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Pre-Feasibility Investigation for Mining Water Supply from Balgasyn Ulaan Nuur Basin, South Gobi, Mongolia

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A Pre-Feasibility (PF) investigation for a mining water supply from the Balgasyn Ulaan Nuur (BUN) Basin, Mongolia was conducted. The PF investigation draws on previous studies by Mukhbaatar.N and A.G.Melekhov (1987), Battumur (2008), AquaTerra (2008) and EcoTrade (2009). In addition to the review of regional hydrogeology, geophysical borehole logging, water level monitoring, 72hr aquifer pumping tests and spring flow surveys have been incorporated into the PF investigation.

The BUN Basin is an internal drainage Basin, with an ephemeral lake / wetland ('the lake') located at its centre. The lake marks the point of groundwater discharge. Groundwater is in the shallow Quaternary Aquifer and the deep Cretaceous Aquifer. There are extensive areas of effluorescing salts, numerous springs and community wells surrounding the lake, particularly along the western edge. The wetlands, most springs, community wells and vegetation around the lake are dependent on the shallow Quaternary Aquifer and are of major importance to the local community.

The PF level hydrogeological conclusions are derived from three-dimensional groundwater flow model (the model). The model was initially constructed based on literature review, relatively representative and reliable assumptions, and limited field observation. The model was calibrated when the results of three 72hr aquifer pumping tests became available.

This paper will present the complicated hydrogeological system within the basin, the challenges for the water supply to the proposed mining activities and predictions on the water supply from groundwater modelling and simulation results.