

# Geology and mineralization of the Len intrusive-hosted gold prospect, McQuesten area, Yukon

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## ABSTRACT

The Len porphyry gold prospect is located 47 km north of Mayo, Yukon, in the Tombstone Suite intrusive belt. The area was explored as a Keno Hill-style silver prospect in the 1960s and 1970s. An arsenic-in-soil anomaly first identified in 1980 was followed up by soil geochemistry and excavator trenching in 1996. Multiple sheeted quartz-sulphide veins hosted in a previously unmapped granodiorite stock were discovered during the trenching program. A six-hole program of diamond drilling in 1997 encountered grades ranging up to 2.22 g/t gold across 18.6 m, and showed that gold mineralization is dominantly within, but not restricted to, the intrusive stock.

## RÉSUMÉ

La zone d'intérêt pour l'or Len est située à 47 kilomètres au nord de Mayo (Yukon) dans la zone intrusive de la suite de Tombstone. La région a été explorée à titre de zone d'intérêt pour l'argent de type Keno Hill pendant les années 60 et 70. La première observation d'une concentration élevée d'arsenic dans le sol en 1980 a été suivie d'analyses géochimiques des sols et de l'excavation de tranchées en 1996. De multiples filons de quartz avec sulfures encaissés dans un stock granodioritique jusqu'ici non cartographié ont été découverts dans le cadre du programme d'excavation de tranchées. Un programme de six forages au diamant exécuté en 1997 a permis de recouper des teneurs atteignant jusqu'à 2,22 g/T d'or sur 18,6 mètres et a montré que la minéralisation en or se concentre principalement, mais non exclusivement, dans le stock intrusif.

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## INTRODUCTION

The Len gold prospect is located at Skate Creek, 47 km north of Mayo, Yukon and 8 km east of New Millenium Mining Ltd.'s Dublin Gulch gold deposit (Fig. 1). Bedrock gold mineralization was discovered in 1996 by trenching zones of anomalous gold, arsenic, and antimony values in an overburden-covered, thickly forested area.

## HISTORY

The earliest recorded bedrock mineral exploration in the area of the Len prospect was in 1965, when United Keno Hill Mines Limited explored for the source of anomalous stream sediments identified by the Geological Survey of Canada during Operation Keno (Van Tassell, 1970). This work culminated in the discovery of a Keno Hill-style argentiferous galena-siderite vein (Yukon Minfile 106D 020, Skate). During the period 1969 to 1974, the vein was explored by trenching and diamond drilling. In 1978, Gordon and Janet Dickson acquired the ground. Soil geochemistry completed in 1980 identified a large arsenic anomaly (McAtee, 1980) centred one km to the east of the galena-siderite vein. These samples were not analyzed for gold. Balaclava Mines Inc. and Panamex Resources Inc. optioned the

ground in 1996 to explore for bedrock gold mineralization associated with the previously identified arsenic anomaly. Soil geochemistry, geological mapping, geophysics, and trenching were completed in 1996, followed by 500 m of diamond drilling in 1997.

