

# Bert De Waele

## Principal Consultant (Geology)



Profession	Geologist
Education	PhD (Geology), Curtin University of Technology, Perth, Australia, 2006 MSc (Geology), University of Ghent, Belgium, 1992 BSc (Geology), University of Ghent, Belgium, 1989
Registrations & Affiliations	Geological Society of Africa University of Western Australia – Adjunct Research Fellow Australian Institute of Geoscientists – Fellow

### Specialisation

Structural mapping – including Precambrian and Phanerozoic terrains, metamorphic or unmetamorphosed rocks, magmatic and sedimentary environments – focus on porphyry copper (gold), iron ore copper gold (IOCG), iron, chromite, REE-U and coal, regional geological mapping and sampling programmes (mostly in Africa), geochronology (U-Pb on Sensitive High Resolution Ion MicroProbe Mass Spectrometry –‘SHRIMP’) and research in global tectonics and palaeogeographic reconstruction

### Expertise

Bert has over 18 years of structural mapping experience, mostly in African Precambrian terranes. In addition, he has consulted on base metal and gold prospects, setting up and running exploration programmes or interpreting regional geochemical data. In recent years Bert has also conducted Independent Technical Assessments on various mineral assets including gold, porphyry copper, iron ore, manganese, diamond, mineral sands and uranium. He also developed both expert and data-driven exploration targeting systems for gold exploration projects. Bert’s regional mapping experience includes mapping parts of quarter degree sheets 1625SE (Sichifulo River area, unpublished), 1231SW (Mupamadzi River area, published) and reconnaissance mapping throughout Zambia, mapping in the Reguibat Shield of Mauritania (2003), the Irumide and Zambezi belts of Zambia (2004), Central and Northern Madagascar (2006-2008), Papua New Guinea (2008), Karratha, Western Australia (2008), Sierra Leone (2009, 2010), Guinea (2010) and West Timor (2010). His PhD encompassed the entire Irumide Belt of Zambia and its tectonic foreland, the Bangweulu Block, and included extensive mapping between 1999 and 2003. His research interests focus on regional geology and tectonics, by integrating field and laboratory work (U-Pb microprobe geochronology, isotope ( $^{147}\text{Sm}$ - $^{144}\text{Nd}$  and  $^{87}\text{Rb}$ - $^{86}\text{Sr}$ ) and whole-rock geochemistry, electron microprobe mineral analyses and Geographic Information Systems. Bert has a strong commitment to transfer of knowledge, having taught structural geology, computing in geoscience (GIS - Remote Sensing and DPA (Geosoft)) and supervised field classes, mapping projects and theses (BSc and Honours equivalent) both in French-speaking and English-speaking environments. Much of his work has included on-the-job training of sampling teams and mapping geologists.

## Employment Record

2008 - Current	SRK Consulting (Australasia) Pty Ltd Principal Consultant (Geology), Perth
2006 - 2008	The British Geological Survey Senior Geologist, UK – projects in Madagascar, Papua New Guinea and Niger
2004 - 2006	The University of Western Australia Research Scientist, Perth – projects in Central Africa, Albany-Fraser Belt
2000 - 2004	Curtin University of Technology PhD researcher, Perth
2000	The University of Ghent Research Fellow (Digital Mapping and GIS), Belgium
1998 - 2000	The University of Zambia / University of Ghent Project Manager (Mapping / Remote Sensing / GIS Unit), Zambia
1995 - 1998	The University of Zambia / University of Ghent Lecturer / researcher (Structural Geology, Geological Mapping and GIS), Zambia
1995	Caledonia Mining Ltd Chief Exploration Geologist, Zambia
1992 - 1995	Geological Survey of Zambia, Belgian Technical Assistance Mapping Geologist, Zambia

Languages Dutch, English, French

- Awards
- PhD thesis: Best Thesis awarded by Earth Sciences Faculty, Curtin University
  - PhD thesis: Lucien Cahen Prize of the Royal Academy of Sciences, Belgium

