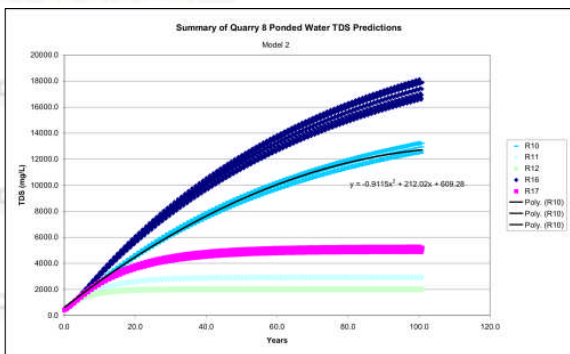
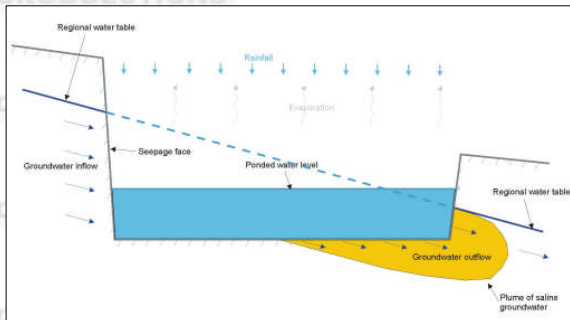
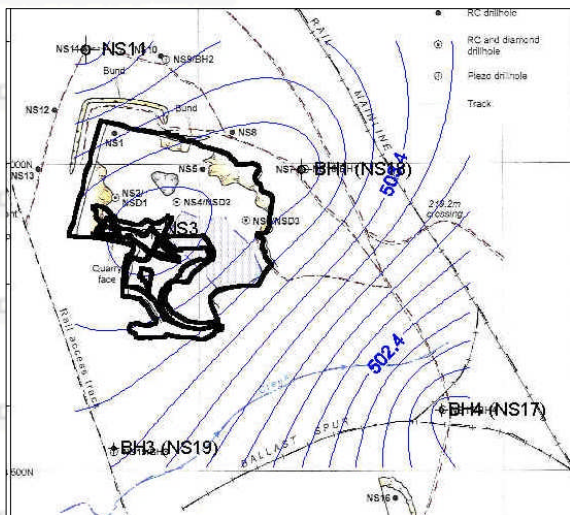




## PROJECTS

## HYDROGEOLOGY



HydroSolutions Hydro28

### BHP BILLITON IRON ORE PTY LTD Hydrogeological investigation; impact on groundwater & open pit water quality of a ballast quarry, Pilbara, Western Australia

An existing quarry established within the outcropping Maddina Basalt of the Chichester Range scarp is proposed to be extended to provide rail ballast by mining below the water table through dewatering.

A hydrogeological investigation was undertaken to establish groundwater monitoring bores and to perform a pumping test to establish representative hydraulic properties for the aquifer. In addition, a groundwater and surface water sampling exercise was performed.

Open pit water is a mixture of regional groundwater and fresh recharge waters, with groundwater discharging to adjacent ephemeral creeks in winter.

Analytical modelling was undertaken to assess dewatering requirements to work the pit in the dry.

A conceptual hydrogeological model was established, and formed the basis for an analytical water balance model, to assess the impact of the enlarged open pit on groundwater quality under a range of possible development scenarios. The most likely outcomes were:  
-Open water levels to recede by c1m  
-Water quality to become brackish after c 7years  
-Approaching saline quality in c100years.

Doubling of the open pit area resulted in reduced water levels but no net change in final water quality.

HydroSolutions Pty Ltd  
U14, 14 Whyalla Street  
Willetton  
Western Australia 6155  
Tel: (+61 8) 9457 5448  
Fax: (+61 8) 9457 4293  
Mob: 0403 021533

E-mail: [stuart.jeffries@hydrosolutions.com.au](mailto:stuart.jeffries@hydrosolutions.com.au)  
Website: [www.hydrosolutions.com.au](http://www.hydrosolutions.com.au)