

NEWFOUNDLAND & LABRADOR

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Frenchman Head - Zn-Cu-Pb-Ag



Map 2. Claims Location and Geology

Geology Sources: Crisby-Whittle, L. V. J. (compiler): 2012: Bedrock geology dataset for the Island of Newfoundland, Newfoundland and Labrador Department of Natural Resources, Geological Survey, Open File NFD/2616 version 7.0. Mineral Occurrence Source: Mineral Occurrence Database - Geological Survey, Department of Natural Resources Website: <http://www.gov.nf.ca/mines/en/geosurvey>

Highlights:

Footwall style, hydrothermal alteration VMS silica-sericite ± chlorite ± pyrite alteration of host felsic volcanics.
Drilling highlights include 18.6 m grading 2.2% Zn, including 2 m grading 7.46% Zn; and 1.6 ozs/t Ag.
Near surface mineralization.
Potential for near surface, bulk tonnage, open pit deposit.
Part of regional VMS belt.

and lesser chalcopyrite and galena in silicified rhyolite. Early work by NALCO included geochemical and geophysical surveys, trenching and drilling (packsack and AXT) (Pickands Mather, 1965). Highlights from the drilling include intersections of **18.6 m grading 2.2% Zn, including 2 m grading 7.46% Zn**. Drilling by Noranda of a coincident geophysical and geochemical anomaly along strike of the Frenchman's Head Prospect, returned an intersection of **8 m grading 2.26% Zn and 1.3 troy ounces/ton Ag, including 2 m grading 6.49% Zn and 1.6 troy ounces/ton Ag** (Graves, 1986). The mineralization has been outlined over an area about 150 m long by about 50 m wide and occurs in possibly two or three sub-horizontal zones, all of which are less than 50 m below surface. Higher grade sections (greater than 3% Zn) typically occur in the lower or central zone if more than one zone was intersected. The mineralization appears to be open to the west and to the east-northeast and may be limited by a fault to the east.

At the **Olive Cove Zn Showings** (Map 2), Noranda discovered several showings (Olive Cove South #1, #2, and #3) in the area of the contact between rhyolitic and andesitic rocks of the Tickle Point Formation. These contain up to 5% disseminated pyrite and trace sphalerite. One diamond drillhole passed through moderately to highly sericite- and chlorite-altered felsic volcanics, then into mafic volcanics and interflow sediments; near the transition zone, the host felsic rocks show more intense sericite alteration and contain up to **5% disseminated pyrite, anomalous Ag values and up to 4,000 ppm Zn over 1 m** (Graves, 1986). Other areas of outcropping, highly silica-, sericite- and pyrite-altered and mineralized felsic and mafic volcanics occur to the east and south of the Olive Cove occurrences indicating the presence of a large VMS hydrothermal alteration system (Copeland, 2009). Felsic volcanic rocks with disseminated, stringer and vein sphalerite, returned assays up to **6.4% Zn** (Figure 1). 92 B-horizon and humus samples were collected here and outlined a 900 m multi-line and multi-element anomaly on the flank of the outcropping mineralization and EM anomaly (Figure 1, Paragon, 2009); assays included up to **1600 ppm Zn, 188 ppm Cu, 149 ppm Pb and 1.3 ppm Ag** from soils. The anomaly trends NE-SW parallel to the mapped contact between felsic volcanic rocks and marine sedimentary rocks (Paragon, 2009). This anomaly has not been drilled.

Mineralization at the **Frenchman Cove Zn Showing** (Map 2) occurs as stringers of massive pyrite-sphalerite, as well as massive pyrite within an extensive rhyolite hosted alteration zone.

The **Frenchman Head Property** consists of 10 claims in two licenses located on the west side of the Connaigre Peninsula, eastern Newfoundland, NTS 1M/12. The coastal town of Harbour Breton lies approximately 25 km SSW of the property. The property is readily accessible via the Harbour Breton Highway (Route 360) just east of the property (Maps 1 and 2).

Regional Geology

The Connaigre Peninsula lies within the Avalon Zone of the Newfoundland Appalachians and is underlain by a Neoproterozoic volcano-plutonic arc formed in a compressional tectonic environment (O'Brien et al., 1996). The oldest part of the basement consists of calc-alkaline rhyolitic flows and pyroclastics and siliciclastic, mafic volcanoclastic and carbonate rocks, termed the Tickle Point Fm (680 Ma), which is host to at least 10 base-metal volcanogenic massive sulphide occurrences in this region (Paragon, 2009). A 670 Ma co-magmatic bimodal intrusive suite comprising granites and gabbros of the Furby's Cove Intrusive Suite intruded the Tickle Point Fm. These rocks form an uplifted basement upon which the Connaigre Bay Group, an extensive succession of volcano-sedimentary rocks was unconformably laid down. (O'Brien et al., 1996).

Local Geology

The property is underlain principally by the Tickle Point Formation (Map 2) comprising mostly massive rhyolite flows, silicic pyroclastics and internally brecciated carbonates. Gabbros of the Grole Intrusive Suite are locally intrusive into the Tickle Point Fm. The base of the Connaigre Bay Gp, Sam Head Formation siliciclastics, is located SE of License 23125M. The top of the Connaigre Bay Gp, the Downs Point Fm, comprising terrestrial clastic and felsic pyroclastic rocks, is just east of license 23131M.

