

Short summary of Australian database

A database of paired petroleum hydrocarbon soil vapour and groundwater source concentrations has been compiled over 3 years from sites in Australia, as summarised in Table 1. All data were reviewed in detail to ensure it was suitable for interpretation and interrogation. Hence some data has been excluded from the database due to a lack of source information, problems with data quality and/or conceptual site model issues. This refined database then formed the basis for conducting more detailed reviews that have been focused on establishing exclusion/separation distances.

Table 1. Summary of petroleum hydrocarbon data within Australian database

Information sources	1083 paired soil vapour and groundwater source concentrations from 124 sites Vapour data from single and nested wells, 12% of which are sub-slab
Data reported	Benzene, toluene, ethylbenzene and xylenes (BTEX), volatile total petroleum hydrocarbon fractions (TPH) and hexane (soil vapour only); measurements of oxygen, carbon dioxide and methane in the soil profile; source type and site characteristics
Locations	43% of sites from VIC, 29% from NSW, 10% from SA, 7% from ACT, 4% from QLD, 3% from WA and remaining 4% from TAS and the NT
Sources	Dissolved phase (28% data) and NAPL (72% data) from petrol and/or diesel sources
Soil types	The dominant soil types comprise sand (13%), clay (42%) and sandy clay (45%). 41% of all data sites include groundwater within a fractured rock system

Climate information

Victoria:

The majority of the sites are located in various suburbs of Melbourne, the capital city of Victoria. Melbourne tends to have changeable weather conditions, due to its location between the hot inland areas and the cold southern ocean. Temperatures in Melbourne range from an average of 6-13 oC in winter to 12-26 oC in summer. Melbourne can experience extreme heat, due to the movement of hot dry air from central Australia, resulting in temperatures above 40oC. Mean rainfall in Melbourne is 650 mm per year.

New South Wales:

The majority of the sites are located in various suburbs of Sydney, the capital city of NSW. Sydney's weather is temperate, with the city temperatures moderated by location close to the ocean. Temperatures in Sydney range from an average of 8-16 oC in winter to 13-25 oC in summer. Sydney's weather can be influenced by the movement of warm/hot moist air from the north (Queensland), or from the movement of hot dry air from central Australia. Mean rainfall in Melbourne is 1213 mm per year. Regional areas of NSW experience hotter, drier conditions than Sydney.

ACT (Australian Capital Territory):

The ACT, which largely comprises Canberra and urban suburbs, is located within NSW, inland and south of Sydney. The climate has warm to hot summers and cool to cold winters. Temperatures in Canberra range from an average of 0-13 oC in winter to 8-28 oC in summer. Mean rainfall in Canberra is 616 mm per year.

Queensland:

The majority of the sites are located in various suburbs of Brisbane, the capital city of QLD, located in the SE corner of the state. Brisbane has a humid subtropical climate with warm to hot humid summers and dry to moderately warm winters. Temperatures in Brisbane range from an average of 9-21 oC in winter to 18-30 oC in summer. Mean rainfall in Melbourne is 986 mm per year.

Brisbane lies in the Tropical Cyclone risk area, however the higher risk areas are located further north. Areas located further north of Brisbane are more tropical. Inland of Brisbane are areas that experience hotter and drier conditions.

South Australia:

The majority of the sites are located in various suburbs of Adelaide, the capital city of SA. Adelaide has a hot Mediterranean climate resulting in cool, wet winters and hot, dry summers. Temperatures in Adelaide range from an average of 7-15 oC in winter to 14-29 oC in summer. Adelaide can experience extreme heat, and extended heatwave conditions, due to the movement of hot dry air from central Australia, resulting in temperatures above 40oC. Adelaide is the driest capital city in Australia, with highly variable and unreliable rainfall. Mean rainfall in Adelaide is 546 mm per year. North of Adelaide, in regional inland areas, the climate is hotter and drier.

Western Australia:

The majority of the sites are located in various suburbs of Perth, the capital city of WA. Perth has temperate to Mediterranean climate resulting in cool, wet winters and hot, dry summers. Temperatures in Perth range from an average of 7-14 oC in winter to 16-31 oC in summer. Mean rainfall in Perth is 850 mm per year. East, North and Northeast of Perth are drier desert that experience more a significant and distinctive wet (winter) season and dry (summer) season.

Dry areas in Australia:

There are some areas of Australia that are dry. In the database these locations include:
Loxton, SA – mean annual rainfall is 264 mm
Barham NSW - mean annual rainfall is 373 mm
Cleve SA - mean annual rainfall is 400 mm
Note that from 2000 to 2010 Australia was in drought with most locations experiencing rainfall much lower than average.