## Publications (Papers)

- Pisarevsky, S.A., De Waele, B., Söderlund, U. and Ernst, E., 2010. 2401+/-3 Ma age of dyke subswarm in the southeastern Yilgarn craton: new member of the Widgiemooltha swarm. *Confidential Report*.
- Bogdanova, S.V., De Waele, B., Belousova, E.A., Bibikova, E.V., Postnikov, A.V., Fedotova, A.A. and Popova, L.P., 2010. Volgo-Uralia: the first U-Pb, Lu-Hf and Sm-Nd isotopic evidence of preserved Paleoproterozoic crust. *American Journal of Science*, in press.
- Wingate, M.T.D., Pisarevsky, S.A. and De Waele, B., 2010. Paleomagnetism of the 765 Ma Luakela volcanics in northwest Zambia and implications for Neoproterozoic positions of the Congo Craton. *American Journal of Science*, in press.
- Singh, Y.K., De Waele, B., Karmakar, S., Sarkar, S. and Biswal, T.K., 2010. Tectonic setting of the Balaram-Kui-Surpagla-Kengora granulites of the South Delhi Terrane of the Aravalli Mobile Belt, NW India and its implication on correlation with the East African Orogen in the Gondwana assembly. *Precambrian Research*, in press.
- Key, R.M., Pitfield, P.E.J., Thomas, R.J., Tucker, R.T., De Waele, B., Horstwood, M.S.A. and Styles, M.T., accepted. Polyphase Neoproterozoic orogenesis within the East Africa-Antarctica Orogenic Belt in Madagascar. *Journal of African Earth Science*, in press.
- Schofield, D.I., Thomas, R.J., Goodenough, K.M., De Waele, B., Pitfield, P.E.J., Key, R.M., Bauer, W., Walsh, G., Lidke, D., Ralison, A.V., Rabarimanana, M., Rafahatelo, J.-M. and Randriamananjara, T., 2010. Geological evolution of the Antongil Craton, NE Madagascar. *Precambrian Research*, in press.
- Fezaa, N.; Liégeois, J-P; Abdallah, N, Cherfouh, E H, De Waele, B; Bruguier, O and Ouabadi, A, 2010. Late Ediacaran geological evolution (575–555 Ma) of the Djanet Terrane, Eastern Hoggar, Algeria, evidence for a Murzukian intracontinental episode, *Precambrian Research* 180: 299-327.
- Ratre, K; De Waele, B; Biswal, T K and Sinha, S, 2010. SHRIMP geochronology for the 1450 Ma Lakhna dyke swarm: its implication for the presence of Eoarchean crust in the Bastar Craton and 1450-517 Ma depositional age for Purana basin (Khariar), Eastern Indian Peninsula, *Journal of Asian Earth Sciences*, in press.
- Tack, L; Wingate, M T D; De Waele, B, Meert, J; Belousova, E, Griffin, B, Tahon, A and Fernandez-Alonso, M, in press. The 1375 Ma "Kibaran Event" in Central Africa: prominent emplacement of bimodal magmatism under extensional regime, *Precambrian Research*.180: 63-84.
- Goodenough, K M, Thomas, R J, De Waele, B, Key, R M, Schofield, D I, Bauer, W, Tucker, R M, Rafahatelo, J-M, Rabarimanana, M, Ralison, A V and Randriamananjara, T, 2010. Post-collisional magmatism in the central East African Orogen: the Maevarano Suite of north Madagascar, *Lithos* 116, 18-34.
- Li, Z X, Bogdanova, S, Collins, A S, Davidson, A, De Waele, B, Ernst, R E, Evans, D A D, Fitzsimons, I C W, Fuck, R A, Gladkochub, D P, Jacobs, J, Karlstrom, K E, Lu, S, Natapov, L M, Pease, V L, Pisarevsky, S A, Thrane, K and Vernikovskiy, V, 2009. How not to assemble a Precambrian supercontinent - Reply to comment by J.D.A. Piper on "Assembly, configuration, and break-up history of Rodinia: A synthesis". *Precambrian Research*, 174, 208-214.
- Thomas, R J, De Waele, B, Schofield, D I, Goodenough, K M, Horstwood, M, Tucker, R D, Bauer, W, Annels, R A, Howard, K, Walsh, G, Rabarimanana, M, Rafahatelo, J M, Ralison, A V and Randriamananjara, T, 2009. Geological Evolution of the Neoproterozoic Bemarivo Belt, northern Madagascar, *Precambrian Research*, 172: 279-300.
- Danderfer, A, De Waele, B, Pedreira, A J and Nalini, H A Jnr, 2009. New geochronological constraints on the geological evolution of Espinhaço Basin within the São Francisco Craton. *Precambrian Research*, 170: 116-128.
- De Waele, B, Fitzsimons, I C W, Wingate, M T D, Tembo, F, Mapani, B S E, 2009. The geochronological framework of the Irumide Belt of Zambia: A prolonged crustal history along the margin of the Bangweulu Craton, *American Journal of Science*, 309: 132-187 (TSRC#365).
- Gladkochub D P , Mazukabzov A M, Donskaya, T V, De Waele, B, Stanevich A M, Pisarevsky, S A, 2008. Structural position, age and composition of the volcanics considered to be a lower part of the Riphean passive continental margin of the Siberian craton, *Russian Geology and Geophysics*, 49: 749-758.

