

## Lake Dartmouth

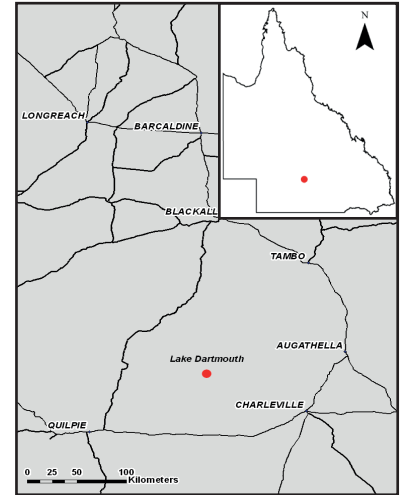


### Study Area

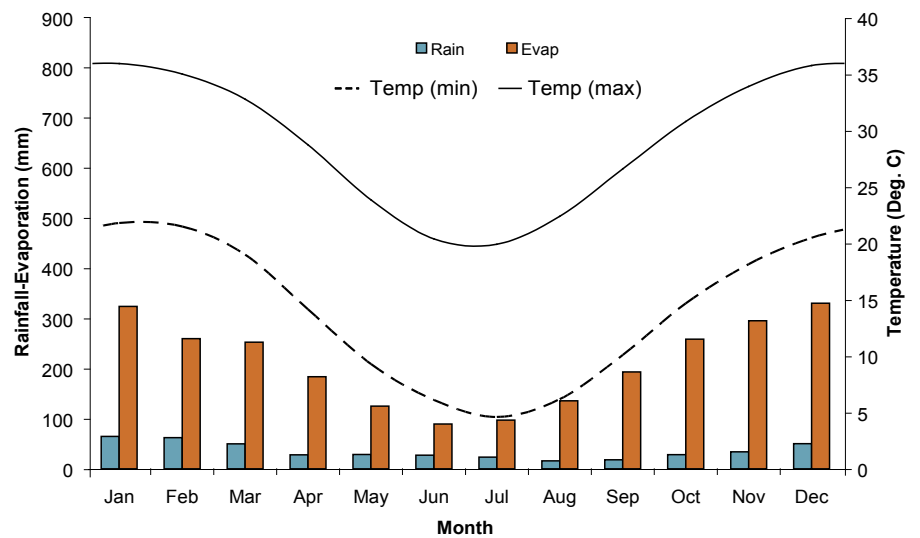
Lake Dartmouth is located approximately 100 km north-west of Charleville, South-West Queensland.

It is the terminal playa lake of Ambathalla Creek. At the time of sampling the lake was not inundated but is usually inundated once in every 5 to 10 years. Inundation can be as little as 0.05 to 0.1 m or up to 3 m deep after large floods<sup>1</sup>.

Lake Dartmouth is an example of a semi-arid floodplain lake in the Mulga Lands Bioregion.



### Climate<sup>2</sup>



The study area is situated within a semi-arid climatic region with no distinct wet or dry season. Evaporation exceeds rainfall in every month. The average annual rainfall for the area is 430 mm.

<b>Landform and Inundation</b>	Periodically inundated lake on gently to strongly undulating tablelands and plains Periodic freshwater inundation from overland flow
<b>Soils<sup>3</sup></b>	Vertosols and Sodosols
<b>Vegetation<sup>4</sup></b>	<i>Eucalyptus coolabah</i> , <i>Acacia stenophylla</i> low open woodland on alluvium (RE 6.3.7)
<b>Geology<sup>5</sup></b>	Quaternary alluvium
<b>Disturbance</b>	No effective disturbance except grazing by hoofed animals



