Technical Report No. 5

Air Emissions Inventory for the Greater Metropolitan Region in New South Wales

Domestic-Commercial Emissions Module: Results

Prepared jointly by

Department of Environment and Climate Change NSW
Optimised Operations Pty Ltd

Department of Environment & Climate Change NSW

Acknowledgments

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Executive Summary

The Department of Environment and Climate Change NSW (DECC), in collaboration with Optimised Operations (Tseng et. al., 2006), has completed a three year air emissions inventory project for domestic-commercial sources. The base year of the domestic-commercial inventory represents activities that took place during the 2003 calendar year and is accompanied by emission projections in yearly increments up to the 2031 calendar year. The area included in the study covers greater Sydney, Newcastle and Wollongong regions, known collectively as the Greater Metropolitan Region (GMR).

The study region defined as the GMR measures 210 km (east-west) by 273 km (north-south). The study region is defined in Table ES1.1 and shown in Figure ES1.1.

Table ES1.1: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong Regions

Region	South-west corner MGA [1] co-ordinates		North-east corner MGA [1] co-ordinates	
	Easting (km)	Northing (km)	Easting (km)	Northing (km)
Greater Metropolitan	210	6159	420	6432
Sydney	261	6201	360	6300
Newcastle	360	6348	408	6372
Wollongong	279	6174	318	6201

[1] MGA = Map Grid of Australia based on the Geocentric Datum of Australia 1994 (GDA94) (ICSM, 2002).

The domestic-commercial air emissions inventory includes emissions from the following sources:

- Aerosols and solvents (domestic & commercial);
- Barbecues (domestic);
- Cutback bitumen;
- Gaseous fuel combustion (domestic);
- Lawn mowing and garden equipment (domestic);
- Lawn mowing and garden equipment (public open space);
- Liquid fuel combustion (domestic);
- Natural gas leakage;
- Solid fuel combustion (domestic); and
- Surface coating (domestic, commercial & industrial).

The pollutants inventoried include criteria pollutants specified in the Air NEPM (NEPC, 2003), air toxics associated with the National Pollutant Inventory (NEPC, 2000) and the Air Toxics NEPM (NEPC, 2004) and any other pollutants associated with state specific programs, i.e. Load Based Licensing (Protection of the Environment Operations (General) Regulation 1998 (PCO, 1998)) and Protection of the Environment Operations (Clean Air) Regulation 2002 (PCO, 2005).

Figure ES1.1: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong Regions

Table ES1.2 shows total estimated annual emissions (for selected substances) from all domestic-commercial sources in the study region (i.e. GMR), Sydney, Newcastle and Wollongong regions. Total estimated annual emissions are also presented for the region defined as Non-Urban. This region is the area of the GMR minus the combined areas of the Sydney, Newcastle and Wollongong regions. These substances were selected since they are:

- The most common air pollutants found in airsheds according to the National Pollutant Inventory (NEPC, 2000);
- Referred to in National Environment Protection Measures (NEPMs) for criteria pollutants (NEPC, 2003) and air toxics (NEPC, 2004); and
- They have been classified as priority air pollutants (NEPC, 2005).

Table ES1.2: Total estimated annual emissions from domestic-commercial sources in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	$4.22 \times 10^{+01}$	3.61	2.29	8.53	$5.66 \times 10^{+01}$
ACETALDEHYDE	$7.83 \times 10^{+02}$	$6.68 \times 10^{+01}$	$4.28 \times 10^{+01}$	$1.55 \times 10^{+02}$	$1.05 \times 10^{+03}$
BENZENE	$5.74 \times 10^{+02}$	$4.87 \times 10^{+01}$	$3.13 \times 10^{+01}$	$1.13 \times 10^{+02}$	$7.67 \times 10^{+02}$
CARBON MONOXIDE	$6.72 \times 10^{+04}$	$5.78 \times 10^{+03}$	$3.64 \times 10^{+03}$	$1.39 \times 10^{+04}$	$9.05 \times 10^{+04}$
FORMALDEHYDE	$8.41 \times 10^{+02}$	$7.13 \times 10^{+01}$	$4.61 \times 10^{+01}$	$1.63 \times 10^{+02}$	$1.12 \times 10^{+03}$
ISOMERS OF XYLENE	$2.07 \times 10^{+03}$	$1.53 \times 10^{+02}$	$1.05 \times 10^{+02}$	$3.71 \times 10^{+02}$	$2.70 \times 10^{+03}$
LEAD AND COMPOUNDS	1.14×10^{-01}	9.65×10^{-03}	6.15×10^{-03}	2.30×10^{-02}	1.53×10^{-01}
OXIDES OF NITROGEN	$1.36 \times 10^{+03}$	$1.05 \times 10^{+02}$	$6.83 \times 10^{+01}$	$2.62 \times 10^{+02}$	$1.79 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	$4.99 \times 10^{+03}$	$4.23 \times 10^{+02}$	$2.74 \times 10^{+02}$	$9.61 \times 10^{+02}$	$6.65 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	$4.83 \times 10^{+03}$	$4.08 \times 10^{+02}$	$2.65 \times 10^{+02}$	$9.29 \times 10^{+02}$	$6.43 \times 10^{+03}$
POLYCYCLIC AROMATIC HYDROCARBONS	$1.70 \times 10^{+02}$	$1.29 \times 10^{+01}$	8.72	$3.03 \times 10^{+01}$	$2.22 \times 10^{+02}$
SULFUR DIOXIDE	$1.08 \times 10^{+02}$	8.87	5.76	$2.08 \times 10^{+01}$	$1.43 \times 10^{+02}$
TETRACHLOROETHYLENE	$5.68 \times 10^{+01}$	3.85	2.75	9.19	$7.26 \times 10^{+01}$
TOLUENE	$3.21 \times 10^{+03}$	$2.31 \times 10^{+02}$	$1.62 \times 10^{+02}$	$5.58 \times 10^{+02}$	$4.16 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	$5.25 \times 10^{+03}$	$4.45 \times 10^{+02}$	$2.88 \times 10^{+02}$	$1.01 \times 10^{+03}$	$7.00 \times 10^{+03}$
TOTAL VOCS	$5.19 \times 10^{+04}$	$3.79 \times 10^{+03}$	$2.62 \times 10^{+03}$	$8.97 \times 10^{+03}$	$6.73 \times 10^{+04}$
TRICHLOROETHYLENE	4.13	3.39×10^{-01}	2.17×10^{-01}	8.22×10^{-01}	5.50

Figure ES1.2 shows the proportion of total estimated annual emissions (for selected substances) from all domestic-commercial sources in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions.

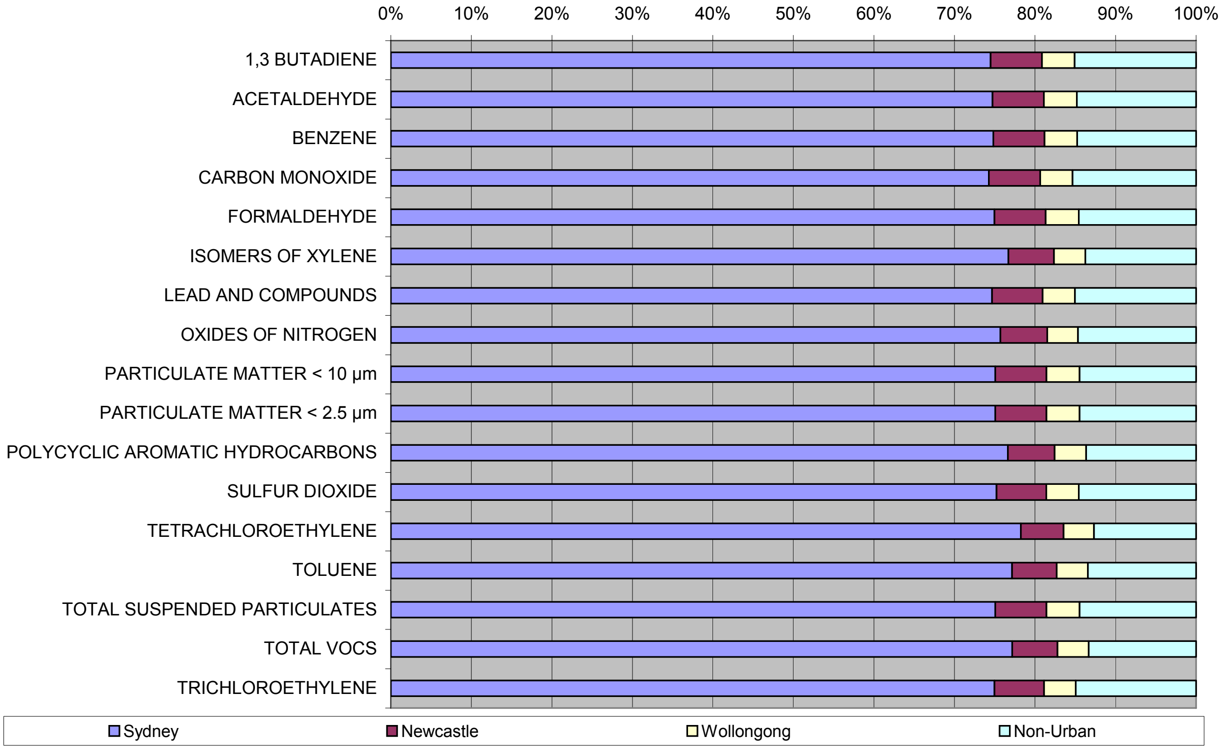

Figure ES1.2: Proportion of total estimated annual emissions from domestic-commercial sources in each region

Tables ES1.3, ES1.4, ES1.5, ES1.6 and ES1.7 show total estimated annual emissions (for selected substances) from each domestic-commercial source type in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions respectively.

Figures ES1.3, ES1.4, ES1.5, ES1.6 and ES1.7 show the proportion of total estimated annual emissions (for selected substances) from each domestic-commercial source type in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions respectively.

Table ES1.3: Total estimated annual emissions by domestic-commercial source type in the GMR

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.37×10^{-01}	-	-	$1.96 \times 10^{+01}$	5.35	-	-	$3.15 \times 10^{+01}$	-	$5.66 \times 10^{+01}$
ACETALDEHYDE	-	3.38	-	-	$1.75 \times 10^{+01}$	$6.74 \times 10^{+01}$	-	-	$9.60 \times 10^{+02}$	-	$1.05 \times 10^{+03}$
BENZENE	1.09×10^{-02}	1.62	-	4.05	$8.98 \times 10^{+01}$	$4.56 \times 10^{+01}$	3.94×10^{-04}	-	$6.15 \times 10^{+02}$	$1.09 \times 10^{+01}$	$7.67 \times 10^{+02}$
CARBON MONOXIDE	-	$2.31 \times 10^{+02}$	-	$3.24 \times 10^{+02}$	$4.16 \times 10^{+04}$	$1.13 \times 10^{+04}$	9.23	-	$3.71 \times 10^{+04}$	-	$9.05 \times 10^{+04}$
FORMALDEHYDE	2.86	3.87	-	8.11	$3.18 \times 10^{+01}$	$4.17 \times 10^{+01}$	6.08×10^{-02}	-	$1.03 \times 10^{+03}$	-	$1.12 \times 10^{+03}$
ISOMERS OF XYLENE	$4.77 \times 10^{+02}$	5.52×10^{-01}	$9.38 \times 10^{+01}$	-	$5.30 \times 10^{+02}$	$1.40 \times 10^{+02}$	2.01×10^{-04}	-	$9.55 \times 10^{+01}$	$1.36 \times 10^{+03}$	$2.70 \times 10^{+03}$
LEAD AND COMPOUNDS	-	6.65×10^{-03}	-	4.10×10^{-03}	5.62×10^{-02}	1.60×10^{-02}	2.78×10^{-03}	-	6.76×10^{-02}	-	1.53×10^{-01}
OXIDES OF NITROGEN	-	$7.04 \times 10^{+01}$	-	$7.62 \times 10^{+02}$	$1.77 \times 10^{+02}$	$2.69 \times 10^{+02}$	$3.32 \times 10^{+01}$	-	$4.80 \times 10^{+02}$	-	$1.79 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	-	$1.23 \times 10^{+01}$	-	$6.08 \times 10^{+01}$	$2.51 \times 10^{+02}$	$1.54 \times 10^{+02}$	7.38×10^{-01}	-	$6.17 \times 10^{+03}$	-	$6.65 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	-	6.87	-	$6.08 \times 10^{+01}$	$2.31 \times 10^{+02}$	$1.43 \times 10^{+02}$	1.85×10^{-01}	-	$5.99 \times 10^{+03}$	-	$6.43 \times 10^{+03}$
POLCYCLIC AROMATIC HYDROCARBONS	$1.07 \times 10^{+02}$	1.23×10^{-01}	-	5.32×10^{-03}	$1.50 \times 10^{+01}$	7.83	2.15×10^{-03}	-	$9.20 \times 10^{+01}$	-	$2.22 \times 10^{+02}$
SULFUR DIOXIDE	-	3.99	-	4.86	$1.50 \times 10^{+01}$	9.40	$1.31 \times 10^{+01}$	-	$9.66 \times 10^{+01}$	-	$1.43 \times 10^{+02}$
TETRACHLOROETHYLENE	$6.54 \times 10^{+01}$	5.10×10^{-03}	-	-	4.44	1.11	-	-	1.58	-	$7.26 \times 10^{+01}$
TOLUENE	$9.95 \times 10^{+02}$	9.61×10^{-01}	-	2.03	$4.90 \times 10^{+02}$	$1.32 \times 10^{+02}$	1.14×10^{-02}	-	$1.97 \times 10^{+02}$	$2.34 \times 10^{+03}$	$4.16 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	$1.30 \times 10^{+01}$	-	$6.08 \times 10^{+01}$	$2.64 \times 10^{+02}$	$1.62 \times 10^{+02}$	7.77×10^{-01}	-	$6.50 \times 10^{+03}$	-	$7.00 \times 10^{+03}$
TOTAL VOCS	$2.62 \times 10^{+04}$	$5.13 \times 10^{+01}$	$2.37 \times 10^{+03}$	$4.46 \times 10^{+01}$	$5.42 \times 10^{+03}$	$1.64 \times 10^{+03}$	1.32	$1.99 \times 10^{+03}$	$1.27 \times 10^{+04}$	$1.69 \times 10^{+04}$	$6.73 \times 10^{+04}$
TRICHLOROETHYLENE	1.12	3.11×10^{-03}	-	-	2.73	6.80×10^{-01}	-	-	9.69×10^{-01}	-	5.50

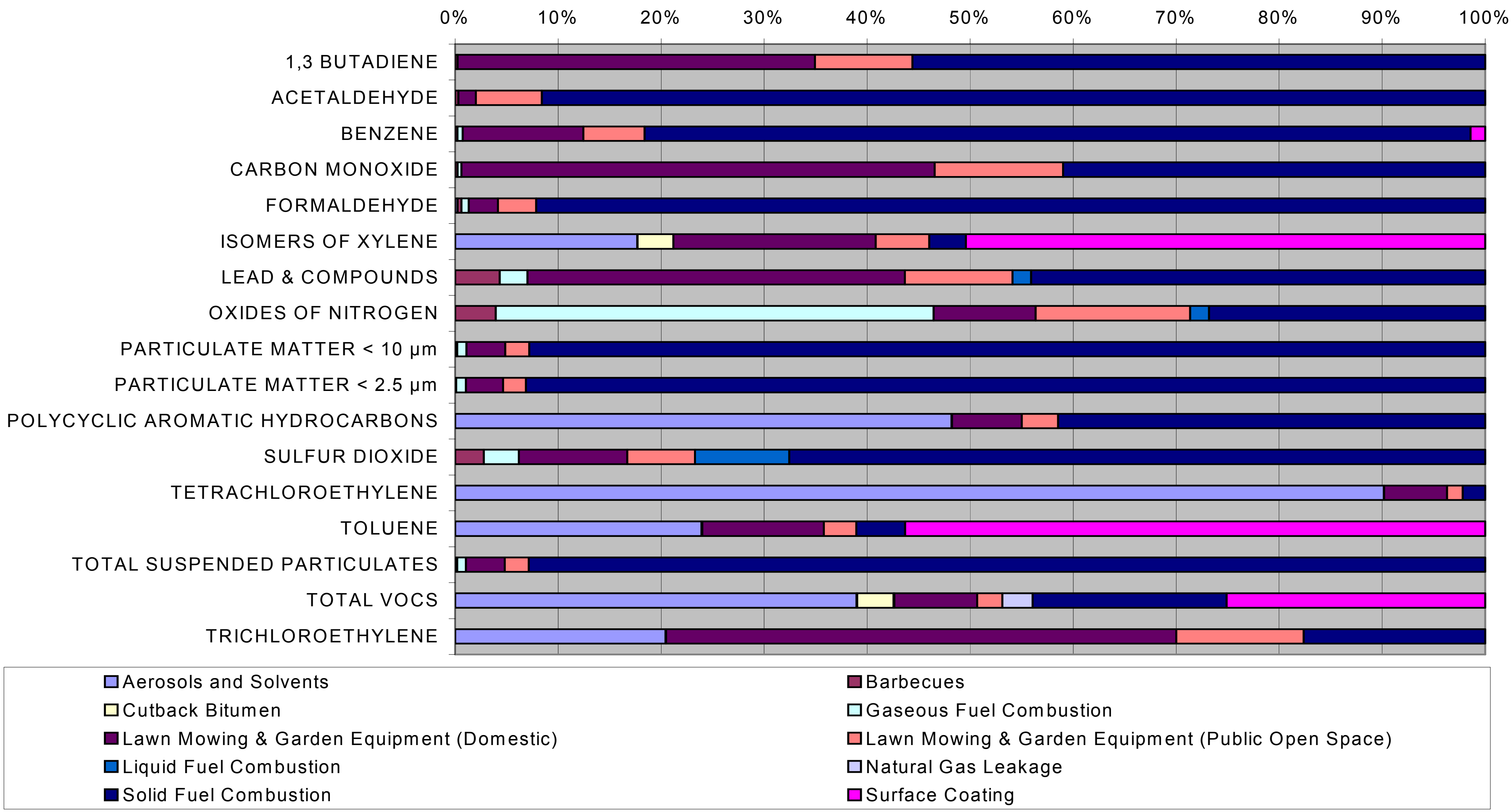

Figure ES1.3: Proportion of total estimated annual emissions by domestic-commercial source type in the GMR

Table ES1.4: Total estimated annual emissions by domestic-commercial source type in the Sydney region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.06×10^{-01}	-	-	$1.48 \times 10^{+01}$	3.61	-	-	$2.37 \times 10^{+01}$	-	$4.22 \times 10^{+01}$
ACETALDEHYDE	-	2.62	-	-	$1.32 \times 10^{+01}$	$4.54 \times 10^{+01}$	-	-	$7.22 \times 10^{+02}$	-	$7.83 \times 10^{+02}$
BENZENE	8.62×10^{-03}	1.26	-	3.19	$6.75 \times 10^{+01}$	$3.08 \times 10^{+01}$	3.10×10^{-04}	-	$4.63 \times 10^{+02}$	8.43	$5.74 \times 10^{+02}$
CARBON MONOXIDE	-	$1.79 \times 10^{+02}$	-	$2.55 \times 10^{+02}$	$3.13 \times 10^{+04}$	$7.62 \times 10^{+03}$	7.26	-	$2.79 \times 10^{+04}$	-	$6.72 \times 10^{+04}$
FORMALDEHYDE	2.25	3.01	-	6.38	$2.39 \times 10^{+01}$	$2.81 \times 10^{+01}$	4.79×10^{-02}	-	$7.77 \times 10^{+02}$	-	$8.41 \times 10^{+02}$
ISOMERS OF XYLENE	$3.75 \times 10^{+02}$	4.28×10^{-01}	$7.21 \times 10^{+01}$	-	$3.98 \times 10^{+02}$	$9.46 \times 10^{+01}$	1.58×10^{-04}	-	$7.19 \times 10^{+01}$	$1.06 \times 10^{+03}$	$2.07 \times 10^{+03}$
LEAD AND COMPOUNDS	-	5.16×10^{-03}	-	3.22×10^{-03}	4.22×10^{-02}	1.08×10^{-02}	2.19×10^{-03}	-	5.08×10^{-02}	-	1.14×10^{-01}
OXIDES OF NITROGEN	-	$5.46 \times 10^{+01}$	-	$5.99 \times 10^{+02}$	$1.33 \times 10^{+02}$	$1.81 \times 10^{+02}$	$2.61 \times 10^{+01}$	-	$3.61 \times 10^{+02}$	-	$1.36 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	-	9.57	-	$4.78 \times 10^{+01}$	$1.89 \times 10^{+02}$	$1.04 \times 10^{+02}$	5.81×10^{-01}	-	$4.64 \times 10^{+03}$	-	$4.99 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	-	5.33	-	$4.78 \times 10^{+01}$	$1.73 \times 10^{+02}$	$9.63 \times 10^{+01}$	1.45×10^{-01}	-	$4.50 \times 10^{+03}$	-	$4.83 \times 10^{+03}$
POLCYCLIC AROMATIC HYDROCARBONS	$8.41 \times 10^{+01}$	9.56×10^{-02}	-	4.19×10^{-03}	$1.13 \times 10^{+01}$	5.28	1.69×10^{-03}	-	$6.92 \times 10^{+01}$	-	$1.70 \times 10^{+02}$
SULFUR DIOXIDE	-	3.09	-	3.83	$1.13 \times 10^{+01}$	6.34	$1.03 \times 10^{+01}$	-	$7.27 \times 10^{+01}$	-	$1.08 \times 10^{+02}$
TETRACHLOROETHYLENE	$5.15 \times 10^{+01}$	3.95×10^{-03}	-	-	3.34	7.47×10^{-01}	-	-	1.19	-	$5.68 \times 10^{+01}$
TOLUENE	$7.83 \times 10^{+02}$	7.46×10^{-01}	-	1.60	$3.69 \times 10^{+02}$	$8.90 \times 10^{+01}$	8.99×10^{-03}	-	$1.48 \times 10^{+02}$	$1.82 \times 10^{+03}$	$3.21 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	$1.01 \times 10^{+01}$	-	$4.78 \times 10^{+01}$	$1.99 \times 10^{+02}$	$1.09 \times 10^{+02}$	6.12×10^{-01}	-	$4.89 \times 10^{+03}$	-	$5.25 \times 10^{+03}$
TOTAL VOCS	$2.06 \times 10^{+04}$	$3.98 \times 10^{+01}$	$1.83 \times 10^{+03}$	$3.51 \times 10^{+01}$	$4.08 \times 10^{+03}$	$1.11 \times 10^{+03}$	1.04	$1.57 \times 10^{+03}$	$9.52 \times 10^{+03}$	$1.31 \times 10^{+04}$	$5.19 \times 10^{+04}$
TRICHLOROETHYLENE	8.84×10^{-01}	2.42×10^{-03}	-	-	2.05	4.59×10^{-01}	-	-	7.29×10^{-01}	-	4.13

