites are abundant in the claims, and mineralized granitoid dykes are probably genetically related to the plutons.
- The recommended optimum method to explore this extensive and rugged area is a helicopter magnetic-radiometric-VLF-EM airborne survey, flown over north-south lines spaced at 50 m. This should reveal buried porphyry plutons and related mineral deposits, also vein, shear zone, skarn and stockwork deposits. Anomalies should be followed up with prospecting recce mapping sampling, grid geochemistry and geophysics as required, trenching and drilling.
- The budget for the above program is estimated to be \$649,800.

#### 2. INTRODUCTION

In early 2006, The Resource Group staked an irregularly shaped claim block, El Toro group that covered some 40 showings, prospects, deposits and past producers located south and southwest of Telkwa, British Columbia. The Smithers Map- Area contains several past producer and significant vein deposits that include Silver Queen, Equity Silver, Cronin, Dome Mountain, Victory and Bob Creek. In addition, porphyry deposits in the area include the past producing Granisle porphyry Cu, Au district, Serb Creek Mo, Blue Pearl Mo(W) (Glacier Gulch), Big Onion CuMo, and Lucky Ship Mo.

The writer was asked to review the published historical data, evaluate the potential for an economic deposit or deposits from several types present, and recommend an exploration program.

## 3. LOCATION

The centre of El Toro claim block is 30 km southwest of Telkwa, in central B.C. It is underlain by mainly rugged topography in the Telkwa range of the Hazelton Mountains. Elevations range from 2340 m A.S.L. at the peaks to 600 m A.S.L. in the Bulkley Valley. About one-third of the claim area is above tree line.

The claim block is plotted on a 1:250 K topo base in Figure 1.

#### 4. CLAIMS

El Toro block comprises the following claim tenure numbers:

512240	512568	525417	528998
512242	512569	525440	529782
512244	512570	528995	530549
512370	513998	528997	530550
512530			

Data on expiry dates and area of claims are not available at time of writing. The claim block is shown in Figure 1.

## 5. GEOLOGY

The area is underlain by dominantly arc volcanic rocks of the Stikine terrane. Oldest rocks locally are the intermediate to mafic marine volcanics and sediments of the Upper Triassic and Lower Jurassic Takla Group. Rocks of the overlying Middle and Upper Jurassic Hazelton Group include the Lower Jurassic Telkwa Formation, the host to most mineral occurrences in the claim block. Geology and mineral deposits are shown on

Figure 2, after MINFILE Mineral Occurrence Map 093L. Subaerial andesitic to dacitic crystal and lithic tuffs predominate over rhyolitic flows, breccia and vesicular basalt. The Telkwa Formation is overlain by the Middle Jurassic Smithers and Ashman formations comprising marine shale, greywacke, breccia, tuff and conglomerate, and by the Upper Cretaceous Red Rose Formation comprising shale, greywacke, conglomerate and coal.

Intrusive rocks of three plutonic suites intrude the host Telkwa volcantcs in and adjacent to El Toro elaims. Oldest intrusions are the mainly Early Jurassic Francois Intrusions (formerly Topley Intrusions) of quartz monzonite and granodiorite stocks arrayed in a northeast-trending belt that intersects the southern part of El Toro claims. Small equant stocks and bosses of the Late Cretaceous Bulkley Intrusions are composed of quartz monzonite, granodiorite and quartz diorite and occur in a northwest-trending belt that is closely associated with vein and porphyry deposits in the eastern El Toro claim group. The most abundant intrusions are the small stocks and bosses of the Eocene Nanika Intrusions (quartz monzonite, granodiorite, quartz diorite) that form a wide northwest-trending belt across the Smithers Map-Area, coincident with that of the Bulkley Suite. Abundant dykes associated with the two latter plutonic suites, including granodiorite, quartz diorite, quartz diorite, granodiorite, and basalt, are closely associated with many of the veh, fraeture-filling, shear hosted and skarn occurrences in the area.

#### 6. MINERAL DEPOSITS

The principal deposit type present is mesothermal polymetallic Ag-Au veins of subvolcanic setting. Vein mineralogy, in approximate order of abundance, is pyrite, chalcopyrite, magnetite, bornite, hematite, tetrahedrite, sphalerite, galena and chalcocite. Gangue is quartz and lesser calcite. Veins commonly follow dyke, fracture and shear zones in the volcanic hostrocks, accompanied by an alteration assemblage that includes intense silicification plus calcite, epidote and sericite. Veins exhibit a dominant northwesterly strike, with a subordinate northeasterly trend. Previous producers include the KING, RAINBOW, COLORADO and SANTA MARIA mines, whose small production commonly peaked during the First World War. Veins were often narrow and lacking in continuity, but high grade: Au to 24g/t, Ag to 1000 g/t and Cu to 13%.