- Donskaya T V, Bibikova, E V, Gladkochub, D P, Mazukabzov, A M, Bayanova, T B, De Waele, B, Didenko, A N, Bukharov, A A, Kirnozova, T I, 2008. Petrogenesis and age of felsic volcanics of the North-Baikal volcanic-plutonic belt, *Petrology*, 16: 422-447.
- De Waele, B and Pisarevsky, S A, 2008. Geochronology, palaeomagnetism and magnetic fabric of metamorphic rocks in the NE Fraser Belt, Western Australia, *Australian Journal of Earth Sciences*, 55 (5): 605-621.
- Pedreira, A J and De Waele, B, 2008. Contemporaneous evolution of the Palaeo / Mesoproterozoic sedimentary basins of the São Francisco - Congo Craton, in *Gondwana XII: Western Gondwana – The Ties that Bind*, Special Publication, 294: 33-48 (TSRC#380) (Geological Society of London).
- De Waele, B; Johnson, S P; Pisarevsky, S A, 2008. Palaeoproterozoic to Neoproterozoic growth and evolution of the eastern Congo Craton: its role in the Rodinia puzzle, *Precambrian Research*, 160: 127-141 (TSRC#363).
- Li, Z X; Bogdanova, S V; Collins, A S; Davidson, A; De Waele, B; Ernst, R E; Fitzsimons, I C W; Fuck, R A; Gladkochub, D P; Jacobs, J; Karlstrom, K E; Lu, S; Natapov, L M; Pease, V, Pisarevsky, S A, Thrane, K, Vernikovsky, V, 2008. Assembly, configuration and break-up history of Rodinia: A synthesis, *Precambrian Research*, 160: 179-210 (TSRC#387).
- Johnson, S P, De Waele, B, Tembo, F, Katongo, C, Tani, K, Chang, Q, Iizuka, T and Dunkley, D, 2007. Geochemistry, geochronology and isotopic evolution of the Chewore-Rufunsa terrane, Southern Irumide Belt: A Mesoproterozoic, continental-margin-arc, *Journal of Petrology*, 48: 1411-1441 (TSRC#405).
- Abdallah, N, Liégeois, J P, De Waele, B, Fezaa, N and Ouabadi, A, 2007. The Temaguessine Fe-cordierite orbicular granite (Central Hoggar, Algeria): U-Pb SHRIMP age, origin and geodynamical consequences for the late Pan-African magmatism of the Tuareg shield, *Journal of African Earth Sciences*, 49: 153-178 (TSRC#419).
- De Waele, B and Fitzsimons, I C W, 2007. The nature and timing of Palaeoproterozoic sedimentation at the southeastern margin of the Congo Craton, *Precambrian Research*, 159: 95-116 (TSRC#422).
- Biswal, T K, De Waele, B and Ahuja, H, 2007. Timing and dynamics of the juxtaposition of the Eastern Ghats Mobile Belt against the Bhandara Craton, India: A structural and zircon U-Pb SHRIMP study of the fold-thrust belt and associated nepheline syenite, *Tectonics*, 26, TC4006, doi:10.1029/2006TC002005 (TSRC#402).
- Johnson, S P, De Waele, B, Tembo, F, Evans, D, Iizuka, T and Tani, K, 2007. Geochronology of the Zambezi Supracrustal sequence, southern Zambia: A record of Neoproterozoic divergent processes along the southern margin of the Congo Craton, *Journal of Geology*, 115: 355-374 (TSRC#360).
- Johnson, S P, De Waele, B and Liyungu, A K, 2006. U-Pb SHRIMP geochronology of granitoid rocks in eastern Zambia: Terrane subdivision of the Mesoproterozoic Southern Irumide Belt, *Tectonics*, 25, TC6004, doi:10.1029/2006TC001977 (TSRC#373).
- Pisarevsky, S A, Gladkochub, D P, Donskaya, T A and De Waele, B, 2006. Palaeomagnetism and geochronology of mafic dykes in the south-west Baikal Lake, south Siberia, Russia: The first precisely dated Early Permian palaeomagnetic pole from the Siberian Craton, *Geophysical Journal International*, doi: 10.1111/j.1365-246X.2006.03160.x (TSRC# 383).
- Cutten, H, Johnson, S P and De Waele, B, 2006. Protolith ages and timing of metasomatism related to the formation of whiteschist at Mautia Hill, Tanzania: Implications for the timing of assembly of Gondwana, *Journal of Geology*, 114 (6): 683-698 (TSRC#346).
- De Waele, B; Liégeois, J-P, Nemchin, A A and Tembo, F, 2006. Isotopic and geochemical evidence of Proterozoic episodic crustal reworking within the Irumide Belt of south-central Africa: The southern metacratonic boundary of an Archaean Bangweulu Craton, *Precambrian Research*, 148: 225-256 (TSRC#362).
- De Waele, B, Kampunzu, A B, Mapani, B, Tembo, F, 2006. The Irumide belt of Zambia, *Journal of African Earth Sciences*, 46: 36-70 (TSRC#257).
- Johnson, S P, Rivers, T and De Waele, B, 2005. A Review of the Mesoproterozoic to early Palaeozoic magmatic and tectonothermal history of south-central Africa: Implications for Rodinia and Gondwana, *Journal of the Geological Society of London*, 162: 433-450 (TSRC#305).

