



Thales Mulwala – Hydraulic Containment Trial 2009 - 2010

Greg Luke and Ross McFarland

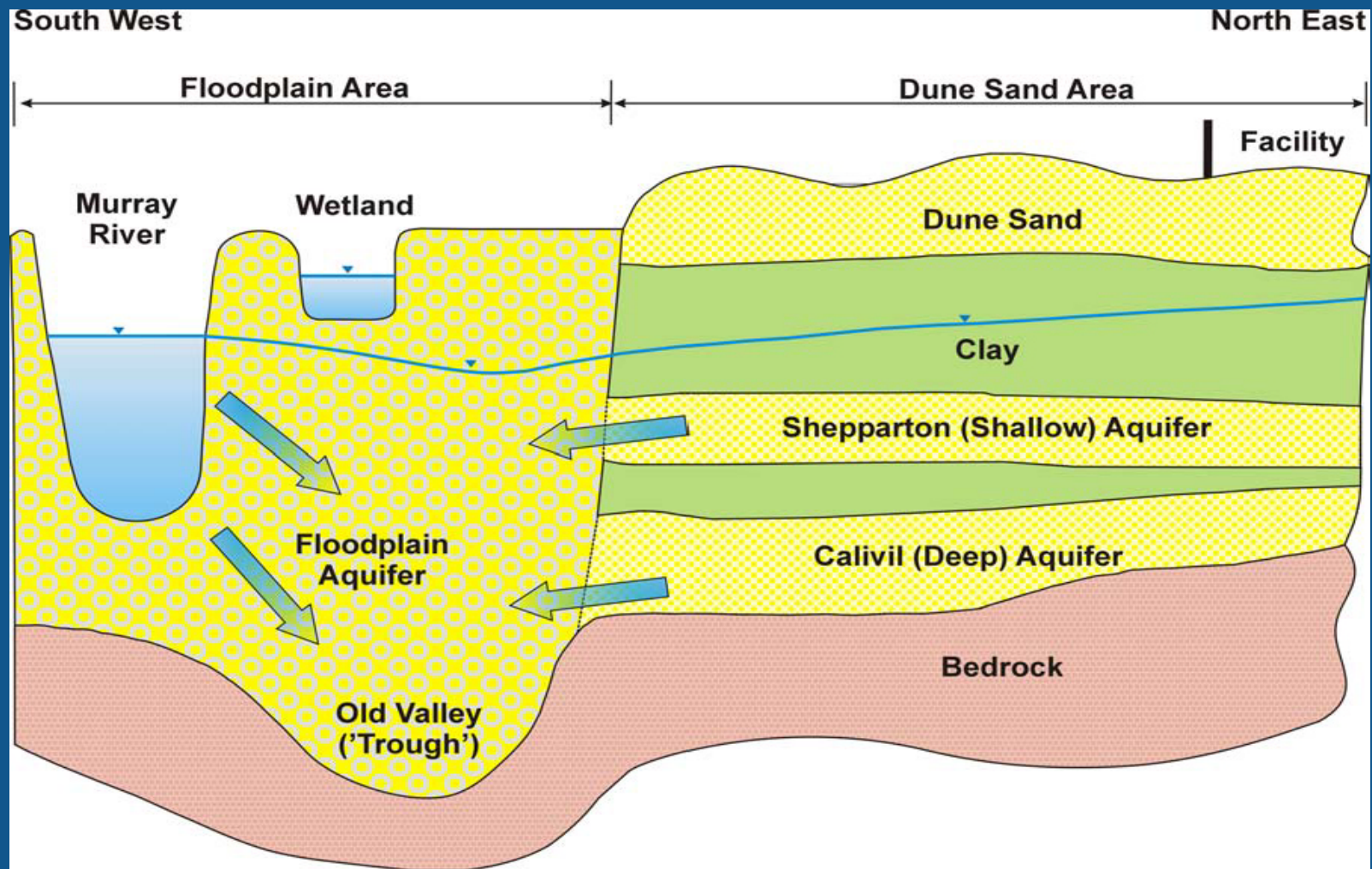
Overview and Background

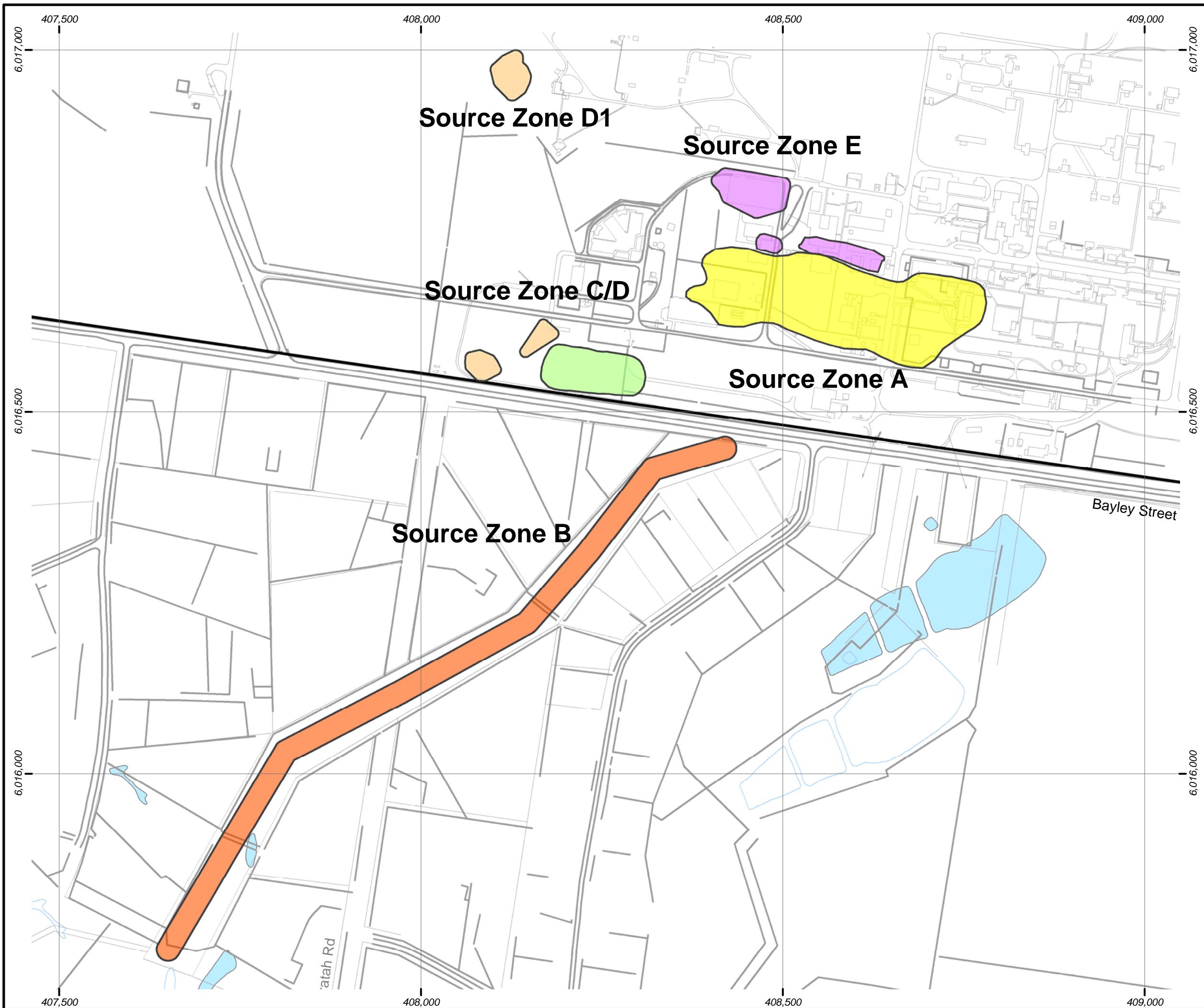
- Assessment History and Previous Works Summary
- Proposed Hydraulic Containment Trial Scope
- Timeline
- Questions?

Assessment History

- URS: ADI Mulwala Environmental Site Assessment (2001)
- HLA: Groundwater Investigation Report (Mar, 2003)
- HLA: Source Investigation Report (Mar, 2003)
- HLA: Groundwater Modeling Report (Jun, 2003)
- HLA: ADI Mulwala Contamination Management Project, Priority A Sources Investigation (Jun, 2003)
- HLA: ADI Mulwala Remediation Feasibility Assessment (Nov, 2003)
- HLA: ADI Mulwala Contamination Management Project, Contamination Management Plan (Dec, 2003)
- HLA: Capping Options Assessment (Mar, 2005)
- HLA ENSR: Further Investigations and Source Zone Practicability Assessment (January 2006 – May 2007).

