GROUNDWATER in the Western Mount Lofty Ranges

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DWLBC
CONTENTS

Hydrogeology
Groundwater Investigation
Monitoring
Groundwater Management
HYDROGEOLOGY

There are two types of aquifers

• Fractured rock aquifers in hills
• Sedimentary aquifers beneath the plains and in the valleys
Porous media

Fractured rock
HYDROGEOLOGY

Characteristics of the various aquifers determine the current usage and potential for future development
How do we assess the amount of groundwater that is available to be allocated through the WAP process?

Recharge estimates from
- catchment water balance
- intensive point investigations
SITE INVESTIGATIONS

- Install specialised wells
- Downhole geophysiscal logging
- Groundwater chemistry sampling
Piezometer Installation

- Well Casing
- Well Screen
- Gravel Pack
- Cement Seal
- Gravel Pack
- Fracture
Groundwater Flow Systems in the MLR

Local Flow System (< 40 years)

Intermediate Flow System (40 to 1000 years)

Regional Flow System (1000’s to 10 000’s years)
MONITORING

Why monitor ??

• Impacts of irrigation extraction
• Impacts of land use change - clearing and forestry
• Impacts of climate change
• River / groundwater interaction (floods)
Monitoring results can be viewed on the internet using OBSWELL


Monitoring networks in the WMLR:

- Torrens
- One Tree Hill
- Piccadilly
- Lenswood
- Charleston
- Inverbrackie
- Echungah
- Willunga
- Myponga
- Hindmarsh Tiers
- Southern Fleurieu
MINING ACT
Legislative requirements

• 1. Mining Lease
  – Statutory consultation is required
  – Details of mining concept and risks to environment
  – If to be granted, will set conditions to protect environment
• 2. Mining and Rehabilitation Program (MARP)
  – Details of how environmental risks will be managed
  – Impacts on groundwater resource and users must be included (DWLBC)
  – May be reviewed during mine life
  – A licence and works approval are also required under Environment Protection Act before mining can be undertaken
• 3. “Waivers of exemption”
  – must be obtained for mining operations near houses (<400m) or on cultivated land
  – negotiate compensation with affected landowners
  – If unable to negotiate, may be taken to the Warden’s court
  – Must be obtained before mining operations begin
Early stakeholder consultation

Benefits:

- Applicant stays in control of process/issues
- Less delays to approval process
- Less risk issues may become political
- Tap into local knowledge
- Build good working relationship for operational phase
Assessment process

Mining Lease Application

Statutory public Consultation

PIRSA Assessment and draft Lease conditions

Lease offered and accepted

MARP Assessment and other agency approvals

Mining can begin
DWLBC ROLE

• Groundwater management
• Sustainable yield (PAV)
• Protection of GDEs
• Monitoring program
• Liaise with PIRSA on mining issues
Mindarie Heavy Mineral Sands
Australian Zircon
MARP - What is it?

• **Mining And Rehabilitation Program**
• An important legal document required by PIRSA, ensuring that mining companies have appropriate rehabilitation, environmental management plans that are *integrated* with the mining plan
• Want to avoid ‘fixing after the event’ – rather, rehabilitation allowed for in all mine planning and management
• The MARP must be approved by PIRSA and the bond in place before mining can commence
• Failure to comply with an approved MARP is considered a breach of the Mining Act and Regulations
Groundwater Monitoring

• Drawdown has been modelled; expecting drawdown of 3 m at 500 m distance, dropping to about 1.5 m at 2 km distance
• Monitoring of water levels and water quality up to 10 km distance by company
• Monitoring continues after mining
• Annual Water Report to PIRSA and DWLBC
• DWLBC intend to make monitoring results available on the web - Obswell
Groundwater Impacts

• Strategies to supplement adversely affected existing users include:
  – Lowering of pump intakes in existing wells if sufficient well depth is available
  – Deepening of existing wells affected by adverse drawdown of the aquifer
  – Provision of supply from the main Australian Zircon wellfield, or other existing wells

• These provisions have been agreed with the landholders as part of the company’s access negotiations
Bird in Hand

• Will have to apply for licence like any other landholder (not existing user)

• Engaged local groundwater consultants who are familiar with area and issues (not a multi-national)