

Evaluation of the source of diamonds and other kimberlitic minerals from the Webb Kimberlite Field, Western Australia

PROKOPIY VASILYEV¹, BRENT MCINNES¹, TOM REDDICLIFFE²

¹John de Laeter Centre, Curtin Uni, Perth, Australia

Prokopiya.vasilyev@curtin.edu.au

³GeoCrystal Ltd, Perth, Australia

The Webb kimberlite field is a new diamond play located ~600 km west of Alice Springs in a remote region of WA. Exploration by GeoCrystal Ltd has identified more than 280 'bulls-eye' magnetic features over a ~400 km² area. Reconnaissance drilling of some of these features has returned mineral samples of kimberlite affinity, while surface sampling has recovered detrital microdiamonds with the number of inclusions, later analysed with FIB-SEM. The unaltered diamond indicator minerals from drill samples analysed include: (i) G9 garnet predominating over G10; (ii) olivine ranging from Fo₈₄-Fo₉₁; (iii) Cr-diopside (0.8-1.8% Cr₂O₃) and (iv) a broad range of Cr-Al spinel.

A thermobarometric assessments of mineral chemistry data [1-3] show good agreement with each other and indicate a mantle origin for number of northern targets, including ones at possible equilibrium within the diamond stability field (P=45-50 kbar; T=1150-1170°C). These results contain important information about the understudied deep lithosphere of Central Australia region.

[1] Brey G.P. and Kohler T. (1990) *J.Pet.* 31 (6) 1353–1378; [2] Liermann H. P. & Ganguly J. (2003) *CMP* 145(2), 217-227; [4] Nimis P. & Taylor W. (2000) *CMP* 139, 541