Previous Works – Conceptual Cross Section





PROJECT FILE NAME D1094401
 DATE 09 April 2008
 DRAWN ART
 APPROVED

Legend

Water Bodies

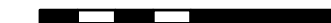
Source Zones

- Source Zone A
- Source Zone B
- Source Zone C/D
- Source Zone D1
- Source Zone E



AMG Zone 55 (AGD66)

0 50 100 200





Metres

SOURCE ZONE LOCATION PLAN
 Thales Australia
 Bayly St
 Mulwala, NSW

PROJECT FILE NAME D1016206
 DATE 26 February 2007
 DRAWN EJW
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Legend

-  Current Soil Bore Location
-  Former Soil Bore Location from Capping Assessment (HLA 2004)


Bores Sampled in Upper Shepparton Clays


SB24 Soil Bore ID
 NO₃²⁻: 23.7 Nitrate Concentration (mg/kg)

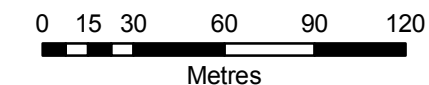
Bores Sampled in Dune Sands in Source Zone

SB22 Soil Bore ID
 NO₃²⁻: 6.7 Nitrate Concentration (mg/kg)

Nitrate Soil Concentration Contours in the Vadose Zone (mg/kg)