Australian Government

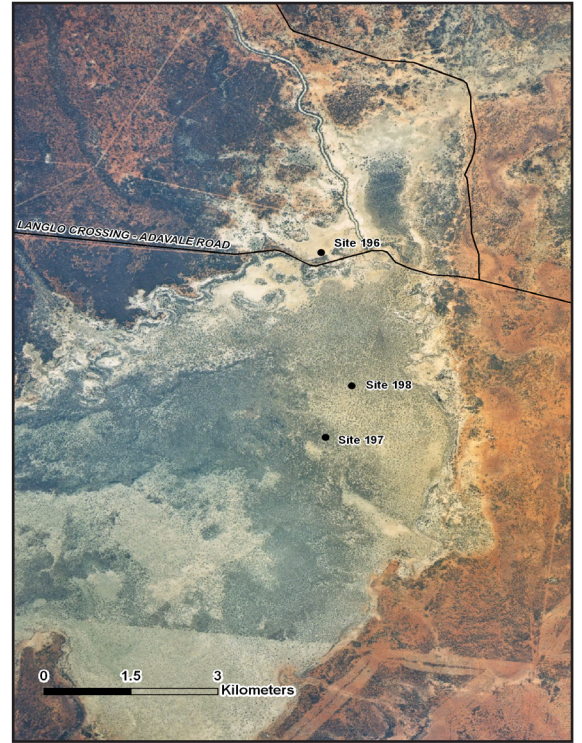


Queensland Government

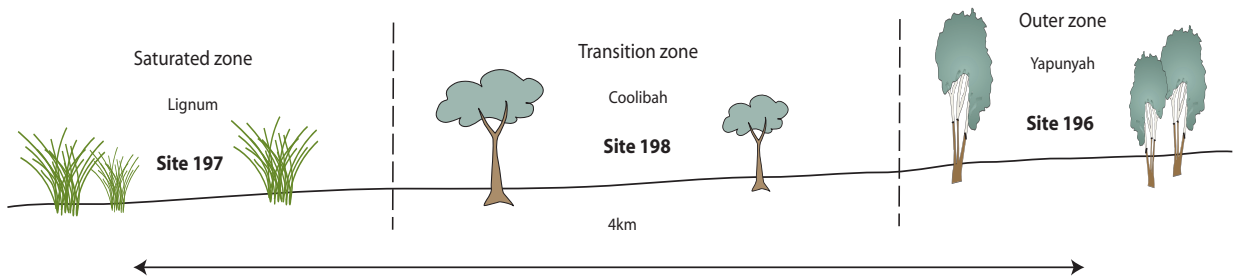
Queensland Wetlands Program

## Location

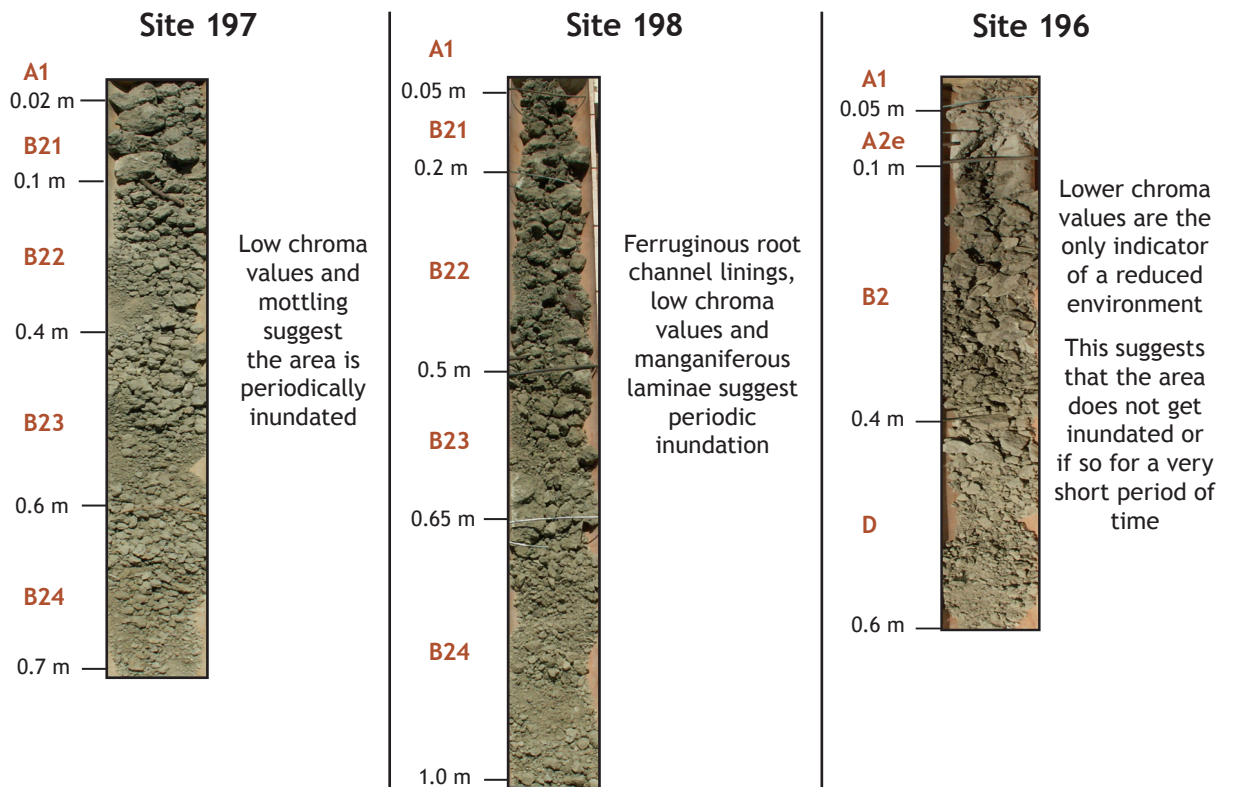
GDA94 • MGA Coordinates : 333345 E, 7118063 N, Zone 55 • Lat/Long : -26.04685 S, 145.33422 E



