



# AMD Witwatersrand Basins Due Diligence

Presentation to Portfolio Committee  
7 September 2011

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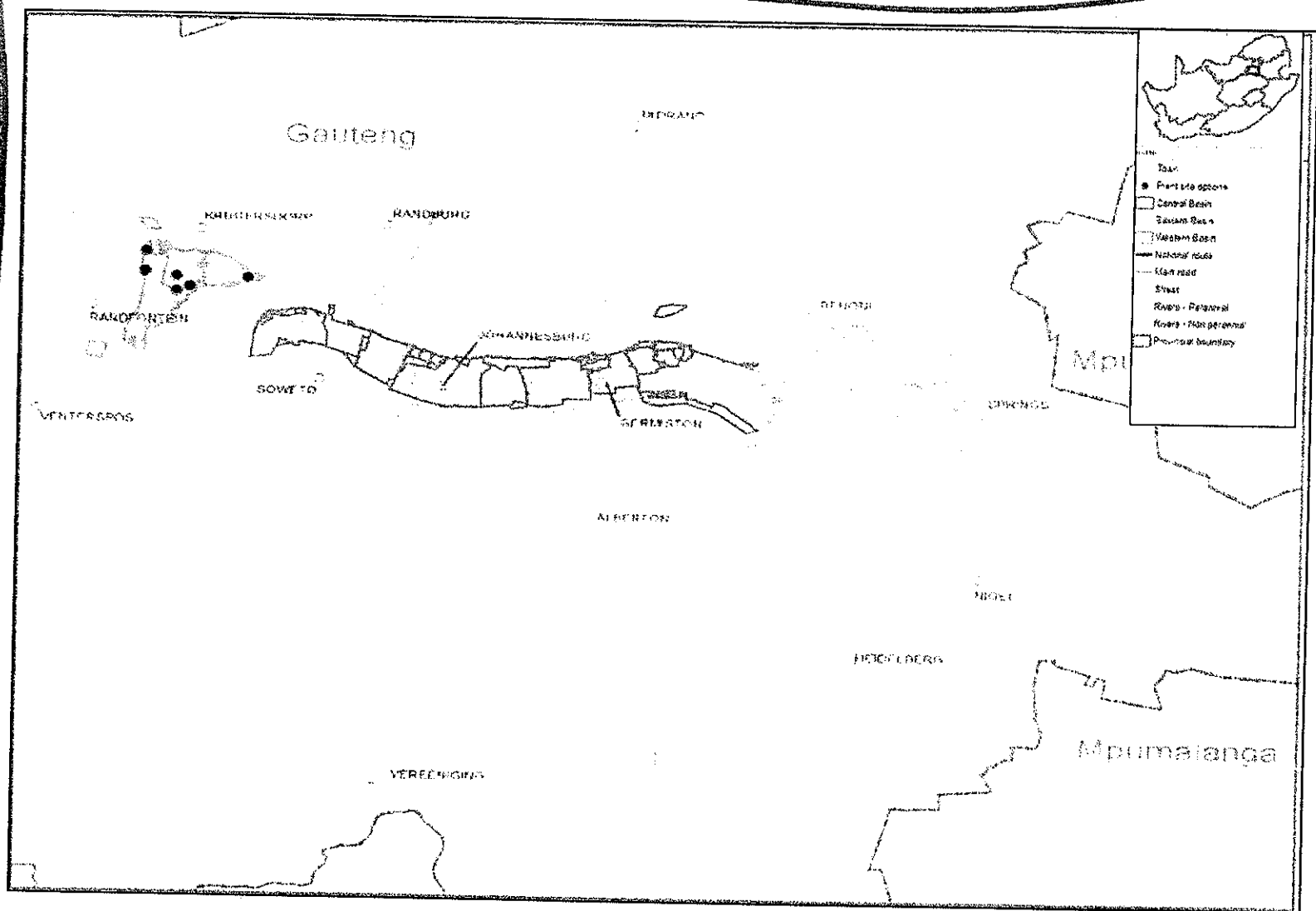


# TCTA Directive

- Ministerial directive – 6 April 2011
- Emergency works in Witwatersrand Gold Fields comprising:
  - Installation of pumps
  - Construction of water treatment plants
  - Release treated water into river system
- Obtain environmental and regulatory approvals
- Funding via National Treasury (R225 million)
- Advise and assist DWA with O&M model
- Minister may direct to do more



# Locality

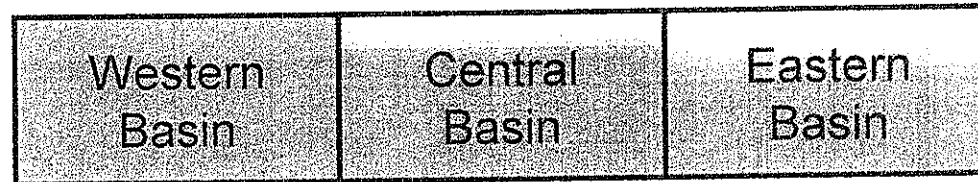


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# Overview of current situation

Rainfall recharge, surface water losses, infrastructure breakdown, groundwater inflow