- Katongo, C, Köller, F, Klötzli, U, Koeberl, C, Tembo, F and De Waele, B, 2004. Petrography, geochemistry and geochronology of key granitoid rocks in the Neoproterozoic-Paleozoic Lufilian - Zambezi belt, Zambia: Implications for the tectonic setting and regional correlation, *Journal of African Earth Sciences*, 40: 219-244 (TSRC#299).
- Key, R M, De Waele, B, Liyungi, A K, 2004. A multi-element baseline geochemical database from the western extension of the central Africa Copperbelt in north-western Zambia, *Applied Earth Sciences* (Transactions of the Institute of Mining and Metallurgy, B) 113: B205-226 (TSRC#302).
- Sikazwe, O N and De Waele, B, 2004. Assessment of the quality and reserves of bat guano at Chipongwe and Kapongo caves near Lusaka as fertiliser material, *UNZA Journal of Science and Technology*, Special Edition, June 2004, pp 32-42.
- Cox, R, Coleman, D S, Chokel, C B, DeOreo, S B, Wooden, J L, Collins, A S, De Waele, B and Kröner, A, 2004. Proterozoic tectonostratigraphy and paleogeography of central Madagascar derived from detrital zircon U-Pb age populations, *Journal of Geology*, 114: 379-399 (TSRC#243).
- De Waele, B, Wingate, M T D, Mapani, B, Fitzsimons, I C W, 2003. Untying the Kibaran knot: A reassessment of Mesoproterozoic correlations in southern Africa based on SHRIMP U-Pb data from the Irumide belt, *Geology*, 31: 509-512 (TSRC#218).
- Johnson, S P, Cutten, H N C, Muhongo, S and De Waele, B, 2003. Neoproterozoic magmatism and metamorphism of the western granulites in the central domain of the Mozambique belt, Tanzania: U-Pb SHRIMP geochronology and PT estimates. *Tectonophysics*, 375: 125-145 (TSRC#214).
- De Waele, B and Mapani, B, 2002. Geology and correlation of the central Irumide belt, *Journal of African Earth Sciences*, 35: 385-397 (TSRC#222).
- De Waele, B and Simasiku, S, 2002. An overview of the refractory mineral potential of Zambia, *International Geology Reviews*, 44 (3): 254-263 (TSRC#221).
- Tembo, F, De Waele, B and Nkemba, S, 2002. Syn- to post-orogenic granitoid magmatism in the Irumide belt of Zambia: Geochemical evidence, *Africa Geoscience Review*, 9: 1-17 (TSRC#220).
- De Waele, B, Tembo, F and Key, R M, 2000. Towards a better understanding of the Mesoproterozoic Irumide belt of Zambia: Report on a geotraverse across the belt, *Episodes*, 23: 126-130.
- De Waele, B, 1997. Geology and stratigraphy of the Mupamadzi river area and correlation with the adjoining areas within the Irumide belt, *Zambian Journal of Applied Earth Sciences*, 11: 34-48.