-  50-100
-  100-200
-  200-500
-  500-1000
-  1000+

 Site Boundary

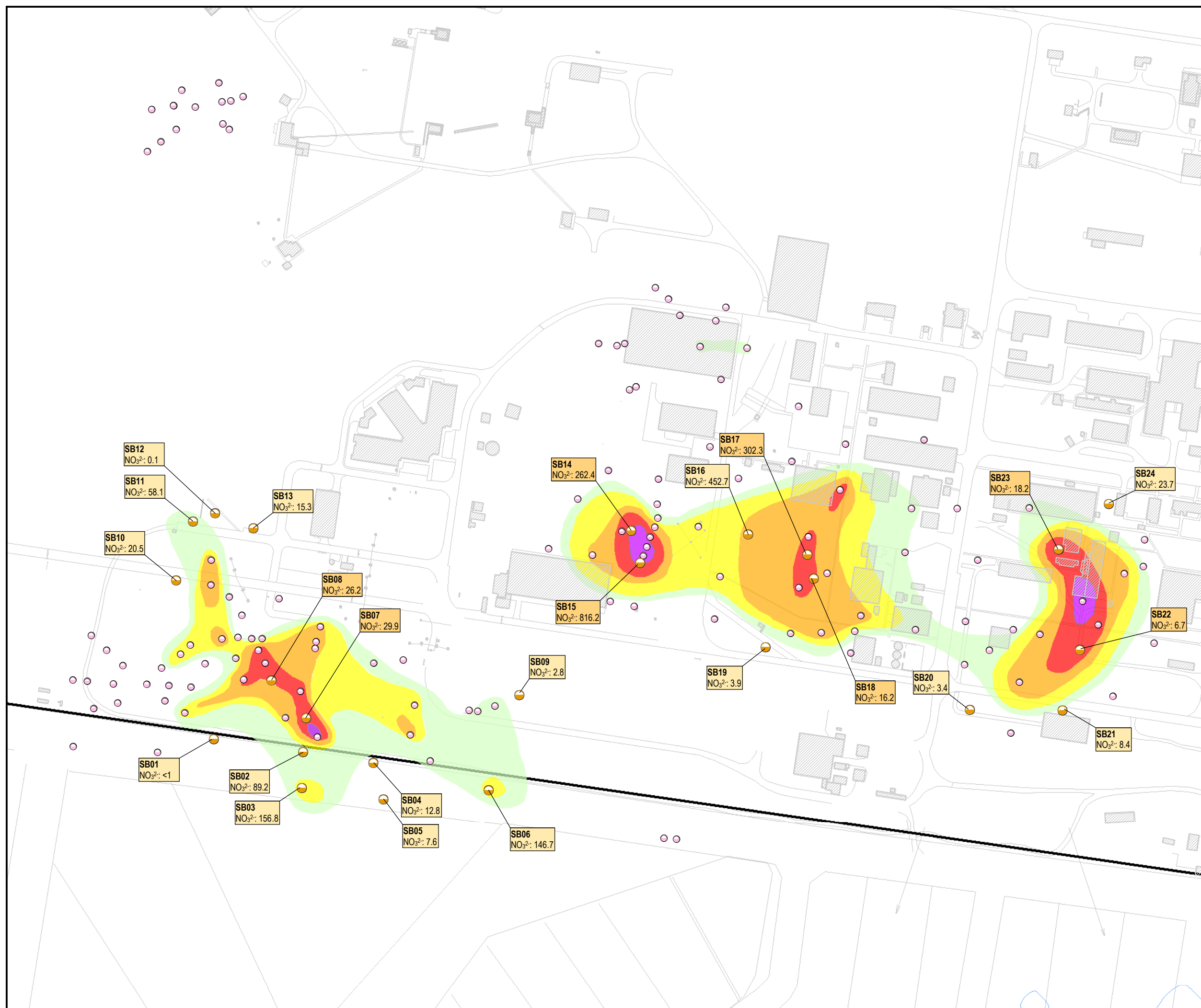


SOIL SOURCE CONCENTRATION CONTOURS (NITRATE)

ADI Limited
 Mulwala
 Bayly Street, Mulwala, NSW