Reach ECL	Currently decanting	June 2012	early 2013
Current Level	<i>Decanting</i>	424 m	654 m
ECL	165 m	186 m	290 m
Required pump flows	Base flow: = 27 MI/day; Peak pumping flow = 35 MI/day	Base flow: = 57 MI/day; Peak pumping flow = 84 MI/day	Base flow: = 82 MI/day; Peak pumping flow = 110MI/d

Sludge ←

Tweelopiespruit

Elsburgspruit

Blesbokspruit

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# Design Philosophy

- Design lifespan - 30 to 50 years – concrete structures
- High quality submersible pumps and pipework – low maintenance – 30 year lifespan
- Short-term solution to serve as first phase of long-term solution
- Plant capacity - ECL maintained even during high inflows
- Site selection - taking long-term solution into account



# Technical Solution: Western Basin

## Implementation of Immediate Solution

- Upgrade Rand Uranium treatment plant - cater for up to 36MI/d
- Implementation agreement with RU
- Target date – November 2011
- Discharge treated water to Tweelopiespruit
- Co-disposal of sludge to Wes Wits Pit
- Operating rule: solo until Aug 2012 then parallel with Short Term solution until ECL

# Technical Solution: Western Basin

## Implementation of short term solution

- New HDS plant to be erected on Randfontein Estate East – capacity 25 to 30 ml/pd
- Installation of new pumps and pipework in Rand Uranium Shaft 8
- Treated water transferred by pipeline to Tweelopiespruit
- Sludge disposal at West Wits Pit - dual pipeline
- Commissioning date – August 2012
- ECL level 165 m – June 2013

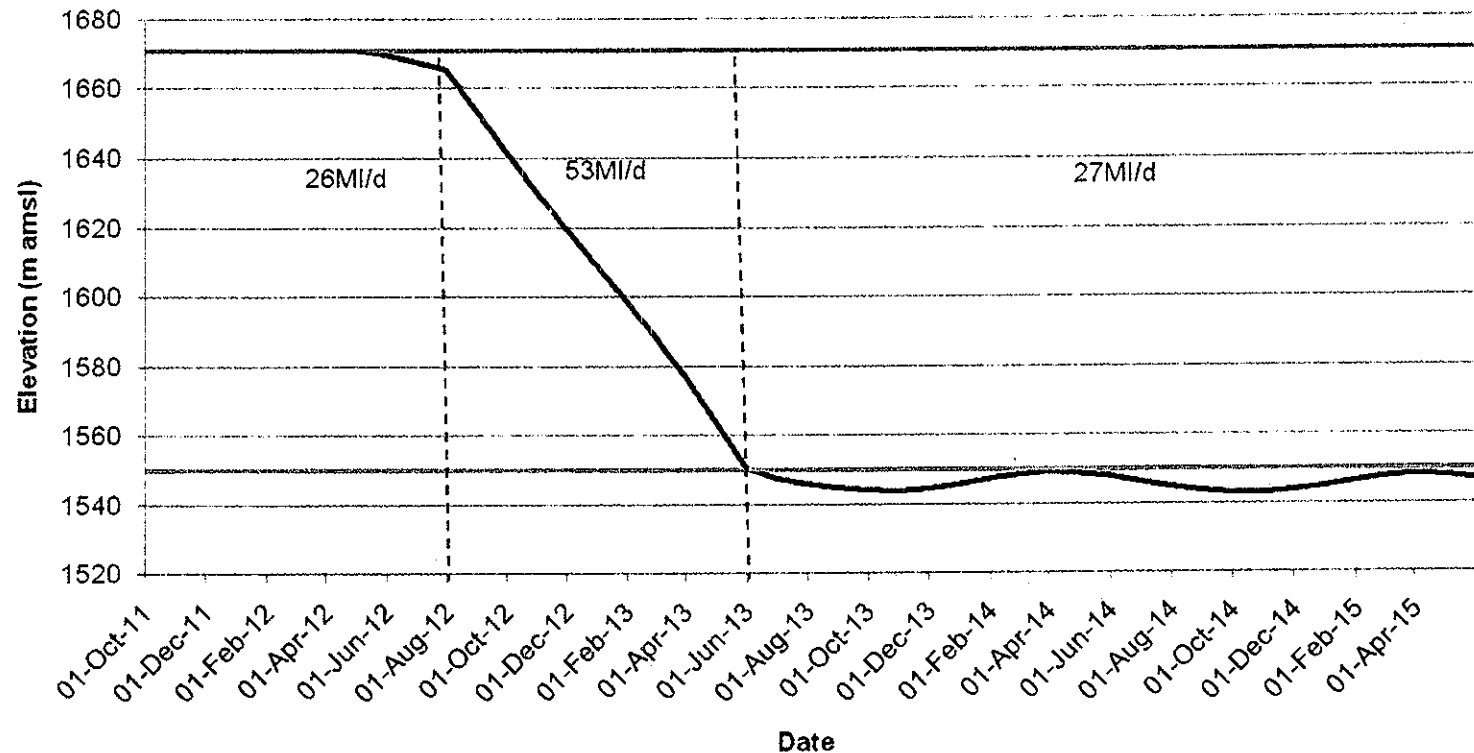


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# Dewatering of the Western Basin