## Landscape Diagram



## Soil Profiles



## Soil Indicators Present (within 0.3 m of surface)

Indicator <sup>6</sup>	Site 196	Site 197	Site 198
Organic materials and organic carbon (OC)*	No organic materials OC: 0.47%	No organic materials OC: 0.34%	No organic materials OC: 0.68%
Matrix colour	Brown to grey	Greyish brown to olive grey	Grey to greyish brown
Chroma (thickness of layer)**	Present (0.2 m)	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Not present	Common <5 mm distinct brown mottles Few <5 mm faint brown mottles	Few 2-6 mm manganiferous laminae
Depth to groundwater	Not present	Not present	Not present
Ferruginous root channel and pore linings	Not present	Not present	Present
pH <sup>7</sup>	Slightly acid	Neutral	Slightly acid
Texture	Fine sandy loam to light clay	Medium clay to medium heavy clay	Light clay to medium clay
Acid sulfate material	Not present	Not present	Not present
Electrical Conductivity (EC) <sup>7</sup>	Non saline	Non saline	Non saline

\*Organic carbon % (Dumas method) and pH taken from surface (0-0.1 m)

\*\*Chroma value is less than or equal to 2

### Summary of Field Observations

- Presence of *Muehlenbeckia florulenta* and *Eucalyptus microtheca* indicative of intermittent inundation
- Grey Vertosol soils appear to define the boundary of the wetland
- Presence of ferruginous root channel linings (Figure 1) and mangiferous segregations are indicative of periodic saturation in the transition zone
- Faint and distinct mottling to depth indicative of water fluctuation throughout soil profile in the saturated zone, mottling drops out of soil profiles moving into the transition zone from the saturated zone

**Figure 1.** Ferruginous root channel linings provide reliable evidence of plant growth in a saturated environment, where the root has pushed oxygen into the saturated soil forming a coating of ferric iron around the root channel



### References

1. DEWHA (2008). Australian Wetlands Database. [online]. Available at <http://www.environment.gov.au/water/publications/environmental/wetlands/database/> [accessed 21/08/08].
1. Queensland Department of Natural Resources and Water (2008). SILO [online]. Available at <http://www.longpaddock.qld.gov.au/silo/> [accessed 5/11/2007].
2. Isbell RF (2002). *The Australian Soil Classification*. CSIRO Publishing, Collingwood, Victoria, revised edition.
3. EPA (2008) Regional Ecosystems. [online]. Available at [http://www.epa.qld.gov.au/nature\\_conservation/biodiversity/regional\\_ecosystems/](http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/) [accessed 28/06/08].
4. Bureau of Mineral Resources (1970). *Quilpie: Australia 1:250,000 Geological Series*, Bureau of Mineral Resources, Canberra.
5. Bryant KB, Wilson PR, Biggs AJW, Brough DM and Burgess JW (2008). *Soil Indicators of Queensland Wetlands: State-wide assessment and methodology*. Queensland Department of Natural Resources and Water. Brisbane.
6. Hazelton P and Murphy B (2007). *Interpreting Soil Test Results: What do all the numbers mean?.* [2nd ed]. CSIRO publishing. Collingwood Victoria.

