



210 S. Third Street • P.O. Box 1 • Laramie, WY 82073-0920 USA
Tel: 307.742.8213 • 800.446.7488 • Fax: 307.721.7598

miniTROLL - Protection Application: Protecting miniTROLL™ with a Water Barrier Kit, Monitoring Corrosive De-watering Wells at a Uranium Mine

John Mancarella, Sales Manager - EnviroEquip, Australia

Project Overview

With consumer demand for electricity expected to double by the middle of the 21st century, and with nuclear power plants producing no greenhouse gas emissions, nuclear energy represents the only way to produce significant amounts of base load power without contributing to global warming.

Already, 17 percent of the world's electricity is generated by nuclear power stations. Against this background, the Beverley uranium mine in the far north of South Australia is playing a valuable role in meeting the growing demand for uranium for nuclear fuel.

From the outset, Heathgate Resources has been committed to developing and operating Beverley as a model In Situ Leach mine. It is a project with a low environmental impact and one that is producing benefits for the world through the supply of uranium for peaceful purposes as well as for South Australia, through initial investment and, now, through long-term, full-time employment and royalty income.



Beverly Mine Location, Australia

The In-Situ miniTROLL is utilized to monitor the hydraulic characteristics of aquifers adjoining the Beverley Mine property. This equipment provides the operators with information critical to well pumping capacity as well as aquifer movement related to mining activity.

Equipment / Procedure Overview

Equipment: Twenty In-Situ miniTROLLs (Professional, 100psig, temperature & pressure), 100m / 328ft Quick-Connect cables, Communication cable and a laptop computer were used as primary equipment. Additionally, due to a corrosive downhole environment, the miniTROLL was encased in the In-Situ Water Barrier Kit and also covered with an open polyethylene bailer tube - offering exceptionally functional corrosive and abrasive protection.

MiniTROLL encased in Water Barrier Kit and Bailer Tube



Deployment: Twenty miniTROLLs are deployed at monitoring wells throughout the property. The monitoring wells are located adjacent to pumping wells, where constant determination of aquifer



hydraulic conductivity is needed to optimize pumping rate. Probes are generally deployed at 100m, within the screened interval of the aquifer. The Quick-Connect cable is fastened securely to the top of the monitoring well via Kellems™ grip and carabiner. Data is logged in 15-minute intervals and downloaded from each probe weekly via laptop computer.

A monitoring well on the Beverley Mine Property



Details of test methodology

Previous to the introduction of miniTROLLs to the test area, weekly depth checks (electronic tape) had been used. While valuable, this information did not provide a complete picture of the changing aquifer characteristics relating to daily mining activity. By continually logging depth and temperature at 15-minute intervals, a much clearer portrait of the aquifer is produced. Additionally, dispersion of the twenty miniTROLLs across the property provides optimal assessment of the local aquifer. Ultimately, the data allows operators to de-water mine locations with efficiency and safety.

A major concern of the operators was the ability of the miniTROLL to withstand potentially

corrosive and radioactive conditions found within the monitoring wells. By utilizing the unique water barrier protection method, as designed by the Australian In-Situ distributor, the miniTROLLs are fully protected and monitor with normal high-accuracy.

Test results

Test results show that water levels are traceable to specific events in the field and graphically explain relative pump efficiency. Aquifer recharge was slower than expected in some cases.

How was the In-Situ equipment helpful in achieving the test objectives?

Ease of operation and set-up allowed operators to quickly learn and successfully deploy the equipment.

More Information

Information contained in this application note was provided by Bryn Jones, Heathgate Resources Pty., Ltd., Beverly Mine, Australia. He may be contacted at bj@heathgateresources.com.au

Information on this product and application may also be obtained from the In-Situ authorized Distributor.

EnviroEquip Pty Ltd.

Head Office

Melbourne
 154 Waverly Rd
 East Malvern, Victoria 3145
 Australia
 Tel: 61-3-9572-3600
 Fax: 61-3-9572-3700
 Web: www.enviroequip.com

Contact: Mr. John Mancarella
 Email: sales@enviroequip.com

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