- ECL = 165 m below Shaft 8

Predicted Drawdown in the Western Basin for Immediate and Short Term Solutions



— Water Level (Average) — ECL — Decant

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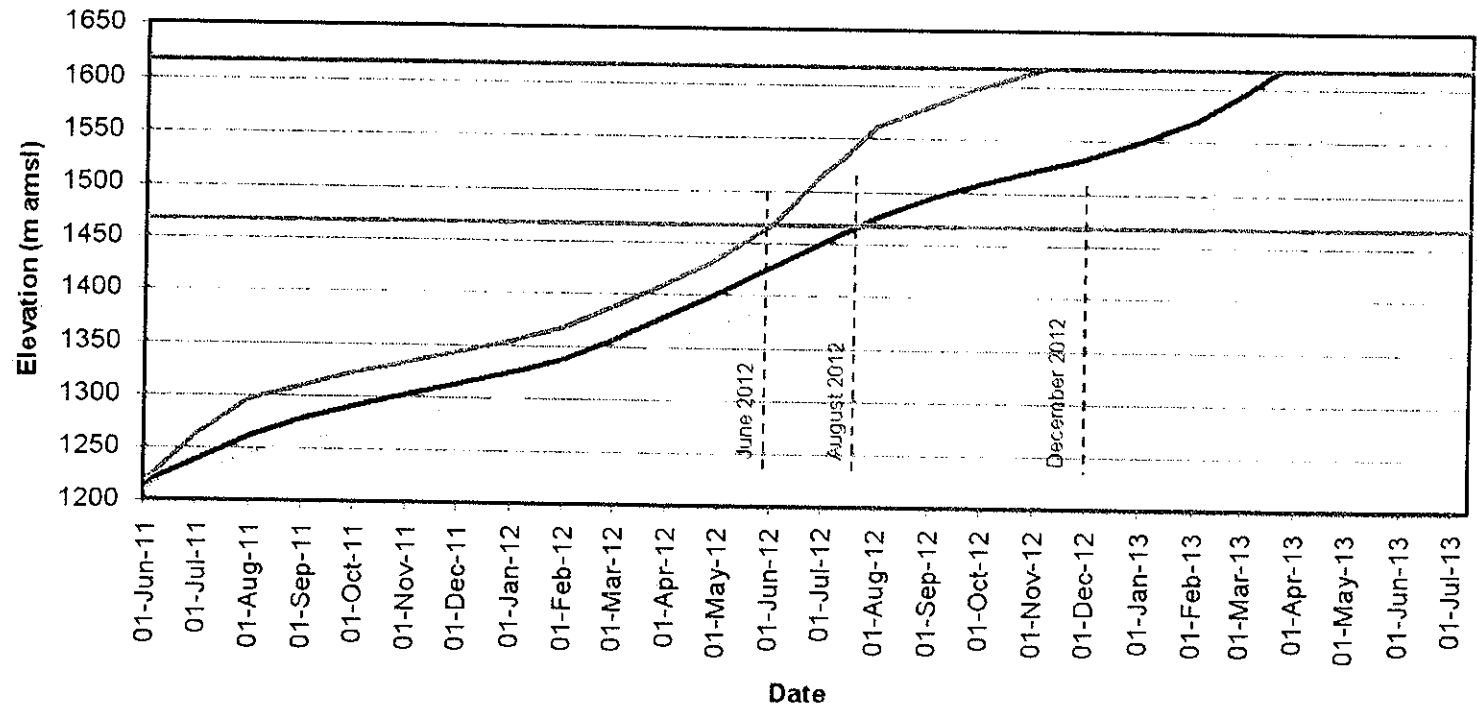




# Central Basin - ECL Level

- ECL = 186m below SWV

Predicted Rate of Rise in the Central Basin for Average, Dry and Wet Periods



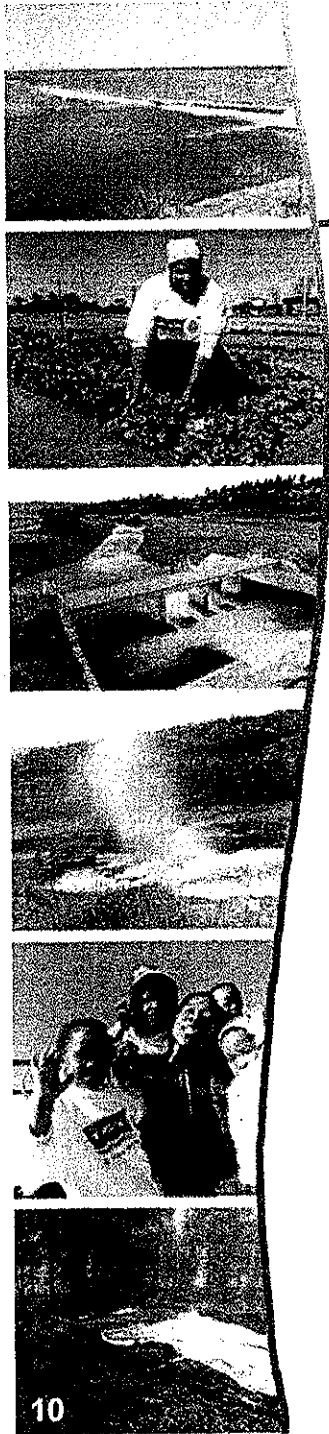
Water Level (Dry) — Water Level (Average) — Water Level (Wet) — ECL — Decant

