



DEWATERING IN THE AUSTRALIAN MINING AND OIL & GAS INDUSTRIES

**Presented by
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OVERVIEW

- Introduction
- Issues Faced in Dewatering Projects
- Who and What is “Airwell”
- Airwell Solutions in the Dewatering Industry
- Other Services and Solutions available from Airwell
- Question and Answer



INTRODUCTION

- Dewatering is a key issue across both the mining and oil and gas industries
- Importance in considering all the variables when deciding on project solutions
- The costs of choosing the wrong solution can be thousands of dollars and / or significant amounts of down time
- Taking a closer look at the issues faced in dewatering projects and the range of solutions available



ISSUES ENCOUNTERED IN DEWATERING PROJECTS

Dewatering always provides its own unique set of issues specific to each project. However 5 issues tend to be present in all projects:

1. Location
2. Variable Flow Rates
3. Water Conditions and Quality
4. Costs
5. OH&S, Site Safety and Operational Issues



LOCATION

- Most dewatering projects are in remote locations.
- Project locations often lack basic infrastructure.
- Existing options for powering pumping systems probably don't exist.
- The use of electricity and electric submersible pumps is the most common option for dewatering when electrical power is available.
- But what if there is no electrical power to the location?
- What are the alternatives to Electrical Power.
 - Diesel Generator
 - Solar or wind power
 - Compressed Air or gas



VARIABLE FLOW RATES

- Long term dewatering requires a focus on a pumps minimum flow rate capability, not only its maximum.
- Dewatering projects normally start out at high flow rates but can quickly reduce as bore recharge rate slows.
- Designing a dewatering system needs to consider if the pumping equipment can handle a reduction in flow rate.
- High flow rate projects are the domain of the electric submersible, but finding an electric pump to reliably pump rates below 1 litre/sec is difficult if not impossible.



WATER CONDITIONS & QUALITY

- Water conditions vary from site to site and even bore to bore.
- Issues faced include high and low Ph. water, acid forming tailings and large quantities of grit or suspended solids. Iron forming scale is also often a major factor.
- High water Salinity speeds up what metal corrosion will occur.
- Many pumps are not designed for pumping environments of poor quality, highly polluted or containing suspended solids.
- This does not make the pump poor quality, they just may not be designed for those conditions.
- Pumping equipment needs to be chosen on its capabilities and suitability for each project.



COSTS

- Gone are the days of “just get the job done” being expressed by the client.
- Projects that do not contribute to improved production are constantly assessed for value, importance and priority.
- In the past 12 months we have seen projects go from urgent to delayed to postponed, or even cancelled.
- It is important that any dewatering project and solution is designed to be as cost effective as possible.
- This means reducing maintenance costs, providing durable equipment and equipment that provides a solution for the long term (handling variable flow) and which is easily installed.



ENERGY DISTRIBUTION OPTIONS V COST

- Electrical power distribution can cost up to \$100,000 / km to establish and continues to pose a considerable hazard to mine operators once installed.
- High pressure poly airline can be supplied and installed at approx \$1,000.00 to \$5,000.00 per km depending on size and is of comparatively low hazard.
- Air lines can be installed or relocated by unlicensed personnel and can be left on the surface if required.
- Diesel fuel for generators can cost up to \$2.00 litre in some locations.
- Solar or wind power have not proved to be viable for large scale dewatering projects due to high cost, complexity, inherently low flow rate and the inability to operate at night in the case of solar.



OH &S, SITE SAFETY AND OPERATIONAL ISSUES

- All project planners should be looking at solutions to maximise safety during implementation and during the life of the project
- Forgetting costs, what is the safer option?
 - Having electrical power cables in or near an operating mine site.
 - Or a poly airline?
- Damaging a live electrical power cable can be dangerous, disruptive and expensive to repair in an active mining area.
- A damaged airline presents low risk of injury, and is quick and inexpensive to repair.



ISSUES IN OIL AND GAS INDUSTRY DEWATERING

- Many of the issues faced in dewatering mine sites are also found in the oil and gas industry.
- Issues faced in dewatering of gas wells
 - Variable flow rates,
 - Many wells spread over a large geographical area,
 - Issues with silt, coal fines and other suspended solids,
 - Risk of gas ignition and explosion,
 - High level of industry standards and requirements.
- Coal Seam Gas is a growing market in Australia. Cost effective and reliable solutions for the dewatering of gas wells is important to the continued growth of this CSG industry.
- The Coal Seam Gas industry is often referred to as a;
“Water Pumping Industry that produces Gas”



WHO AND WHAT IS AIRWELL?