Less abundant deposit types are porphyry Mo, Cu (Low- F type) and porphyry Cu, Mo (Ag, Au). The principal Mo porphyry occurrences are the FOG and FOG, FLY hosted by an elongate Bulkley pluton immediately south of Hunter Basin in the northeastern claim group. At FOG quartz-molybdenite-minor chalcopyrite veins 2 to 5 cm wide are associated with two zones of quartz-sericite alteration, one of which is over 200 m wide. Argillic and potassic alteration of intrusive rocks occurs between the veins, and a skarn calc-silicate assemblage is developed in volcanic rocks in contact with the stock. A 0.5 m channel sample from the eastern quartz-sericite zone assayed 0.252 % Mo and 0.01 % Cu. Plutons of both Bulkley and Nanika plutonic suites are prospective for porphyry deposits.

The potential for porphyry Cu, Mo (Ag, Au) deposits exists where disseminated mineralization occurs in felsic granitoid dykes associated with veins, as at DUCHESS

prospect and RAINBOW previous producer. Plutons associated with mineralized dykes are prospective for porphyry-type deposits.

Several occurrences of skarn Cu-Ag-Zn mineralization with calc-silicate-magnetite skarn assemblages are recorded adjacent to dyke and plutonic contacts, in association with vein and disseminated mineralization, e.g. DUCHESS, FOG. Host Telkwa formation rocks are lacking in carbonate members, and extensive or economic concentrations of skarn Cu-Ag-Au mineralization are not likely to occur.

## 7. MINERAL POTENTIAL

#### 7.1 **PRIORITY 1**: Porphyry Mo (Cu) and Cu Mo (Au, Ag).

The potential for discovery of an economic porphyry Mo or porphyry Cu deposit is estimated to be HIGH. Some of the positive factors influencing this choice are:

- Several other economic porphyry deposits occur in the area, e.g. Granisle, Blue Pearl.
- Plutons of two known porphyry-mineralized suites, e.g. Bulkley and Nanika, crop out in El Toro claim group.
- Several showings include disseminated, porphyry-style Cu and Mo mineralization within the host pluton, e.g. FOG.
- Several vein deposits show disseminated Cu-Ag-Au mineralization in associated felsic granitoid dykes probably related to adjacent plutons, e.g. RAINBOW, DUCHESS.
- Limited historic geophysical data indicates numerous chargeability and gravity anomalies may overlie shallowly buried mineralized plutons.

Exploration targets for porphyry-type, open-pittable deposits are estimated as follows: Mo ore at 0.1% Mo would have a gross value of US\$50/t, and a deposit of about 50 million t may be economic, all other conditions being favourable.

Cu ore at 0.5% Cu would have a gross value of US\$35/t plus about \$5 credits for Au and Ag, and a deposit of about 100 million t may be economic, all other conditions being favourable. These model tonnage and grade criteria are deemed reasonable for this area.

7.2 **PRIORITY 2**: Polymetallic Au Ag vein.

The potential for discovery of a vein deposit of dimension and grade sufficient to support an underground mining operation is estimated to be MODERATE. Some of the factors influencing this rating are:

- Four vein deposits in El Toro area have produced ore in the early 20<sup>th</sup> century, e.g. KING, RAINBOW, COLORADO and SANTA MARIA.
- At least 10 other vein deposits of similar mineralogy and elevated Cu-Ag-Au grade in El Toro area have the uotential to contain limited tonnages i.e. 300-500 t, of high-grade ore.

• Several past producing and near-producing vein deposits of similar type in the Smithers area include Silver Queen, Equity Silver, Cronin, Dome Mountain, Victory and Bob Creek

Whereas numerous vein deposits are known in the region, the probability of discovering one whose economics would support an underground operation is deemed to be moderate. For veins other than SANTA MARIA, average of 13 published assay widths is 1-2 m and lengths is less than 100 m. An exploration target for a vein deposit of grades and dimensions similar to those encountered at El Toro may be taken as a gross metal value of US\$200/t, reserve of 1 million t, and dimensions of about 50 m long, 2 ru wide and 25 m deep. Minimum grades for these dimensions would be in the order of 1% Cu, 100 g/t Ag and 5 g/t Au.

#### 7.3 **PRIORITY 3**: Stockwork, disseminated Au, Ag deposit.

Potential for discovery is deemed to be LOW to MODERATE.