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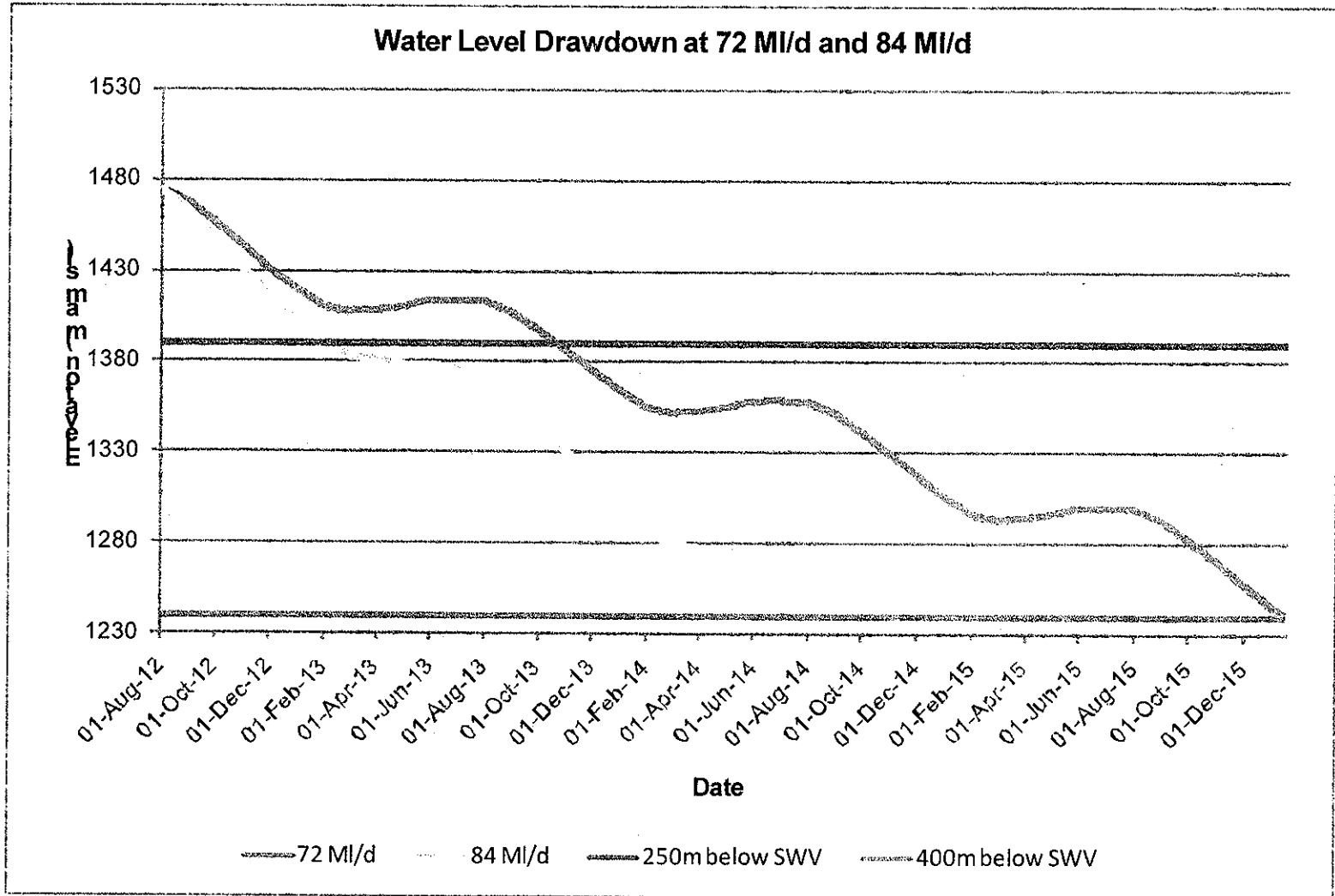


# Technical Solution: Central Basin

- New HDS plant next to South West Vertical Shaft – capacity 84 ml/pd
- CRG Ritz pumps
- Treated water transferred pipeline to EsburgSpruit
- Sludge co-disposal with Durban DRD Gold via duel lines
- Grey water – DRD 20ml/pd
- Commissioning date – August 2012
- ECL level 186 m/400



