The development of the later stages of the Murray Basin and The development of the smectite (bentonite) clays

Anthony J Mason

Geological Consultant to Arumpo Bentonite, 3350 Kulkyne Way, Colignan, VIC 3494.
camelia@hotkey.net.au or tony.mason@bhpbilliton.com

This talk will be in two sections – the first part will discuss the development of the Murray Basin from the start of the final marine incursion (Loxton/Parilla Sand) until the present and will discuss the tectonic events that occurred and how they modified the landscape. The second part of the talk will discuss the development of the bentonitic clays that are associated with the later stages of the Murray Basin sedimentation.

The Loxton/Parilla Sand was deposited on the pre-existing Geera Clay. The Loxton/Parilla Sand deposition commenced with deep water, very fine grained, clayey, micaceous, silty sands that are followed by fine to coarse grained beach sands and coastal dune barriers. Following the deposition of the Loxton/Parilla Sands there was the development of the Karoonda Land Surface and then the deposition of the fluvial or lucastrine sediments of the Shepparton Formation and the Blanchetown Clay.

Faulting has had a major effect on the sedimentary deposition within the Murray Basin and also on the development of the current day river system.

The second part of the talk will investigate the possible origins of the smectite clay that forms the most significant Bentonite deposit in Australia (Arumpo). There have been numerous suggested depositional models in the past, but recent geophysical surveys have highlighted the presence of a series of volcanic vents that are thought to be the source of the smectite clay.

Arumpo Bentonite has been shown to have been formed by the alteration of an intermediate volcanic ash that has been deposited in an isolated trap site that had no other sediment input (Gardam et al., 2008). There are two separate trap sites that occur at Arumpo which have given rise to clays with different physical properties.

References

Gardam M, Mason AJ, Reid AF, Churchman GJ and Raven M (2008) Arumpo bentonite deposits: distinctive indicators of past volcanic events in the Murray Basin, southeastern Australia. *Aust J. Earth Science*, **55**, 183 – 194.

Notes