

The Fairview Story - Hydrology

1. Hypothesis

Following construction of the Fairview Drain in 1998, a characteristic draw down pattern and a significant reduction in the water table was observed. Currently, however, the water table appears to have lost the draw down pattern and mimics the surface features.

An investigation of the soils adjacent to the drain and inspection of the drain batters has revealed podsol pipe features in the sandy light medium clay layer that show a highly leached pure sand centre consistently 100-200mm diameter. At approximately 2.5 – 3.0 metres BGL the clayey layer is underlain by a saturated sandy layer. Drilling in January 2004 revealed that at the study site this sand extended to at least 11 metres BGL in the immediate vicinity of the drain when drilling was halted. These pure sand “pipes” are distinctively vertical and provide a preferential flow path for surface water through the clayey layer to the highly permeable sand layer below.

The lateral extent of the distribution of these “pipes” has not been fully investigated but they appear up to 50 K towards the north on the inter-dunal flat that incorporates the the Fairview and Wongawilli Drains and the un-drained region between them. No evidence could be found in any of the other inter-dunal flats immediately to the east and west. Similar feaures do, however, appear in the soil profile at the Northern Catchment monitored site, but are nowhere near as striking.

The Fairview Drain was excavated to an average depth of 3 m at the principal study site and intercepted the sandy layer thereby initiating a quick response from the water table. Since then, erosion of the highly sodic clays in the bank and the spoil heaps has in-filled the drain with approximately 500 mm of sediment thereby producing an effective seal for the high yielding sandy layer. As a consequence, the effectiveness of the drain is greatly diminished though the physical processes of slumping and silting.

Drainage status	Effect
No drain	Elevated watertable
New drain	Lowered watertable
In-filled drain	Increasing watertable