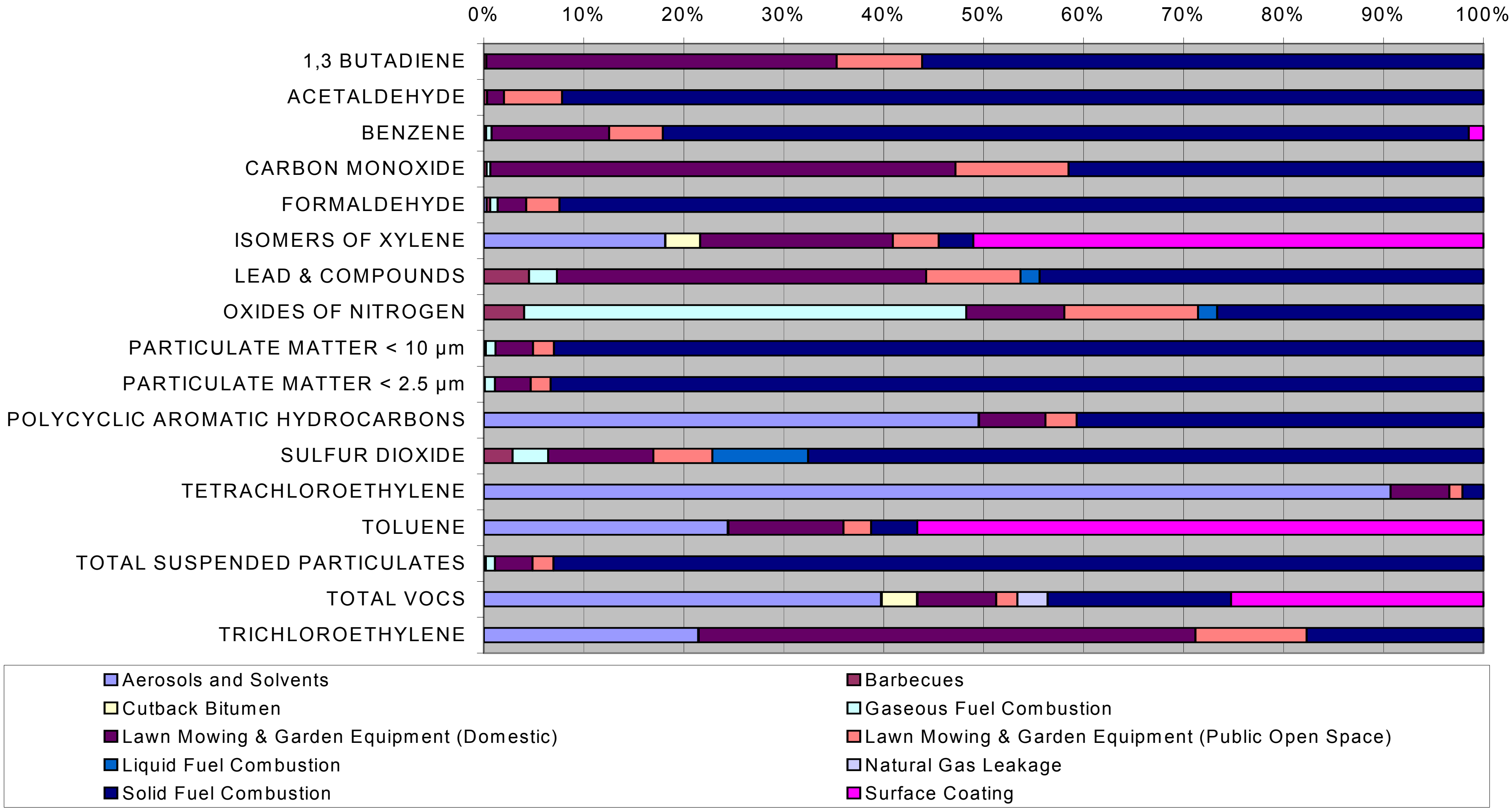

Figure ES1.4: Proportion of total estimated annual emissions by domestic-commercial source type in the Sydney region

Table ES1.5: Total estimated annual emissions by domestic-commercial source type in the Newcastle region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	7.39×10^{-03}	-	-	1.25	3.55×10^{-01}	-	-	2.00	-	3.61
ACETALDEHYDE	-	1.82×10^{-01}	-	-	1.12	4.47	-	-	$6.11 \times 10^{+01}$	-	$6.68 \times 10^{+01}$
BENZENE	5.68×10^{-04}	8.76×10^{-02}	-	2.10×10^{-01}	5.71	3.03	2.04×10^{-05}	-	$3.91 \times 10^{+01}$	5.86×10^{-01}	$4.87 \times 10^{+01}$
CARBON MONOXIDE	-	$1.25 \times 10^{+01}$	-	$1.68 \times 10^{+01}$	$2.64 \times 10^{+03}$	$7.49 \times 10^{+02}$	4.78×10^{-01}	-	$2.36 \times 10^{+03}$	-	$5.78 \times 10^{+03}$
FORMALDEHYDE	1.49×10^{-01}	2.09×10^{-01}	-	4.21×10^{-01}	2.02	2.77	3.15×10^{-03}	-	$6.57 \times 10^{+01}$	-	$7.13 \times 10^{+01}$
ISOMERS OF XYLENE	$2.47 \times 10^{+01}$	2.98×10^{-02}	5.64	-	$3.37 \times 10^{+01}$	9.30	1.04×10^{-05}	-	6.08	$7.33 \times 10^{+01}$	$1.53 \times 10^{+02}$
LEAD AND COMPOUNDS	-	3.59×10^{-04}	-	2.12×10^{-04}	3.57×10^{-03}	1.06×10^{-03}	1.44×10^{-04}	-	4.30×10^{-03}	-	9.65×10^{-03}
OXIDES OF NITROGEN	-	3.80	-	$3.95 \times 10^{+01}$	$1.13 \times 10^{+01}$	$1.78 \times 10^{+01}$	1.72	-	$3.05 \times 10^{+01}$	-	$1.05 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	-	6.65×10^{-01}	-	3.15	$1.59 \times 10^{+01}$	$1.02 \times 10^{+01}$	3.83×10^{-02}	-	$3.93 \times 10^{+02}$	-	$4.23 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	3.71×10^{-01}	-	3.15	$1.47 \times 10^{+01}$	9.46	9.57×10^{-03}	-	$3.81 \times 10^{+02}$	-	$4.08 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	5.54	6.65×10^{-03}	-	2.76×10^{-04}	9.54×10^{-01}	5.19×10^{-01}	1.12×10^{-04}	-	5.85	-	$1.29 \times 10^{+01}$
SULFUR DIOXIDE	-	2.15×10^{-01}	-	2.52×10^{-01}	9.57×10^{-01}	6.23×10^{-01}	6.79×10^{-01}	-	6.14	-	8.87
TETRACHLOROETHYLENE	3.39	2.75×10^{-04}	-	-	2.82×10^{-01}	7.34×10^{-02}	-	-	1.00×10^{-01}	-	3.85
TOLUENE	$5.16 \times 10^{+01}$	5.18×10^{-02}	-	1.05×10^{-01}	$3.12 \times 10^{+01}$	8.75	5.92×10^{-04}	-	$1.25 \times 10^{+01}$	$1.26 \times 10^{+02}$	$2.31 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	7.00×10^{-01}	-	3.15	$1.68 \times 10^{+01}$	$1.07 \times 10^{+01}$	4.03×10^{-02}	-	$4.13 \times 10^{+02}$	-	$4.45 \times 10^{+02}$
TOTAL VOCS	$1.36 \times 10^{+03}$	2.76	$1.43 \times 10^{+02}$	2.31	$3.45 \times 10^{+02}$	$1.09 \times 10^{+02}$	6.82×10^{-02}	$1.09 \times 10^{+02}$	$8.05 \times 10^{+02}$	$9.11 \times 10^{+02}$	$3.79 \times 10^{+03}$
TRICHLOROETHYLENE	5.82×10^{-02}	1.68×10^{-04}	-	-	1.73×10^{-01}	4.51×10^{-02}	-	-	6.17×10^{-02}	-	3.39×10^{-01}

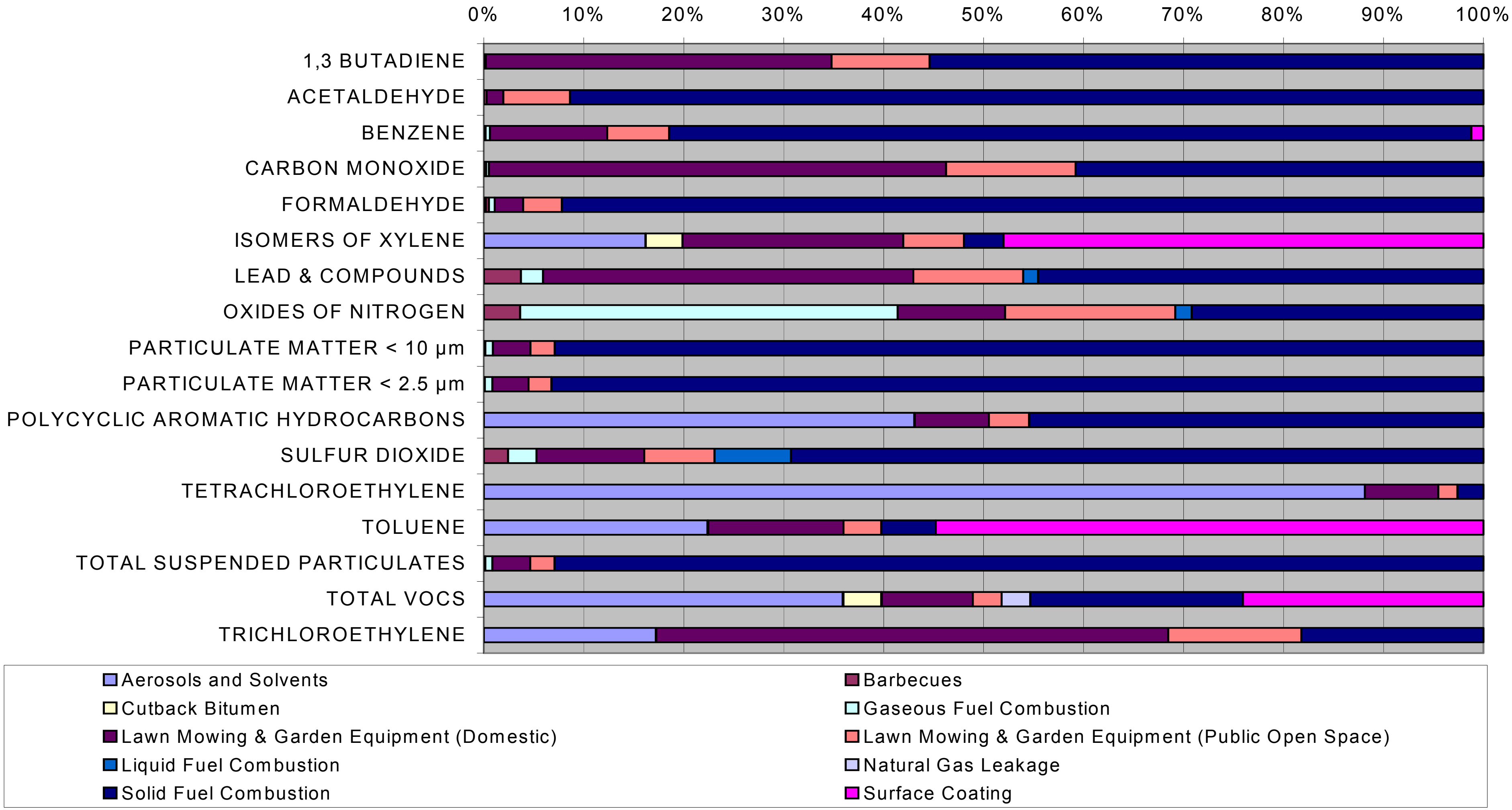

Figure ES1.5: Proportion of total estimated annual emissions by domestic-commercial source type in the Newcastle region

Table ES1.6: Total estimated annual emissions by domestic-commercial source type in the Wollongong region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	5.35×10^{-03}	-	-	8.14×10^{-01}	1.67×10^{-01}	-	-	1.31	-	2.29
ACETALDEHYDE	-	1.32×10^{-01}	-	-	7.28×10^{-01}	2.10	-	-	$3.98 \times 10^{+01}$	-	$4.28 \times 10^{+01}$
BENZENE	4.13×10^{-04}	6.34×10^{-02}	-	1.53×10^{-01}	3.72	1.42	1.49×10^{-05}	-	$2.55 \times 10^{+01}$	4.24×10^{-01}	$3.13 \times 10^{+01}$
CARBON MONOXIDE	-	9.02	-	$1.22 \times 10^{+01}$	$1.72 \times 10^{+03}$	$3.52 \times 10^{+02}$	3.48×10^{-01}	-	$1.54 \times 10^{+03}$	-	$3.64 \times 10^{+03}$
FORMALDEHYDE	1.08×10^{-01}	1.51×10^{-01}	-	3.06×10^{-01}	1.32	1.30	2.29×10^{-03}	-	$4.29 \times 10^{+01}$	-	$4.61 \times 10^{+01}$
ISOMERS OF XYLENE	$1.80 \times 10^{+01}$	2.15×10^{-02}	3.35	-	$2.20 \times 10^{+01}$	4.38	7.57×10^{-06}	-	3.96	$5.31 \times 10^{+01}$	$1.05 \times 10^{+02}$
LEAD AND COMPOUNDS	-	2.60×10^{-04}	-	1.54×10^{-04}	2.33×10^{-03}	5.00×10^{-04}	1.05×10^{-04}	-	2.80×10^{-03}	-	6.15×10^{-03}
OXIDES OF NITROGEN	-	2.75	-	$2.87 \times 10^{+01}$	7.34	8.38	1.25	-	$1.99 \times 10^{+01}$	-	$6.83 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	-	4.81×10^{-01}	-	2.29	$1.04 \times 10^{+01}$	4.79	2.78×10^{-02}	-	$2.56 \times 10^{+02}$	-	$2.74 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	2.68×10^{-01}	-	2.29	9.57	4.45	6.96×10^{-03}	-	$2.48 \times 10^{+02}$	-	$2.65 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	4.03	4.81×10^{-03}	-	2.01×10^{-04}	6.22×10^{-01}	2.44×10^{-01}	8.12×10^{-05}	-	3.82	-	8.72
SULFUR DIOXIDE	-	1.56×10^{-01}	-	1.83×10^{-01}	6.24×10^{-01}	2.93×10^{-01}	4.94×10^{-01}	-	4.01	-	5.76
TETRACHLOROETHYLENE	2.47	1.99×10^{-04}	-	-	1.84×10^{-01}	3.46×10^{-02}	-	-	6.55×10^{-02}	-	2.75
TOLUENE	$3.75 \times 10^{+01}$	3.75×10^{-02}	-	7.64×10^{-02}	$2.03 \times 10^{+01}$	4.12	4.31×10^{-04}	-	8.16	$9.14 \times 10^{+01}$	$1.62 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	5.07×10^{-01}	-	2.29	$1.09 \times 10^{+01}$	5.05	2.93×10^{-02}	-	$2.69 \times 10^{+02}$	-	$2.88 \times 10^{+02}$
TOTAL VOCS	$9.89 \times 10^{+02}$	2.00	$8.49 \times 10^{+01}$	1.68	$2.25 \times 10^{+02}$	$5.13 \times 10^{+01}$	4.96×10^{-02}	$7.97 \times 10^{+01}$	$5.25 \times 10^{+02}$	$6.60 \times 10^{+02}$	$2.62 \times 10^{+03}$
TRICHLOROETHYLENE	4.24×10^{-02}	1.22×10^{-04}	-	-	1.13×10^{-01}	2.12×10^{-02}	-	-	4.02×10^{-02}	-	2.17×10^{-01}

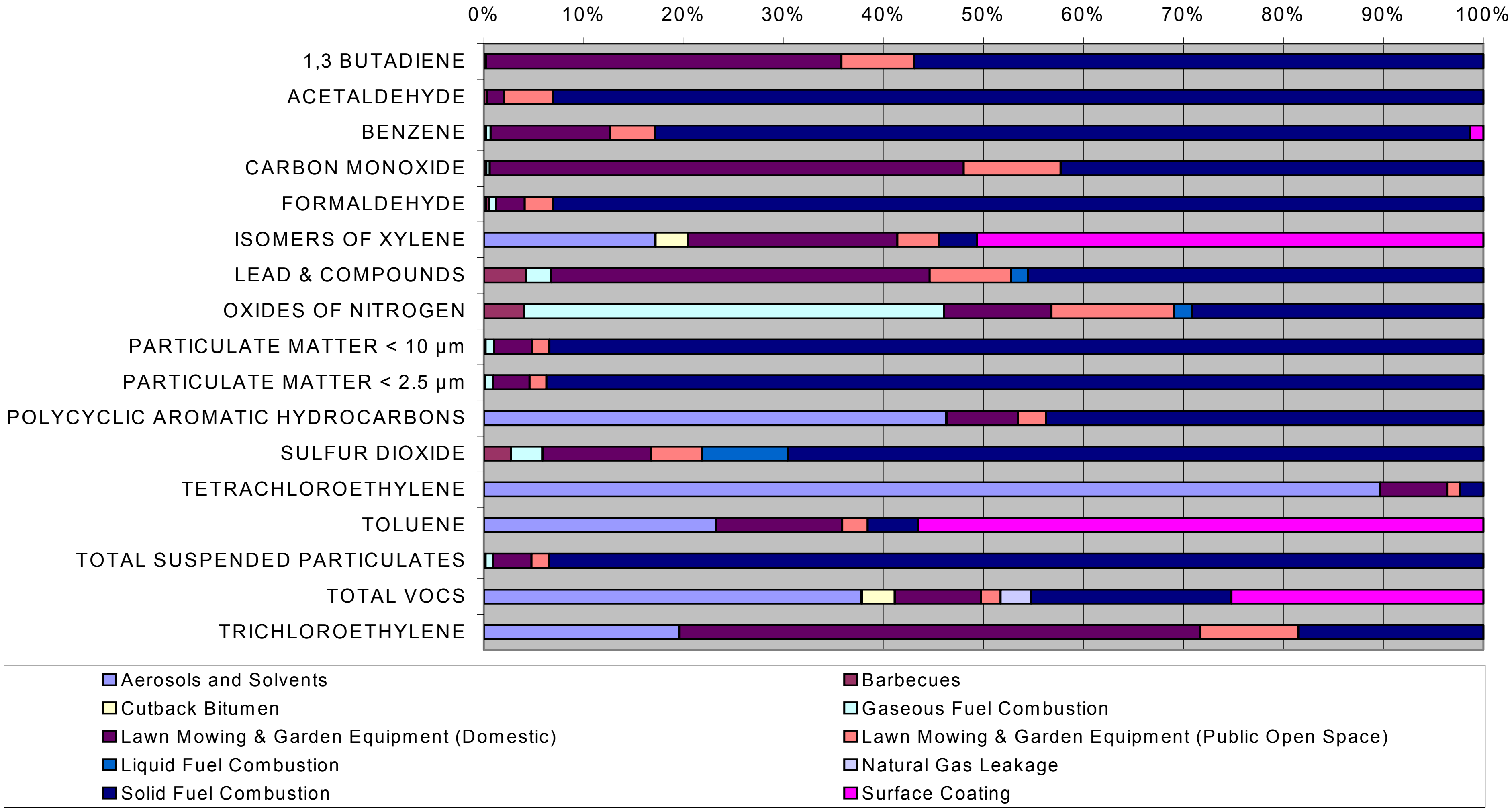

Figure ES1.6: Proportion of total estimated annual emissions by domestic-commercial source type in the Wollongong region