# Dewatering of the Central Basin

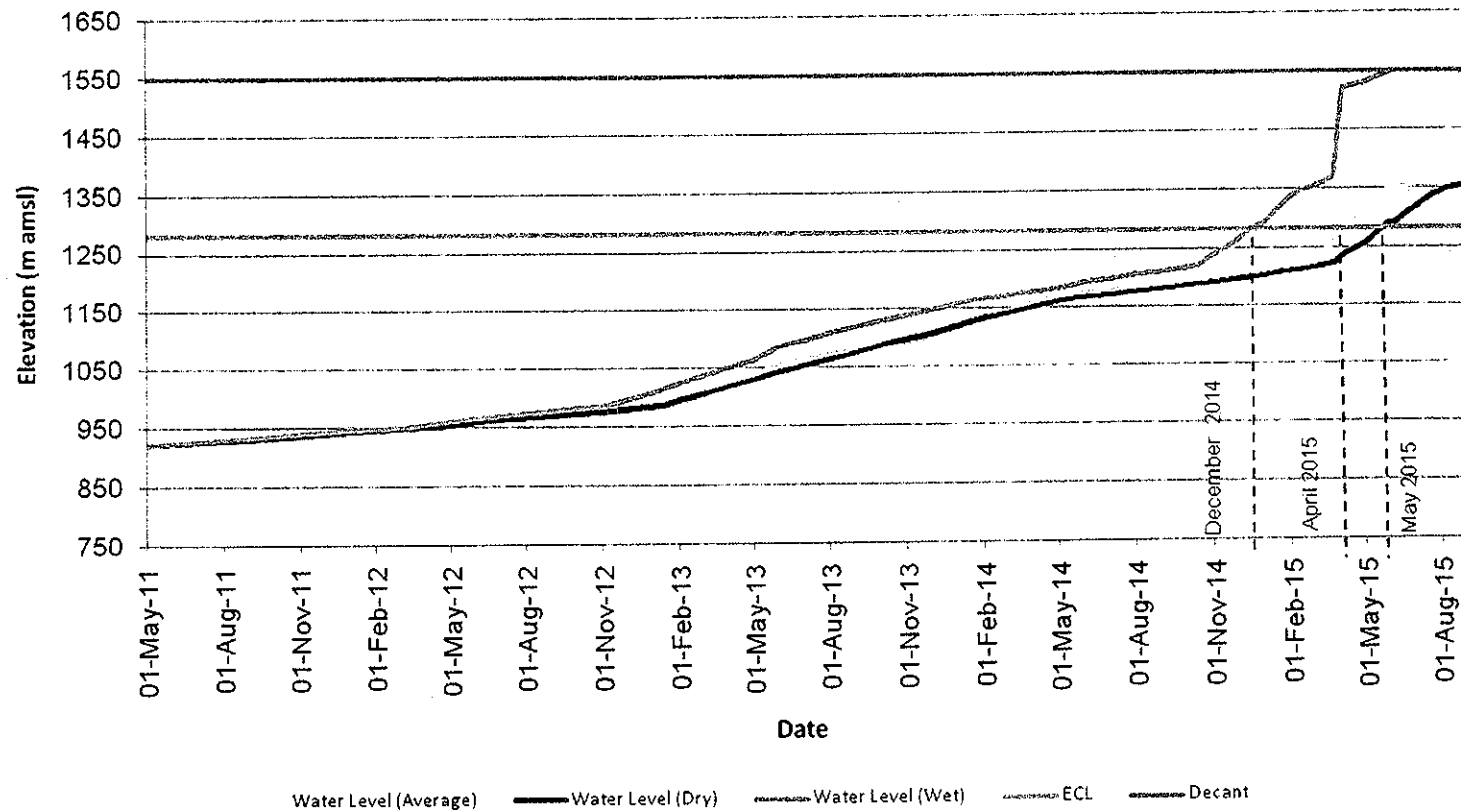


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# Eastern Basin ECL Level

- ECL = 290m below Grootvlei Shaft 3

Predicted Rate of Rise in the Eastern Basin for Average, Dry and Wet Periods

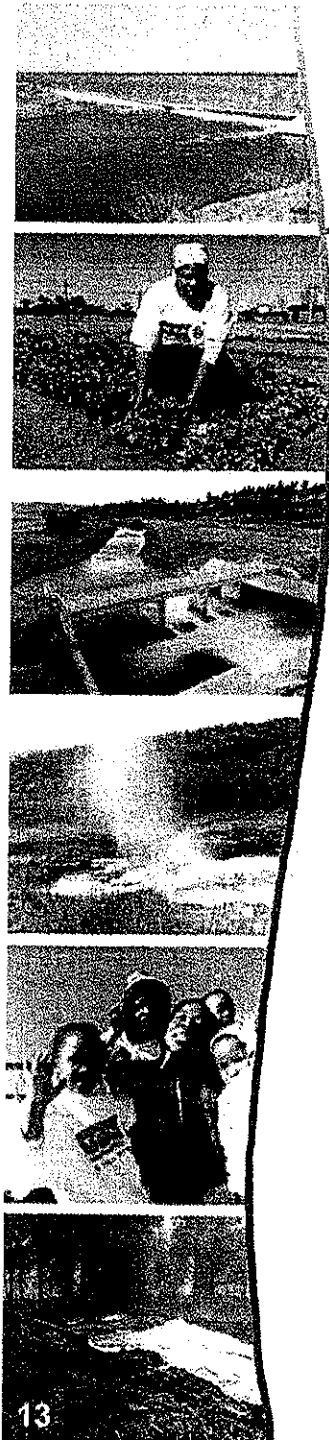


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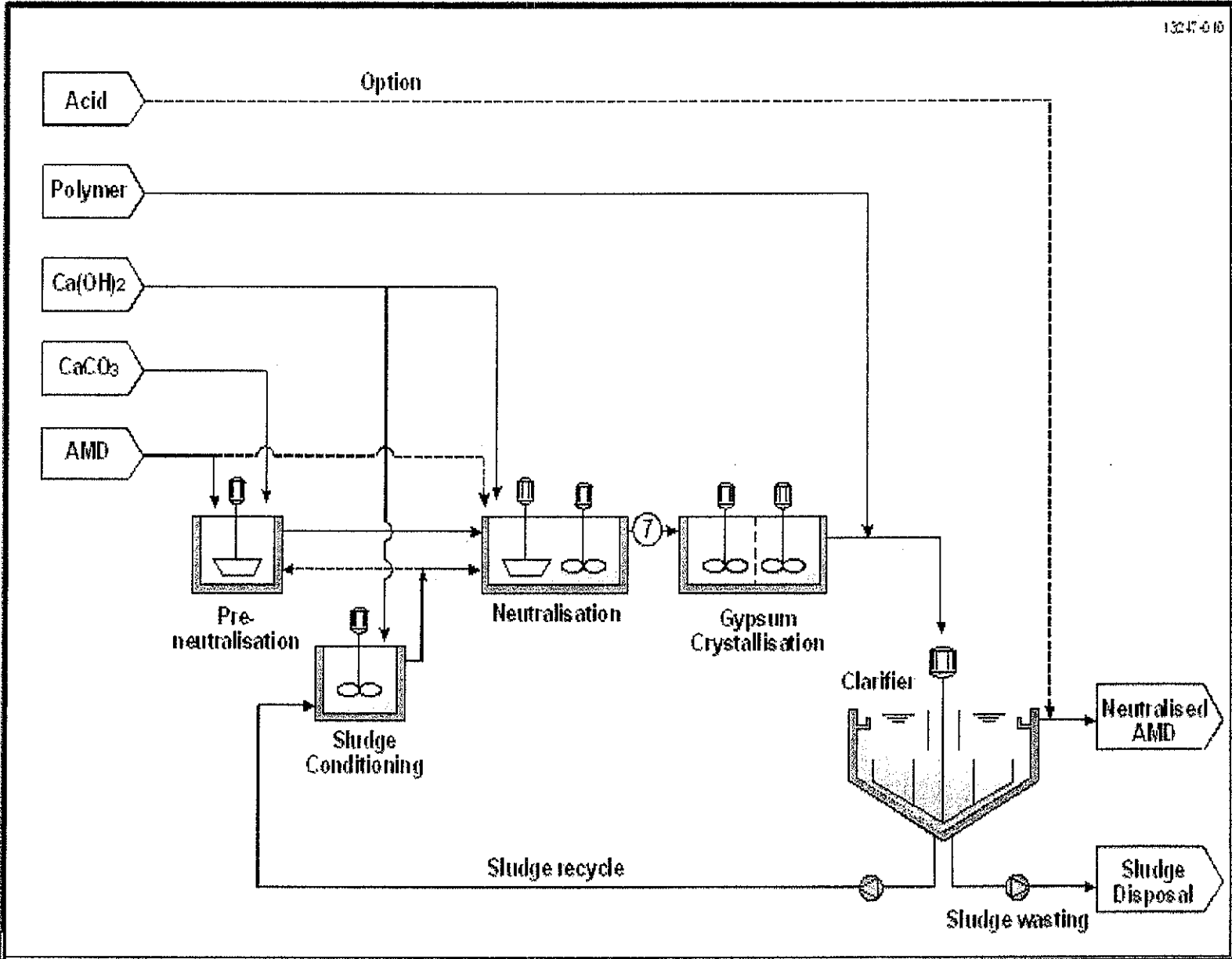


# Technical Solution Eastern Basin

- New HDS plant next to Grootvlei No 3 shaft – capacity shaft 110ml/pd
- Installation of new pumps and pipework - Grootvlei No. 3 Shaft
