

## **Decay Products In Cemetery Groundwaters**

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In Australia during 1994-98, 72 sampling points located throughout 9 different cemeteries were sampled to detect the presence of decay products. The cemeteries are representative of about 60% of the population and occur in diverse hydrogeological settings; varying from unconsolidated aeolian dune sand deposits hosting a phreatic aquifer to partially consolidated, Tertiary sediment of stiff clays with interbedded sands and gravels hosting ephemeral, perched watertables.

In a cemetery there is a great temporal and spatial variation to the decay of the interred remains. Such factors as the age, size, and intactness of the remains, the presence of funereal artefacts, coffin construction and methodologies of burial all have an influence, in addition to the multiple soil parameters and the hydrogeological setting. For assessment, a cemetery needs to be considered as a "black box" and investigations concentrated on potential inputs and outputs at the boundaries.

On the basis of the typical lean, 70kg, representative, male human it would be anticipated that 16000g C, 1800g N, 500g P, 140g S would be ultimately released to the environment during decay. Together with this would be the full microbiological complement of the remains which should be detectable through indicator organisms like *E. coli* or *faecal coliforms*, *faecal streptococci*, and *pseudomonas aeruginosa*. In the temperate zone sites studied, very little decay product is observed at any significant distance from the remains whether in small or large or old cemeteries. Sites located on materials with high K are predicably more likely to allow off-site transmission: however, when background values are compared to those within the cemetery and at downgradient cemetery boundaries, there is little effect measured.