Table ES1.7: Total estimated annual emissions by domestic-commercial source type in the Non-Urban region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.80×10^{-02}	-	-	2.80	1.22	-	-	4.49	-	8.53
ACETALDEHYDE	-	4.43×10^{-01}	-	-	2.50	$1.54 \times 10^{+01}$	-	-	$1.37 \times 10^{+02}$	-	$1.55 \times 10^{+02}$
BENZENE	1.35×10^{-03}	2.13×10^{-01}	-	5.00×10^{-01}	$1.28 \times 10^{+01}$	$1.04 \times 10^{+01}$	4.87×10^{-05}	-	$8.78 \times 10^{+01}$	1.42	$1.13 \times 10^{+02}$
CARBON MONOXIDE	-	$3.03 \times 10^{+01}$	-	$4.00 \times 10^{+01}$	$5.94 \times 10^{+03}$	$2.57 \times 10^{+03}$	1.14	-	$5.29 \times 10^{+03}$	-	$1.39 \times 10^{+04}$
FORMALDEHYDE	3.53×10^{-01}	5.08×10^{-01}	-	1.00	4.54	9.51	7.50×10^{-03}	-	$1.48 \times 10^{+02}$	-	$1.63 \times 10^{+02}$
ISOMERS OF XYLENE	$5.88 \times 10^{+01}$	7.23×10^{-02}	$1.27 \times 10^{+01}$	-	$7.56 \times 10^{+01}$	$3.20 \times 10^{+01}$	2.48×10^{-05}	-	$1.36 \times 10^{+01}$	$1.78 \times 10^{+02}$	$3.71 \times 10^{+02}$
LEAD AND COMPOUNDS	-	8.71×10^{-04}	-	5.05×10^{-04}	8.02×10^{-03}	3.65×10^{-03}	3.43×10^{-04}	-	9.65×10^{-03}	-	2.30×10^{-02}
OXIDES OF NITROGEN	-	9.23	-	$9.40 \times 10^{+01}$	$2.53 \times 10^{+01}$	$6.12 \times 10^{+01}$	4.10	-	$6.85 \times 10^{+01}$	-	$2.62 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	-	1.62	-	7.50	$3.58 \times 10^{+01}$	$3.50 \times 10^{+01}$	9.11×10^{-02}	-	$8.81 \times 10^{+02}$	-	$9.61 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	9.01×10^{-01}	-	7.50	$3.29 \times 10^{+01}$	$3.25 \times 10^{+01}$	2.28×10^{-02}	-	$8.55 \times 10^{+02}$	-	$9.29 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	$1.32 \times 10^{+01}$	1.61×10^{-02}	-	6.57×10^{-04}	2.14	1.79	2.66×10^{-04}	-	$1.31 \times 10^{+01}$	-	$3.03 \times 10^{+01}$
SULFUR DIOXIDE	-	5.23×10^{-01}	-	6.00×10^{-01}	2.15	2.14	1.62	-	$1.38 \times 10^{+01}$	-	$2.08 \times 10^{+01}$
TETRACHLOROETHYLENE	8.08	6.68×10^{-04}	-	-	6.34×10^{-01}	2.53×10^{-01}	-	-	2.25×10^{-01}	-	9.19
TOLUENE	$1.23 \times 10^{+02}$	1.26×10^{-01}	-	2.50×10^{-01}	$7.00 \times 10^{+01}$	$3.01 \times 10^{+01}$	1.41×10^{-03}	-	$2.81 \times 10^{+01}$	$3.07 \times 10^{+02}$	$5.58 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	1.70	-	7.50	$3.77 \times 10^{+01}$	$3.69 \times 10^{+01}$	9.59×10^{-02}	-	$9.28 \times 10^{+02}$	-	$1.01 \times 10^{+03}$
TOTAL VOCS	$3.24 \times 10^{+03}$	6.72	$3.21 \times 10^{+02}$	5.51	$7.74 \times 10^{+02}$	$3.75 \times 10^{+02}$	1.62×10^{-01}	$2.31 \times 10^{+02}$	$1.81 \times 10^{+03}$	$2.21 \times 10^{+03}$	$8.97 \times 10^{+03}$
TRICHLOROETHYLENE	1.39×10^{-01}	4.08×10^{-04}	-	-	3.89×10^{-01}	1.55×10^{-01}	-	-	1.38×10^{-01}	-	8.22×10^{-01}

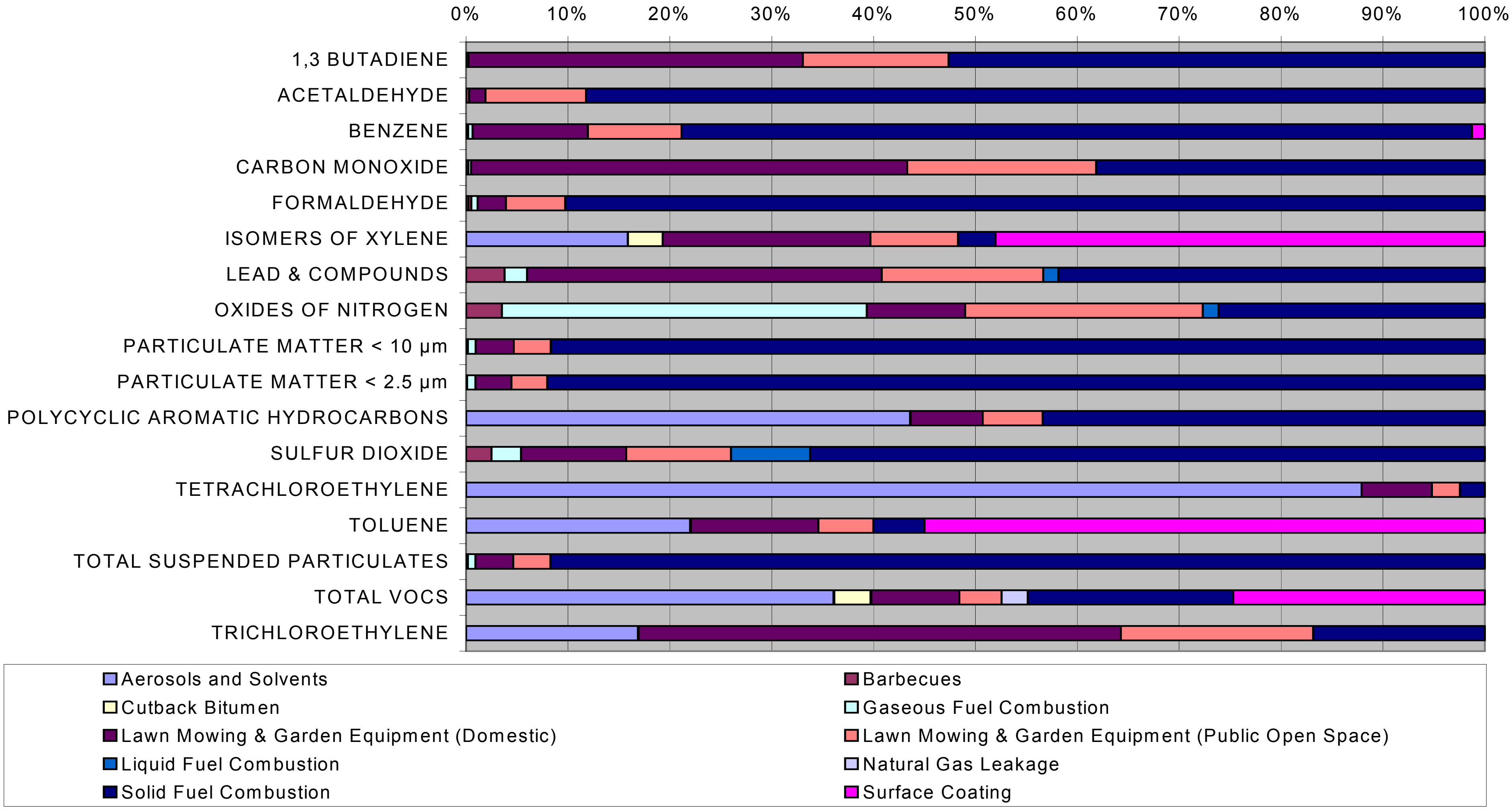

Figure ES1.7: Proportion of total estimated annual emissions by domestic-commercial source type in the Non-Urban region

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1 Introduction

The Department of Environment and Climate Change NSW (DECC), in collaboration with Optimised Operations (Tseng et. al., 2006), has completed a three year air emissions inventory project for domestic-commercial sources. The base year of the domestic-commercial inventory represents activities that took place during the 2003 calendar year and is accompanied by emission projections in yearly increments up to the 2031 calendar year. The area included in the study covers greater Sydney, Newcastle and Wollongong regions, known collectively as the Greater Metropolitan Region (GMR).

The purpose of this document is to focus on the results of the domestic-commercial air emissions inventory. The information is structured as follows:

- ❑ A description of the domestic-commercial air emissions inventory specification (Section 2) including:
    - The study year of the inventory (Section 2.1);
    - A description of the study region (Section 2.2);
    - A description of the grid coordinate system (Section 2.3);
    - A description of emission sources considered (Section 2.4);
    - A description of the pollutants evaluated (Section 2.5); and
    - A broad discussion of the methodology (Section 2.6).
- ❑ An emissions summary for selected substances presented by domestic-commercial source type for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions (Section 3).
- ❑ An emissions summary for selected substances presented for all domestic-commercial sources for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions (Section 4).
- ❑ A complete list of references (Section 5).
- ❑ A sample domestic survey questionnaire form used to collect activity data (Appendix A).
- ❑ Total domestic-commercial emissions of all substances emitted in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions (Appendix B).
- ❑ A comparison of number and sales of domestic and commercial lawn mowing and garden equipment (Appendix C).

2 Inventory Specifications

2.1 The Study Year

The domestic-commercial air emissions inventory results presented in this report are based on activities that took place in the 2003 calendar year.

2.2 The Study Region

The study region defined as the GMR measures 210 km (east-west) by 273 km (north-south). The study region is defined in Table 2.1 and shown in Figure 2.2.

Table 2.1: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong Regions

Region	South-west corner MGA [1] co-ordinates		North-east corner MGA [1] co-ordinates	
	Easting (km)	Northing (km)	Easting (km)	Northing (km)
Greater Metropolitan	210	6159	420	6432
Sydney	261	6201	360	6300
Newcastle	360	6348	408	6372
Wollongong	279	6174	318	6201

[1] MGA = Map Grid of Australia based on the Geocentric Datum of Australia 1994 (GDA94) (ICSM, 2002).

2.3 Grid Coordinate System

The grid coordinate system used for the domestic-commercial air emissions inventory uses 1 km by 1 km grid cells. The grid coordinates start from the bottom left corner having index number with Easting (km) in the horizontal and Northing (km) in the vertical direction. The grid coordinate system is illustrated in Figure 2.1.

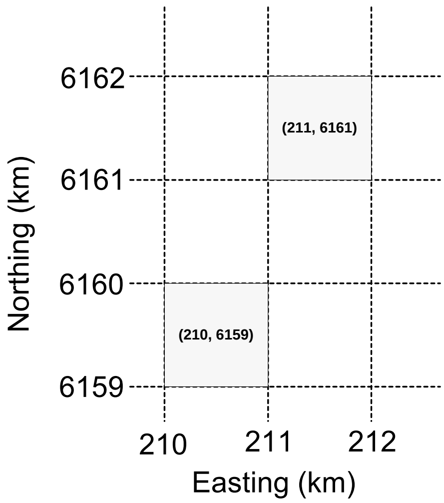

Figure 2.1: Grid coordinate system

Figure 2.2: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong Regions

2.4 Emission Sources Considered

The domestic-commercial air emissions inventory includes emissions from the following sources:

- Aerosols and solvents (domestic & commercial);
- Barbecues (domestic);
- Cutback bitumen;
- Gaseous fuel combustion (domestic);
- Lawn mowing and garden equipment (domestic);
- Lawn mowing and garden equipment (public open space);
- Liquid fuel combustion (domestic);
- Natural gas leakage;
- Solid fuel combustion (domestic); and
- Surface coating (domestic, commercial & industrial).

2.5 Pollutants Evaluated

The inventory includes domestic-commercial emission releases to air in the region depicted by Figure 2.2. The following pollutants were considered:

- Substances included in the National Pollutant Inventory (NPI) National Environment Protection Measure (NEPC, 2000);
- Pollutants included in the Air Quality National Environment Protection Measure (NEPC, 2003);
- Pollutants included in the Air Toxics National Environment Protection Measure (NEPC, 2004);
- Pollutants associated with the Protection of the Environment Operations (Clean Air) Regulation 2002 (PCO, 2005);
- Air pollutants associated with the Protection of the Environment Operations (General) Regulation 1998 (PCO, 1998);
- Speciation of oxides of nitrogen for photochemical modelling (i.e. NO and NO_2)[1];
- Speciated organic compounds for photochemical modelling sourced from Carter (2003);
- Speciated particulate emissions (i.e. TSP (total suspended particulate), PM_{10} (particulate matter with an aerodynamic diameter < 10 μm) and $PM_{2.5}$ (particulate matter with an aerodynamic diameter < 2.5 μm));
- Environment Protection Authority of Victoria air toxic pollutants sourced from Hazardous Air Pollutants - A Review of Studies Performed in Australia and New Zealand (EPAV, 1999);
- Commonwealth Government Air Toxics Program Technical Advisory Group (13 March 2000) priority air pollutants (DEH, 2001);
- U.S. Environmental Protection Agency list of 189 Hazardous Air Pollutants (USEPA, 2005b);

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).

- Air pollutants included in the Office of Environmental Human Health Assessment (OEHHA)/Air Resources Board (ARB) 'hot spots' list (CARB, 2005);
- NSW DEC regulated pollutants with design ground level concentrations (DEC, 2005);
- USEPA 16 priority polycyclic aromatic hydrocarbons (PAHs) (Keith et. al., 1979); and
- WHO97 polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs) (Van den Berg et. al., 1998).

2.6 Methodology Overview

This section contains a broad overview of the methodology used to develop the domestic-commercial air emissions inventory.

The methodology used to develop the domestic-commercial air emissions inventory involved the following steps:

1. Domestic-Commercial Source Identification

Domestic-commercial sources considered in this project include all sources defined in Section 2.4 with the potential for air emissions in the GMR.

Domestic-commercial air emission sources were identified from a number of different sources including:

- National Pollutant Inventory (NPI) aggregated emissions data (AED) sources (DEH, 2005a);
- USEPA AP-42 Compilation of Air Pollutant Emission Factors (USEPA, 1995);
- USEPA Emission Inventory Improvement Program (EIIP) (USEPA, 2005c & USEPA, 2005d); and
- USEPA National Emissions Inventory (NEI) (ERG, 2003).

2. Emission Estimation Technique Design

Emission estimation techniques for domestic-commercial sources have been based on the following methodologies:

- National Pollutant Inventory (NPI) aggregated emissions data (AED) emission estimation technique manuals (DEH, 2005b);
- USEPA AP-42 Compilation of Air Pollutant Emission Factors (USEPA, 1995);
- USEPA Emission Inventory Improvement Program (EIIP) (USEPA, 2005c & USEPA, 2005d);
- USEPA National Emissions Inventory (NEI) (ERG, 2003);
- USEPA Final NONROAD2005 Model (USEPA, 2005e); and
- USEPA Speciate V3.2 database (USEPA, 2002).

3. Activity Data Acquisition

A domestic survey was conducted as part of this study, in accordance with National Pollutant Inventory (NPI) guidelines for the conduct of domestic surveys (DEH, 2005b), to provide activity data for the following sources:

- Barbecues (domestic);
- Gaseous fuel combustion (domestic);
- Lawn mowing and garden equipment (domestic);
- Liquid fuel combustion (domestic); and
- Solid fuel combustion (domestic).

Households were selected at random across the GMR to limit bias. Two thousand (2,000) survey questionnaire forms were mailed out in the first quarter of 2005 and three hundred and four (304) completed survey questionnaire forms were returned. A campaign of additional phone surveys was conducted in the second quarter of 2005 using the same survey questions to increase the total sample size to five hundred (500).

Based on a population of 5,091,366 in the GMR for the 2003 calendar year (ABS, 2001 & TPDC, 2004) and a sample size of 500, the confidence interval is 4.38% at the 95% confidence level.

The confidence interval quantifies the uncertainty or range in possible values. For example, for a confidence interval of 4.38% and where 47% percent of the sample picks a particular answer one can be "sure" that if the question has been asked of the entire relevant population, between 42.62% (47-4.38) and 51.38% (47+4.38) would have picked that answer.

The confidence level quantifies the level of certainty to which an estimate can be trusted. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means one can be 95% certain. Most researchers use the 95% confidence level.

When combining the confidence level and confidence interval together, one can be 95% sure that the true answer for the entire relevant population is between 42.62% and 51.38% for the example described above.

The domestic survey questionnaire form is included in Appendix A.

Additional sources of information were used to obtain activity data for the following sources:

- Barbecues (domestic);
  - Domestic and commercial barbecue briquette consumption for NSW from Auschar, 2005.
- Cutback bitumen;
  - Bitumen consumption for NSW and ACT from ABARE, 2005a; and
  - Proportion of cutback to total bitumen consumption and quantity of cutter solvent used from DEH, 2005c.
- Gaseous fuel combustion (domestic);
  - Residential natural gas consumption for NSW and ACT from ABARE, 2005b and AGL, 2003.

- Lawn mowing and garden equipment (domestic);
  - NSW Lawn Mowing and Garden Equipment Sales, Unit Cost and Operating Life Data for 2000 to 2004 (AIA, 2005).
- Lawn mowing and garden equipment (public open space);
  - Data from nine local government areas (LGA) including Auburn, Bankstown, Canada Bay, Great Lakes, Kiama, Ku-ring-gai, Newcastle, Port Stephens and Strathfield LGAs; and
  - Data from five golf courses including Castle Hill, Killara, Manly, Pennant Hills and Saint Michael's. The New South Wales Golf Course Superintendent's Association (NSWGCSA) provided assistance by contacting members to provide assistance.
- Liquid fuel combustion (domestic);
  - Residential lighting kerosene consumption for NSW and ACT from ABARE, 2005b.
- Natural gas leakage; and
  - Data for the GMR from AGL, 2003.
- Surface coating (domestic, commercial & industrial).
  - Surface coating consumption data for NSW from APMF, 2005.

Specific details of the activity data used for each domestic-commercial source type are provided in Section 3.

4. Emission Estimation

Generally, emissions have been estimated by combining activity data with emission factors. The emissions have been allocated spatially to each 1 km by 1 km grid cell, and temporally to months, weekdays/weekend days and hours. Specific details of the methodology for each domestic-commercial source type are provided in Section 3.

5. Deriving Domestic-Commercial Source Specific Emission Projection Factors

Emission projection factors for each domestic-commercial source type were developed using either published:

- Primary energy usage growth data (ABARE, 2005c);
- Population growth data (ABS, 2001 & TPDC, 2004);
- Total or free standing dwelling growth data (ABS, 2001 & TPDC, 2004); or
- Vehicle kilometres travelled growth data (TPDC, 2005).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Emission projection factors are provided to the year 2031.

The emission projection factors for each source have been used to estimate emissions in future annual periods using the following formula (Pechan, 1999):

$$E_{i,j,k,n} = E_{i,j,k,2003} \times PF_{j,k,n}$$

where:

$E_{i,j,k,n}$	=	Emission of substance i from location j for source type k for year n	(tonnes/year)
$E_{i,j,k,2003}$	=	Emission of substance i from location j for source type k for the base year, 2003	(tonnes/year)
$PF_{j,k,n}$	=	Emission projection factor for location j for source type k for year n (relative to the base year)	(factor)

The projection methodology for each domestic-commercial source type is presented in Section 3.

3 Data Sources and Results

This section presents the data sources used and the associated emission estimates for the 2003 calendar year for the following domestic-commercial sources:

- Aerosols and solvents (domestic & commercial);
- Barbecues (domestic);
- Cutback bitumen;
- Gaseous fuel combustion (domestic);
- Lawn mowing and garden equipment (domestic);
- Lawn mowing and garden equipment (public open space);
- Liquid fuel combustion (domestic);
- Natural gas leakage;
- Solid fuel combustion (domestic); and
- Surface coating (domestic, commercial & industrial).

The emission estimation techniques used for domestic-commercial sources have been based on the following methodologies:

- National Pollutant Inventory (NPI) aggregated emissions data (AED) emission estimation technique manuals (DEH, 2005b);
- USEPA AP-42 Compilation of Air Pollutant Emission Factors (USEPA, 1995);
- USEPA Emission Inventory Improvement Program (EIIP) (USEPA, 2005c & USEPA, 2005d);
- USEPA National Emissions Inventory (NEI) (ERG, 2003);
- USEPA Final NONROAD2005 Model (USEPA, 2005e); and
- USEPA Speciate V3.2 database (USEPA, 2002).

In this section, total estimated emissions (for selected substances) are presented from each domestic-commercial source type in the study region (i.e. GMR), Sydney, Newcastle and Wollongong regions. Total estimated emissions are also presented for the region defined as Non-Urban. This region is the area of the GMR minus the combined areas of the Sydney, Newcastle and Wollongong regions. In this section emissions are presented for the following pollutants only:

- 1,3-butadiene
- Acetaldehyde
- Benzene
- Carbon monoxide (CO)
- Formaldehyde
- Isomers of xylene

- Lead and compounds
- Oxides of nitrogen (NO_x)
- Particulate matter < 10 µm (PM_{10})
- Particulate matter < 2.5 µm ($PM_{2.5}$)
- Polycyclic aromatic hydrocarbons (PAHs)
- Sulfur dioxide (SO_2)
- Tetrachloroethylene
- Toluene
- Total suspended particulates (TSP)
- Total volatile organic compounds (Total VOCs)
- Trichloroethylene

These substances were selected since they are:

- The most common air pollutants found in airsheds according to the National Pollutant Inventory (NEPC, 2000);
- Referred to in National Environment Protection Measures (NEPMs) for criteria pollutants (NEPC, 2003) and air toxics (NEPC, 2004); and
- They have been classified as priority air pollutants (NEPC, 2005).

Total domestic-commercial emissions of all substances emitted in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions are presented in Appendix B.

3.1 Aerosols and Solvents

3.1.1 Emission Source Description

Emissions of VOCs from domestic-commercial aerosols and solvents originate from a number of sources, including:

- Personal care products;
- Household products;
- Automotive aftermarket products;
- Adhesives and sealants;
- Insecticide, fungicide, rodenticide and herbicide products;
- Coatings and related products; and
- Miscellaneous products.

The domestic-commercial aerosols and solvents product groupings and subcategories included in the domestic-commercial air emissions inventory are listed in Table 3.1.

Table 3.1: Domestic-commercial aerosols and solvents product groups and subcategories

Personal Care Products [1]	**Household Products [1]**
Deodorants and antiperspirants Facial and body treatments Fragrance products Hair care products Health use products Miscellaneous personal care products Nail care products Oral care products Powders	Air fresheners Dishwashing products Fabric and carpet care products Hard surface cleaners Laundry products Miscellaneous household products Shoe and leather care products Waxes and polishes
Automotive Aftermarket Products Detailing Products [1]	**Automotive Aftermarket Products Maintenance and Repair Products [1]**
Body cleaning compounds Bug and tar removers Car washing products Fibreglass polish Glass, plexiglass and plastic window cleaner/treatment Metal polish and chrome cleaner Polishes Rubber, vinyl and leather protectants/dressings and vinyl top cleaners and waxes Rustproofing and other exterior treatment compounds Tyre coatings and paints Upholstery cleaners and interior cleaners Waxes Wheel, tyre and mat cleaners	Antifreeze and coolant Belt dressings Engine cleaners, degreasers and parts cleaners Engine starting fluids Fuel system antifreeze Lubricants Motor flush and crankcase cleaner Transmission sealer, conditioner, additive and leak- stop Tyre cement, sealant and inflators Windshield deicer Windshield washer fluid
Adhesives and Sealants [1]	**Coatings and Related Products [1,2]**
Consumer adhesives (e.g. cements, glues and pastes) Sealants	Aerosol spray paints Coating related products (e.g. paint removers)
Insecticide, Fungicide, Rodenticide and Herbicide Products [1]	**Miscellaneous Products (not otherwise covered) [1]**
Antimicrobial agents Fungicides and nematicides Herbicides Insecticides Other products	Arts and crafts supplies Non-pesticidal veterinary and pet products Office supplies Pressurised food products

[1] Data Source: (ERG, 1996).
[2] Note: Emissions from the coatings and related products listed in Table 3.1 are in addition to emissions from surface coating presented in Section 3.10.