- Treated water transferred pipeline to Blesbokspruit
- Sludge co-disposal at Daggafontein Tailings Storage Facility via duel lines
- Commissioning date – June 2014
- ECL level 290m/ mines ?

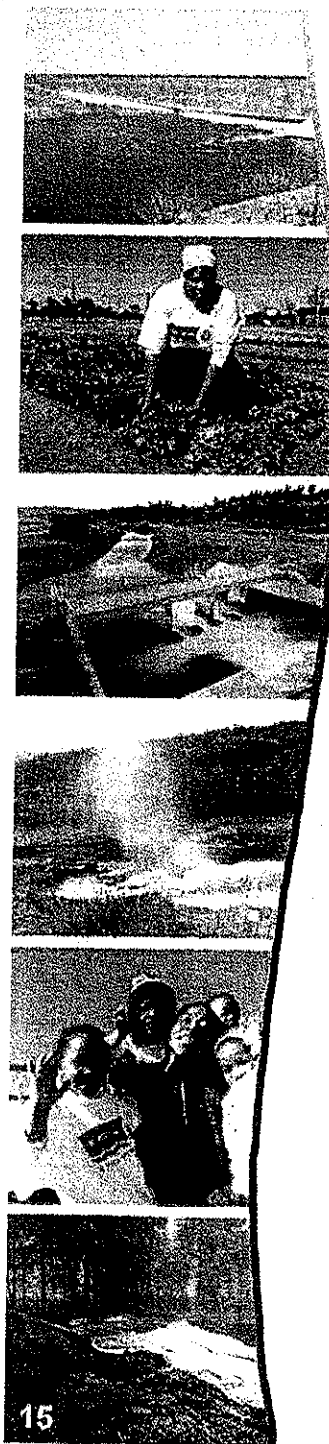


# Generic Mine Water Neutralisation Process



# Programme

ACTIVITY	DATE
Receive directive	6 April 2011
Appoint PSP	9 May 2011
Complete due diligence	7 July 2011
Issue tenders	mid September 2011
Commission immediate solution (Western B)	November 2011
Contract award	November 2011
Start construction	January 2012
Project commissioning	Augustus 2012
Project closeout	December 2012



