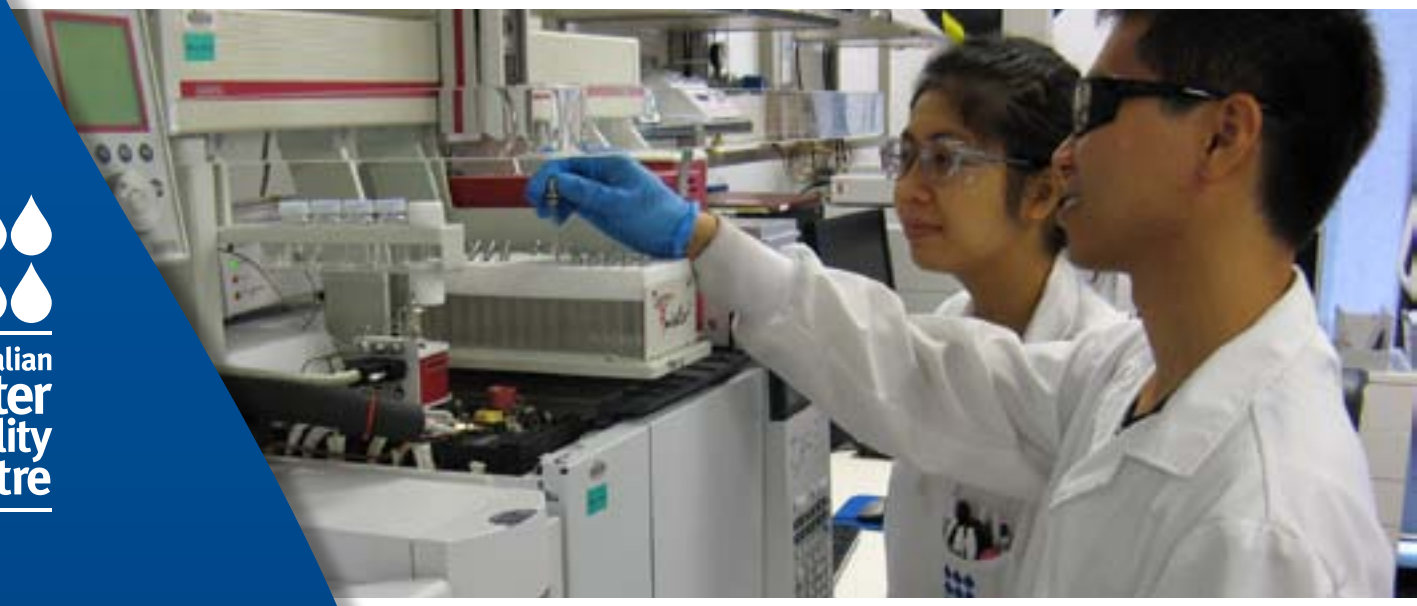
Polyaromatic Hydrocarbons (PAHs) in Water



Australian Water Quality Centre

AWQC has developed an environmentally friendly method for determining Polycyclic Aromatic Hydrocarbons (PAHs) in Water.

PAH is a hydrocarbon molecule with two or more fused aromatic rings, and are found mainly in crude oil and coal, as well as in processed fossil fuels, tar and various edible oils. In the natural environment, PAHs are often detected primarily in soil, sediment and oily substances, however they are introduced to aquatic environments by runoff and can leach out from bituminous liners into water distribution systems.

PAHs are one of the most common organic pollutants and are listed as priority pollutants by many countries. Their toxicities range from relatively non-toxic to highly carcinogenic. The Australian Drinking Water Guidelines limit for benzo[a]pyrene is 0.01 µg/L.

Sample Requirements:

- Minimum volume 100 mL
- 100 mL amber glass bottles with PTFE liners
- No air gap essential
- Transport & store at 4°C

Available for potable water, groundwater, surface and sea water.

AWQC has developed and validated a method using a stir bar sorptive extraction (SBSE) technique for extracting trace levels of 18 PAHs in water. This method has many advantages over such traditional methods as liquid-liquid and solid phase extraction techniques, in that it uses virtually no solvent, requires a small sample volume, and eliminates completely the use of liquid nitrogen, which poses a serious hazard in many analytical laboratories worldwide.

The PAH method developed by AWQC is validated for various sample matrices, including surface water, bore water, seawater and treated water. The method is in the process of gaining NATA accreditation.

Limits of Reporting		Average recoveries in seven replicates (%)			
Components	LOR (µg/L)	0.01µg/L	0.02µg/L	0.05µg/L	0.10µg/L
Naphthalene	0.05	-	-	109	100
1-Methylnaphthalene	0.05	-	-	101	90
2-Methylnaphthalene	0.05	-	-	102	93
Acenaphthylene	0.05	-	-	110	99
Acenaphthene	0.02	-	112	106	102
Fluorene	0.02	-	110	107	100
Phenanthrene	0.02	-	106	103	102
Anthracene	0.02	-	99	96	93
Fluoranthene	0.02	-	100	101	96
Pyrene	0.02	-	100	101	95
Benzo[a]anthracene	0.02	-	108	106	93
Chrysene	0.02	-	100	98	103
Benzo[a]pyrene	0.01	95	96	94	92
Benzo[b]fluoranthene	0.02	-	103	97	91
Benzo[k]fluoranthene	0.02	-	115	99	85
Dibenz[a,h]anthracene	0.02	-	100	86	92
Benzo[g,h,i]perylene	0.02	-	110	88	93
Indeno[1,2,3-cd]pyrene	0.02	-	106	89	98

Australian Drinking Water Guideline for benzo[a]pyrene is 0.01 µg/L.

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