

Nova Scotia Gold Grain Study

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During the 2004 field season, twenty 10 kg till samples were collected in order to determine: (1) background concentrations of gold grains from across the province, (2) anomalous gold grain concentrations and the associated dispersal pattern from within a known gold district (Beaver Dam) and (3) the morphology of each of the grains recovered, an estimator for the distance of glacial transport. Sampling depths varied from approximately 1.5 to 2.5 m for regional till samples collected along roadside till exposures, while till samples associated with the detailed sampling program at Beaver Dam were collected from hand-dug till pits between 1.0 and 1.5 m in depth.

The morphology of gold grains recovered from till samples is, generally, classed into three categories: pristine, modified and reshaped. The distance of glacial transport from source can be estimated based on the gold grain morphology: pristine grains are indicative of minimal transport ranging from 0 to 100 m, modified gold grains have travelled in the order of 500 m, and reshaped grains have been transported in excess of 1000 m. There are, of course, exceptions.

Results for the fourteen 10 kg till samples collected from across mainland Nova Scotia indicate background gold grain concentrations range from 0 to 3 gold grains per 10 kg sample. The gold grains have been transported at least 1000 m from source, based on the reshaped morphology of the majority of the grains. Additional regional sampling throughout mainland Nova Scotia and Cape Breton Island is required to increase confidence and firmly establish background concentrations for the entire province.

Detailed 10 kg till samples collected along a 1400 m profile line from within the Beaver Dam Gold District, an area of known gold mineralization, indicate gold grain concentrations range from a low of 7 gold grains approximately several hundred metres up-ice from the Mill Shaft to a maximum of 161 gold grains approximately 300 m down-ice from the Mill Shaft. The farthest till sample collected approximately 1200 m down-ice from the Mill Shaft still contained 25 gold grains. The gold grain morphology indicates the majority (>80%) of the gold grains are dominated by pristine and modified gold grains, indicating proximity to source (<500 m). There is an increase in the percentage of reshaped gold grains in the down-ice, tail position.

In profile, a classic head and tail dispersal pattern is associated with gold mineralization from the Mill Shaft area. Additional down-ice sampling of till is required to establish the dispersal length of the anomaly, which is still open to the south. Additional sampling is also required up-ice to clearly establish the cut-off between background and anomalous gold grain counts.

Recently acquired 10 kg till samples from within the Kemptville and Tangier gold districts indicate the till in these districts also contain anomalous gold grain concentrations, typically several hundred grains per sample.