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**Provenance of clasts in conglomerate units in northeastern mainland Nova Scotia and southwestern Cape Breton Island**

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Coarse conglomerate units are common in the Guysborough – Isle Madame area of northeastern mainland Nova Scotia and southwestern Cape Breton Island. Maps of the area assign the conglomerate sequences to various units of several different ages, including the mid-Devonian Guysborough Group (Glenkeen Formation), the upper Devonian – lower Carboniferous Horton Group (Clam Harbour River Formation), and the Viséan Windsor Group. The Guysborough – Isle Madame area is located along part of the boundary between the Avalon (to the north) and Meguma (to the south) terranes, and hence the provenance of the clasts in the conglomerate units, as well as any differences in clast provenance in units of different ages, may provide information about the history of terrane juxtaposition.

Clasts were sampled from conglomerate units on Petit de Grat Island (Glenkeen Formation), in the Arichat area (Windsor Group), in the Guysborough area (both Glenkeen and Clam Harbour River formations), and at Cape Argos. Clasts from the Glenkeen Formation in both areas sampled are dominantly rhyolitic and dacitic lithic-crystal lapilli tuff, together with minor rhyolitic flow rocks. Crystals in the tuffaceous clasts are mainly quartz and plagioclase. Clasts of moderately mature quartz arenite are abundant in some sections of the conglomerate units, and rare clasts of granophyric granite were found in the conglomerate on Petit de Grat Island. Sericitic and chloritic alteration is pervasive, but the clasts have not been metamorphosed. The quartz arenite is well indurated and has the appearance of quartzite in hand specimen, but thin section examination shows that it retains a sedimentary texture. True quartzite clasts with sutured or polygonal quartz were observed in the Glenkeen conglomerate near Guysborough, where minor coarse-grained granitic clasts were also found. Like that in the Glenkeen Formation, conglomerate in the Clam Harbour River Formation has abundant felsic volcanic clasts.

Clasts from the Windsor Group north of the Arichat fault on Isle Madame are mainly deformed and recrystallized fine-grained granite/rhyolite and amphibolite-facies metamorphic rocks such as garnet-mica schist. These clasts appear to have been locally derived from the adjacent belt (within the Arichat fault zone) of metamorphic rocks of uncertain age. Quartz arenite and quartzite clasts are also present. The conglomerate at Cape Argos is of uncertain age, and differs from the other conglomerate sequences in that it contains mafic/intermediate volcanic clasts.

Older units of the Guysborough Group, underlying the Glenkeen Formation, are potential sources for the volcanic clasts in the conglomerate units, although the abundance of felsic clasts is not consistent with the reported dominance of basaltic rocks in those units. Other possible sources are the late Precambrian volcanic belts of southeastern Cape Breton Island, and Silurian volcanic units in the Antigonish Highlands.