3.1.2 Emission Estimation Methodology

Emissions from domestic-commercial aerosols and solvents have been estimated using the preferred population-based method (ERG, 1996) for total VOCs, speciated VOCs and organic air toxics. The population-based method uses United States national average per-capita mass based emission factors for total VOCs, speciated VOCs and organic air toxics. According to the National Pollutant Inventory (Environment Australia, 1999a), these per-capita mass based emission factors are considered to give estimates of reasonable and acceptable accuracy for the Australian situation. Emissions from domestic-commercial aerosols and solvents have been calculated using the following formula:

$$E_{i,j} = EF_{i,j} \times SF_{i,j} \times P$$

where:

$E_{i,j}$	=	Emission of substance i from product group j	(kg/year)
$EF_{i,j}$	=	Per-capita mass based VOC emission factor of substance i for product group j	(kg/year/person)
$SF_{i,j}$	=	VOC speciation factor of substance i for product group j	(%)
P	=	Population	(person)

3.1.3 Activity Data

Activity data required for estimating emissions from domestic-commercial aerosols and solvents includes:

- 1 km by 1 km gridded population data for the GMR (ABS, 2001 & TPDC, 2004). The total population in the GMR during 2003 was 5,091,366; and
- Per-capita mass based emission factors for total VOCs (Environment Australia, 1999a), speciated VOCs (USEPA, 2002) and organic air toxics (ERG, 1996).

3.1.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic-commercial aerosols and solvents are detailed in Table 3.2.

Table 3.2: Emission and speciation factors for all substances from domestic-commercial aerosols and solvents

Substance	Product Group	Emission Factor (kg/year/person)	Emission Factor Source
Total VOC	Personal Care Products	1.52	(ERG, 1996) [1] & (Environment Australia, 1999a)
	Household Products	0.52	
	Automotive Aftermarket Products	0.90	
	Adhesives and Sealants	0.38	
	Insecticide, Fungicide, Rodenticide and Herbicide Products	1.17	
	Coatings and Related Products	0.62	
	Miscellaneous Products	0.04	
Substance	**Product Group**		**Emission Factor Source**
Organic air toxics	All		(ERG, 1996)
Speciated VOC	Personal Care Products		Profile Number 8501 (USEPA, 2002)
	Household Products		Profile Number 8511 (USEPA, 2002)
	Automotive Aftermarket Products		Profile Number 8520 (USEPA, 2002)
	Adhesives and Sealants		Profile Number 8523 (USEPA, 2002)
	Insecticide, Fungicide, Rodenticide and Herbicide Products		Profile Number 8526 (USEPA, 2002)
	Coatings and Related Products		Profile Number 8532 (USEPA, 2002)
	Miscellaneous Products		Profile Number 8535 (USEPA, 2002)

[1] Total VOCs from ERG, 1996 have been adjusted to include non-reactive VOCs using a multiplication factor of 1.45 (Environment Australia, 1999a).

3.1.5 Spatial Distribution of Emissions

Emissions from domestic-commercial aerosols and solvents have been spatially distributed according to population (ERG, 1996). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell in proportion to the population in each grid cell. Figure 3.1 shows the spatial distribution of population in the GMR.

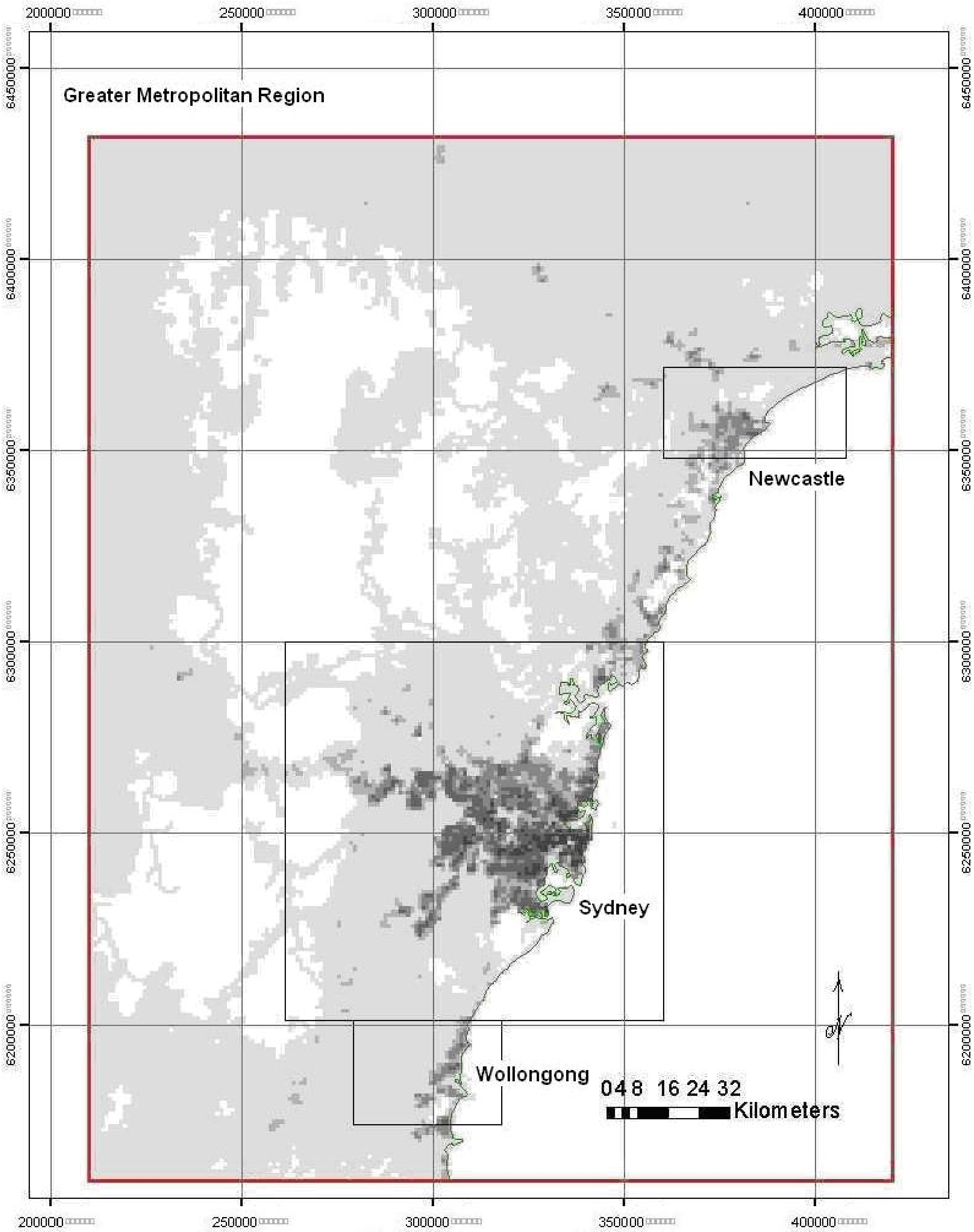

Figure 3.1: Spatial distribution of population in the GMR

3.1.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic-commercial aerosols and solvents:

- Monthly - assumed to be constant for each month of the year (ERG, 1996);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (ERG, 1996); and
- Daily – assumed to be constant between 7am and 7pm and this period constitutes 80% of daily emissions (Carnovale et. al., 1996).

Tables 3.3, 3.4 and 3.5 detail the temporal emissions variation profiles that have been used for domestic-commercial aerosols and solvents.

Table 3.3: Monthly temporal emissions variation profile for domestic-commercial aerosols and solvents

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	1	8.33%	July	1	8.33%
February	1	8.33%	August	1	8.33%
March	1	8.33%	September	1	8.33%
April	1	8.33%	October	1	8.33%
May	1	8.33%	November	1	8.33%
June	1	8.33%	December	1	8.33%

The monthly temporal emissions variation profile describes the distribution of annual emissions during each month. The temporal factors used in the monthly profile are scalar factors representing the ratio of emissions that occur in one month as opposed to another month.

Table 3.4: Weekly temporal emissions variation profile for domestic-commercial aerosols and solvents

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

The weekly temporal variation emissions profile describes the distribution of annual emissions over a period of a week. The temporal factors used in the weekly profile are scalar factors representing the ratio of emissions that occur in one day type as opposed to another day type.

Table 3.5: Daily temporal emissions variation profile for domestic-commercial aerosols and solvents

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	2	1.67%	2	1.67%	1 pm	8	6.67%	8	6.67%
2 am	2	1.67%	2	1.67%	2 pm	8	6.67%	8	6.67%
3 am	2	1.67%	2	1.67%	3 pm	8	6.67%	8	6.67%
4 am	2	1.67%	2	1.67%	4 pm	8	6.67%	8	6.67%
5 am	2	1.67%	2	1.67%	5 pm	8	6.67%	8	6.67%
6 am	2	1.67%	2	1.67%	6 pm	8	6.67%	8	6.67%
7 am	8	6.67%	8	6.67%	7 pm	2	1.67%	2	1.67%
8 am	8	6.67%	8	6.67%	8 pm	2	1.67%	2	1.67%
9 am	8	6.67%	8	6.67%	9 pm	2	1.67%	2	1.67%
10 am	8	6.67%	8	6.67%	10 pm	2	1.67%	2	1.67%
11 am	8	6.67%	8	6.67%	11 pm	2	1.67%	2	1.67%
12 noon	8	6.67%	8	6.67%	12 midnight	2	1.67%	2	1.67%

The daily temporal emissions variation profile describes the distribution of daily emissions that occur during each hour for a typical weekday and a typical weekend day. The temporal factors used in the daily profile are scalar factors representing the ratio of emissions that occur in one hour as opposed to another hour.

3.1.7 Emission Estimates

Table 3.6 presents total estimated annual emissions (for selected substances) from domestic-commercial aerosols and solvents for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic-commercial aerosols and solvents are presented in Appendix B.

Table 3.6: Total estimated annual emissions from domestic-commercial aerosols and solvents in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	8.62×10^{-03}	5.68×10^{-04}	4.13×10^{-04}	1.35×10^{-03}	1.09×10^{-02}
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	2.25	1.49×10^{-01}	1.08×10^{-01}	3.53×10^{-01}	2.86
ISOMERS OF XYLENE	$3.75 \times 10^{+02}$	$2.47 \times 10^{+01}$	$1.80 \times 10^{+01}$	$5.88 \times 10^{+01}$	$4.77 \times 10^{+02}$
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	$8.41 \times 10^{+01}$	5.54	4.03	$1.32 \times 10^{+01}$	$1.07 \times 10^{+02}$
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	$5.15 \times 10^{+01}$	3.39	2.47	8.08	$6.54 \times 10^{+01}$
TOLUENE	$7.83 \times 10^{+02}$	$5.16 \times 10^{+01}$	$3.75 \times 10^{+01}$	$1.23 \times 10^{+02}$	$9.95 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$2.06 \times 10^{+04}$	$1.36 \times 10^{+03}$	$9.89 \times 10^{+02}$	$3.24 \times 10^{+03}$	$2.62 \times 10^{+04}$
TRICHLOROETHYLENE	8.84×10^{-01}	5.82×10^{-02}	4.24×10^{-02}	1.39×10^{-01}	1.12

Table 3.7 presents total estimated annual emissions (for selected substances) from domestic-commercial aerosols and solvents by product group for the GMR.

Table 3.7: Total estimated annual emissions from domestic-commercial aerosols and solvents by product group

Substance	Emissions (tonnes/year)							
	Personal Care Products	Household Products	Automotive Aftermarket Products	Adhesives and Sealants	Insecticide, Fungicide, Rodenticide and Herbicide Products	Coatings and Related Products	Miscellaneous Products	Domestic-Commercial Aerosols and Solvents Total
1,3 BUTADIENE	-	-	-	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-	-	-	-
BENZENE	-	-	1.09×10^{-02}	-	-	-	-	1.09×10^{-02}
CARBON MONOXIDE	-	-	-	-	-	-	-	-
FORMALDEHYDE	-	1.56×10^{-02}	-	5.81×10^{-02}	8.82×10^{-01}	1.91	-	2.86
ISOMERS OF XYLENE	-	7.59	$2.77 \times 10^{+01}$	$2.26 \times 10^{+01}$	$3.24 \times 10^{+02}$	$9.37 \times 10^{+01}$	9.98×10^{-01}	$4.77 \times 10^{+02}$
LEAD AND COMPOUNDS	-	-	-	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-	-	-	-
POLCYCLIC AROMATIC HYDROCARBONS	-	1.28×10^{-03}	5.24×10^{-03}	4.30×10^{-01}	$1.06 \times 10^{+02}$	1.33×10^{-02}	-	$1.07 \times 10^{+02}$
SULFUR DIOXIDE	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE	-	6.87	$5.45 \times 10^{+01}$	1.56	4.44×10^{-01}	3.43×10^{-01}	1.74	$6.54 \times 10^{+01}$
TOLUENE	7.89	1.35	$5.75 \times 10^{+01}$	$1.95 \times 10^{+02}$	-	$7.33 \times 10^{+02}$	5.69×10^{-03}	$9.95 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-	-	-	-
TOTAL VOCS	$7.74 \times 10^{+03}$	$2.65 \times 10^{+03}$	$4.58 \times 10^{+03}$	$1.93 \times 10^{+03}$	$5.96 \times 10^{+03}$	$3.16 \times 10^{+03}$	$2.04 \times 10^{+02}$	$2.62 \times 10^{+04}$
TRICHLOROETHYLENE	-	1.00×10^{-01}	6.16×10^{-01}	8.98×10^{-02}	-	3.17×10^{-01}	-	1.12

Table 3.8 presents total estimated daily emissions (for selected substances) from domestic-commercial aerosols and solvents for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.8: Total estimated daily emissions from domestic-commercial aerosols and solvents in each region for typical January weekday/weekend day and July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	2.36×10^{-05}	1.55×10^{-06}	1.13×10^{-06}	3.70×10^{-06}	3.00×10^{-05}
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	6.18×10^{-03}	4.07×10^{-04}	2.96×10^{-04}	9.68×10^{-04}	7.85×10^{-03}
ISOMERS OF XYLENE	1.03	6.77×10^{-02}	4.92×10^{-02}	1.61×10^{-01}	1.31
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	2.31×10^{-01}	1.52×10^{-02}	1.10×10^{-02}	3.61×10^{-02}	2.93×10^{-01}
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	1.41×10^{-01}	9.30×10^{-03}	6.76×10^{-03}	2.21×10^{-02}	1.79×10^{-01}
TOLUENE	2.15	1.41×10^{-01}	1.03×10^{-01}	3.36×10^{-01}	2.73
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$5.65 \times 10^{+01}$	3.72	2.71	8.86	$7.18 \times 10^{+01}$
TRICHLOROETHYLENE	2.42×10^{-03}	1.60×10^{-04}	1.16×10^{-04}	3.80×10^{-04}	3.08×10^{-03}

3.1.8 Emission Projection Methodology

Emission projection factors for domestic-commercial aerosols and solvents use population growth as the surrogate. Emission projection factors for domestic-commercial aerosols and solvents were developed using the following data:

- Population growth data (ABS, 2001 & TPDC, 2004).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.9 presents the emission projection factors for domestic-commercial aerosols and solvents.

Table 3.9: Emission projection factors for domestic-commercial aerosols and solvents

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0095	2018	1.1419
2005	1.0190	2019	1.1509
2006	1.0284	2020	1.1600
2007	1.0382	2021	1.1691
2008	1.0480	2022	1.1778
2009	1.0578	2023	1.1866
2010	1.0676	2024	1.1953
2011	1.0774	2025	1.2041
2012	1.0867	2026	1.2128
2013	1.0959	2027	1.2210
2014	1.1052	2028	1.2292
2015	1.1145	2029	1.2374
2016	1.1237	2030	1.2456
2017	1.1328	2031	1.2538

[1] Data Source: (ABS, 2001 & TPDC, 2004).

3.2 Barbecues

3.2.1 Emission Source Description

Emissions of combustion products from domestic barbecues originate when different fuels are combusted in different appliances, including:

- Briquette barbecues;
- Butane cartridge and LPG portable stoves;
- Electric barbecues;
- Firewood barbecues;
- Liquefied petroleum gas (LPG) barbecues; and
- Natural gas barbecues.

The domestic barbecue fuels and appliances included in the domestic-commercial air emissions inventory include barbecues and portable stoves using briquettes, butane, firewood and LPG.

Emissions from barbecues that use natural gas from the reticulated gas supply have been separately estimated for the entire GMR and the results are presented in Section 3.4. Emissions from electric barbecues have not been included, since emissions from electricity generation have been separately estimated as part of the industrial air emissions inventory (DECC, 2007b).

3.2.2 Emission Estimation Methodology

Emissions from domestic barbecues have been estimated using the preferred method (Environment Australia, 1999b), which requires fuel consumption data to be obtained from a domestic survey for each fuel type. Fuel consumption data for each fuel type have been combined with mass or volume based emission factors to estimate emissions for each substance. Emissions from domestic barbecues have been calculated using the following formula:

$$E_{i,j} = EF_{i,j} \times SF_{i,j} \times F_j$$

where:

$E_{i,j}$	=	Emission of substance i from fuel type j	(kg/year)
$EF_{i,j}$	=	Mass or volume based emission factor of substance i for fuel type j	(kg/kg fuel) or (kg/litres fuel)
$SF_{i,j}$	=	NO_x, VOC or PM speciation factor of substance i for fuel type j	(%)
F_j	=	Fuel consumption of fuel type j	(kg/year) or (litres/year)

3.2.3 Activity Data

Activity data required for estimating emissions from domestic barbecues includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572;
- Appliance type, fuel type, fuel consumption, frequency, duration and seasonal variation of barbecue use from the domestic survey. Specific details about the information obtained are included in the domestic questionnaire survey form for domestic barbecues, which is included in Section 6 of Appendix A; and
- Domestic and commercial barbecue briquette consumption for NSW from Auschar, 2005.

Table 3.10 includes the barbecue fuel type, the quantity of barbecue fuel consumed, the number of households with a barbecue and the proportion of total dwellings with a barbecue in the GMR that was obtained through the domestic survey and Auschar, 2005.

Table 3.10: Domestic barbecues activity data during 2003 in the GMR

Barbecue Fuel Type [1]	Quantity of Fuel Consumed [1]	Number of Households [1]	Proportion of Households (%)[1,2]
Briquette	1,262 tonnes/year [3]	33,832	1.8
LPG and Butane [4]	38,208 m^3/year [5]	657,850	35.0
Wood	381 tonnes/year	11,277	0.6

[1] Data Source: (Domestic Survey).
[2] Calculated from 1,879,572 total dwellings (ABS, 2001 & TPDC, 2004).
[3] Annual briquette consumption for NSW residential and commercial use is 4,468 tonnes/year (Auschar, 2005).
[4] 37,849 m^3 LPG barbecues plus 358 m^3 LPG and butane portable stoves (Domestic Survey). Specific volume of LPG and butane is 1,890 litres/tonnes (ABARE, 2005d).
[5] Total LPG and butane consumption in the GMR equals 40,126 m^3/year (i.e. domestic LPG barbecues and butane portable stoves – 38,208 m^3/year plus domestic LPG combustion for other appliances – 1,918 m^3/year). Annual LPG consumption for NSW and ACT residential use during 2003-04 is 104,198 m^3/year (ABARE, 2005b). Energy content of LPG and butane is 26.2 mega joules/litres (ABARE, 2005d).

3.2.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic barbecues are detailed in Table 3.11.

Table 3.11: Emission and speciation factors for all substances from domestic barbecues

Substance	Fuel	Emission Factor Source
CO, NO_x[1], PM_{10}, SO_2 & Total VOC	Briquette	(Environment Australia, 1999b)
	LPG	(USEPA, 1996a)
	Wood	(USEPA, 1996b)
$PM_{2.5}$ & TSP	Briquette	(USEPA, 1996e) & (Houck et. al., 1998)
	LPG	(USEPA, 1996e) & (USEPA, 1996e)
	Wood	(USEPA, 1996e) & (Houck et. al., 1998)
Organic air toxics	Briquette	(Environment Australia, 1999b)
	LPG	(Environment Australia, 1999c)
	Wood	(Environment Australia, 1999b) & (Environment Australia, 2002)
Metal air toxics	Briquette	(Environment Australia, 1999b)
	LPG	(Environment Australia, 1999c)
	Wood	(Environment Australia, 1999b)
PAH	Briquette	(Environment Australia, 1999b) & (USEPA, 1996c)
	LPG	(Environment Australia, 1999c) & (USEPA, 1998a)
	Wood	(Environment Australia, 1999b) & (USEPA, 1996c)
PCDD/PCDF	Briquette	NA
	LPG	NA
	Wood	(Environment Australia, 2002) & (Bawden et. al., 2004b)
Speciated VOC & Methane	Briquette	Profile Number 1085 (USEPA, 2002)
	LPG	Profile Number 0003 (USEPA, 2002)
	Wood [2]	Profile Number 1084 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).
[2] Profile Number 0000 (USEPA, 2002) for "Unidentified" VOC.

3.2.5 Spatial Distribution of Emissions

Emissions from domestic barbecues have been spatially distributed according to total dwellings (Environment Australia, 1999b). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell in proportion to the total dwellings in each grid cell. Figure 3.2 shows the spatial distribution of total dwellings in the GMR.