- The possibility of bulk tonnage, open-pittable precious metal deposits in El Toro area is supported by disseminated and/or stockwork mineralization of limited extent adjacent to veins and shear zones at LEFTY (WOLVERINE), WAR EAGLE and DUCHESS.
- El Toro area is one of intersection of regional northwest and northeast fractures, emplacement of equant to eylindrical intrusions along intersection zones of high-angle fractures, and doming of host volcanics over intrusive stocks. This structural setting is permissive for stockwork development.
- Historical exploration data define numerous areas of hydothermal alteration in fractured rocks and anomalous Cu, Ag, Zn and Au geochemical response in soils. Most of these anomalies have been inadequately tested.

A realistic target grade for a bulk-tonnage low-grade precious metal deposit is estimated to be about 1 g/t Au equivalent, which would necessitate an ore volume of at least 100 Mt.

## 8. PROPOSED EXPLORATION

#### 8.1 Airborne Survey

Historical exploration for at least a century has been successful in the discovery of vein deposits, mainly by classical prospecting, and subsequent application of geochemical and geophysical exploration methods has been largely localized by vein discoveries. The rugged topography has limited the extent of regional surveys. To effectively explore the potential for buried porphyry-type deposits (Priority 1) a departure from ground-based methods is recommended. A helicopter-borne combined magnetometer-scintillometer-VLF-EM survey is recommended as a cost effective way of covering this large and rugged area.

Figure 3 gives the outline of the proposed area to be covered by an airborne survey. The irregular outline of El Toro claim block creates problems for detailed airborne coverage, and the proposed survey area represents compromises. If north-south lines spaced at 50 m were flown across the area, a total of 7420 line-km would be flown. At an estimated contract cost of \$60/line-km, the program would cost \$445,200. A 50 m line spacing is deemed the optimum to reveal targets of the size recorded in El Toro area. The magnetic survey will be particularly useful in detecting contacts of concealed plutons and magnetite-bearing mineralization, and assisting in mapping of known intrusive contacts. The radiometric survey allows identification and discrimination of plutonic suites and petrographic types on the bases of U/Th ratios and K content, and is particularly useful in detecting zones of potassic alteration. The airborne VLF-EM survey should reveal sulphide-rich conductors, particularly large veins and mineralized shear zones.

#### 8.2 Follow-Up Surveys

Anomalies generated by the airborne survey may include magnetic highs over buried plutons, contacts and magnetic mineralization, potassium-rich alteration zones, and linear EM conductors. These and other anomalies should be followed up by first carrying out conventional prospecting, recce mapping and sampling, then doing grid geochemical and geophysical surveys as warranted. Developed anomalies should be first trenched by hand or excavator, and then drilled. The results of the airborne and ground follow-up surveys will dictate the scope of the drilling program.

#### 9. CONCLUSIONS

- El Toro claim block overlies a well mineralized area south of Telkwa that includes over 40 part producers, deposits, prospects and occurrences.
- Whereas four previous producing polymetallie Au, Ag vein deposits are located within El Toro claims, and several past producing mines are located in the Smithers Map-Area, the potential for discovery of an economic underground mine of this type is rated as only Moderate. The narrow widths, short and/or discontinuous lengths, and inconsistent grades of most vein deposits are negative factors in their economic potential.
- Whereas only two modest porphyry-type occurrences are recorded at El Toro, the potential for discovery of at least one economic porphyry Mo (Cu) or porphyry Cu (Mo, Au, Ag) deposit is rated as High. Plutons of two suites (Bulkley and Nanika) that host significant porphyry-type deposits elsewhere in the region are common in the claim area. Some plutons appear to be genetically related to mineralized granitoid dykes.

• An airborne magnetic-radiometric-VLF-EM survey, flown on north-south lines at 50 m spacing, is recommended to reveal the presence of buried plutons and accompanying porphyry-style mineralization. The presence of vein, mineralized shear zone, stockwork and skarn mineralization should also be detected by an airborne multi-channel survey.

#### 10. BUDGET

Airborne survey: multi-channel helicopter borne survey that covers	
7420 line-km at an estimated contract price of \$60/line- km\$	445,200.
Follow-up prospecting, recce mapping and sampling of anomalies,	
limited trenching, grid geochemical and geophysical surveys, crew of	
4 for 1 month:	
Salaries:	
geologist\$500/day,assistants\$350/day	.46,500
R&B	12,000
Trucks (2), fuel	5,000
Assays	. 7,500
Supplies	1,000
Excavator, est. 7 days@\$2000	14,000
Incidentals@10%	8,600
Diamond drilling, est. 1000 m@\$100	.100,000
Reporting, data handling	10,000
Total	5649,800

#### 11. **REFERENCES**

MINFILE Map 093L Smithers, Scale 1:250,000, 1989.

ARIS Reports for 093 L, B.C. Ministry of Energy Mines and Petroleum Resources