FIGURE
5A



Project Objectives

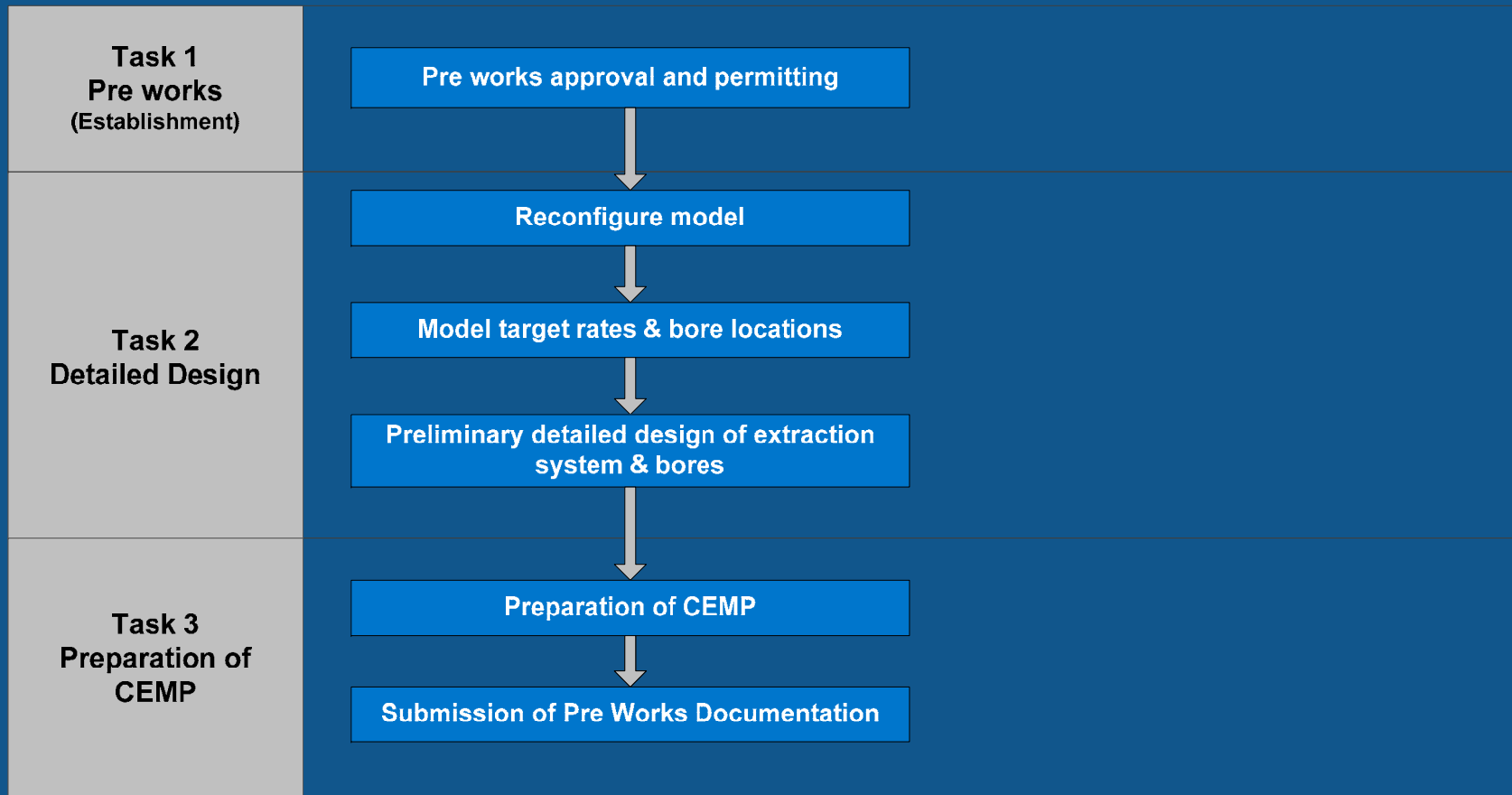
As agreed with the Environmental Auditor, the objectives for remediation of groundwater contamination at the Site are summarised as follows:

- **Primary objective:** To reduce the migration of groundwater contamination from the Site at concentrations that precludes the use of groundwater off-Site.
- **Secondary objective:** To reduce the time over which groundwater contamination off-Site will be reduced to levels that allow off-Site use of the groundwater.
- **Other lesser level objectives:** To reduce the time over which groundwater contamination on-Site will be reduced to levels that allow the use of the groundwater.

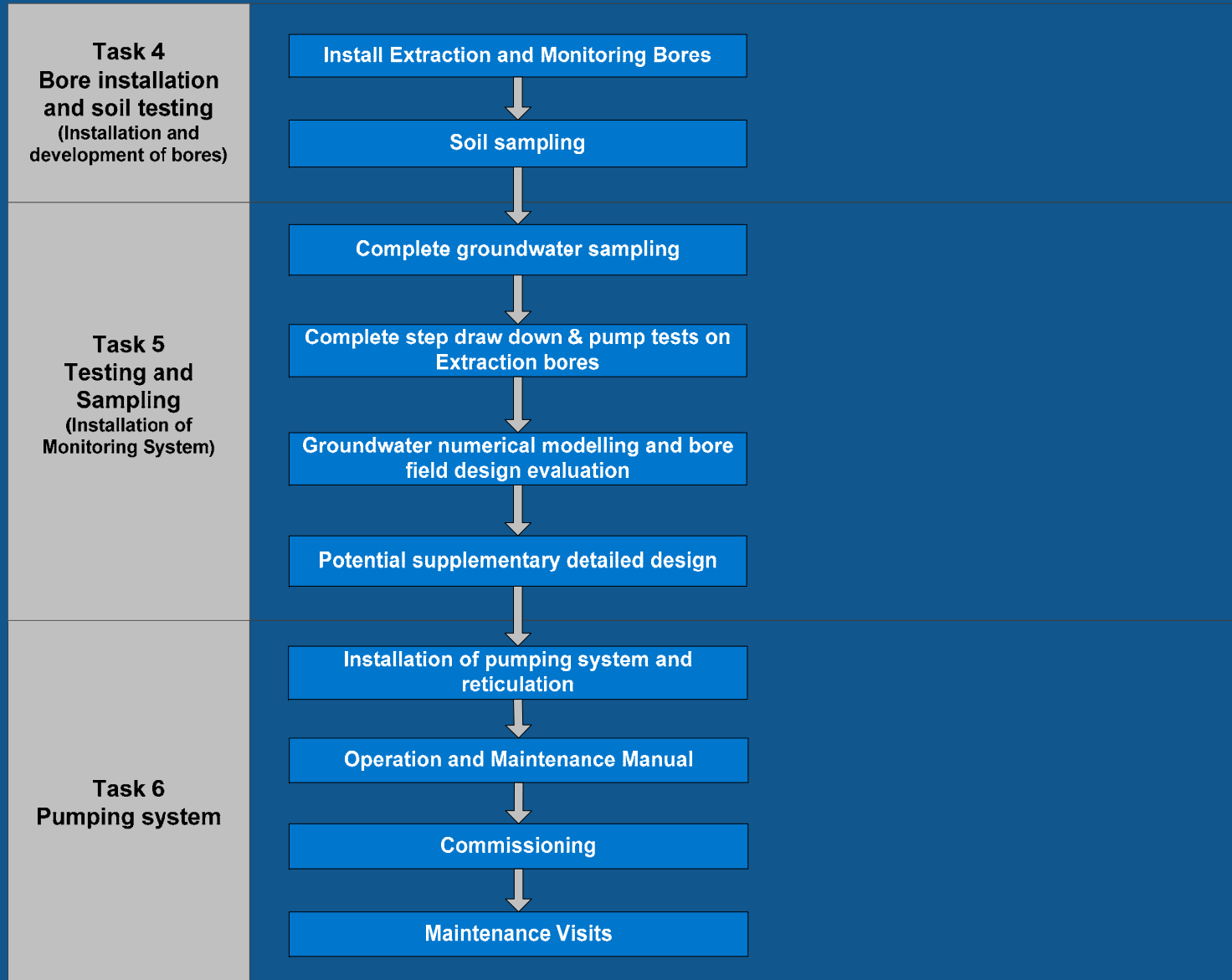
Remediation Implementation Plan

- Phase 1 Aquifer testing and Groundwater Modelling; Hydraulic Containment Trial (pending results of the aquifer testing) and Capping Implementation of Source Zones B and D1.
- Phase 2 Groundwater Carbon Source Addition (CSA) trial followed by implementation of Hydraulic Containment and/or Groundwater CSA should either be considered feasible as a result of the trials.
- Phase 3 Soil CSA Trial and feasibility assessment of capping Implementation of Source Zones C/D2/D3 and E, should the findings from Phase 2 prove infeasible.
- Phase 4 Soil CSA Implementation (if considered feasible based on trial); Capping Implementation of Source Zones A, C/D2/D3 and E or part thereof if considered to be feasible; Monitored Natural Attenuation if either method is infeasible.

