

quartz monzonites of the Archaean Slave craton. The HL occurrences are classified as kimberlites (sensu stricto, Group 1 or archetypal). The kimberlite bodies form two contrasting groups, each with distinct textural characteristics. The smaller bodies are composed of fresh internally uniform hypabyssal kimberlite that occurs as pipes and small sheet-like intrusions. The larger bodies are infilled with inhomogeneous, partly bedded, volcanoclastic kimberlite. The volcanoclastic rocks are composed mainly of single grains of olivine and some juvenile lapilli set in a fine grained non-magmatic inter-clast matrix which resembles shale. Shale xenoliths are also present which may have been derived from sedimentary country rocks that covered the Archaean basement at the time of kimberlite emplacement but have since been eroded. Palynology of the xenoliths show that the Great Western Interior Seaway covered this part of the Slave during most of the Cretaceous and that the kimberlites were emplaced since the period 74-78 Ma, which is consistent with a single reported isotopic age. Most of the microfossils from the sediment xenoliths (97-73 Ma.) are marine. However, the youngest microfossils from each of the host kimberlites are terrestrial. This suggests that the period 74-66 Ma. was a time of regression. This is consistent with the last overall main regression of the Western Interior Seaway which occurred at ~71 Ma. After this time, terrestrial conditions probably predominated. The host volcanoclastic kimberlite, where it appears to be devoid of xenolithic material, contains microfossils. In contrast to the single sediment xenoliths, each sample of the host kimberlite yielded palynomorphs with a wide range of ages of between 30 and 60 Ma.. This shows that the inter-clast matrix of the volcanoclastic kimberlites is composed of a blend of disseminated shale from mixed stratigraphic sources from the sedimentary cover. This result strongly suggests that the final deposition of the kimberlitic material containing the blended shaly matrix was by resedimentation processes (possibly long lived) into previously excavated pipes.

Emplacement of the Hardy Lake Kimberlites, NWT, Canada

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Saskatoon 2002

Technical Programme

SS10: The Albian-Cenomanian central Saskatchewan kimberlite field and relationships to Western Canada Sedimentary Basin host strata

Organizers / Organisateurs: Bruce Kjarsgaard

Room / Salle: Th105

Date: 5/28/2002

Time: 2:20 PM

Presenter: Barbara H. Scott Smith

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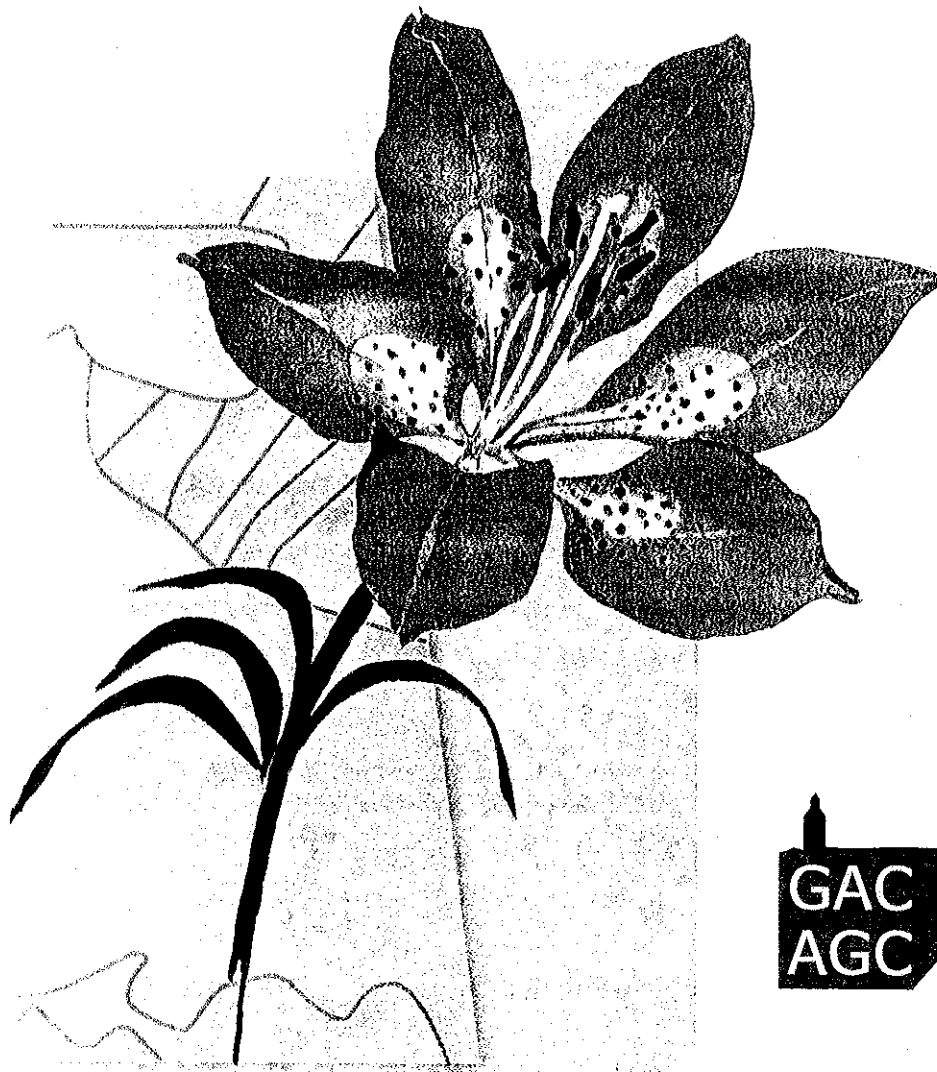
The Hardy Lake (HL) property is located ~350km NNE of Yellowknife in the Northwest Territories, Canada. The HL bodies form an eastern extension of the Lac de Gras kimberlite province(s) and are hosted by granite and quartz monzonites of the Archaean Slave craton. The HL occurrences are classified as kimberlites (*sensu stricto*, Group 1 or archetypal). The kimberlite bodies form two contrasting groups, each with distinct textural characteristics. The smaller bodies are composed of fresh internally uniform hypabyssal kimberlite that occurs as pipes and small sheet-like intrusions. The larger bodies are infilled with inhomogeneous, partly bedded, volcanoclastic kimberlite. The volcanoclastic rocks are composed mainly of single grains of olivine and some juvenile lapilli set in a fine grained non-magmatic inter-clast matrix which resembles shale. Shale xenoliths are also present which must have been derived from sedimentary country rocks that covered the Archaean basement at the time of kimberlite emplacement but have since been eroded. Palynology of the xenoliths show that the Great Western Interior Seaway covered this part of the Slave during most of the Cretaceous and that the kimberlites were emplaced since the period 74-78 Ma. which is consistent with a single reported isotopic age. Most of the microfossils from the sediment xenoliths (97-73 Ma.) are marine. However, the youngest microfossils from each of the host kimberlites are terrestrial. This suggests that the period 74-66 Ma. was a time of regression. This is consistent with the last overall main regression of the Western Interior Seaway which occurred at ~71 Ma. After this time, terrestrial conditions probably predominated. The host volcanoclastic kimberlite, where it appears to be devoid of xenolithic material, contains microfossils. In contrast to the single sediment xenoliths, each sample of the host kimberlite yielded palynomorphs with a wide range of ages of between 30 and 60 Ma.. This shows that the inter-clast matrix of the volcanoclastic kimberlites is composed of a blend of disseminated shale from mixed stratigraphic sources from the sedimentary cover. This result strongly suggests that the final deposition of the kimberlitic material containing the blended shaly matrix was by resedimentation processes (possibly long lived) into previously excavated pipes.

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