


**Division of Mines and Mineral Resources — Report 1990/11**

# A leachate monitoring programme at the Lauderdale landfill site.

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## Abstract

Stainless-steel screens were installed in holes drilled around the perimeter of a landfill disposal area on swampy land at Lauderdale. Two distinct sand layers underly the tip area. Water samples were taken from the holes and analysed.

## INTRODUCTION

The Clarence City Council operates a landfill disposal area on swampy land at Lauderdale, 13 km south-east of Hobart. Seventeen holes were drilled around the perimeter of the existing tip area (fig. 1) using a Triefus augering machine with 110 mm augers.

Stainless-steel sand screens, 50 mm diameter × 600 mm long, were installed in the holes to monitor leachate discharge from the landfill into the groundwater.

## RESULTS

Unfortunately, detailed sampling was not carried out in the area during the first phase of the programme. However sufficient information was collected during the second phase to fill the gap in information.

There are two distinct sand layers (aquifers) underlying the tip area. Basically all the holes were very similar in lithology to holes 14 and 15 (refer to attached logs). The only significant variation occurred in holes 13, 16 and 17, in which there was no upper organic layer and the depth of saturated sands was greater (for example hole 13 – 6 metres and hole 16 – 3.6 metres).

Screens were installed to allow monitoring of the groundwater in both the upper and lower aquifers. The shallow screens were placed in sand overlying a silty clayey layer containing some organic material. The deeper screens (samples designated 'A' in Appendices 1 and 2) were installed just into an olive-green clay layer and sealed off, hopefully preventing the contamination of water samples from the upper aquifer. Above the lower clay layer is, in most cases, coarse sand with shell fragments. This sand allows a reasonable quantity of water to flow into the screens for sampling purposes.

It is possible that during the summer or dryer periods, sampling of the top aquifer (samples marked 'B' in Appendices 1 and 2) may be difficult, as the water table may be too low. However these holes will be useful when the water table is at its maximum, as they should enable better sampling of the surface water before it flows into Ralphs Bay.

Sufficient quantities of water were found in the bottom aquifers to allow water sampling. In most cases sampling can be carried out by using a small pump, or alternatively, a 25 mm bailer manufactured from PVC would be more than suitable. Some examples of yields extracted are:

Hole 13a — 8 L/m  
 Hole 14a — 4 L/m  
 Hole 15a — 2.5 L/m  
 Hole 17 — 4 L/m

To assist with long term monitoring of the immediate area it may be necessary to install at least two control points, i.e. two more screens, some distance away to measure any variation in water qualities over a longer period.

[4 May 1990]



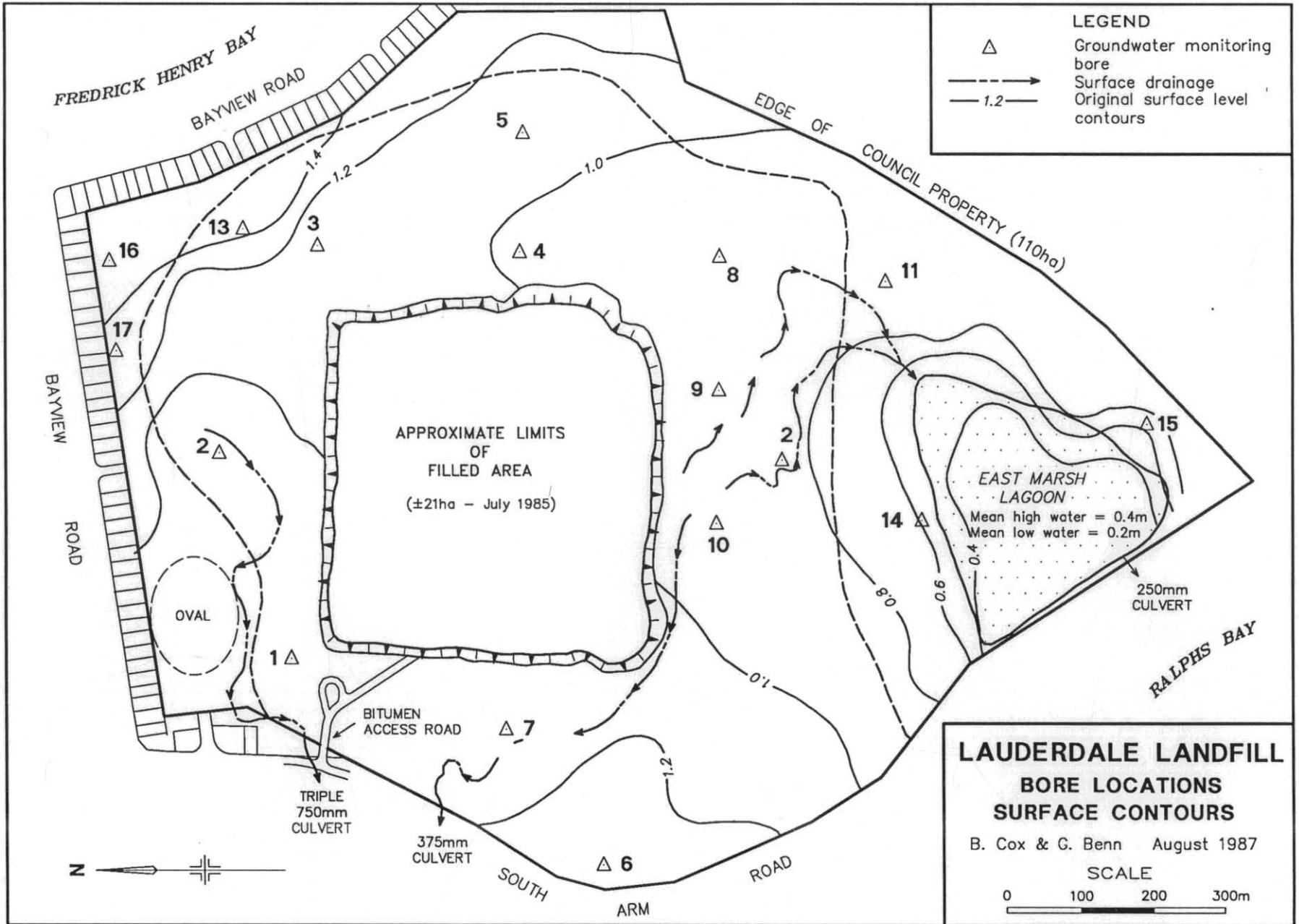
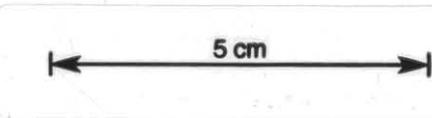