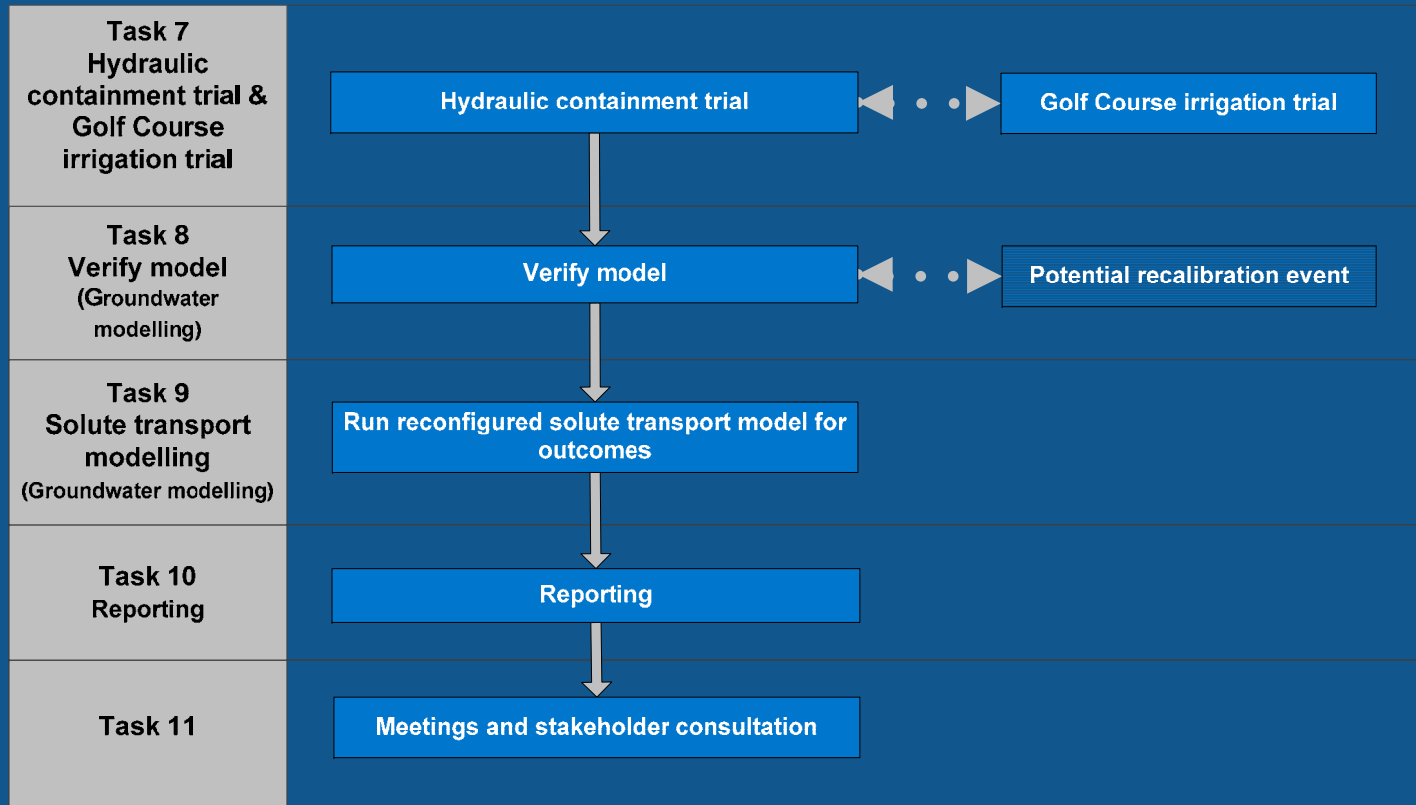
Staging of Proposed Tasks



Staging of Proposed Tasks – continued


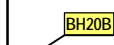
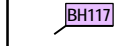

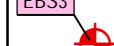










Staging of Proposed Tasks – continued








PROJECT FILE NAME D1094401
 DATE 01 April 2008
 DRAWN ART
 LAST MODIFIED BY DJB 30 Apr 2009
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Legend

-  Particle Tracking and Capture Zones
-  Bore Hole ID
Shepparton Aquifer Bores Proposed to be Sampled and have Water Levels measured
-  Bore Hole ID
Shepparton Aquifer Bores Proposed to have Water Levels Measured
-  Proposed Shepparton Aquifer Monitoring Bore
-  Proposed Extraction Bore
-  Shepparton Formation Aquifer Bore
-  100 Interpreted Nitrate Concentration Contour mg/L
-  Inferred Nitrate Concentration Contour mg/L
-  Nitrate Concentration: Adopted Assessment Criteria For Drinking Water
-  118.0 Interpreted Groundwater Elevation Contour m(AHD) - April 2006
-  Shepparton Formation Aquitard Absent
-  Bedrock High
-  Site Boundary

Nitrate Soil Concentration Contours in the Vadose Zone (mg/kg)