## Published maps and explanatory notes

- 1 :100,000 scale geological map, Jimi Sheet (Central Highlands), mapped under a European Development Fund Project.
- Participating author on the final report for the World Bank Mapping Project of the BGS-USGS team in central and northern Madagascar. 984 pages + appendices.
- Eight (first author) and seven more 1:100,000 scale geological maps in central and northern Madagascar mapped as part of a World Bank project.
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- Feybesse, J-L, Sidibé, Y T, Konaté, C M, Lacomme, A, Zammit, C, Guerrot, C, Liégeois, P and De Waele, B, 2006. BRGM, CPG, DNGM. Notice explicative de la Carte géologique de la République du Mali à 1/200 000, Feuille n° ND-29-XVIII, Tingréla. - Bamako (Mali) : Ministère des Mines, de l'Énergie et de l'Eau.
- Van de Velde, P and De Waele, B, 1998. The geology of the Mupamadzi river area; explanation of degree sheet 1231, SW quarter, Report and geological maps, Geological Survey Department of Zambia, Lusaka, rep. 105.

## Published abstracts and extended abstracts

- Bogdanova, S.V., De Waele, B., Bibikova, E.A., Belousova, E.A., Postnikov, A.V. and Popova, L.P., 2010. Aleoarchaeoan to Neoarchaeoan Granitoids and Migmatites Making Up the Crustal Structure of Volgo-Uralia, 5th International Archean Symposium, Perth, Western Australia.
- Taylor, C D, Tucker, R D and De Waele, B, 2010. The Metallogeny and Mineral Deposits of Madagascar, in *Proceedings 13th Quadrennial IAGOD Symposium 2010 'Giant Ore Deposits Down-Under'*, Adelaide, Australia, pp. 260-261.
- Chan, G and De Waele, B, 2010. U-Pb geochronological study of the specularite-hematite bearing Marampa Group and Kenema Assemblage, Sierra Leone, in *Proceedings 13<sup>th</sup> Quadrennial IAGOD Symposium 2010 'Giant Ore Deposits Down-Under'*, Adelaide, Australia, pp. 255-256.
- Goodenough, K M, Thomas, R J, De Waele, B, Key, R M and Jacobs, J, 2009. Cambrian post-tectonic granitoid magmatism in northern Madagascar, paper presented to 6th International Colloquium Magmatism, Metamorphism and Associated Mineralizations, Beni Mellal, Morocco, 23-24 April.
- De Waele, B, Horstwood, M S A, Pitfield, P E J, Thomas, R J, Key, R M, Rabarimana, M, Rafahatelo, J-M, Ralison, V and Randriamananjara, T., 2009. The architecture of the 'Betsimisaraka Suture Zone'; a record of oceanic arcs and associated metasedimentary successions between the 'Indian' and 'African' parts of Madagascar, paper presented to International Conference on Island Arc-Continent Collisions, The Macquarie Arc Conference, Orange, New South Wales, 13-21 April.