# Capital Cost Budget

## AMD (Phase 1) Capital Cost

Description	Grand-Total (R' million)
<b>Construction</b>	<b>665</b>
Western Basin: Immediate (Oct'11)	20
Western Basin: Short Term (Nov'12)	195
Central Basin: Short Term (Nov'12)	210
Eastern Basin: Short Term (May'13)	240
<b>Engineering- Infrastructure</b>	<b>62</b>
<b>Environment</b>	<b>9</b>
<b>Total : Contr &amp; Eng &amp; Env</b>	<b>736</b>

5%	<b>Administration Cost</b>	<b>37</b>
<b>Total: Administration Cost</b>		<b>37</b>

**Total : Excl Contingency & Escalation** **772**

15%	<b>Contingency</b>	<b>116</b>
<b>Total: After Contingency</b>		<b>888</b>

6%	<b>Escalation</b>	<b>36</b>
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**Grand Total : Project Implementation Cost** **924**

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# O&M Cost Budget

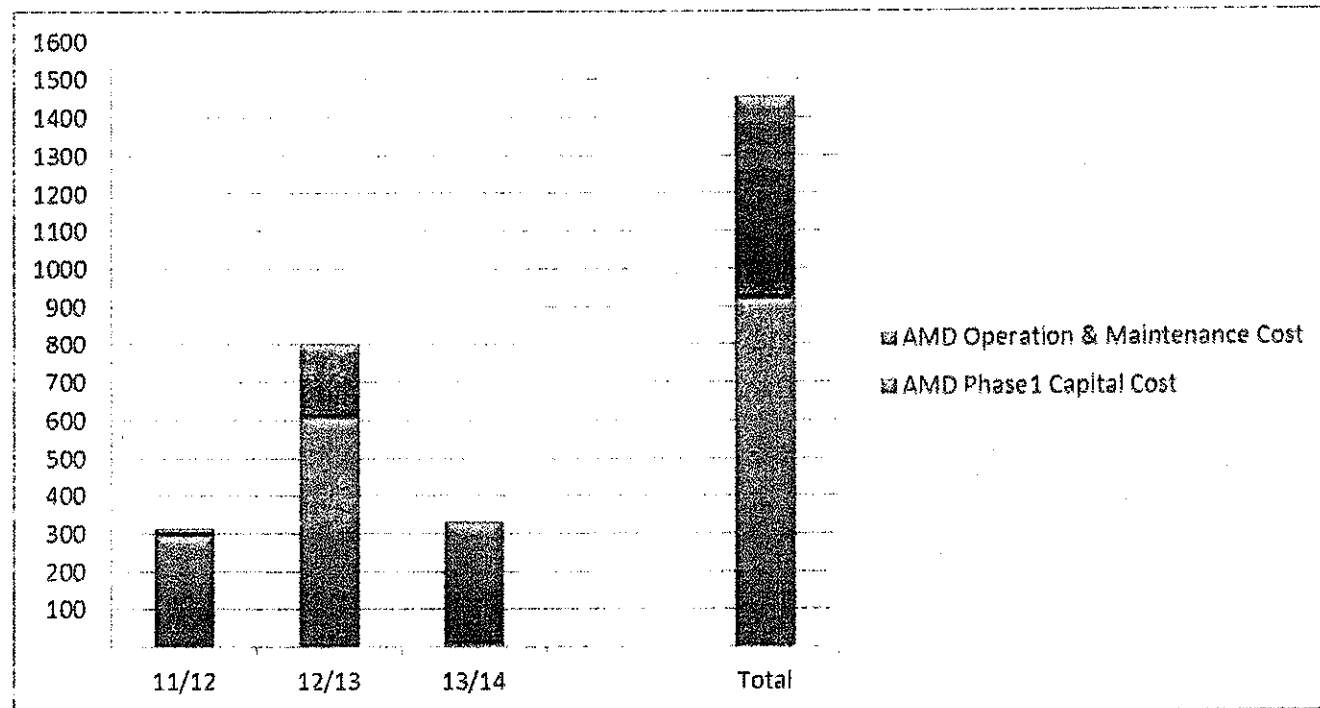
## AMD1 Operation & Maintenance Cost

Description	Monthly (R'million)	Annual (R'million)
Western Basin: Immediate (15 months)	5	55
Western Basin: Short Term (18 months)	8	101
Central Basin: Short Term (18 months)	11	128
Eastern Basin: Short Term (9 months)	8	101
<b>Operations &amp; Maintenance</b>	<b>32</b>	<b>385</b>