Figure 2.

## APPENDIX 1

## Analyses of water samples

Reg No.	875803	875804	875805	875806	875807	875808	875809	875810
Cond ( $\mu\text{S}/\text{cm}$ )	68,000	48,000	29,000	45,000	60,000	95,000	62,000	83,000
Cl (mg/l)	49,400	28,300	13,100	40,300	49,400	72,400	43,900	50,900
Total Fe	28	44	18.0	88	4.0	12.5	24	52
Colour	100	50	30	60	70	170	80	120
K Nitrogen	5.6	4.1	2.0	6.6	6.6	2.3	2.5	12.7
Locality	4	5A	6	7B	9	10	11	12

Reg No.	875811	875812	875813	875814	875238	875239	875240	875241
Cond ( $\mu\text{S}/\text{cm}$ )	100,000	55,000	72,000	70,000	52,000	80,000	2900	1100
Cl (mg/l)	81,200	77,200	44,300	40,900	25,500	53,000	760	155
Total Fe	34	87	120	91	220	130	35	40
Colour	60	110	180	90	40	200	20	40
K Nitrogen	6.8	11.9	18.8	10.8	6.7	11.5	<0.4	<0.4
Locality	14A	14B	15A	15B	5B	8	13A	13B

Reg No.	875242	875374	875375	875376	875376	875377		
Cond ( $\mu\text{S}/\text{cm}$ )	4600	39,000	64,000	64,000	60,000	50,000		
Cl (mg/l)	1100	22,700	43,400	43,400	38,200	32,100		
Total Fe	60	120	35	35	30	40		
Colour	30	280	40	40	70	50		
K Nitrogen	<0.4	6.7	11.0	11.0	6.0	3.7		
Locality	16	1	2	2	3	17		

## APPENDIX 2

## Details of holes drilled

Hole no.	Depth of sand screens (m)	Pumping rate for 2 litres (sec)	Water level as at 8.1.1989 (m)
1	3	57	0.630
2a	5	105	GL
2b	1.9	-	0.240
3	2.6	30	0.185
4	2.7	17	0.665
5a	4.0	203	0.575
5b	2.0	84	0.550
6	3.4	190	0.210
7a	3.8	37	0.280
7b	2.5	60	0.185
8	4.4	15	0.160
9	4.5	10	0.285
10	2.5	280	0.375
11	3.3	12	0.325
12	2.0	120	0.485
13	4.5	14	0.230
14a	2.8	38	0.290
14b	1.2	55	0.380
15a	2.5	120	0.410
15b	1.4	120	0.880
16a	3.6	15	0.905
16b	2.2	-	0.540
17	5.1	12	

# ENGINEERING LOG – BOREHOLE

project		WASTE DISPOSAL SITE		location		LAUDERDALE TIP					
co-ordinates		drill type		Triefus		hole commenced		21.8.1986			
R.L.		drill method		Auger		hole completed		21.8.1986			
inclination		drill fluid				drilled by		B.E.Cox			
bearing						logged by		R.C.Donaldson			
checked by											
penetration	support	water	notes	metres	graphic log	classification	material	moisture	consistency	hand	structure, geology
1 2 3			samples, tests	R.L. depth		symbol	soil type: plasticity or particle characteristics, colour, secondary and minor components.	condition	density index	penetr-ometer kPa 25 50 100 200 400	
			First hole terminated at 1.5 m	1		SP	SAND: fine, yellow				TOP
						SP	SAND: fine, grey, some shell frags.	W			AQUIFER
			Hole continued 1 m away to 2.8 m	2		CH	Sandy CLAY: high plasticity, mottled green (glaucanitic?), sand fine, some clayey sand (SC) lenses	M > PL	F		AQUICLUDE
						CH	Sandy CLAY: high plasticity, olive to khaki green. Sand fine, some coarse sand to fine gravel, Fe nod.	M > PL			
						SP	SAND: fine, grey-green, some clay. Becoming more clayey with depth to form clayey sand (SC)	W			BOTTOM
						CH	Sandy CLAY: High plasticity, grey-brown, sand fine	M > PL	F		AQUICLUDE
				3			HOLE TERMINATED AT REQUIRED DEPTH OF 2.8 m IN SANDY CLAY				