- De Waele, B, Williams, P and Chan, G, 2009. An investigation of tectonic control on the distribution of porphyry copper (gold) and epithermal gold in southeast Asia, paper presented to 10th Biennial Meeting of the Society for Geology Applied to Mineral Deposits, Townsville, Australia, 17-20 August.
- De Waele, B, Thomas, R J, Horstwood, M S A, Pitfield, P E J, Tucker, R D, Potter, C J, Key, R M, Smith, R A, Bauer, W, Randriamananjara, T, Ralison, A V, Rafahatelo, J M and Rabarimanana, M, 2008. U-Pb detrital zircon geochronological provenance patterns of supracrustal successions in central and northern Madagascar, paper presented to 22nd Colloquium of African Geology, Hammamet, Tunisia, 4-6 November.
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- Cherfouh, E H, Liégeois, J-P, De Waele, B and Ouabadi, A, 2008. Géochronologie et géochimie des granitoïdes du terrane d'Edembo (Hoggar oriental, Algérie), paper presented to 22nd Colloquium of African Geology, Hammamet, Tunisia, 4-6 November.
- Thomas, R J, De Waele, B, Schofield, D I S, Goodenough, K G, Key, R M, Annels, R, Tucker, R D, Bauer, W, Burtin, W B, Walsh, G J, Howard, K, Lidke, D, Rabarimanana, M, Rafahatelo, J M, Ralison, A V and Randriamananjara, T, 2008. Crustal architecture of northern Madagascar: Results from recent geological mapping. Gondwana XIII, Dali, China.
- De Waele, B, Thomas, R J, Schofield, D I S, Bauer, W, Walsh, G J, Lidke, D, Goodenough, K G, Key, R M, Rabarimanana, M, Rafahatelo, J M, Ralison, A V and Randriamananjara, T, 2008. An overview of the Archaean Antongil Block, northern Madagascar, paper presented to 33rd International Geological Congress, Oslo, Norway, 6-14 August.
- Schofield, D I S, Thomas, R J, De Waele, B, Tucker, R D, Walsh, G J, Goodenough, K G, Key, R M, Rabarimanana, M, Rafahatelo, J M, Ralison, A V and Randriamananjara, T, 2008. New constraints on the assembly of the East African Orogen from northern Madagascar, paper presented to 33rd International Geological Congress, Oslo, Norway, 6-14 August.
- Goodenough, K G, Rucker, R D, Thomas, R J, Bauer, W, Conrad, J, De Waele, B, Key, R M., Rafahatelo, J M and Randriamananjara, T, 2008. New light on volcanic sources in central and northern Madagascar. 33rd International Geological Congress, Oslo, Norway, 6-14 August.