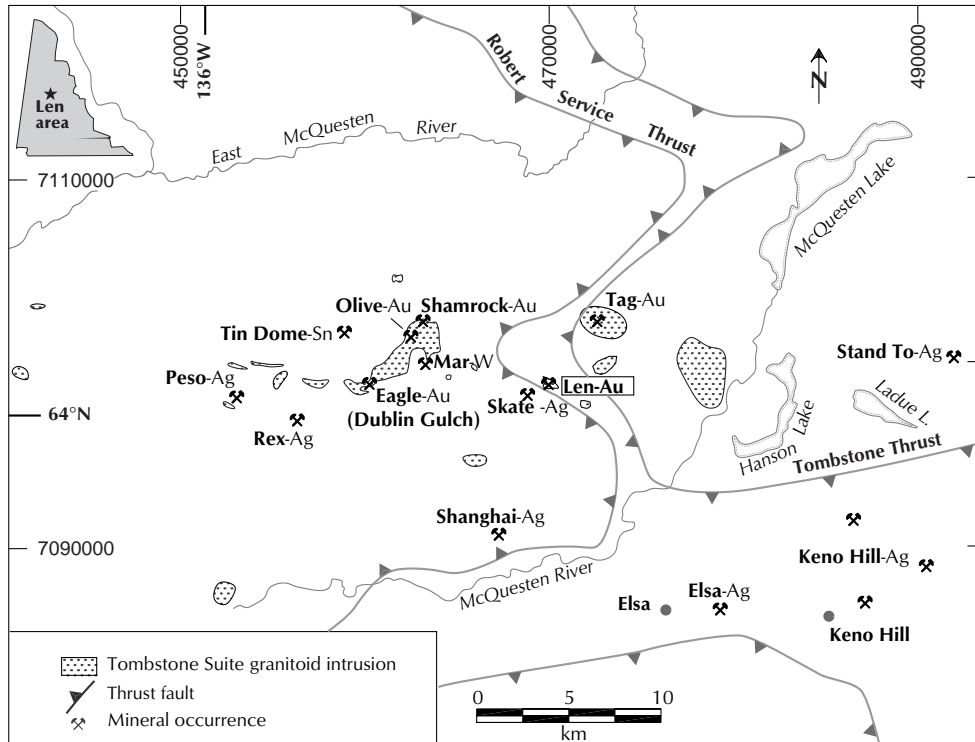
## GEOLOGY

The Len prospect is located in an intrusive belt known as the Tombstone Plutonic Suite. The oldest rocks in the area are schist and limestone of the Upper Proterozoic to Lower Cambrian Hyland Group which have been thrust over variably deformed Keno Hill quartzite (Boyle and Gleeson, 1980). Regional scale geological mapping (Green, 1972) does not show intrusives in the area of the Len prospect. Detailed mapping of boulders and rock rubble in 1996 suggested that a 400 x 700 metre elliptical granodiorite stock (Fig. 2) was centred 1 km east of the previously identified galena-siderite vein. The stock locally contains disseminated arsenopyrite and rare tourmaline, and is variably silicified and sericitized, particularly near the southern margin. An east-west fracture system at the southern margin of the granodiorite stock has recessive weathering and forms an indistinct break in slope. Trench exposures suggest that the southern intrusive contact of the stock dips gently to the south

and may coincide with a thrust fault.

## GEOCHEMISTRY

Soil geochemistry was completed in 1996 to determine whether gold was present in the area of the arsenic anomaly identified in 1980. The 1996 samples were sieved to -150 mesh (Tyler screen) and anomalous thresholds were established at 30 ppb gold, 200 ppm arsenic, and 30 ppm antimony. A 500 x 1600 metre gold-arsenic-antimony anomaly was identified closely coincident with the granodiorite stock as defined by the distribution of granodiorite boulders and rubble in soil. Bismuth, silver, and lead are variably anomalous. Stream sediments collected one km downstream of subsequently exposed mineralization and sieved to -230 mesh are anomalous in gold (up to 250 ppb), arsenic, and antimony.



**Figure 1.** Granitoid intrusions and mineral occurrences – Len area. Thrust faults modified from Green (1971) and C.F. Roots (pers. comm., 1998).

## MINERALIZATION

In 1996, detailed examination of lithic material recovered from hand-dug pits within the geochemically anomalous area identified rare angular quartz-arsenopyrite pebbles and cobbles carrying anomalous, but sub-ore grade, gold values in soil and thin glacial alluvium. Subsequent excavator trenching exposed multiple, structurally controlled, sheeted quartz-sulphide-carbonate veins striking approximately parallel with the south margin of the granodiorite stock. Veins range in size from one millimetre to two metres. They dip steeply to the north, and have been traced along a strike length of 600 m. Arsenopyrite is the dominant sulphide, with lesser amounts of galena, sphalerite, pyrite, stibnite, and bismuthinite. Fine grained arsenopyrite and

stibnite coat some fracture surfaces, without quartz. Sulphide minerals are strongly oxidized to a depth of approximately 10 m, resulting in locally gossanous soil and dispersed metal values.

Trench samples ranging up to 22.2 g/t gold across 3.0 m and another zone of 4.4 g/t gold across 8.0 m led to the decision to drill the prospect. A total of six inclined diamond drill holes (Fig. 3) were completed in 1997, which tested the mineralization along a strike length of 400 m. All of the holes intersected gold mineralization grading in excess of 4 g/t across variable widths. Two of the most significant intervals (all apparent widths) are 2.22 g/t gold across 18.6 m (including 7.06 g/t across 4.3 m) in Hole 97-01, and 1.27 g/t gold across 32.0 m (including 7.37 g/t across 3.4 m) in Hole 97-03. Gold mineralization is not restricted to the granodiorite. The last and easternmost hole (97-06) of the