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# Project Cost Budget



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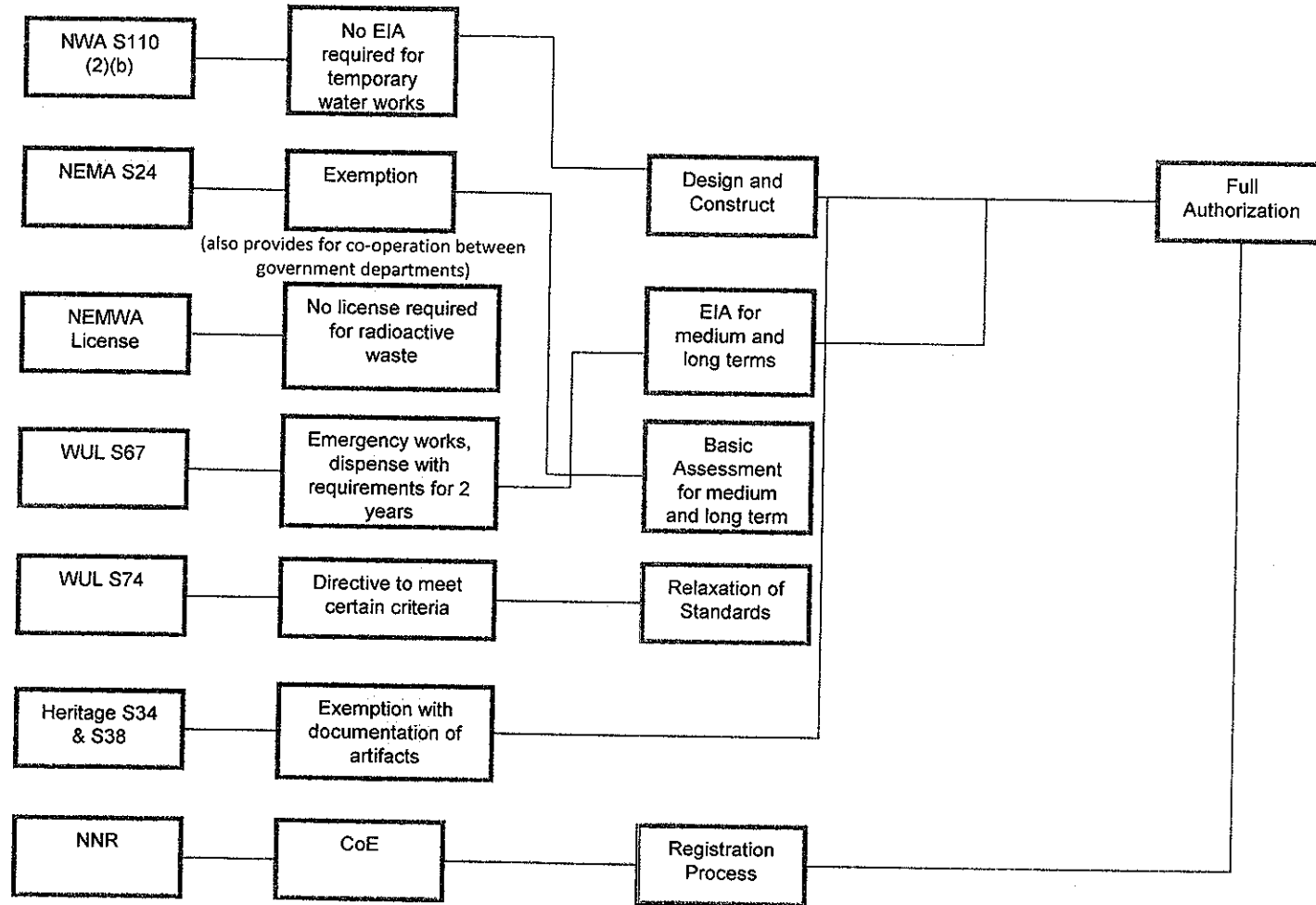
# The Integrated Regulatory Process

# Immediate Authorisation

- Apply for Waste License to upgrade Rand Uranium Water Treatment Plant to handle the extra 18 MI/d that is decanting.



# Complexity of Processes



# Optimised Approach

## Enabling Legislation

National Water Act (Act 36 of 1998)

Section 110 (2)(a) applies as the waterworks is deemed to be constructed in emergency circumstances

# Communications Strategy

- Regulatory requirements for public participation (i.e. scoping requirements for environmental assessment in terms of the EIA regulations).
- Communication requirements for dissemination of project information.
- Engagement of stakeholders.



# Key Project Risks

Risk	Response
Project delay due to funding constraints – contract award subject to funding	<ul style="list-style-type: none"> <li>• MTEF submission</li> <li>• Budget reprioritization</li> <li>• Accelerate long-term solution</li> <li>• Optimize sale of “grey water”</li> </ul>
Severely limited timeframes	<ul style="list-style-type: none"> <li>• Optimized procurement processes</li> <li>• Accelerated approvals</li> </ul>
Environmental authorizations – delay project	<ul style="list-style-type: none"> <li>• Establish authorities forum</li> <li>• Develop optimized approval process – emergency project</li> </ul>
Poor state of existing infrastructure impacting on project costs	<ul style="list-style-type: none"> <li>• Construct new infrastructure</li> <li>• Project lifespan 30 to 50 years</li> </ul>
Reputational risk – high public interest	<ul style="list-style-type: none"> <li>• Communication strategy</li> <li>• Public participation</li> </ul>
Environmental degradation	<ul style="list-style-type: none"> <li>• Accelerate long-term solution</li> </ul>