-  50-100
-  100-200
-  200-500
-  500-1000
-  1000+



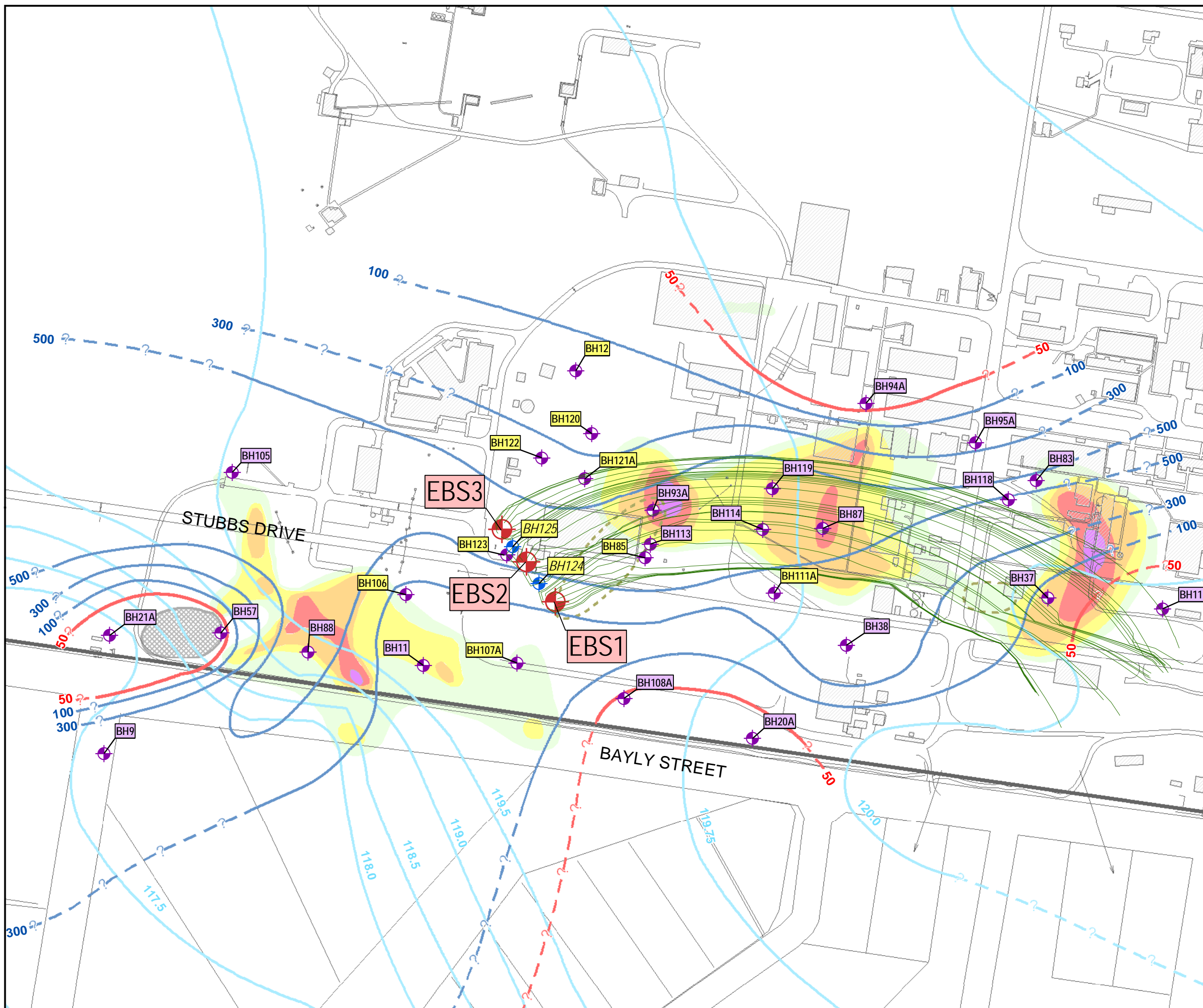
0 15 30 60 90 120

Metres

Scale 1 : 3500 @ A3

PREDICTED CAPTURE ZONE IN SHEPPARTON AQUIFER

Thales Australia
 Bayly St,
 Mulwala, NSW



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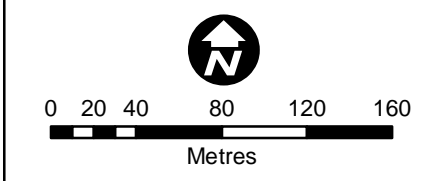
PROJECT FILE NAME D1016206
 DATE 01 April 2008
 DRAWN ART
 LAST MODIFIED BY DJB 30 Apr 2009
 APPROVED

Legend

- Particle Tracking and Capture Zones
- Bore Hole ID
Calvil Aquifer Bores Proposed to be Sampled and have Water Levels measured
- Bore Hole ID
Calvil Aquifer Bores Proposed to have Water Levels Measured
- Proposed Calvil Aquifer Monitoring Bore
- Proposed Extraction Bore
- Calvil Formation Aquifer Bore
- 100 Interpreted Nitrate Concentration Contour mg/L
- Inferred Nitrate Concentration Contour mg/L
- Nitrate Concentration: Adopted Assessment Criteria For Drinking Water
- 118.0 Interpreted Groundwater Elevation Contour m(AHD) - April 2006
- Interpreted Boundary of Calvil Sands
- Bedrock High
- Shepparton Formation Aquitard Absent
- Site Boundary

Nitrate Soil Concentration Contours (mg/kg)

	50-100
	100-200
	200-500
	500-1000
	1000+



PREDICTED CAPTURE ZONE IN CALVIL AQUIFER
 Thales Australia
 Bayly St,
 Mulwala, NSW



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Project Timeline

- Pre Works Documentation and Establishment: May to September 2009
- Installation of Bores and Monitoring System: October to December 2009
 - Well Installation
 - Pump Testing
 - Groundwater Modelling
 - Hydraulic Containment System Installation
 - Hydraulic Containment System Commissioning
- Hydraulic Containment Trial: January to March 2010
- Groundwater Modelling: March to April 2010
- Reporting: March to May 2010
- Stakeholder Meetings and Presentations: Post May 2010

Questions?