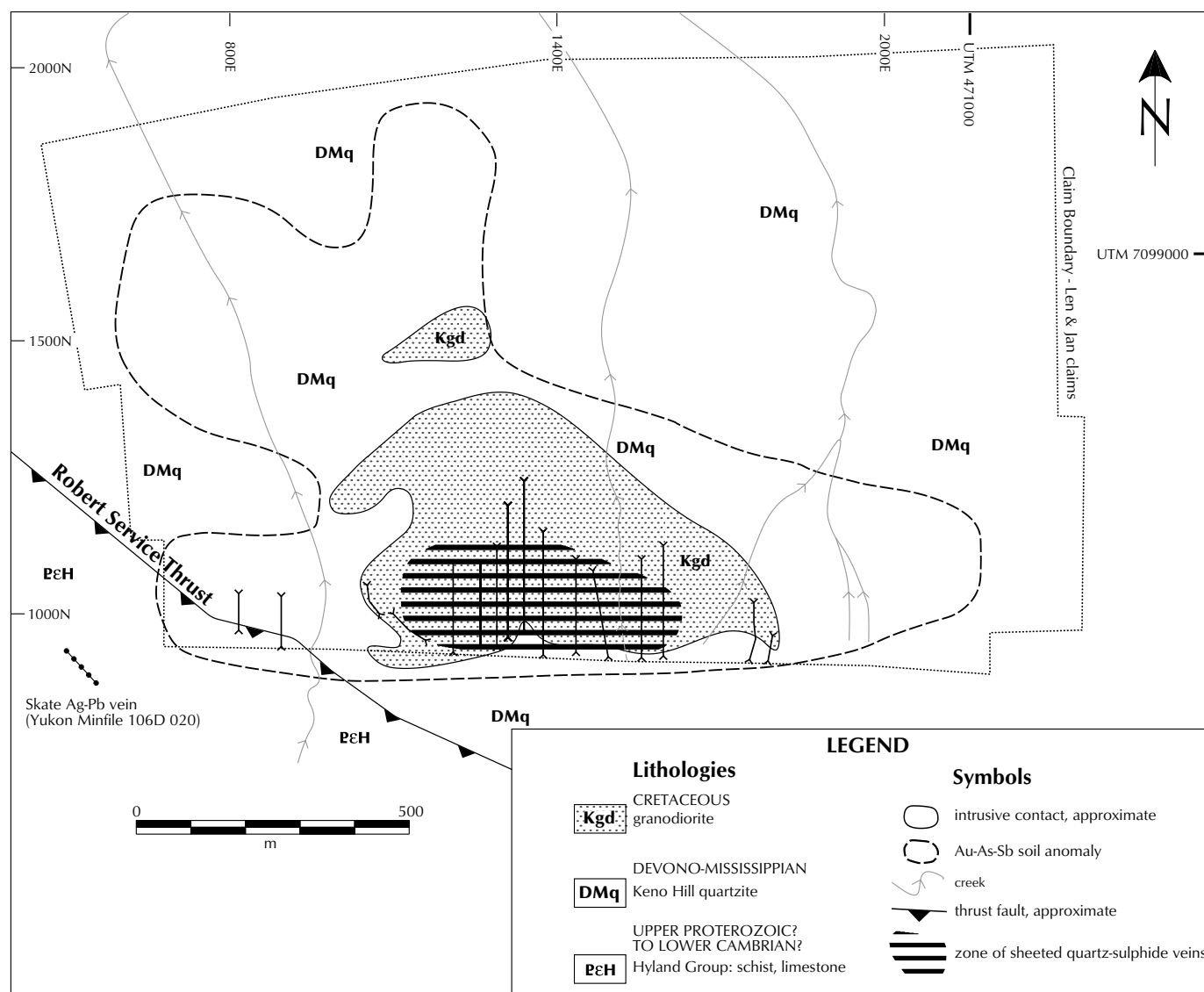


Figure 2. Simplified geology and geochemistry of Len prospect.

**PROPERTY DESCRIPTIONS**

1997 drilling program (Fig. 4) encountered fractured and veined limonitic quartzite below trench exposures of similarly mineralized granodiorite. In addition to gold, mineralized intervals are variably anomalous in arsenic, silver, lead, zinc, copper, antimony, cadmium, iron and bismuth.

**DISCUSSION**

Exploration work that culminated in the discovery of bedrock gold mineralization at the Len prospect in 1996 was based on study of the results of exploration programs carried out during the period 1965 to 1980. Even though the previous exploration target was silver-bearing vein-type mineralization in Keno Hill quartzite, data filed by previous operators were instrumental in the success of the 1996-1997 work. The large arsenic-in-soil

anomaly and granodiorite boulders were re-evaluated as potential indicators of porphyry-style gold mineralization, and allowed the current work to focus on a relatively small area. Nevertheless, mineralization at the Len prospect could have been identified earlier using detailed stream sediment geochemistry with multi-element analyses performed on fine fractions.

The 1996 soil geochemistry was carried out on a grid with sample spacings as detailed as 10 x 50 m, which led to specific sites where quartz-arsenopyrite fragments were first identified in hand-dug soil pits. Subsequent examination of the geochemical data shows that grid spacings of 25 x 200 m would have been sufficient to identify a large gold-arsenic-antimony soil anomaly. Anomalous values of antimony and bismuth in soil best defined the known zone of gold mineralization, more precisely than gold or other pathfinder elements.

