

# **A DIAMOND DRILLING PROGRAM NEAR THE AMHERST MARKET, INVESTIGATING BEDROCK AGGREGATE POTENTIAL IN THE NORTHWESTERN COBEQUID HIGHLANDS, NOVA SCOTIA**

by

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## **ABSTRACT**

The bedrock underlying the Cumberland-Pictou Lowlands in the Amherst region consists exclusively of soft sedimentary rock. Similarly the gravel deposits of the area are predominantly comprised of the same lithologies. Low durability and mechanical strength inherent to the rock make it unsuitable for the production of high quality aggregate. The result is a general absence of local materials to meet market needs. To address this problem a diamond drilling program was conducted from 1991-1992 in the northwestern Cobequid Highlands to identify bedrock aggregate potential as close as possible to the Amherst area. Twenty holes were successfully drilled into a variety of igneous rocks including Devono-Carboniferous granite (6 holes), Devono-Carboniferous diorite (7 holes), Devono-Carboniferous volcanics of the Fountain Lake Group (5 holes) and Hadrynian Jeffers Formation volcanics (2 holes).

The study determined that the Devono-Carboniferous diorite rocks were best suited for high quality aggregate production. The volcanic rocks of the Fountain Lake Group and the Jeffers Formation generally produced good test results as well, however the stratigraphy showed less consistency and the rocks appeared to be more negatively affected by structural deformation. The Devono-Carboniferous red granites performed less satisfactorily in the tests, generally being too friable for high quality applications and commonly containing several metres of residuum at the top.

Overburden thickness at the drill sites varied from none to more than 10 m thick. Depth to bedrock is commonly unpredictable and thought to be related to irregularities in the bedrock surface. Major stream valleys along the edge of the Highlands commonly contain thick deposits of till or ice contact gravels on the valley walls. Due to costs associated with overburden removal, careful determination of its thickness should be a priority in selecting a quarry site.

Other factors affecting quarrying in the Cobequid Highlands are structure and mineralization. Major faults and shear zones have a negative impact on stone quality by causing the aggregate particles to be friable or platy and producing complexities in the local geology. Mineralization, primarily metallic, can cause a variety of problems in a potential quarry development including environmental and health concerns. Therefore, areas of extensive faulting or known mineralization should be avoided or approached with caution.