- Tack, L, Wingate, M T D, De Waele, B, Meert, J, Belousova, E A, Griffin, B, Tahon, A, Fernandez-Alonso, M, Baudet, D, Cutten, H N C and De Waele, S, 2008. The Proterozoic Kibaran Belt in Central Africa: intracratonic 1375 Ma emplacement of a LIP, paper presented at 33rd International Geological Congress, Oslo, Norway, 6-14 August.
- Li, Z X, Bogdanova, S, Collins, A S, Davidson, A, De Waele, B, Ernst, R E, Fitzsimons, I C W, Fuck, R A, Gladkochub, D P, Jacobs, J, Karlstrom, K E, Lu, S, Natapov, L M, Pease, V L, Pisarevsky, S A, Thrane, K and Vernikovsky, V, 2008. The geodynamic map and evolution history of the Neoproterozoic supercontinent Rodinia, paper presented to 33rd International Geological Congress: Oslo, Norway, 6-14 August.
- De Waele, B, Key, R M, Pitfield, P E J, Thomas, R J, Tucker, R D, Rafahatelo, J-M, Rabarimanana, M H, Randriamananjara, T and Ralison, A V, 2007. The chronology of Central and North Madagascar, in *International Symposium on Precambrian Chronology and Tectonic Evolution* (abstracts).
- De Waele, B and Pisarevsky, S A, 2007. Geochronology, palaeomagnetism and magnetic fabric of metamorphic rocks in the NE Fraser Belt, Western Australia, in *International Symposium on Precambrian Chronology and Tectonic Evolution* (abstracts).
- Abdallah, N, Ouabadi, A, Liégeois, J-P, Fezaa, N, De Waele, B, 2006. Les granitoïdes panafricains liés à la shear-zone de l'Ounane (Egéré-Aleksod terrane): géochimie et géochronologie. Abstract IGCP 485: The boundaries of the West African Craton, Alger-Tamanrasset, 2006.
- Fezaa, N, Ouabadi, A, Liégeois, J-P, Abdallah, N, De Waele, B and Bruguier, O, 2006. Le Terrane de Djanet: Géochronologie et géochimie de ses granites et sediments; lien avec le metacraton Saharien. Abstract IGCP 485: The boundaries of the West African Craton, Alger-Tamanrasset, 2006.
- Pedreira, A J and De Waele, B, 2006. Evolução paralela das bacias sedimentares paleo/mesoproterozóicas da Península São Francisco e Cráton do Congo, in *Congresso Brasileiro de Geologia* (abstracts Volume do XLIII) ST02:AO-380.
- Bogdanova, S V, De Waele, B, Bibikova, E V, Postnikov, A V, and Popova, L P, 2006. New data on the age of the crystalline basement of the Volga-Ural oil and gas province, in *Hydrocarbon potential of the basement of young and old platforms* (eds: R K Muslimov and I A Larochkina) pp. 40-42 (Kazan State University: Tatarstan, Russia).
- De Waele, B; Liégeois, J-P, Johnson, S P, Nemchin, A A. and Tembo, F, 2006. Recurrent reworking in the Irumide Belt of Zambia, paper presented to 21st Colloquium on African Geology, Maputo, Mozambique, 3-5 July.
- Johnson, S P, De Waele, B and Tembo, F, 2006. The Southern Irumide Belt of Zambia, paper presented to 21st Colloquium on African Geology, Maputo, Mozambique, 3-5 July
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- Tack, L, Fernandez-Alonso, M, De Waele, B, Tahon, A, Dewaele, S, Baudet, D and Cutten, H, 2006. The Northeastern Kibaran Belt (NKB): A long-lived Proterozoic intraplate history, paper presented to 21st Colloquium on African Geology, Maputo, Mozambique, 3-5 July.
- Fernandez-Alonso, M, Tack, L, De Waele, B, Cutten, H, Baudet, D and Tahon, A, 2006. The NE Kibaran Belt (NKB): New uniform stratigraphies and GIS-compiled geological map, paper presented to 21st Colloquium on African Geology, Maputo, Mozambique, 3-5 July.
- Bulambo, J-P, De Waele, B, Kampunzu, A B and Tembo, F, 2006. SHRIMP U-Pb geochronology of the Choma - Kalomo block (Zambia) and geological implications, paper presented to 21st Colloquium on African Geology, Maputo, Mozambique, 3-5 July.
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## Key experience

### Geological and Structural Mapping

Bert's main experience is in regional mapping, coupled with organisation and running of regional geochemical sampling programmes and the accompanying delineation of potential targets for detailed follow up work. Bert is an accomplished trainer, both in formal to practical courses or in on-the-job training. His training programmes have included GIS, Data Analysis and Processing (geochemical and geophysical data sets), practical mapping and sampling methodologies.

Bert has also proved his mark as an accomplished research scientist, with broad interests ranging from regional/global tectonics to detailed geochronological field studies.

Recent mapping experience includes:

