



ENVIRONMENT

MT ARTHUR

Soil Bentonite Alluvial Cut-off Wall

AUSTRALIA



Owner

Daracon Pty Ltd

Engineer

GeoSolutions Pty Ltd

General contractor

Menard Oceania

Period of works

July 2013-October 2013

Main figures

Cut-off walls

excavation of an 800mm wide trench
1.34km bund wall



Project description

The Mt Arthur alluvial cut-off wall project comprised the construction of a dam wall style bund along the western boundary of the mine to protect the future coal mining exploration from potential flooding of the Hunter River from reaching the open cut areas. The project had two key goals; to protect the mine from a 1000yr flood event water level and to cut-off any potential subsurface flow along the rock/soil interface.

Ground conditions

The site ground conditions generally comprised of very stiff clays overlying alluvial gravel deposits above the shale bedrock. The depth of the rock varied between 4m to 13m from existing ground level with an average depth of 9m.

Menard, along with GeoSolutions, were awarded the project in mid-2013 as specialist contractor to construct a soil bentonite cut-off wall. This wall was completed prior to the construction of the bund, to reduce subsurface flow through the alluvial gravel deposits in the event of a flood event.

Solution

The scope of the works involved the excavation of an 800mm wide trench from existing ground level to the underlying rock along the alignment of the 1.34km bund wall. The excavation was performed using an 80 ton excavator mounted with a custom designed bucket and long reach to enable such depths to be achieved. The excavated material was simultaneously mixed using a second excavator and dozer along with hydrated bentonite and backfilled into the trench to create the cut off wall.

Despite strict environmental restrictions along with recycling poor quality mine water, an efficient mix design was proposed and implemented that successfully met the global permeability requirement of less than 1×10^{-9} m/s.

The project was completed in October 2013 with the method proving to be very successful for this application.

