

Water sampling results

Metal	Units	Guidelines			Results			
		Australian and New Zealand guidelines for fresh and marine water quality – 95% level of protection	Australian recreational water quality guidelines	Australian drinking water guidelines	Residential pool	Residential water tank	Morwell wetlands	Hourigan Road Creek
DATE					18/02/2014	24/02/2014	24/02/2014	24/02/2014
pH	pH units	6.5-7.7		6.5-8.5		7.4	7.3	6.9
Aluminium	mg/L	0.055	-	-	1	0.22	4.2	0.15
Antimony	mg/L	-	0.03	0.003	<0.01	<0.001	<0.001	<0.001
Arsenic	mg/L	0.024 (as As III)	0.1	0.01	<0.01	<0.001	0.015	<0.001
Barium	mg/L	-	20	2	0.31	0.15	0.13	0.066
Beryllium	mg/L	-	0.6	0.06	<0.01	<0.001	<0.001	<0.001
Boron	mg/L	0.37	40	4	<0.2	0.12	0.06	0.03
Cadmium	mg/L	0.0002	0.02	0.002	<0.002	<0.0002	<0.0002	<0.0002
Chromium (all)	mg/L	0.001 (as Cr III)	0.5	0.05	<0.01	<0.001	0.006	<0.001
Cobalt	mg/L	-	-	-	<0.01	<0.001	0.004	0.002
Copper	mg/L	0.0014	20	2	0.02	0.027	0.007	0.002
Iron	mg/L	-	-	-	6.5	3	13	1.8
Lead	mg/L	0.0034	0.1	0.01	<0.01	0.017	0.006	<0.001
Manganese	mg/L	1.9	5	0.5	0.1	0.062	0.95	0.65
Mercury	mg/L	0.0006	0.01	0.001	<0.001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.5	0.05	<0.01	<0.001	0.003	<0.001
Nickel	mg/L	0.011	0.2	0.02	<0.01	0.002	0.005	0.002
Selenium	mg/L	0.011	0.1	0.01	<0.01	<0.001	0.002	<0.001
Silver	mg/L	0.00005	1	0.1	<0.01	<0.001	<0.001	<0.001
Strontium	mg/L	-	-	-	0.27	0.37	0.19	0.19
Thallium	mg/L	-	-	-	<0.01	<0.001	<0.001	<0.001
Tin	mg/L	-	-	-	<0.01	<0.001	<0.001	<0.001
Titanium	mg/L	-	-	-	0.06	0.009	0.047	0.007
Vanadium	mg/L	-	-	-	<0.01	<0.001	0.023	<0.001
Zinc	mg/L	0.008	-	-	0.35	3.5	0.016	0.069
Polycyclic aromatic hydrocarbons (PAHs)								
Acenaphthene	mg/L	-			0.001	<0.001	<0.001	<0.001
Acenaphthylene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Anthracene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Benz(a)anthracene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Benzo(a)pyrene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Benz(b)fluoranthene	mg/L	-		0.00001	<0.001	<0.001	<0.001	<0.001
Benzo(ghi)perylene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Benzo(k)fluoranthene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Chrysene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Dibenz(ah)anthracene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Fluoranthene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Fluorene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Indeno(123)pyrene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Napthalene	mg/L	0.016			<0.001	<0.001	<0.001	<0.001
Phenanthrene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Pyrene	mg/L	-			<0.001	<0.001	<0.001	<0.001
Total PAHs	mg/L	-			0.001	<0.001	<0.001	<0.001

Ash and soil sampling results

	Guidelines		Results					
	<i>National Environment Protection (Assessment of Site Contamination) Measure</i>	Soil hazard categorisation and management (EPA Victoria, IWRG 621)	Soil sample Residential 1	Soil sample Residential 1	Soil sample Residential 2	Soil sample Residential 3	Soil sample Morwell East air monitoring station, Hourigan Road	Sediment (ash) from water sample
	HIL: Residential-A ¹	Fill material upper limits ²	18/02/14	24/02/14	24/02/14	24/02/14	24/02/14	18/02/14
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Metal								
Aluminium (Al)	-	-	8900	6500	8500	2700	4500	1700
Antimony (Sb)	-	-	<5	<5	<5	<5	<5	<5
Arsenic (As)	100	20	<5	6	<5	<5	<5	<5
Barium (Ba)	-	-	1500	27	36	22	35	190
Beryllium (Be)	60	-	<5	<5	<5	<5	<5	<5
Boron (B)	4500	-	220	<10	<10	<10	<10	<10
Cadmium (Cd)	20	3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (Cr)	100 (as Cr VI)	1 (as Cr VI)	9	14	19	8	10	<5
Cobalt (Co)	100	-	7	<5	<5	<5	<5	<5
Copper (Cu)	6000	100	12	10	6	10	9	7
Iron (Fe)	-	-	39000	9500	12000	5600	9400	9100
Lead (Pb)	300	300	5	17	21	15	8	<5
Manganese (Mn)	3800	-	440	55	95	71	140	91
Mercury (Hg)	40	1	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Molybdenum (Mo)	-	40	<5	<5	<5	<5	<5	<5
Nickel (Ni)	400	60	20	<5	5	6	12	<5
Selenium (Se)	200	10	5	<3	<3	<3	<3	<3
Silver (Ag)	-	10	<5	<5	<5	<5	<5	<5
Strontium (Sr)	-	-	1100	10	13	9	17	84
Thallium (Tl)	-	-	<5	<5	<5	<5	<5	<5
Thorium (Th)	-	-	<5	<5	<5	<5	<5	<5
Tin (Sn)	-	50	<5	<5	<5	<5	<5	<5
Titanium (Ti)	-	-	460	21	41	170	170	86
Uranium (U)	-	-	<5	<5	<5	<5	<5	<5
Vanadium (V)	-	-	14	19	22	11	14	<5
Zinc (Zn)	7400	200	110	210	24	32	28	340
Polycyclic aromatic hydrocarbons (PAHs)								
Acenaphthene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	-	-	0.4	<0.1	<0.1	<0.1	<0.1	0.2
Anthracene	-	-	0.6	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	-	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	-	-	0.4	<0.1	<0.1	<0.1	<0.1	0.1
Fluorene	-	-	1	<0.1	<0.1	<0.1	<0.1	0.4
Indeno(123)pyrene	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Napthalene	-	-	6.5	<0.1	<0.1	<0.1	<0.1	2.8
Phenanthrene	-	-	3.7	<0.1	<0.1	<0.1	<0.1	1.3
Pyrene	-	-	0.3	<0.1	<0.1	<0.1	<0.1	0.1
Total PAHs	300	20	13	<0.1	<0.1	<0.1	<0.1	5.1
BaP TEQ (zero)	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BaP TEQ (LOR)	3	-	0.2	0.2	0.2	0.2	0.2	0.2

1. HIL: Residential A – Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.

2. Fill Material Upper Limits – these soils may be used anywhere within the State of Victoria without approval from EPA.