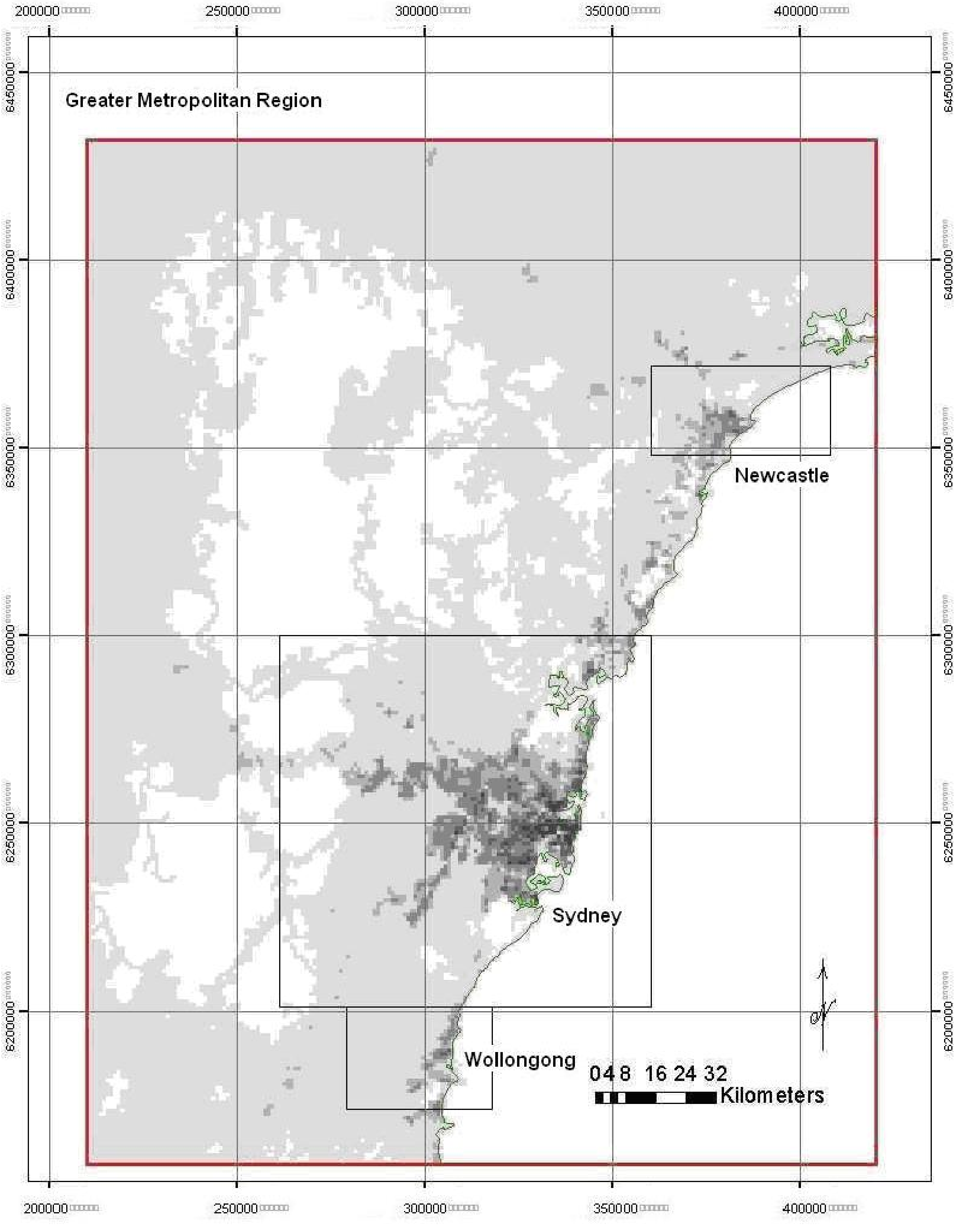

Figure 3.2: Spatial distribution of total dwellings in the GMR

3.2.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic barbecues:

- Monthly - assumed to vary for each month of the year (Domestic Survey);
- Weekly (i.e. Weekday and Weekend day) - assumed to be ~1.65 times higher on weekend days compared with weekdays (Domestic Survey); and
- Daily – assumed to be constant between 9 am and 10 pm (Domestic Survey).

Tables 3.12, 3.13 and 3.14 detail the temporal emissions variation profiles that have been used for domestic barbecues.

Table 3.12: Monthly temporal emissions variation profile for domestic barbecues

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	1.16	8.95%	July	1.00	7.71%
February	1.16	8.95%	August	1.00	7.71%
March	1.06	8.21%	September	1.10	8.46%
April	1.06	8.21%	October	1.10	8.46%
May	1.06	8.21%	November	1.10	8.46%
June	1.00	7.71%	December	1.16	8.95%

Table 3.13: Weekly temporal emissions variation profile for domestic barbecues

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5.0	60.24%	Weekend day	3.3	39.76%

Table 3.14: Daily temporal emissions variation profile for domestic barbecues

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0	0%	0	0%	1 pm	1	7.69%	1	7.69%
2 am	0	0%	0	0%	2 pm	1	7.69%	1	7.69%
3 am	0	0%	0	0%	3 pm	1	7.69%	1	7.69%
4 am	0	0%	0	0%	4 pm	1	7.69%	1	7.69%
5 am	0	0%	0	0%	5 pm	1	7.69%	1	7.69%
6 am	0	0%	0	0%	6 pm	1	7.69%	1	7.69%
7 am	0	0%	0	0%	7 pm	1	7.69%	1	7.69%
8 am	0	0%	0	0%	8 pm	1	7.69%	1	7.69%
9 am	1	7.69%	1	7.69%	9 pm	1	7.69%	1	7.69%
10 am	1	7.69%	1	7.69%	10 pm	0	0%	0	0%
11 am	1	7.69%	1	7.69%	11 pm	0	0%	0	0%
12 noon	1	7.69%	1	7.69%	12 midnight	0	0%	0	0%

3.2.7 Emission Estimates

Table 3.15 presents total estimated annual emissions (for selected substances) from domestic barbecues for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic barbecues are presented in Appendix B.

Table 3.15: Total estimated annual emissions from domestic barbecues in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.06×10^{-01}	7.39×10^{-03}	5.35×10^{-03}	1.80×10^{-02}	1.37×10^{-01}
ACETALDEHYDE	2.62	1.82×10^{-01}	1.32×10^{-01}	4.43×10^{-01}	3.38
BENZENE	1.26	8.76×10^{-02}	6.34×10^{-02}	2.13×10^{-01}	1.62
CARBON MONOXIDE	$1.79 \times 10^{+02}$	$1.25 \times 10^{+01}$	9.02	$3.03 \times 10^{+01}$	$2.31 \times 10^{+02}$
FORMALDEHYDE	3.01	2.09×10^{-01}	1.51×10^{-01}	5.08×10^{-01}	3.87
ISOMERS OF XYLENE	4.28×10^{-01}	2.98×10^{-02}	2.15×10^{-02}	7.23×10^{-02}	5.52×10^{-01}
LEAD AND COMPOUNDS	5.16×10^{-03}	3.59×10^{-04}	2.60×10^{-04}	8.71×10^{-04}	6.65×10^{-03}
OXIDES OF NITROGEN	$5.46 \times 10^{+01}$	3.80	2.75	9.23	$7.04 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	9.57	6.65×10^{-01}	4.81×10^{-01}	1.62	$1.23 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	5.33	3.71×10^{-01}	2.68×10^{-01}	9.01×10^{-01}	6.87
POLYCYCLIC AROMATIC HYDROCARBONS	9.56×10^{-02}	6.65×10^{-03}	4.81×10^{-03}	1.61×10^{-02}	1.23×10^{-01}
SULFUR DIOXIDE	3.09	2.15×10^{-01}	1.56×10^{-01}	5.23×10^{-01}	3.99
TETRACHLOROETHYLENE	3.95×10^{-03}	2.75×10^{-04}	1.99×10^{-04}	6.68×10^{-04}	5.10×10^{-03}
TOLUENE	7.46×10^{-01}	5.18×10^{-02}	3.75×10^{-02}	1.26×10^{-01}	9.61×10^{-01}
TOTAL SUSPENDED PARTICULATES	$1.01 \times 10^{+01}$	7.00×10^{-01}	5.07×10^{-01}	1.70	$1.30 \times 10^{+01}$
TOTAL VOCS	$3.98 \times 10^{+01}$	2.76	2.00	6.72	$5.13 \times 10^{+01}$
TRICHLOROETHYLENE	2.42×10^{-03}	1.68×10^{-04}	1.22×10^{-04}	4.08×10^{-04}	3.11×10^{-03}

Tables 3.16, 3.17, 3.18 and 3.19 present total estimated daily emissions (for selected substances) from domestic barbecues for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday, January weekend day, July weekday and July weekend day daily emissions.

Table 3.16: Total estimated daily emissions from domestic barbecues in each region for typical January weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	2.49×10^{-04}	1.73×10^{-05}	1.25×10^{-05}	4.21×10^{-05}	3.21×10^{-04}
ACETALDEHYDE	6.14×10^{-03}	4.27×10^{-04}	3.09×10^{-04}	1.04×10^{-03}	7.92×10^{-03}
BENZENE	2.96×10^{-03}	2.05×10^{-04}	1.49×10^{-04}	4.99×10^{-04}	3.81×10^{-03}
CARBON MONOXIDE	4.20×10^{-01}	2.92×10^{-02}	2.11×10^{-02}	7.10×10^{-02}	5.42×10^{-01}
FORMALDEHYDE	7.05×10^{-03}	4.90×10^{-04}	3.55×10^{-04}	1.19×10^{-03}	9.09×10^{-03}
ISOMERS OF XYLENE	1.00×10^{-03}	6.98×10^{-05}	5.05×10^{-05}	1.70×10^{-04}	1.29×10^{-03}
LEAD AND COMPOUNDS	1.21×10^{-05}	8.41×10^{-07}	6.08×10^{-07}	2.04×10^{-06}	1.56×10^{-05}
OXIDES OF NITROGEN	1.28×10^{-01}	8.91×10^{-03}	6.45×10^{-03}	2.16×10^{-02}	1.65×10^{-01}
PARTICULATE MATTER < 10 µm	2.24×10^{-02}	1.56×10^{-03}	1.13×10^{-03}	3.79×10^{-03}	2.89×10^{-02}
PARTICULATE MATTER < 2.5 µm	1.25×10^{-02}	8.69×10^{-04}	6.29×10^{-04}	2.11×10^{-03}	1.61×10^{-02}
POLYCYCLIC AROMATIC HYDROCARBONS	2.24×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.79×10^{-05}	2.89×10^{-04}
SULFUR DIOXIDE	7.26×10^{-03}	5.04×10^{-04}	3.65×10^{-04}	1.23×10^{-03}	9.35×10^{-03}
TETRACHLOROETHYLENE	9.27×10^{-06}	6.44×10^{-07}	4.66×10^{-07}	1.57×10^{-06}	1.19×10^{-05}
TOLUENE	1.75×10^{-03}	1.22×10^{-04}	8.80×10^{-05}	2.95×10^{-04}	2.25×10^{-03}
TOTAL SUSPENDED PARTICULATES	2.36×10^{-02}	1.64×10^{-03}	1.19×10^{-03}	3.99×10^{-03}	3.04×10^{-02}
TOTAL VOCS	9.33×10^{-02}	6.48×10^{-03}	4.69×10^{-03}	1.58×10^{-02}	1.20×10^{-01}
TRICHLOROETHYLENE	5.66×10^{-06}	3.94×10^{-07}	2.85×10^{-07}	9.57×10^{-07}	7.30×10^{-06}

Table 3.17: Total estimated daily emissions from domestic barbecues in each region for typical January weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	4.73×10^{-04}	3.29×10^{-05}	2.38×10^{-05}	7.99×10^{-05}	6.10×10^{-04}
ACETALDEHYDE	1.17×10^{-02}	8.10×10^{-04}	5.86×10^{-04}	1.97×10^{-03}	1.50×10^{-02}
BENZENE	5.61×10^{-03}	3.90×10^{-04}	2.82×10^{-04}	9.48×10^{-04}	7.23×10^{-03}
CARBON MONOXIDE	7.97×10^{-01}	5.54×10^{-02}	4.01×10^{-02}	1.35×10^{-01}	1.03
FORMALDEHYDE	1.34×10^{-02}	9.30×10^{-04}	6.73×10^{-04}	2.26×10^{-03}	1.72×10^{-02}
ISOMERS OF XYLENE	1.91×10^{-03}	1.32×10^{-04}	9.59×10^{-05}	3.22×10^{-04}	2.46×10^{-03}
LEAD AND COMPOUNDS	2.30×10^{-05}	1.60×10^{-06}	1.15×10^{-06}	3.88×10^{-06}	2.96×10^{-05}
OXIDES OF NITROGEN	2.43×10^{-01}	1.69×10^{-02}	1.22×10^{-02}	4.11×10^{-02}	3.13×10^{-01}
PARTICULATE MATTER < 10 µm	4.26×10^{-02}	2.96×10^{-03}	2.14×10^{-03}	7.19×10^{-03}	5.49×10^{-02}
PARTICULATE MATTER < 2.5 µm	2.37×10^{-02}	1.65×10^{-03}	1.19×10^{-03}	4.01×10^{-03}	3.06×10^{-02}
POLYCYCLIC AROMATIC HYDROCARBONS	4.25×10^{-04}	2.96×10^{-05}	2.14×10^{-05}	7.18×10^{-05}	5.48×10^{-04}
SULFUR DIOXIDE	1.38×10^{-02}	9.57×10^{-04}	6.93×10^{-04}	2.33×10^{-03}	1.77×10^{-02}
TETRACHLOROETHYLENE	1.76×10^{-05}	1.22×10^{-06}	8.85×10^{-07}	2.97×10^{-06}	2.27×10^{-05}
TOLUENE	3.32×10^{-03}	2.31×10^{-04}	1.67×10^{-04}	5.60×10^{-04}	4.28×10^{-03}
TOTAL SUSPENDED PARTICULATES	4.48×10^{-02}	3.11×10^{-03}	2.25×10^{-03}	7.57×10^{-03}	5.77×10^{-02}
TOTAL VOCS	1.77×10^{-01}	1.23×10^{-02}	8.90×10^{-03}	2.99×10^{-02}	2.28×10^{-01}
TRICHLOROETHYLENE	1.07×10^{-05}	7.47×10^{-07}	5.41×10^{-07}	1.82×10^{-06}	1.39×10^{-05}

Table 3.18: Total estimated daily emissions from domestic barbecues in each region for typical July weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	2.15×10^{-04}	1.49×10^{-05}	1.08×10^{-05}	3.63×10^{-05}	2.77×10^{-04}
ACETALDEHYDE	5.29×10^{-03}	3.68×10^{-04}	2.66×10^{-04}	8.94×10^{-04}	6.82×10^{-03}
BENZENE	2.55×10^{-03}	1.77×10^{-04}	1.28×10^{-04}	4.30×10^{-04}	3.28×10^{-03}
CARBON MONOXIDE	3.62×10^{-01}	2.52×10^{-02}	1.82×10^{-02}	6.12×10^{-02}	4.67×10^{-01}
FORMALDEHYDE	6.08×10^{-03}	4.22×10^{-04}	3.06×10^{-04}	1.03×10^{-03}	7.83×10^{-03}
ISOMERS OF XYLENE	8.65×10^{-04}	6.01×10^{-05}	4.35×10^{-05}	1.46×10^{-04}	1.12×10^{-03}
LEAD AND COMPOUNDS	1.04×10^{-05}	7.24×10^{-07}	5.24×10^{-07}	1.76×10^{-06}	1.34×10^{-05}
OXIDES OF NITROGEN	1.10×10^{-01}	7.67×10^{-03}	5.55×10^{-03}	1.87×10^{-02}	1.42×10^{-01}
PARTICULATE MATTER < 10 µm	1.93×10^{-02}	1.34×10^{-03}	9.73×10^{-04}	3.27×10^{-03}	2.49×10^{-02}
PARTICULATE MATTER < 2.5 µm	1.08×10^{-02}	7.49×10^{-04}	5.42×10^{-04}	1.82×10^{-03}	1.39×10^{-02}
POLYCYCLIC AROMATIC HYDROCARBONS	1.93×10^{-04}	1.34×10^{-05}	9.72×10^{-06}	3.26×10^{-05}	2.49×10^{-04}
SULFUR DIOXIDE	6.25×10^{-03}	4.35×10^{-04}	3.15×10^{-04}	1.06×10^{-03}	8.06×10^{-03}
TETRACHLOROETHYLENE	7.99×10^{-06}	5.55×10^{-07}	4.02×10^{-07}	1.35×10^{-06}	1.03×10^{-05}
TOLUENE	1.51×10^{-03}	1.05×10^{-04}	7.58×10^{-05}	2.55×10^{-04}	1.94×10^{-03}
TOTAL SUSPENDED PARTICULATES	2.04×10^{-02}	1.41×10^{-03}	1.02×10^{-03}	3.44×10^{-03}	2.62×10^{-02}
TOTAL VOCS	8.04×10^{-02}	5.59×10^{-03}	4.04×10^{-03}	1.36×10^{-02}	1.04×10^{-01}
TRICHLOROETHYLENE	4.88×10^{-06}	3.39×10^{-07}	2.46×10^{-07}	8.25×10^{-07}	6.29×10^{-06}

Table 3.19: Total estimated daily emissions from domestic barbecues in each region for typical July weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	4.08×10^{-04}	2.83×10^{-05}	2.05×10^{-05}	6.89×10^{-05}	5.25×10^{-04}
ACETALDEHYDE	1.00×10^{-02}	6.98×10^{-04}	5.05×10^{-04}	1.70×10^{-03}	1.29×10^{-02}
BENZENE	4.83×10^{-03}	3.36×10^{-04}	2.43×10^{-04}	8.17×10^{-04}	6.23×10^{-03}
CARBON MONOXIDE	6.87×10^{-01}	4.78×10^{-02}	3.46×10^{-02}	1.16×10^{-01}	8.85×10^{-01}
FORMALDEHYDE	1.15×10^{-02}	8.01×10^{-04}	5.80×10^{-04}	1.95×10^{-03}	1.49×10^{-02}
ISOMERS OF XYLENE	1.64×10^{-03}	1.14×10^{-04}	8.26×10^{-05}	2.77×10^{-04}	2.12×10^{-03}
LEAD AND COMPOUNDS	1.98×10^{-05}	1.37×10^{-06}	9.95×10^{-07}	3.34×10^{-06}	2.55×10^{-05}
OXIDES OF NITROGEN	2.10×10^{-01}	1.46×10^{-02}	1.05×10^{-02}	3.54×10^{-02}	2.70×10^{-01}
PARTICULATE MATTER < 10 µm	3.67×10^{-02}	2.55×10^{-03}	1.85×10^{-03}	6.20×10^{-03}	4.73×10^{-02}
PARTICULATE MATTER < 2.5 µm	2.05×10^{-02}	1.42×10^{-03}	1.03×10^{-03}	3.45×10^{-03}	2.64×10^{-02}
POLYCYCLIC AROMATIC HYDROCARBONS	3.67×10^{-04}	2.55×10^{-05}	1.84×10^{-05}	6.19×10^{-05}	4.72×10^{-04}
SULFUR DIOXIDE	1.19×10^{-02}	8.25×10^{-04}	5.97×10^{-04}	2.00×10^{-03}	1.53×10^{-02}
TETRACHLOROETHYLENE	1.52×10^{-05}	1.05×10^{-06}	7.63×10^{-07}	2.56×10^{-06}	1.95×10^{-05}
TOLUENE	2.86×10^{-03}	1.99×10^{-04}	1.44×10^{-04}	4.83×10^{-04}	3.68×10^{-03}
TOTAL SUSPENDED PARTICULATES	3.86×10^{-02}	2.68×10^{-03}	1.94×10^{-03}	6.52×10^{-03}	4.98×10^{-02}
TOTAL VOCS	1.53×10^{-01}	1.06×10^{-02}	7.67×10^{-03}	2.58×10^{-02}	1.97×10^{-01}
TRICHLOROETHYLENE	9.26×10^{-06}	6.44×10^{-07}	4.66×10^{-07}	1.56×10^{-06}	1.19×10^{-05}

3.2.8 Emission Projection Methodology

Emission projection factors for domestic barbecues use dwelling growth as the surrogate. Emission projection factors for domestic barbecues were developed using the following data:

- Dwelling growth data (ABS, 2001 & TPDC, 2004).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.20 presents the emission projection factors for domestic barbecues.

Table 3.20: Emission projection factors for domestic barbecues

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0125	2018	1.2026
2005	1.0249	2019	1.2158
2006	1.0374	2020	1.2290
2007	1.0513	2021	1.2422
2008	1.0652	2022	1.2558
2009	1.0791	2023	1.2695
2010	1.0930	2024	1.2831
2011	1.1070	2025	1.2967
2012	1.1208	2026	1.3103
2013	1.1346	2027	1.3238
2014	1.1485	2028	1.3374
2015	1.1623	2029	1.3509
2016	1.1761	2030	1.3644
2017	1.1894	2031	1.3780

[1] Data Source: (ABS, 2001 & TPDC, 2004).

3.3 Cutback Bitumen

3.3.1 Emission Source Description

Emissions from cutback bitumen arise through the use of bituminous materials for road construction and maintenance work. Bitumen itself consists of long chain, viscous hydrocarbons which are not volatile in themselves. However, to temporarily reduce bitumen viscosity and aid the application to a road surface, cutter solvent may be added to the bitumen. Cutter solvents used in NSW are essentially kerosene and they evaporate over time resulting in an increased bitumen viscosity. Cutback bitumen (i.e. bitumen with cutter solvent added) is a source of VOC emissions.