- Design and Manufacturer of our unique Direct Air Displacement pumping system
- Operating in the industry for nearly 30 years.
- Often referred to as “the best kept secret in the industry”
- Worked on key pollution recovery projects for many of the largest mining, oil & gas and consultancy companies in Australia and internationally.



WHO AND WHAT IS AIRWELL

- Equipment and projects currently in operation for many of the top 100 mining and industrial companies including:
 - Alcoa
 - BP
 - KCGM
 - Rio Tinto
 - Roy Hill
 - Newmont
 - BHP



AIRWELL IN THE DEWATERING INDUSTRY

Mining

- Provided pumps and equipment for mine site dewatering and leachate recovery from tailings dams.
- Projects for several different types of dewatering
 - Wet Spot Dewatering
 - Pit Wall Stabilisation / Depressurisation



CURRENT PROJECT: OZ MINERALS

- Our most recent major mine site dewatering project was for Oz Minerals at their Prominent Hill site in SA.
- Removal of water through pumping for the de-pressurisation of the Southern Wall of the open pit.
- To complete the project Airwell have installed 37 pumps to dewater the area, with additional pumps to be installed in other areas for dewatering.
- This is an ongoing project with some further installations expected.
- Project specifications
 - Initial flow rates experienced were up to 0.72 l/s
 - Current flow rates now range from 0.00 l/s to 0.72 l/s
 - Bore depths range from 80m to 94m
 - Difficult to establish electrical power at bore sites due to location and insufficient power requirements close to site for other purposes.





AIRWELL IN THE DEWATERING INDUSTRY

Oil and Gas

- Spent the last 5 years on R&D of a pumping solution to overcome issues faced in the industry. The majority of which was conducted in the USA and Canada.
- Designed pump to operate at variable flows.
- Ability to handle silt and coal fines encountered.
- Designed complete with all well control skids for management of gas well operations
- System designed for nodal compression or to be powered by the centralised sales gas compressors.
- Use of industry leading SCADA remote telemetry control and monitoring, systems, all design, programming and construction performed in house.





OTHER AIRWELL SERVICES AND SOLUTIONS

Mobile Bore / Groundwater Sampling

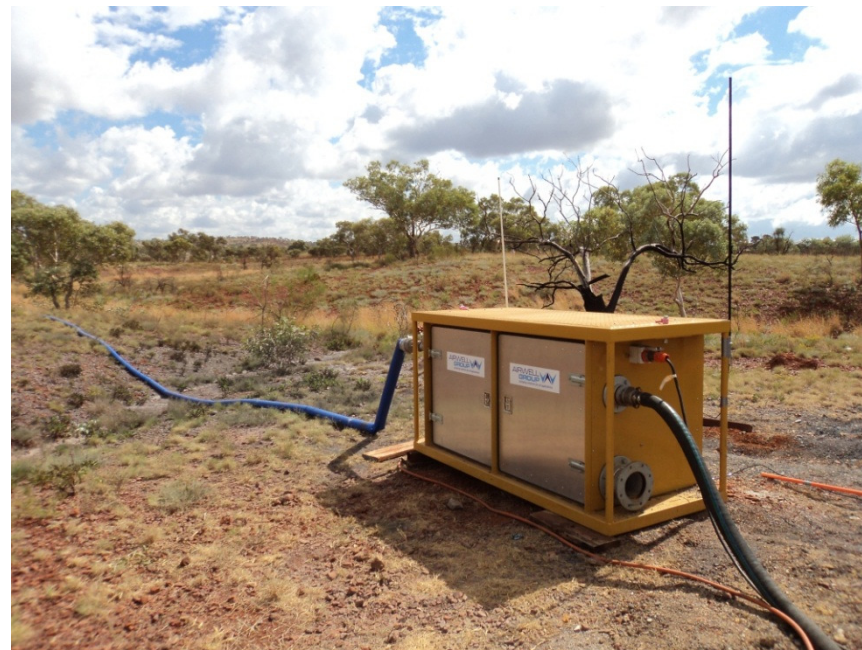
- Developed to complete groundwater monitoring safely and more efficiently
- Can sample as many as 15 bores a day depending on depths and requirements
- Hydraulically operated reel improves efficiency and safety



OTHER AIRWELL SERVICES AND SOLUTIONS

Flow Testing Services

- Developed accurate equipment for capturing electronic flow test data required by consultants.
- All equipment contained in skid mounted frame.
- Clear SCADA telemetry allows for remote logging and operation.



QUESTION AND ANSWER



MORE INFORMATION

Information packs available tonight

Speak with Alan or David following the presentation

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