Soil Morphology

Site 196		Classification			Australian Soil Classification			Eutrophic, Subnatric, Grey Sodosol		
		Landform Element			Terrace Flat					
		Morphological Type			Flat					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	
A1	0 to .02	-	fine sandy clay loam	brown (10YR53)	none	none	massive	none	-	
A2e	.02 to .1	-	fine sandy loam	brown (10YR53)	none	none	weak 5-10 mm platy	none	-	
B2	.1 to .4	-	light clay	grey (10YR51)	none	none	moderate 10-20 mm angular blocky, strong 2-5 mm angular blocky	none	-	
D	.4 to .6	-	loam	light brownish grey (2.5Y62)	none	none	moderate 5-10 mm platy	common (10-20%) medium (2-6 mm) manganimiferous laminae	-	

Site 197		Classification			Australian Soil Classification			Mottled, Epipedal, Aquic Vertosol		
		Landform Element			Swamp					
		Morphological Type			Flat					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	
A	0 to .03		medium clay	greyish brown (2.5Y52)	none	none	strong 5-10 mm subangular blocky	none	-	
B	.03 to .15		medium heavy clay	greyish brown (2.5Y52)	common (10-20%) fine (<5 mm) distinct brown mottles	none	weak 20-50 mm angular blocky	none	-	
B	.15 to .4		medium clay	olive grey (5Y52)	few (2-10%) fine (<5 mm) faint brown mottles	none	strong 5-10 mm subangular blocky	none	-	
B	.4 to .6		medium clay	olive grey (5Y52)	few (2-10%) fine (<5 mm) faint brown mottles	none	strong 5-10 mm subangular blocky	very few (<2%) fine (<2 mm) manganimiferous soft segregations	-	
B	.6 to .7		light medium clay	light olive grey (5Y62)	common (10-20%) fine (<5 mm) distinct brown mottles	very few (<2%) rounded gravel small pebbles (2-6 mm)	strong 5-10 mm subangular blocky	very few (<2%) fine (<2 mm) manganimiferous soft segregations	-	

Site 198		Classification			Australian Soil Classification				Epihypersodic, Crusty, Grey Vertosol		
		Landform Element			Plain				Flat		
		Morphological Type			Structure				Segregations		Consistence
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .05	abrupt to	light medium clay	grey (10YR6/1)	none	none	moderate 5-10 mm platy	common (10-20%) fine (<2 mm) ferruginous root linings	-		
B21	.05 to .2	clear to	medium clay	grey (2.5Y5/1)	none	none	moderate 10-20 mm angular blocky, moderate 2-5 mm angular blocky	few (2-10%) fine (<2 mm) ferruginous root linings	-		
B22	.2 to .5	clear to	light clay	greyish brown (2.5Y5/2)	none	none	moderate 5-10 mm angular blocky, strong <2 mm lenticular	few (2-10%) medium (2-6 mm) manganiferous laminae	-		
B23	.5 to .65	clear to	light clay	light brownish grey (2.5Y6/2)	few (2-10%) fine (<5 mm) faint orange mottles	none	moderate 2-5 mm angular blocky, strong <2 mm lenticular	few (2-10%) medium (2-6 mm) manganiferous nodules, few (2-10%) medium (2-6 mm) manganiferous laminae	-		
B24	.65 to 1	clear to	light clay	light brownish grey (2.5Y6/2)	none	none	moderate 2-5 mm angular blocky,	few (2-10%) medium (2-6 mm) manganiferous nodules	-		
B25	1 to 1.2	-	light clay	light brownish grey (2.5Y6/2)	none	none	moderate 2-5 mm angular blocky,	none	-		

### Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO3-N (mg/kg)	TC%**	TN%**
196	0.00-0.10	6.2	0.03	<20	<1	0.47	<0.03
	0.20-0.30	6.9	0.06	36	6	0.44	0.04
	0.40-0.50	8.1	0.14	70	3	0.18	<0.03
197	0.00-0.10	7.2	0.06	28	2	0.34	0.05
	0.20-0.30	7.5	0.07	32	3	0.24	0.04
	0.40-0.50	8.2	0.09	43	3	0.1	<0.03
198	0.00-0.10	6.1	0.15	150	3	0.68	0.08
	0.20-0.30	7.1	0.69	848	18	0.34	0.05
	0.40-0.50	7.7	1.31	1530	8	0.18	0.03

\*Aqueous 1:5

\*\*Total carbon and total nitrogen



9 31 1662 180643