3.3.2 Emission Estimation Methodology

Emissions from cutback bitumen have been estimated using the preferred method (Environment Australia, 1999d), which requires cutter solvent consumption data to be obtained. Cutter solvent consumption data have been combined with the fraction of cutter solvent evaporated to estimate emissions of total VOCs and speciated VOCs. The volume of bitumen used in NSW and ACT (ABARE, 2005a) was multiplied by ~72% (i.e. the proportion of population in the GMR to NSW and ACT (ABS, 2001, ABS, 2004 & TPDC, 2004)) to determine the amount used in the GMR. The ratio of cutback bitumen to total bitumen was assumed to be ~42% (DEH, 2005c) and the ratio of cutter solvent added to the bitumen was assumed to be ~5.4% (DEH, 2005c). It was assumed that ~65% of the cutter oil evaporates over time (Environment Australia, 1999d). Emissions from cutback bitumen have been calculated using the following formula:

$$E_i = SF_i \times EV \times C$$

where:

E_i	=	Emission of substance i	(kg/year)
SF_i	=	VOC speciation factor of substance i	(%)
EV	=	Quantity of cutter solvent evaporated	(%)
C	=	Cutter solvent consumption	(kg/year)

3.3.3 Activity Data

Activity data required for estimating emissions from cutback bitumen includes:

- ❑ 1 km by 1 km gridded VKT data for the GMR (TPDC, 2005). The total VKT in the GMR during 2003 was 126,772,070;
- ❑ Bitumen consumption for NSW and ACT from ABARE, 2005a;
- ❑ Proportion of cutback to total bitumen consumption and quantity of cutter solvent used from DEH, 2005c; and
- ❑ Fraction of cutter solvent evaporated from Environment Australia, 1999d.

Table 3.21 includes the activity data and data sources for calculating emissions from cutback bitumen.

Table 3.21: Cutback bitumen activity data during 2003 in the GMR

Activity Data	Quantity	Data Source
Bitumen consumption for NSW and ACT	~219 mega litres/year [1] (2002-03 and 2003-04 average)	(ABARE, 2005a) & (ABARE, 2005b)
Bitumen density	~981 litres/tonnes	(ABARE, 2005d)
Proportion of cutback to total bitumen	~42%	(DEH, 2005c)
Proportion of cutter solvent to cutback bitumen	~5.4%	(DEH, 2005c)
Fraction of cutter solvent evaporated	~65%	(Environment Australia, 1999d)
Proportion of cutback bitumen consumption in the GMR to NSW and ACT	~72%	(ABS, 2001) & (TPDC, 2004)
Cutter solvent consumption in the GMR	3,653 tonnes/year	(Mass Balance)

[1] Energy content of bitumen is 44.0 mega joules/litres (ABARE, 2005d).

3.3.4 Emission and Speciation Factors

The emission and speciation factors for all substances from cutback bitumen are detailed in Table 3.22.

Table 3.22: Emission and speciation factors for all substances from cutback bitumen

Substance	Emission Factor (kg Total VOC/kg Cutter Solvent)	Emission Factor Source	Substance	Emission Factor Source
Total VOC	0.65	(Environment Australia, 1999d) & (Mass Balance)	Speciated VOC	(ATSDR, 1998)

3.3.5 Spatial Distribution of Emissions

Emissions from cutback bitumen have been spatially distributed according to VKT (Environment Australia, 1999d). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell in proportion to the VKT in each grid cell. Figure 3.3 shows the spatial distribution of VKT in the GMR.

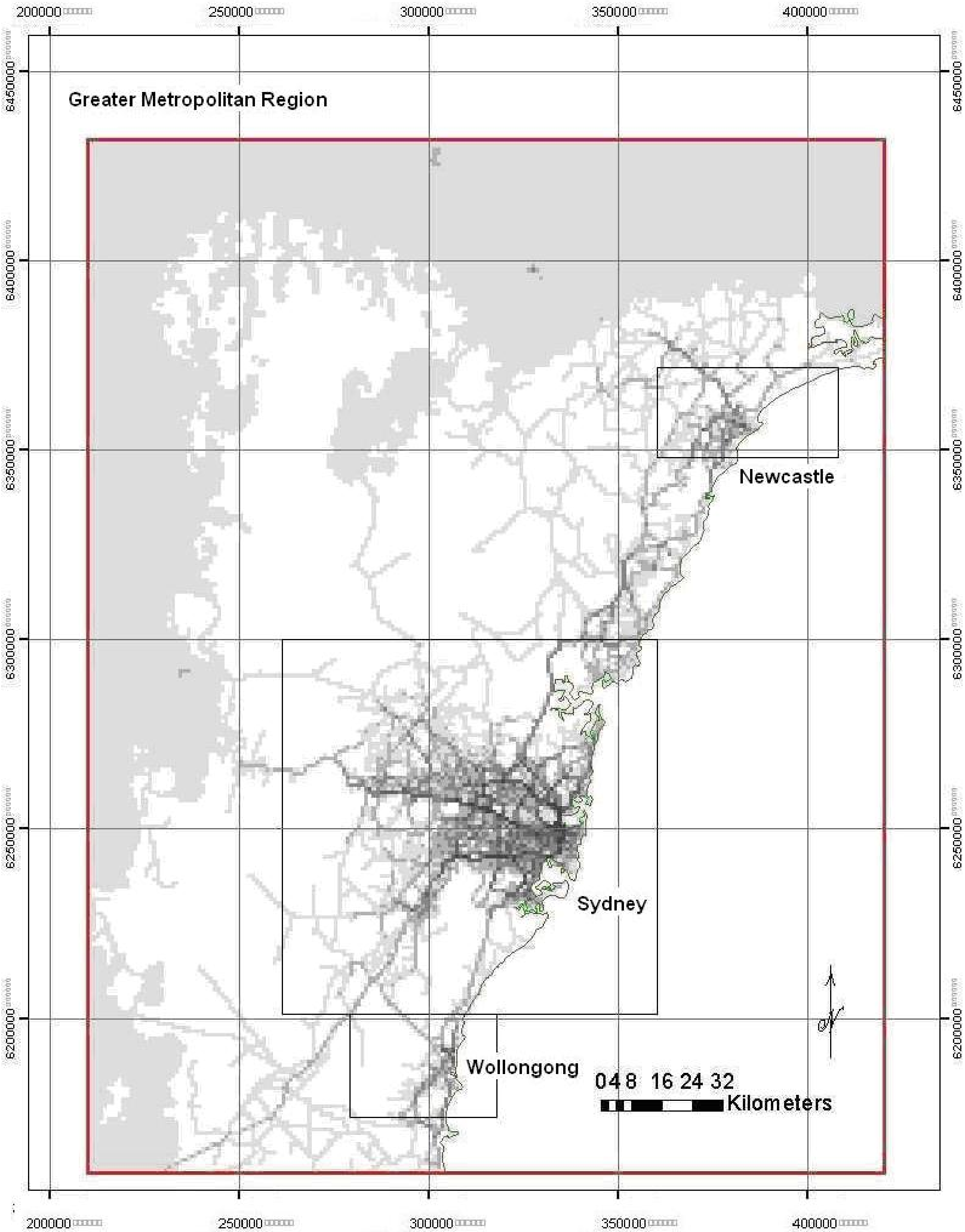

Figure 3.3: Spatial distribution of VKT in the GMR

3.3.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for cutback bitumen:

- Monthly - assumed to be constant for each month of the year (Carnovale et. al., 1996);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (Carnovale et. al., 1996); and
- Daily – assumed to be constant for each hour of the day (Carnovale et. al., 1996).

Tables 3.23, 3.24 and 3.25 detail the temporal emissions variation profiles that have been used for cutback bitumen.

Table 3.23: Monthly temporal emissions variation profile for cutback bitumen

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	1	8.33%	July	1	8.33%
February	1	8.33%	August	1	8.33%
March	1	8.33%	September	1	8.33%
April	1	8.33%	October	1	8.33%
May	1	8.33%	November	1	8.33%
June	1	8.33%	December	1	8.33%

Table 3.24: Weekly temporal emissions variation profile for cutback bitumen

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

Table 3.25: Daily temporal emissions variation profile for cutback bitumen

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	1	4.17%	1	4.17%	1 pm	1	4.17%	1	4.17%
2 am	1	4.17%	1	4.17%	2 pm	1	4.17%	1	4.17%
3 am	1	4.17%	1	4.17%	3 pm	1	4.17%	1	4.17%
4 am	1	4.17%	1	4.17%	4 pm	1	4.17%	1	4.17%
5 am	1	4.17%	1	4.17%	5 pm	1	4.17%	1	4.17%
6 am	1	4.17%	1	4.17%	6 pm	1	4.17%	1	4.17%
7 am	1	4.17%	1	4.17%	7 pm	1	4.17%	1	4.17%
8 am	1	4.17%	1	4.17%	8 pm	1	4.17%	1	4.17%
9 am	1	4.17%	1	4.17%	9 pm	1	4.17%	1	4.17%
10 am	1	4.17%	1	4.17%	10 pm	1	4.17%	1	4.17%
11 am	1	4.17%	1	4.17%	11 pm	1	4.17%	1	4.17%
12 noon	1	4.17%	1	4.17%	12 midnight	1	4.17%	1	4.17%

3.3.7 Emission Estimates

Table 3.26 presents total estimated annual emissions (for selected substances) from cutback bitumen for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from cutback bitumen are presented in Appendix B.

Table 3.26: Total estimated annual emissions from cutback bitumen in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	-	-	-	-	-
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	$7.21 \times 10^{+01}$	5.64	3.35	$1.27 \times 10^{+01}$	$9.38 \times 10^{+01}$
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$1.83 \times 10^{+03}$	$1.43 \times 10^{+02}$	$8.49 \times 10^{+01}$	$3.21 \times 10^{+02}$	$2.37 \times 10^{+03}$
TRICHLOROETHYLENE	-	-	-	-	-

Table 3.27 presents total estimated daily emissions (for selected substances) from cutback bitumen for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.27: Total estimated daily emissions from cutback bitumen in each region for typical January weekday/weekend day and July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	-	-	-	-	-
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	1.98×10^{-01}	1.54×10^{-02}	9.19×10^{-03}	3.47×10^{-02}	2.57×10^{-01}
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	5.00	3.91×10^{-01}	2.33×10^{-01}	8.79×10^{-01}	6.51
TRICHLOROETHYLENE	-	-	-	-	-

3.3.8 Emission Projection Methodology

Emission projection factors for cutback bitumen use VKT growth as the surrogate. Emission projection factors for cutback bitumen were developed using the following data:

- ❑ VKT growth data (TPDC, 2005).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.28 presents the emission projection factors for cutback bitumen.

Table 3.28: Emission projection factors for cutback bitumen

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0098	2018	1.1598
2005	1.0197	2019	1.1695
2006	1.0295	2020	1.1792
2007	1.0407	2021	1.1889
2008	1.0519	2022	1.1977
2009	1.0631	2023	1.2066
2010	1.0743	2024	1.2154
2011	1.0855	2025	1.2242
2012	1.0965	2026	1.2331
2013	1.1075	2027	1.2431
2014	1.1185	2028	1.2531
2015	1.1295	2029	1.2631
2016	1.1404	2030	1.2731
2017	1.1501	2031	1.2831

[1] Data Source: (TPDC, 2005).

3.4 Gaseous Fuel Combustion

3.4.1 Emission Source Description

Emissions of combustion products from domestic gaseous fuel combustion originate when different fuels are combusted in different appliances, including:

- Liquefied petroleum gas (LPG) cooktops, ovens, hot water heaters, space heaters and barbecues; and
- Natural gas cooktops, ovens, hot water heaters, space heaters and barbecues.

The domestic gaseous fuel combustion fuels and appliances included in the domestic-commercial air emissions inventory include cooktops, ovens, hot water heaters and space heaters using LPG and natural gas, and barbecues using natural gas only.

Emissions from barbecues that use LPG have been separately estimated for the entire GMR and the results are presented in Section 3.2.

3.4.2 Emission Estimation Methodology

Emissions from domestic gaseous fuel combustion have been estimated using the preferred method (Environment Australia, 1999c), which requires fuel consumption data to be obtained from either local distributors, Australian Bureau of Agriculture and Resource Economics (ABARE) or domestic survey for each fuel type. Fuel consumption data for each fuel type have been combined with volume based emission factors to estimate emissions for each substance. Emissions from domestic gaseous fuel combustion have been calculated using the following formula:

$$E_{i,j} = EF_{i,j} \times SF_{i,j} \times F_j$$

where:

$E_{i,j}$	=	Emission of substance i from fuel type j	(kg/year)
$EF_{i,j}$	=	Volume based emission factor of substance i for fuel type j	(kg/m^3 fuel)
$SF_{i,j}$	=	NO_x, VOC or PM speciation factor of substance i for fuel type j	(%)
F_j	=	Fuel consumption of fuel type j	(m^3/year)

3.4.3 Activity Data

Activity data required for estimating emissions from domestic gaseous fuel combustion includes:

- 1 km by 1 km gridded population data for the GMR (ABS, 2001 & TPDC, 2004). The total population in the GMR during 2003 was 5,091,366;
- Residential natural gas consumption and usage patterns for NSW and ACT from ABARE, 2005b and AGL, 2003; and
- Appliance type, fuel type, fuel consumption, frequency, duration and seasonal variation of gaseous fuel combustion appliances use from the domestic survey. Specific details about the information obtained are included in the domestic questionnaire survey form for domestic gas combustion, which is included in Sections 5 and 6 of Appendix A.

Table 3.29 includes the domestic gaseous fuel type and volume of domestic gaseous fuel consumed in the GMR that was obtained from: ABARE, 2005b; AGL, 2003; and the domestic survey.

Table 3.29: Domestic gaseous fuel combustion activity data during 2003 in the GMR

Domestic Gaseous Fuel Type	Volume of Fuel Consumed (m^3/year)	Data Source
LPG	1,918 [1]	(Domestic Survey)
Natural Gas	505,631,443 [2]	(ABARE, 2005b) & (AGL, 2003)

[1] Total LPG and butane consumption in the GMR equals 40,126 m^3/year (i.e. domestic LPG barbecues and LPG and butane portable stoves – 38,208 m^3/year plus domestic LPG combustion for other appliances – 1,918 m^3/year). Annual LPG consumption for NSW and ACT residential use during 2003-04 is 104,198 m^3/year (ABARE, 2005b). Energy content of LPG and butane is 26.2 mega joules/litres (ABARE, 2005d).
[2] Annual natural gas consumption for NSW and ACT residential use during 2003-04 is 529,381,443 m^3/year (ABARE, 2005b). Energy content of natural gas is 38.8 mega joules/m^3 (ABARE, 2005d).

3.4.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic gaseous fuel combustion are detailed in Table 3.30.

Table 3.30: Emission and speciation factors for all substances from domestic gaseous fuel combustion

Substance	Fuel	Emission Factor Source
CO, NO_x[1], PM_{10}, SO_2 & Total VOC	LPG	(USEPA, 1996a)
	Natural Gas	(USEPA, 1998a)
$PM_{2.5}$ & TSP	LPG	(USEPA, 1996e) & (USEPA, 1996e)
	Natural Gas	(USEPA, 1996e) & (USEPA, 1996e)
Organic air toxics	LPG	(Environment Australia, 1999c)
	Natural Gas	(Environment Australia, 1999c)
Metal air toxics	LPG	(Environment Australia, 1999c)
	Natural Gas	(Environment Australia, 1999c)
PAH	LPG	(Environment Australia, 1999c) & (USEPA, 1998a)
	Natural Gas	(Environment Australia, 1999c) & (USEPA, 1998a)
Speciated VOC & Methane	LPG	Profile Number 0003 (USEPA, 2002)
	Natural Gas	Profile Number 0003 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).

3.4.5 Spatial Distribution of Emissions

Emissions from domestic gaseous fuel combustion have been spatially distributed according to population (Environment Australia, 1999c). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the natural gas reticulation area in proportion to the population in each grid cell. Figure 3.4 shows the spatial distribution of population within the natural gas reticulation area in the GMR.

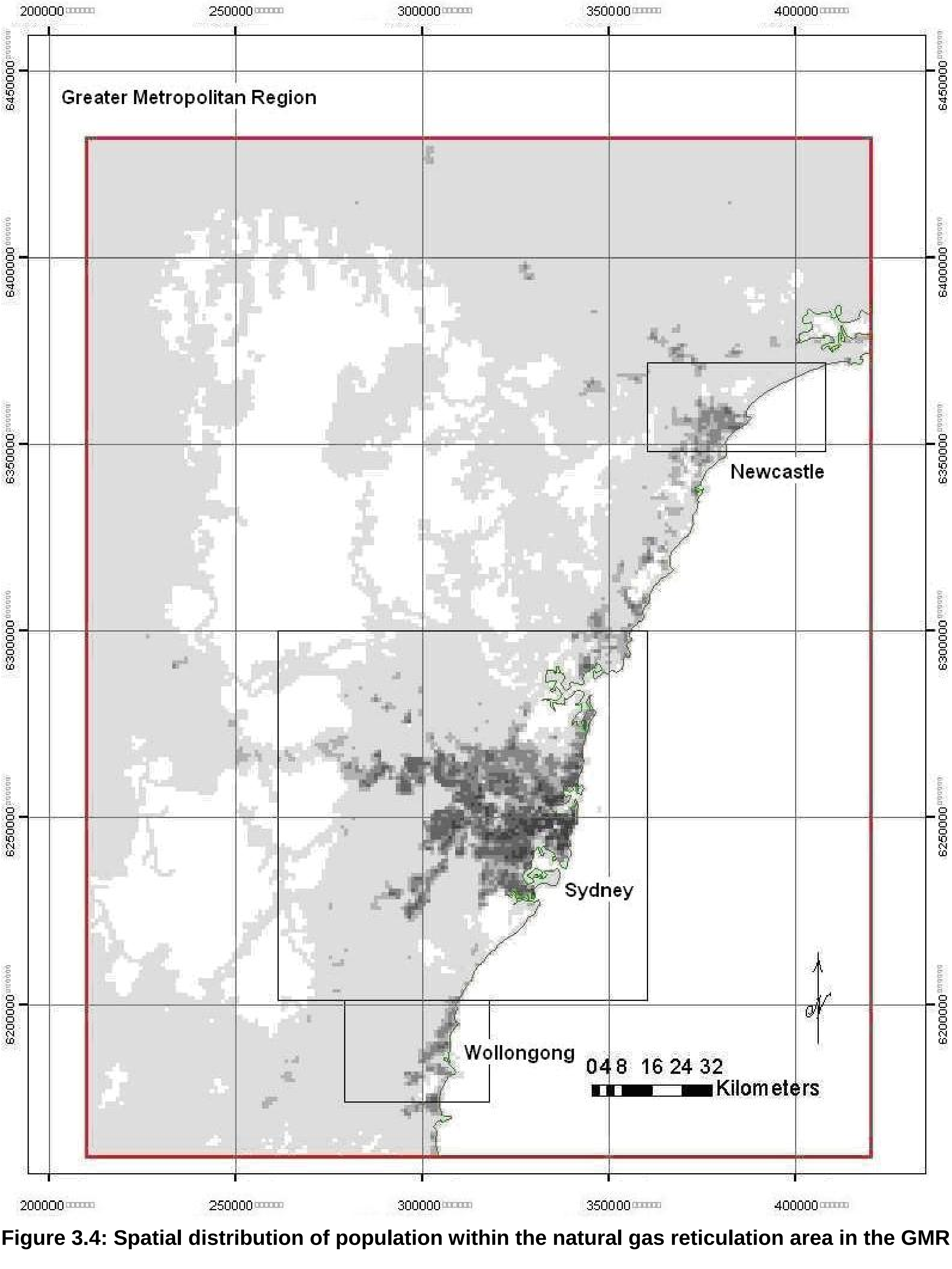

Figure 3.4: Spatial distribution of population within the natural gas reticulation area in the GMR

3.4.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic gaseous fuel combustion:

- Monthly - assumed to vary for each month of the year (AGL, 2003);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (Carnovale et. al. 1996); and
- Daily – assumed to vary for each hour of the day (Carnovale et. al., 1996).

Tables 3.31, 3.32 and 3.33 detail the temporal emissions variation profiles that have been used for domestic gaseous fuel combustion.

Table 3.31: Monthly temporal emissions variation profile for domestic gaseous fuel combustion

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	0.071	7.10%	July	0.108	10.80%
February	0.069	6.90%	August	0.098	9.80%
March	0.079	7.90%	September	0.087	8.70%
April	0.077	7.70%	October	0.081	8.10%
May	0.092	9.20%	November	0.076	7.60%
June	0.092	9.20%	December	0.071	7.10%

Table 3.32: Weekly temporal emissions variation profile for domestic gaseous fuel combustion

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

Table 3.33: Daily temporal emissions variation profile for domestic gaseous fuel combustion

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0.0190	1.90%	0.0190	1.90%	1 pm	0.0370	3.70%	0.0370	3.70%
2 am	0.0175	1.75%	0.0175	1.75%	2 pm	0.0350	3.50%	0.0350	3.50%
3 am	0.0175	1.75%	0.0175	1.75%	3 pm	0.0330	3.30%	0.0330	3.30%
4 am	0.0175	1.75%	0.0175	1.75%	4 pm	0.0360	3.60%	0.0360	3.60%
5 am	0.0190	1.90%	0.0190	1.90%	5 pm	0.0500	5.00%	0.0500	5.00%
6 am	0.0225	2.25%	0.0225	2.25%	6 pm	0.0670	6.70%	0.0670	6.70%
7 am	0.0450	4.50%	0.0450	4.50%	7 pm	0.0780	7.80%	0.0780	7.80%
8 am	0.0675	6.75%	0.0675	6.75%	8 pm	0.0720	7.20%	0.0720	7.20%
9 am	0.0640	6.40%	0.0640	6.40%	9 pm	0.0590	5.90%	0.0590	5.90%
10 am	0.0550	5.50%	0.0550	5.50%	10 pm	0.0480	4.80%	0.0480	4.80%
11 am	0.0440	4.40%	0.0440	4.40%	11 pm	0.0340	3.40%	0.0340	3.40%
12 noon	0.0400	4.00%	0.0400	4.00%	12 midnight	0.0225	2.25%	0.0225	2.25%

3.4.7 Emission Estimates

Table 3.34 presents total estimated annual emissions (for selected substances) from domestic gaseous fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic gaseous fuel combustion are presented in Appendix B.