- Sunny Power Holdings limited, 2010: Mapping and Exploration targeting in West Timor (manganese)
- Marampa Iron Ore Limited, 2010: Structural mapping of the Kukuna area, Sierra Leone (iron ore)
- SARI, 2010: Independent Technical Assessment and geological mapping, Forécariah, Guinea (gold, iron, diamond and mineral sands)
- St Barbara Mines Ltd, 2010: Detailed structural analysis of drill core at the Tower Hill deposit
- Ferromet Ltd, 2009: Detailed mapping for iron ore exploration over tenement in southern Lao People's Democratic Republic
- Marampa Iron Ore Ltd, Lunsar, Sierra Leone, 2009: Detailed mapping of the tenement
- Cape Lambert Iron Ore, 2008: Detailed mapping of the Cape Lambert South tenement, Karratha, Western Australia
- The British Geological Survey, 2008: Mapping work in the Jimi Sheet, Western Highlands of Papua New Guinea
- The British Geological Survey, 2006-2008: Mapping work on the central and northern zones of Madagascar; (World Bank contract number 175/05 – MEM/SG/DG/UCP/PGRM) – 16 x 100K map sheets
- Curtin University, Perth, 2000-2004: PhD research included extensive mapping work in the Irumide Belt and Bangweulu Block of Zambia, and assistance with mapping classes in the Yilgarn Craton, Albany-Fraser Belt and the Carnarvon Basin in Western Australia
- University of Zambia, 1995-2000: Management of student mapping projects and geological mapping classes, and industrial placement of students in the mining / exploration industry
- Caledonia Mining Ltd, 1995: Exploration management in the Nama prospect area – mapping, sampling, trenching / pitting and drilling
- Geological Survey Department of Zambia, 1992-1995: Geologist in charge of regional mapping of Mupamadzi River area (QDS 1231 SW) and assistance with mapping 1124SW (West-Lunga area) and 1625SE (Sichifulo River area)
- Digital processing and GIS work on geological maps of Eastern Zambia, Geological Survey Department - British Geological Survey – ERIPTA Project: Digitising and GIS database creation of 19 x 100K map sheets covering Eastern Zambia
- Data processing and GIS work on geophysical data over the Kagem emerald mine, Ndola, Zambia. (Zambian Privatisation Agency ZPA): Geophysical interpretation and GIS integration of ground magnetic, radiometric, resistivity and seismic data for Kagem Emerald Mine
- Digital processing and digital data processing, Geological Survey Department - British Geological Survey – ERIPTA Project: Analysis of geochemical data on Mwinilunga and Kalene Hill sheets, northwestern Zambia
- Desktop cartography and database design on Copperbelt Environmental Impact Assessment project, Carl Duisburgh Gesellschaft: Desktop cartography and conversion of GIS data for production of Environmental Impact Assessment maps of the Zambian Copperbelt
- Desktop cartography of Kanyama and Chazanga compounds in Lusaka, Scott & Wilson Consultants:

Cartographic work based on aerial photography at scale 1:5000, including scanning of aerial photographs, collection of Ground Control Points (GCPs) with relational Global Position System, geocorrection of imagery, mosaicing and heads-up digitising – maps produced using Arcview 3.0a

### Exploration Targeting

- Principal Consultant, geophysical data interpretation and targeting for gold in western Mali
- Principal Consultant, Weights of Evidence targeting work, manganese, Pilbara, West Australia
- Principal Consultant on several regional targeting study for base metals in the Central African Copperbelt, using a range of geophysical and geological datasets including VTEM and airborne magnetic/radiometric data (two projects)
- Principal Consultant in a regional targeting exercise for gold prospectivity in the greenstone belt of the Murchison Province, Western Australia
- Consultant, Sfariates-Ouassat gold exploration programme, Mauritania: Processing and interpretation of geochemical data, and training of personnel at the Office Mauritanien de Recherches Géologiques

### Project Review

- Principal Consultant, site visit to a base metal tenement in the Mount Isa Inlier, Queensland
- Principal Consultant involved in compilation of prospectus on an iron ore project in south west India for inclusion in ASX listing document
- Principal Consultant responsible for review of three deposits in Morocco including a vein-hosted gold prospect, a sedimentary iron prospect and a carbonatite complex
- Italterrazzo, 1998: Extensive review and literature search to produce an Access© database of all occurrences, a GIS model with all refractory mineral occurrences and detailed descriptions of all localities of refractory mineral occurrences in Zambia

### Training

- On site tutoring of company geologists in structural mapping
- Training in GIS

### Geotechnical Engineering

- Zambian Electricity Supply Corporation (ZESCO): Geological survey of the spillway at Kafue Gorge Dam; geotechnical study of the Kafue Gorge dam to assess controlling factors in the deformation of the dam's spillway gates – including 10 days fieldwork and three weeks of data analysis, and report recommending measures to remedy and / or control the situation