Mineralization

There are 5 historic mineral occurrences on the property (Map 2), all hosted in felsic volcanics of the Tickle Point Formation. **The Frenchman Head Zn Prospect** was discovered in the 1960's by NALCO. Several other companies have explored in the area since then. The Frenchman Head Prospect consists of disseminated, stringer and semi-massive pyrite, sphalerite

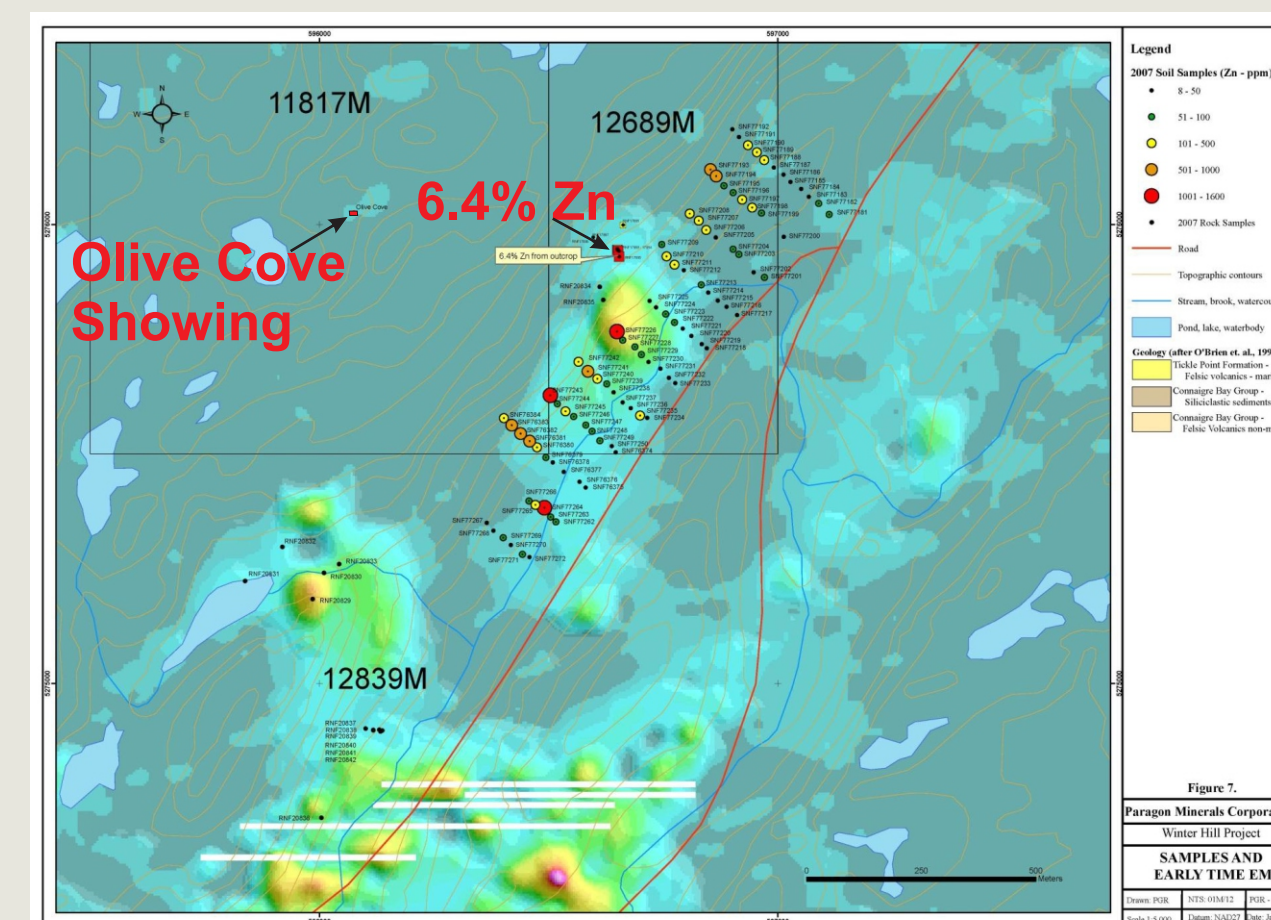


Figure 1: Soil survey results from Paragon (2009)

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Mineralization Model

Mineralization in the Winter Hill - Frenchman Head area typically consists of massive, banded and disseminated sphalerite, with lesser pyrite, pyrrhotite, magnetite, galena and chalcopyrite. The mineralization is hosted within a thick, up to 30 m wide, "stratabound" zone of carbonate and calc-silicate altered rocks located along the transition between the felsic volcanic rocks (Tickle Point Fm) and overlying mafic volcanic rocks (Connaigre Bay Group). The Winter Hill and Frenchman Head prospects comprises largely footwall style, volcanogenic massive sulphide alteration including pervasive silicification and sericitization accompanied by lesser and variable chlorite and pyrite alteration of host felsic volcanic rocks. Although the grade is somewhat lower at Frenchman Head, the initial interpretation of the geometry suggests potential for a relatively low-grade, bulk tonnage, open pit target. Mineralization at the Winter Hill Prospect is interpreted to be of volcanic-hosted massive sulphide (VMS) affinity (Sears and Wilton, 1996). This interpretation provides further evidence that the Tickle Point formation is host to district scale VMS-style mineralization.