Table 3.34: Total estimated annual emissions from domestic gaseous fuel combustion in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	3.19	2.10×10^{-01}	1.53×10^{-01}	5.00×10^{-01}	4.05
CARBON MONOXIDE	$2.55 \times 10^{+02}$	$1.68 \times 10^{+01}$	$1.22 \times 10^{+01}$	$4.00 \times 10^{+01}$	$3.24 \times 10^{+02}$
FORMALDEHYDE	6.38	4.21×10^{-01}	3.06×10^{-01}	1.00	8.11
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	3.22×10^{-03}	2.12×10^{-04}	1.54×10^{-04}	5.05×10^{-04}	4.10×10^{-03}
OXIDES OF NITROGEN	$5.99 \times 10^{+02}$	$3.95 \times 10^{+01}$	$2.87 \times 10^{+01}$	$9.40 \times 10^{+01}$	$7.62 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$4.78 \times 10^{+01}$	3.15	2.29	7.50	$6.08 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$4.78 \times 10^{+01}$	3.15	2.29	7.50	$6.08 \times 10^{+01}$
POLYCYCLIC AROMATIC HYDROCARBONS	4.19×10^{-03}	2.76×10^{-04}	2.01×10^{-04}	6.57×10^{-04}	5.32×10^{-03}
SULFUR DIOXIDE	3.83	2.52×10^{-01}	1.83×10^{-01}	6.00×10^{-01}	4.86
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	1.60	1.05×10^{-01}	7.64×10^{-02}	2.50×10^{-01}	2.03
TOTAL SUSPENDED PARTICULATES	$4.78 \times 10^{+01}$	3.15	2.29	7.50	$6.08 \times 10^{+01}$
TOTAL VOCS	$3.51 \times 10^{+01}$	2.31	1.68	5.51	$4.46 \times 10^{+01}$
TRICHLOROETHYLENE	-	-	-	-	-

Tables 3.35 and 3.36 present total estimated daily emissions (for selected substances) from domestic gaseous fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.35: Total estimated daily emissions from domestic gaseous fuel combustion in each region for typical January weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	7.31×10^{-03}	4.82×10^{-04}	3.50×10^{-04}	1.15×10^{-03}	9.29×10^{-03}
CARBON MONOXIDE	5.84×10^{-01}	3.85×10^{-02}	2.80×10^{-02}	9.16×10^{-02}	7.42×10^{-01}
FORMALDEHYDE	1.46×10^{-02}	9.63×10^{-04}	7.00×10^{-04}	2.29×10^{-03}	1.86×10^{-02}
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	7.38×10^{-06}	4.86×10^{-07}	3.54×10^{-07}	1.16×10^{-06}	9.38×10^{-06}
OXIDES OF NITROGEN	1.37	9.05×10^{-02}	6.58×10^{-02}	2.15×10^{-01}	1.74
PARTICULATE MATTER < 10 µm	1.10×10^{-01}	7.22×10^{-03}	5.25×10^{-03}	1.72×10^{-02}	1.39×10^{-01}
PARTICULATE MATTER < 2.5 µm	1.10×10^{-01}	7.22×10^{-03}	5.25×10^{-03}	1.72×10^{-02}	1.39×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	9.59×10^{-06}	6.32×10^{-07}	4.59×10^{-07}	1.50×10^{-06}	1.22×10^{-05}
SULFUR DIOXIDE	8.77×10^{-03}	5.78×10^{-04}	4.20×10^{-04}	1.37×10^{-03}	1.11×10^{-02}
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	3.65×10^{-03}	2.41×10^{-04}	1.75×10^{-04}	5.73×10^{-04}	4.64×10^{-03}
TOTAL SUSPENDED PARTICULATES	1.10×10^{-01}	7.22×10^{-03}	5.25×10^{-03}	1.72×10^{-02}	1.39×10^{-01}
TOTAL VOCS	8.04×10^{-02}	5.30×10^{-03}	3.85×10^{-03}	1.26×10^{-02}	1.02×10^{-01}
TRICHLOROETHYLENE	-	-	-	-	-

Table 3.36: Total estimated daily emissions from domestic gaseous fuel combustion in each region for typical July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	1.11×10^{-02}	7.32×10^{-04}	5.33×10^{-04}	1.74×10^{-03}	1.41×10^{-02}
CARBON MONOXIDE	8.89×10^{-01}	5.85×10^{-02}	4.26×10^{-02}	1.39×10^{-01}	1.13
FORMALDEHYDE	2.22×10^{-02}	1.47×10^{-03}	1.07×10^{-03}	3.49×10^{-03}	2.83×10^{-02}
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	1.12×10^{-05}	7.40×10^{-07}	5.38×10^{-07}	1.76×10^{-06}	1.43×10^{-05}
OXIDES OF NITROGEN	2.09	1.38×10^{-01}	1.00×10^{-01}	3.27×10^{-01}	2.65
PARTICULATE MATTER < 10 µm	1.67×10^{-01}	1.10×10^{-02}	7.98×10^{-03}	2.61×10^{-02}	2.12×10^{-01}
PARTICULATE MATTER < 2.5 µm	1.67×10^{-01}	1.10×10^{-02}	7.98×10^{-03}	2.61×10^{-02}	2.12×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	1.46×10^{-05}	9.61×10^{-07}	6.99×10^{-07}	2.29×10^{-06}	1.85×10^{-05}
SULFUR DIOXIDE	1.33×10^{-02}	8.79×10^{-04}	6.39×10^{-04}	2.09×10^{-03}	1.69×10^{-02}
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	5.56×10^{-03}	3.66×10^{-04}	2.66×10^{-04}	8.72×10^{-04}	7.06×10^{-03}
TOTAL SUSPENDED PARTICULATES	1.67×10^{-01}	1.10×10^{-02}	7.98×10^{-03}	2.61×10^{-02}	2.12×10^{-01}
TOTAL VOCS	1.22×10^{-01}	8.06×10^{-03}	5.86×10^{-03}	1.92×10^{-02}	1.55×10^{-01}
TRICHLOROETHYLENE	-	-	-	-	-

3.4.8 Emission Projection Methodology

Emission projection factors for domestic gaseous fuel combustion use residential gas consumption growth as the surrogate. Emission projection factors for domestic gaseous fuel combustion were developed using the following data:

- ❑ Residential gas consumption growth data (ABARE, 2005c).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.37 presents the emission projection factors for domestic gaseous fuel combustion.

Table 3.37: Emission projection factors for domestic gaseous fuel combustion

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0191	2018	1.3275
2005	1.0385	2019	1.3528
2006	1.0583	2020	1.3786
2007	1.0785	2021	1.4049
2008	1.0990	2022	1.4317
2009	1.1200	2023	1.4590
2010	1.1413	2024	1.4868
2011	1.1631	2025	1.5152
2012	1.1853	2026	1.5440
2013	1.2079	2027	1.5735
2014	1.2309	2028	1.6035
2015	1.2544	2029	1.6341
2016	1.2783	2030	1.6652
2017	1.3027	2031	1.6970

[1] Data Source: (ABARE, 2005c), http://www.abareconomics.com/data_services/excel/TPEC 05.xls?prodid=13183.

3.5 Lawn Mowing and Garden Equipment (domestic)

3.5.1 Emission Source Description

Emissions of combustion products from domestic lawn mowing and garden equipment arise from 2-stroke and 4-stroke petrol engines used in household lawn mowing and other garden utility equipment. The domestic-commercial air emissions inventory includes the following types of appliances with small engines:

- Brush Cutters;
- Chainsaws;
- Chippers and Mulchers;
- Compactors;
- Edgers;
- Hedge Trimmers;
- Leaf Blowers;
- Push Lawnmowers;
- Ride-on Lawnmowers; and
- Vacuums.

Emissions from commercial lawn mowing and garden equipment have been separately estimated for the entire GMR and the results are presented in Section 3.6.

3.5.2 Emission Estimation Methodology

Emissions from domestic lawn mowing and garden equipment have been estimated using the preferred method (Environment Australia, 1999e), which requires equipment type, fuel type and operating hours data to be obtained from a domestic survey. Operating hours data for each equipment and fuel type have been combined with time based emission factors to estimate emissions for each substance using the NONROAD2005 Model (USEPA, 2005e). The NONROAD2005 Model estimates emissions for each specific type of domestic lawn mowing and garden equipment by multiplying the following input data estimates:

- Equipment population for base year, distributed by age, power, fuel type, and application;
- Average load factor expressed as average fraction of available power;
- Available power in horsepower;
- Activity in hours of use per year; and
- Emission factor with deterioration and/or new standards.

The emissions are then temporally and geographically allocated using appropriate allocation factors. Emissions from domestic lawn mowing and garden equipment have been calculated using the following formula:

$$E_{i,j,k} = EF_{i,j,k} \times SF_{i,j,k} \times OT_{j,k} \times N_{j,k}$$

where:

$E_{i,j,k}$	=	Emission of substance i from fuel type j and equipment type k	(kg/year)
$EF_{i,j,k}$	=	Time based emission factor of substance i for fuel type j and equipment type k	(kg/hr)
$SF_{i,j,k}$	=	NO_x, VOC or PM speciation factor of substance i for fuel type j and equipment type k	(%)
$OT_{j,k}$	=	Operating time for fuel type j and equipment type k	(hr/year)
$N_{j,k}$	=	Number with fuel type j and equipment type k	(number)

3.5.3 Activity Data

Activity data required for estimating emissions from domestic lawn mowing and garden equipment includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572;
- 1 km by 1 km gridded free standing[2] dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of free standing dwellings in the GMR during 2003 was 1,373,772;
- Equipment type, fuel type, frequency, duration and seasonal variation of lawn mowing and garden equipment use from the domestic survey. Specific details about the information obtained are included in the domestic questionnaire survey form for domestic lawn mowing and garden equipment, which is included in Section 2 of Appendix A;
- Load factors (USEPA, 2004c) and proportion of equipment in each power range (USEPA, 2005f); and
- NSW Lawn Mowing and Garden Equipment Sales, Unit Cost and Operating Life Data for 2000 to 2004 (AIA, 2005).

Table 3.38 includes the type and number of domestic lawn mowing and garden equipment in the GMR based on activity data obtained through the domestic survey.

Table 3.38: Domestic lawn mowing and garden equipment – equipment type and number during 2003 in the GMR

Equipment Type [1]	Number [1]
Brush Cutter, Edger and Hedge Trimmer	477,412
Chainsaw	60,147
Chippers and Mulchers	7,518
Compactor	7,518
Leaf Blowers and Vacuums	78,942
Push Lawnmower	932,269
Ride-on Lawnmower	75,183
Domestic Lawn Mowing and Garden Equipment Total	1,638,989

[1] Data Source: (Domestic Survey).

Table 3.39 includes the number and annual usage of domestic lawn mowing and garden equipment with a given fuel type in the GMR based on activity data obtained through the domestic survey.

Table 3.39: Domestic lawn mowing and garden equipment – fuel type and number during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Number [1]	Proportion of Number (%) [1]	Proportion of Households (%) [1,2]	Annual Usage (hours/year) [1]
Lawn Mower	2 - Stroke Petrol	530,040	32.3%	38.6%	22.0
Lawn Mower	4 - Stroke Petrol	477,412	29.1%	34.8%	38.7
Lawn Mower	All	1,007,452	61.5%	73.3%	29.9
Garden Equipment	2 - Stroke Petrol	593,946	36.2%	43.2%	11.9
Garden Equipment	4 - Stroke Petrol	37,591	2.3%	2.7%	5.8
Garden Equipment	All	631,537	38.5%	46.0%	11.6
All	2 - Stroke Petrol	1,123,986	68.6%	-	-
All	4 - Stroke Petrol	515,003	31.4%	-	-
All	All	1,638,989	100.0%	-	-

[1] Data Source: (Domestic Survey).
[2] Calculated from 1,373,772 free standing dwellings (ABS, 2001 & TPDC, 2004).

[2] Free standing dwellings include separate dwellings plus semi detached dwellings.

Table 3.40 includes the number of domestic lawn mowing and garden equipment with a given engine power range in the GMR based on activity data obtained through the domestic survey.

Table 3.40: Domestic lawn mowing and garden equipment – engine power range and number during 2003 in the GMR

Power Range (kW) [1]	Number of 2 - Stroke Petrol Equipment [2]	Number of 4 - Stroke Petrol Equipment [2]	Total [2]
0.75 to 2.25	515,004	2,506	517,510
2.25 to 4.5	608,982	437,314	1,046,296
4.5 to 8.2	-	75,183	75,183
Total	1,123,986	515,003	1,638,989

[1] Data Source: (USEPA, 2005f).
[2] Data Source: (Domestic Survey).

Table 3.41 includes detailed activity data for domestic lawn mowing and garden equipment in the GMR based on activity data obtained through the domestic survey.

Table 3.41: Domestic lawn mowing and garden equipment – detailed activity data during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Power Range (kW) [2]	Number [1]	Proportion of Number (%) [1]	Proportion of Households (%) [1,3]	Annual Usage (hours/year) [1]
Brush Cutter, Edger and Hedge Trimmer	2 – Stroke Petrol	0.75 to 2.25	451,098	27.5%	32.8%	12
Chainsaw	2 - Stroke Petrol	0.75 to 2.25	60,147	3.7%	4.4%	11
Compactor	2 - Stroke Petrol	0.75 to 2.25	3,759	0.2%	0.3%	17
Leaf Blowers and Vacuums	2 - Stroke Petrol	2.25 to 4.5	78,942	4.8%	5.7%	12
Push Lawnmower	2 - Stroke Petrol	2.25 to 4.5	530,040	32.3%	38.6%	22
Brush Cutter, Edger and Hedge Trimmer	4 - Stroke Petrol	2.25 to 4.5	26,314	1.6%	1.9%	6
Chippers and Mulchers	4 - Stroke Petrol	0.75 to 2.25	2,506	0.2%	0.2%	5
Chippers and Mulchers	4 - Stroke Petrol	2.25 to 4.5	5,012	0.3%	0.4%	5
Compactor	4 - Stroke Petrol	2.25 to 4.5	3,759	0.2%	0.3%	6
Push Lawnmower	4 - Stroke Petrol	2.25 to 4.5	402,229	24.5%	29.3%	33
Ride-on Lawnmower	4 - Stroke Petrol	4.5 to 8.2	75,183	4.6%	5.5%	69
All	All	All	1,638,989	100.0%	-	-

[1] Data Source: (Domestic Survey).
[2] Data Source: (USEPA, 2005f).
[3] Calculated from 1,373,772 free standing dwellings (ABS, 2001 & TPDC, 2004).

Figure 3.5 shows the proportion of domestic lawn mowing and garden equipment with a given fuel type and engine power range in the GMR based on activity data obtained through the domestic survey.

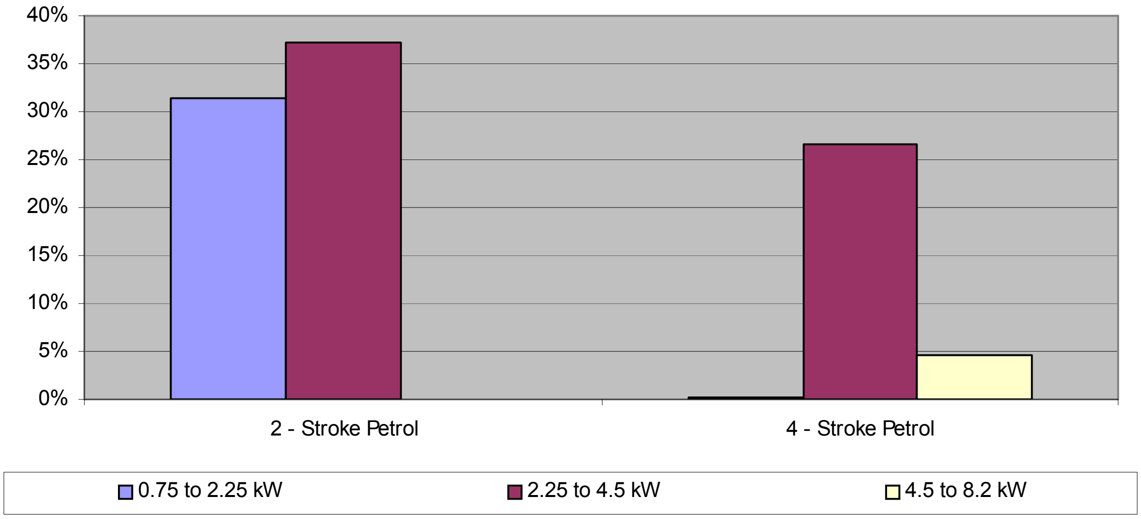

Figure 3.5: Proportion of fuel type and engine power range for domestic lawn mowing and garden equipment during 2003 in the GMR

Table C1.1 and Figure C1.1 in Appendix C include a comparison between number and sales of 2-stroke and 4-stroke petrol domestic and commercial lawn mowing and garden equipment in the GMR and NSW respectively.

3.5.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic lawn mowing and garden equipment are detailed in Table 3.42.

Table 3.42: Emission and speciation factors for all substances from domestic lawn mowing and garden equipment

Substance	Equipment/ Fuel Type		Emission Factor Source
CO, NO_x[1], $PM_{2.5}$, PM_{10}, SO_2 & Total VOC	All		(USEPA, 2005e)
TSP	All		(Norbeck et. al., 1998)
Organic air toxics	All		Appendix D (ERG, 2003)
Metal air toxics	All		(Environment Australia, 1999e)
PAH	All	PM phase	Appendix D (ERG, 2003)
		VOC phase	(Khalili et. al., 1995)
PCDD/PCDF	All		Appendix D (ERG, 2003)
Speciated VOC & Methane	All [2]		Profile Number 1203 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).
[2] Profile Number 0000 (USEPA, 2002) for “Unidentified” VOC.

3.5.5 Spatial Distribution of Emissions

Emissions from domestic lawn mowing and garden equipment have been spatially distributed according to free standing dwellings (Environment Australia, 1999e). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the GMR in proportion to the free standing dwellings in each grid cell. Figure 3.6 shows the spatial distribution of free standing dwellings in the GMR.

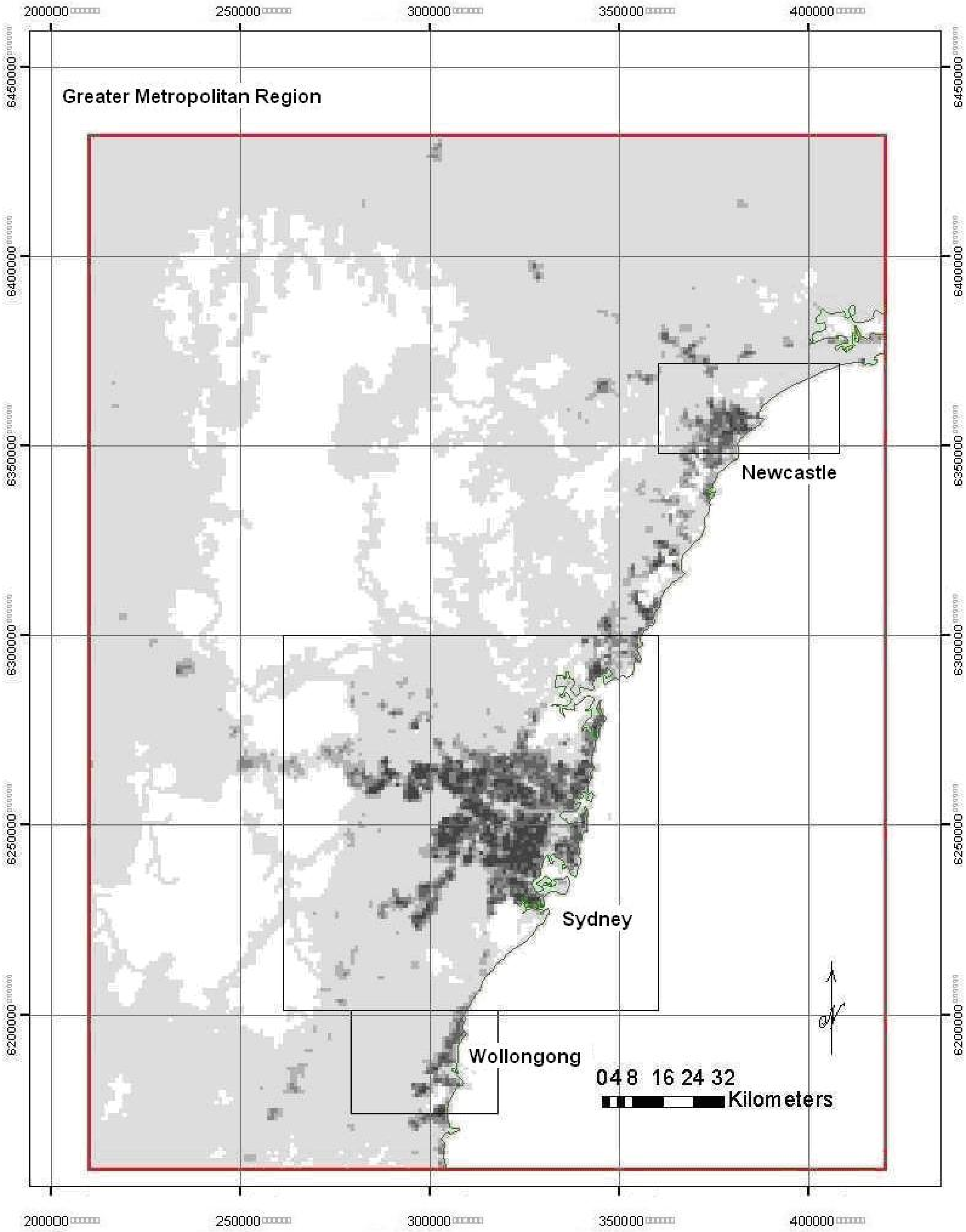

Figure 3.6: Spatial distribution of free standing dwellings in the GMR

3.5.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic lawn mowing and garden equipment:

- Monthly - assumed to vary for each month of the year (Domestic Survey);
- Weekly (i.e. Weekday and Weekend day) - assumed to be ~3.95 times higher on weekend days compared with weekdays (Domestic Survey); and
- Daily – assumed to be constant between 8 am and 6 pm (Domestic Survey).

Tables 3.43, 3.44 and 3.45 detail the temporal emissions variation profiles that have been used for domestic lawn mowing and garden equipment.