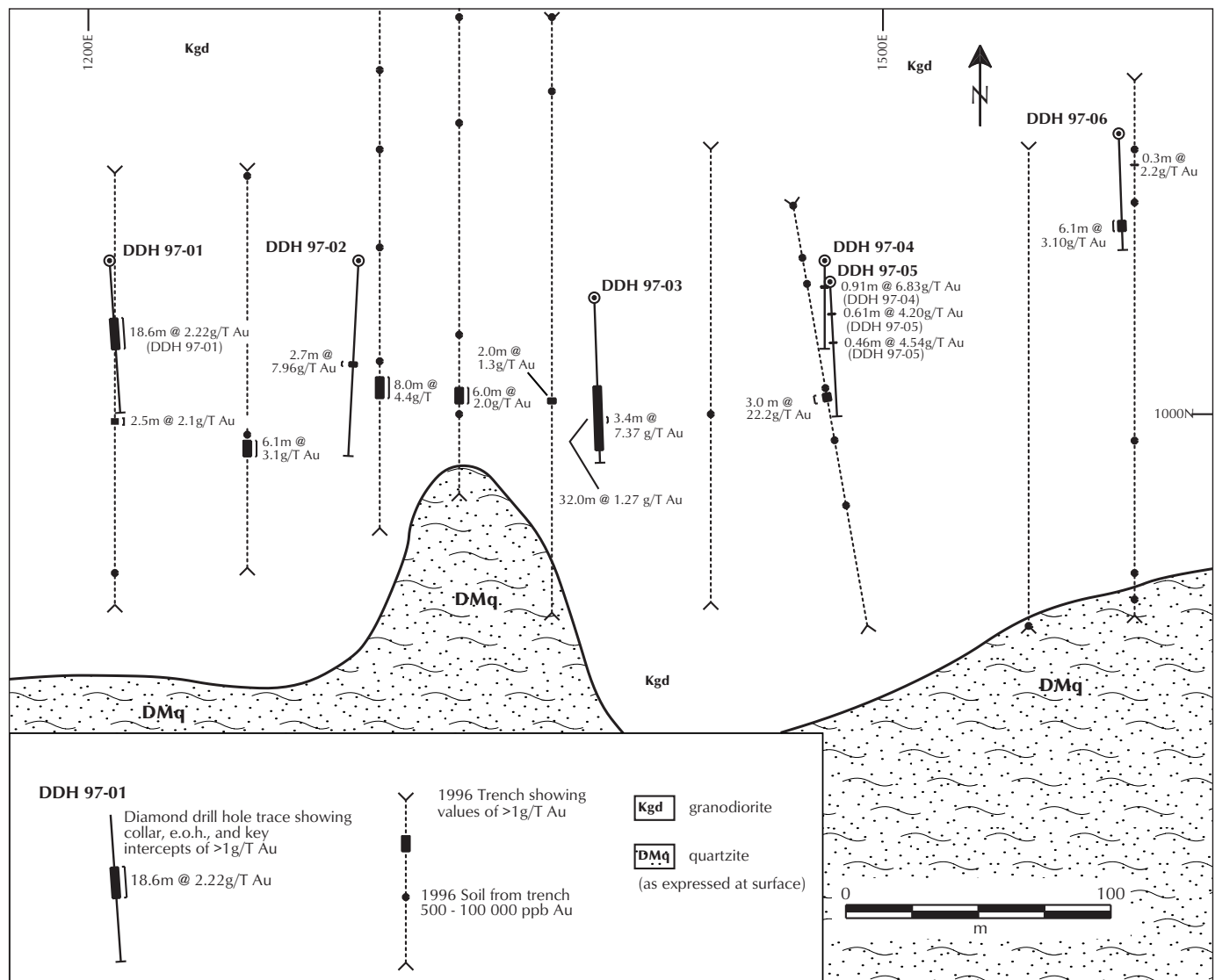


Figure 3. Len prospect trench and drill hole plan.

## CONCLUSIONS

The Len prospect is a new Tombstone Suite intrusive hosted gold occurrence similar to the Dublin Gulch and Fort Knox porphyry gold deposits. It was discovered in a completely overburden-covered area by a systematic exploration program. Work included mapping a previously unknown intrusive stock by defining granodiorite rubble in overburden, carrying out gold-arsenic-antimony soil geochemistry, excavator trenching and diamond drilling. Exploration to date has not defined any limits to the mineralized zone. While many known intrusive stocks in the Tombstone Suite intrusive belt have been explored for their gold potential with variable success, the discovery of the Len gold prospect in an overburden-covered area demonstrates the potential for many more unexposed and unexplored Tombstone Suite intrusives.



*Figure 4. Diamond drilling on Len property, in 1997.*

## ACKNOWLEDGEMENTS

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