Table 3.43: Monthly temporal emissions variation profile for domestic lawn mowing and garden equipment

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	2.0	11.11%	July	1.0	5.56%
February	2.0	11.11%	August	1.0	5.56%
March	1.5	8.33%	September	1.5	8.33%
April	1.5	8.33%	October	1.5	8.33%
May	1.5	8.33%	November	1.5	8.33%
June	1.0	5.56%	December	2.0	11.11%

Table 3.44: Weekly temporal emissions variation profile for domestic lawn mowing and garden equipment

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5.0	38.68%	Weekend day	7.9	61.32%

Table 3.45: Daily temporal emissions variation profile for domestic lawn mowing and garden equipment

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0	0%	0	0%	1 pm	1	10%	1	10%
2 am	0	0%	0	0%	2 pm	1	10%	1	10%
3 am	0	0%	0	0%	3 pm	1	10%	1	10%
4 am	0	0%	0	0%	4 pm	1	10%	1	10%
5 am	0	0%	0	0%	5 pm	1	10%	1	10%
6 am	0	0%	0	0%	6 pm	0	0%	0	0%
7 am	0	0%	0	0%	7 pm	0	0%	0	0%
8 am	1	10%	1	10%	8 pm	0	0%	0	0%
9 am	1	10%	1	10%	9 pm	0	0%	0	0%
10 am	1	10%	1	10%	10 pm	0	0%	0	0%
11 am	1	10%	1	10%	11 pm	0	0%	0	0%
12 noon	1	10%	1	10%	12 midnight	0	0%	0	0%

3.5.7 Emission Estimates

Table 3.46 presents total estimated annual emissions (for selected substances) from domestic lawn mowing and garden equipment for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic lawn mowing and garden equipment are presented in Appendix B.

Table 3.46: Total estimated annual emissions from domestic lawn mowing and garden equipment in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	$1.48 \times 10^{+01}$	1.25	8.14×10^{-01}	2.80	$1.96 \times 10^{+01}$
ACETALDEHYDE	$1.32 \times 10^{+01}$	1.12	7.28×10^{-01}	2.50	$1.75 \times 10^{+01}$
BENZENE	$6.75 \times 10^{+01}$	5.71	3.72	$1.28 \times 10^{+01}$	$8.98 \times 10^{+01}$
CARBON MONOXIDE	$3.13 \times 10^{+04}$	$2.64 \times 10^{+03}$	$1.72 \times 10^{+03}$	$5.94 \times 10^{+03}$	$4.16 \times 10^{+04}$
FORMALDEHYDE	$2.39 \times 10^{+01}$	2.02	1.32	4.54	$3.18 \times 10^{+01}$
ISOMERS OF XYLENE	$3.98 \times 10^{+02}$	$3.37 \times 10^{+01}$	$2.20 \times 10^{+01}$	$7.56 \times 10^{+01}$	$5.30 \times 10^{+02}$
LEAD AND COMPOUNDS	4.22×10^{-02}	3.57×10^{-03}	2.33×10^{-03}	8.02×10^{-03}	5.62×10^{-02}
OXIDES OF NITROGEN	$1.33 \times 10^{+02}$	$1.13 \times 10^{+01}$	7.34	$2.53 \times 10^{+01}$	$1.77 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$1.89 \times 10^{+02}$	$1.59 \times 10^{+01}$	$1.04 \times 10^{+01}$	$3.58 \times 10^{+01}$	$2.51 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	$1.73 \times 10^{+02}$	$1.47 \times 10^{+01}$	9.57	$3.29 \times 10^{+01}$	$2.31 \times 10^{+02}$
POLYCYCLIC AROMATIC HYDROCARBONS	$1.13 \times 10^{+01}$	9.54×10^{-01}	6.22×10^{-01}	2.14	$1.50 \times 10^{+01}$
SULFUR DIOXIDE	$1.13 \times 10^{+01}$	9.57×10^{-01}	6.24×10^{-01}	2.15	$1.50 \times 10^{+01}$
TETRACHLOROETHYLENE	3.34	2.82×10^{-01}	1.84×10^{-01}	6.34×10^{-01}	4.44
TOLUENE	$3.69 \times 10^{+02}$	$3.12 \times 10^{+01}$	$2.03 \times 10^{+01}$	$7.00 \times 10^{+01}$	$4.90 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$1.99 \times 10^{+02}$	$1.68 \times 10^{+01}$	$1.09 \times 10^{+01}$	$3.77 \times 10^{+01}$	$2.64 \times 10^{+02}$
TOTAL VOCS	$4.08 \times 10^{+03}$	$3.45 \times 10^{+02}$	$2.25 \times 10^{+02}$	$7.74 \times 10^{+02}$	$5.42 \times 10^{+03}$
TRICHLOROETHYLENE	2.05	1.73×10^{-01}	1.13×10^{-01}	3.89×10^{-01}	2.73

Table 3.47 presents total estimated annual emissions (for selected substances) from domestic lawn mowing and garden equipment by fuel type for the GMR.

Table 3.47: Total estimated annual emissions from domestic lawn mowing and garden equipment by fuel type

Substance	Emissions (tonnes/year)		
	2-Stroke Petrol	4-Stroke Petrol	Total
1,3 BUTADIENE	7.63	$1.20 \times 10^{+01}$	$1.96 \times 10^{+01}$
ACETALDEHYDE	$1.24 \times 10^{+01}$	5.17	$1.75 \times 10^{+01}$
BENZENE	$2.63 \times 10^{+01}$	$6.35 \times 10^{+01}$	$8.98 \times 10^{+01}$
CARBON MONOXIDE	$1.26 \times 10^{+04}$	$2.89 \times 10^{+04}$	$4.16 \times 10^{+04}$
FORMALDEHYDE	$1.01 \times 10^{+01}$	$2.16 \times 10^{+01}$	$3.18 \times 10^{+01}$
ISOMERS OF XYLENE	$4.44 \times 10^{+02}$	$8.55 \times 10^{+01}$	$5.30 \times 10^{+02}$
LEAD AND COMPOUNDS	3.75×10^{-02}	1.87×10^{-02}	5.62×10^{-02}
OXIDES OF NITROGEN	$3.30 \times 10^{+01}$	$1.44 \times 10^{+02}$	$1.77 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$2.23 \times 10^{+02}$	$2.82 \times 10^{+01}$	$2.51 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	$2.05 \times 10^{+02}$	$2.59 \times 10^{+01}$	$2.31 \times 10^{+02}$
POLYCYCLIC AROMATIC HYDROCARBONS	9.35	5.65	$1.50 \times 10^{+01}$
SULFUR DIOXIDE	4.67	$1.04 \times 10^{+01}$	$1.50 \times 10^{+01}$
TETRACHLOROETHYLENE	3.39	1.05	4.44
TOLUENE	$4.00 \times 10^{+02}$	$9.06 \times 10^{+01}$	$4.90 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$2.34 \times 10^{+02}$	$2.97 \times 10^{+01}$	$2.64 \times 10^{+02}$
TOTAL VOCS	$4.16 \times 10^{+03}$	$1.26 \times 10^{+03}$	$5.42 \times 10^{+03}$
TRICHLOROETHYLENE	2.08	6.45×10^{-01}	2.73

Tables 3.48, 3.49, 3.50 and 3.51 present total estimated daily emissions (for selected substances) from domestic lawn mowing and garden equipment for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday, January weekend day, July weekday and July weekend day daily emissions.

Table 3.48: Total estimated daily emissions from domestic lawn mowing and garden equipment in each region for typical January weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	2.76×10^{-02}	2.33×10^{-03}	1.52×10^{-03}	5.24×10^{-03}	3.67×10^{-02}
ACETALDEHYDE	2.47×10^{-02}	2.08×10^{-03}	1.36×10^{-03}	4.68×10^{-03}	3.28×10^{-02}
BENZENE	1.26×10^{-01}	1.07×10^{-02}	6.96×10^{-03}	2.39×10^{-02}	1.68×10^{-01}
CARBON MONOXIDE	$5.84 \times 10^{+01}$	4.94	3.22	$1.11 \times 10^{+01}$	$7.77 \times 10^{+01}$
FORMALDEHYDE	4.47×10^{-02}	3.78×10^{-03}	2.46×10^{-03}	8.48×10^{-03}	5.94×10^{-02}
ISOMERS OF XYLENE	7.44×10^{-01}	6.30×10^{-02}	4.11×10^{-02}	1.41×10^{-01}	9.90×10^{-01}
LEAD AND COMPOUNDS	7.89×10^{-05}	6.68×10^{-06}	4.35×10^{-06}	1.50×10^{-05}	1.05×10^{-04}
OXIDES OF NITROGEN	2.49×10^{-01}	2.10×10^{-02}	1.37×10^{-02}	4.72×10^{-02}	3.31×10^{-01}
PARTICULATE MATTER < 10 µm	3.52×10^{-01}	2.98×10^{-02}	1.94×10^{-02}	6.69×10^{-02}	4.68×10^{-01}
PARTICULATE MATTER < 2.5 µm	3.24×10^{-01}	2.74×10^{-02}	1.79×10^{-02}	6.15×10^{-02}	4.31×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	2.11×10^{-02}	1.78×10^{-03}	1.16×10^{-03}	4.00×10^{-03}	2.80×10^{-02}
SULFUR DIOXIDE	2.11×10^{-02}	1.79×10^{-03}	1.17×10^{-03}	4.01×10^{-03}	2.81×10^{-02}
TETRACHLOROETHYLENE	6.24×10^{-03}	5.27×10^{-04}	3.44×10^{-04}	1.18×10^{-03}	8.29×10^{-03}
TOLUENE	6.89×10^{-01}	5.83×10^{-02}	3.80×10^{-02}	1.31×10^{-01}	9.16×10^{-01}
TOTAL SUSPENDED PARTICULATES	3.71×10^{-01}	3.14×10^{-02}	2.05×10^{-02}	7.04×10^{-02}	4.93×10^{-01}
TOTAL VOCS	7.62	6.44×10^{-01}	4.20×10^{-01}	1.45	$1.01 \times 10^{+01}$
TRICHLOROETHYLENE	3.83×10^{-03}	3.24×10^{-04}	2.11×10^{-04}	7.27×10^{-04}	5.09×10^{-03}

Table 3.49: Total estimated daily emissions from domestic lawn mowing and garden equipment in each region for typical January weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.26×10^{-01}	1.06×10^{-02}	6.94×10^{-03}	2.39×10^{-02}	1.67×10^{-01}
ACETALDEHYDE	1.12×10^{-01}	9.50×10^{-03}	6.20×10^{-03}	2.13×10^{-02}	1.49×10^{-01}
BENZENE	5.75×10^{-01}	4.86×10^{-02}	3.17×10^{-02}	1.09×10^{-01}	7.64×10^{-01}
CARBON MONOXIDE	$2.66 \times 10^{+02}$	$2.25 \times 10^{+01}$	$1.47 \times 10^{+01}$	$5.06 \times 10^{+01}$	$3.54 \times 10^{+02}$
FORMALDEHYDE	2.04×10^{-01}	1.72×10^{-02}	1.12×10^{-02}	3.86×10^{-02}	2.71×10^{-01}
ISOMERS OF XYLENE	3.39	2.87×10^{-01}	1.87×10^{-01}	6.44×10^{-01}	4.51
LEAD AND COMPOUNDS	3.60×10^{-04}	3.04×10^{-05}	1.98×10^{-05}	6.83×10^{-05}	4.78×10^{-04}
OXIDES OF NITROGEN	1.13	9.59×10^{-02}	6.25×10^{-02}	2.15×10^{-01}	1.51
PARTICULATE MATTER < 10 µm	1.61	1.36×10^{-01}	8.86×10^{-02}	3.05×10^{-01}	2.14
PARTICULATE MATTER < 2.5 µm	1.48	1.25×10^{-01}	8.15×10^{-02}	2.81×10^{-01}	1.96
POLYCYCLIC AROMATIC HYDROCARBONS	9.61×10^{-02}	8.13×10^{-03}	5.30×10^{-03}	1.82×10^{-02}	1.28×10^{-01}
SULFUR DIOXIDE	9.64×10^{-02}	8.15×10^{-03}	5.32×10^{-03}	1.83×10^{-02}	1.28×10^{-01}
TETRACHLOROETHYLENE	2.84×10^{-02}	2.40×10^{-03}	1.57×10^{-03}	5.40×10^{-03}	3.78×10^{-02}
TOLUENE	3.14	2.66×10^{-01}	1.73×10^{-01}	5.96×10^{-01}	4.18
TOTAL SUSPENDED PARTICULATES	1.69	1.43×10^{-01}	9.32×10^{-02}	3.21×10^{-01}	2.25
TOTAL VOCS	$3.47 \times 10^{+01}$	2.94	1.91	6.59	$4.62 \times 10^{+01}$
TRICHLOROETHYLENE	1.75×10^{-02}	1.48×10^{-03}	9.63×10^{-04}	3.32×10^{-03}	2.32×10^{-02}

Table 3.50: Total estimated daily emissions from domestic lawn mowing and garden equipment in each region for typical July weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.38×10^{-02}	1.17×10^{-03}	7.61×10^{-04}	2.62×10^{-03}	1.83×10^{-02}
ACETALDEHYDE	1.23×10^{-02}	1.04×10^{-03}	6.80×10^{-04}	2.34×10^{-03}	1.64×10^{-02}
BENZENE	6.31×10^{-02}	5.33×10^{-03}	3.48×10^{-03}	1.20×10^{-02}	8.38×10^{-02}
CARBON MONOXIDE	$2.92 \times 10^{+01}$	2.47	1.61	5.55	$3.88 \times 10^{+01}$
FORMALDEHYDE	2.23×10^{-02}	1.89×10^{-03}	1.23×10^{-03}	4.24×10^{-03}	2.97×10^{-02}
ISOMERS OF XYLENE	3.72×10^{-01}	3.15×10^{-02}	2.05×10^{-02}	7.07×10^{-02}	4.95×10^{-01}
LEAD AND COMPOUNDS	3.95×10^{-05}	3.34×10^{-06}	2.18×10^{-06}	7.49×10^{-06}	5.25×10^{-05}
OXIDES OF NITROGEN	1.24×10^{-01}	1.05×10^{-02}	6.86×10^{-03}	2.36×10^{-02}	1.65×10^{-01}
PARTICULATE MATTER < 10 µm	1.76×10^{-01}	1.49×10^{-02}	9.72×10^{-03}	3.34×10^{-02}	2.34×10^{-01}
PARTICULATE MATTER < 2.5 µm	1.62×10^{-01}	1.37×10^{-02}	8.94×10^{-03}	3.08×10^{-02}	2.15×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	1.05×10^{-02}	8.91×10^{-04}	5.81×10^{-04}	2.00×10^{-03}	1.40×10^{-02}
SULFUR DIOXIDE	1.06×10^{-02}	8.94×10^{-04}	5.83×10^{-04}	2.01×10^{-03}	1.41×10^{-02}
TETRACHLOROETHYLENE	3.12×10^{-03}	2.64×10^{-04}	1.72×10^{-04}	5.92×10^{-04}	4.15×10^{-03}
TOLUENE	3.44×10^{-01}	2.91×10^{-02}	1.90×10^{-02}	6.54×10^{-02}	4.58×10^{-01}
TOTAL SUSPENDED PARTICULATES	1.85×10^{-01}	1.57×10^{-02}	1.02×10^{-02}	3.52×10^{-02}	2.47×10^{-01}
TOTAL VOCS	3.81	3.22×10^{-01}	2.10×10^{-01}	7.23×10^{-01}	5.06
TRICHLOROETHYLENE	1.92×10^{-03}	1.62×10^{-04}	1.06×10^{-04}	3.64×10^{-04}	2.55×10^{-03}

Table 3.51: Total estimated daily emissions from domestic lawn mowing and garden equipment in each region for typical July weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	6.29×10^{-02}	5.32×10^{-03}	3.47×10^{-03}	1.19×10^{-02}	8.36×10^{-02}
ACETALDEHYDE	5.62×10^{-02}	4.75×10^{-03}	3.10×10^{-03}	1.07×10^{-02}	7.47×10^{-02}
BENZENE	2.87×10^{-01}	2.43×10^{-02}	1.59×10^{-02}	5.46×10^{-02}	3.82×10^{-01}
CARBON MONOXIDE	$1.33 \times 10^{+02}$	$1.13 \times 10^{+01}$	7.34	$2.53 \times 10^{+01}$	$1.77 \times 10^{+02}$
FORMALDEHYDE	1.02×10^{-01}	8.61×10^{-03}	5.61×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
ISOMERS OF XYLENE	1.70	1.43×10^{-01}	9.36×10^{-02}	3.22×10^{-01}	2.26
LEAD AND COMPOUNDS	1.80×10^{-04}	1.52×10^{-05}	9.92×10^{-06}	3.42×10^{-05}	2.39×10^{-04}
OXIDES OF NITROGEN	5.67×10^{-01}	4.80×10^{-02}	3.13×10^{-02}	1.08×10^{-01}	7.54×10^{-01}
PARTICULATE MATTER < 10 µm	8.03×10^{-01}	6.79×10^{-02}	4.43×10^{-02}	1.52×10^{-01}	1.07
PARTICULATE MATTER < 2.5 µm	7.39×10^{-01}	6.25×10^{-02}	4.07×10^{-02}	1.40×10^{-01}	9.82×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	4.80×10^{-02}	4.06×10^{-03}	2.65×10^{-03}	9.12×10^{-03}	6.39×10^{-02}
SULFUR DIOXIDE	4.82×10^{-02}	4.08×10^{-03}	2.66×10^{-03}	9.15×10^{-03}	6.41×10^{-02}
TETRACHLOROETHYLENE	1.42×10^{-02}	1.20×10^{-03}	7.84×10^{-04}	2.70×10^{-03}	1.89×10^{-02}
TOLUENE	1.57	1.33×10^{-01}	8.66×10^{-02}	2.98×10^{-01}	2.09
TOTAL SUSPENDED PARTICULATES	8.45×10^{-01}	7.15×10^{-02}	4.66×10^{-02}	1.60×10^{-01}	1.12
TOTAL VOCS	$1.74 \times 10^{+01}$	1.47	9.57×10^{-01}	3.29	$2.31 \times 10^{+01}$
TRICHLOROETHYLENE	8.73×10^{-03}	7.38×10^{-04}	4.82×10^{-04}	1.66×10^{-03}	1.16×10^{-02}

3.5.8 Emission Projection Methodology

Emission projection factors for domestic lawn mowing and garden equipment use dwelling growth as the surrogate. Emission projection factors for domestic lawn mowing and garden equipment were developed using the following data:

- Dwelling growth data (ABS, 2001 & TPDC, 2004).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.52 presents the emission projection factors for domestic lawn mowing and garden equipment.

Table 3.52: Emission projection factors for domestic lawn mowing and garden equipment

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0125	2018	1.2026
2005	1.0249	2019	1.2158
2006	1.0374	2020	1.2290
2007	1.0513	2021	1.2422
2008	1.0652	2022	1.2558
2009	1.0791	2023	1.2695
2010	1.0930	2024	1.2831
2011	1.1070	2025	1.2967
2012	1.1208	2026	1.3103
2013	1.1346	2027	1.3238
2014	1.1485	2028	1.3374
2015	1.1623	2029	1.3509
2016	1.1761	2030	1.3644
2017	1.1894	2031	1.3780

[1] Data Source: (ABS, 2001 & TPDC, 2004).

3.6 Lawn Mowing and Garden Equipment (public open space)

3.6.1 Emission Source Description

Emissions of combustion products from commercial lawn mowing and garden equipment arise from 2-stroke and 4-stroke petrol engines and diesel engines used in commercial lawn mowing and other garden utility equipment. The domestic-commercial air emissions inventory includes the following types of appliances with small engines:

- Brush Cutters;
- Chainsaws;
- Chippers, Mulchers and Stump Grinders;
- Compactors;
- Edgers;
- Hedge Trimmers;
- Leaf Blowers;
- Push Lawnmowers;
- Ride-on Lawnmowers;
- Rotary Tillers;
- Tractors;
- Turf Equipment; and
- Vacuums.

Public open space is defined as all lawn areas normally accessible by the public, including:

- Parks;
- Gardens; and
- Golf Courses.

Emissions from domestic lawn mowing and garden equipment have been separately estimated for the entire GMR and the results are presented in Section 3.5.

3.6.2 Emission Estimation Methodology

Emissions from commercial lawn mowing and garden equipment have been estimated using the preferred method (Pechan, 1997), which requires equipment type, fuel type and operating hours data to be obtained from a commercial survey. Operating hours data for each equipment and fuel type have been combined with time based emission factors to estimate emissions for each substance using the NONROAD2005 Model (USEPA, 2005e). The NONROAD2005 Model estimates emissions for each specific type of commercial lawn mowing and garden equipment by multiplying the following input data estimates:

- Equipment population for base year, distributed by age, power, fuel type, and application;
- Average load factor expressed as average fraction of available power;
- Available power in horsepower;
- Activity in hours of use per year; and
- Emission factor with deterioration and/or new standards.

The emissions are then temporally and geographically allocated using appropriate allocation factors. Emissions from commercial lawn mowing and garden equipment have been calculated using the following formula:

$$E_{i,j,k} = EF_{i,j,k} \times SF_{i,j,k} \times OT_{j,k} \times N_{j,k}$$

where:

$E_{i,j,k}$	=	Emission of substance i from fuel type j and equipment type k	(kg/year)
$EF_{i,j,k}$	=	Time based emission factor of substance i for fuel type j and equipment type k	(kg/hr)
$SF_{i,j,k}$	=	NO_x, VOC or PM speciation factor of substance i for fuel type j and equipment type k	(%)
$OT_{j,k}$	=	Operating time for fuel type j and equipment type k	(hr/year)
$N_{j,k}$	=	Number with fuel type j and equipment type k	(number)

3.6.3 Activity Data

Activity data required for estimating emissions from commercial lawn mowing and garden equipment includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572. Local government area (LGA) emissions from commercial lawn mowing and garden equipment have been spatially distributed according to grid cells with more than 50 dwellings. Section 3.6.5 provides specific details.
- Equipment type, fuel type, frequency, duration and seasonal variation of lawn mowing and garden equipment use from the commercial survey as follows:
  - Data from nine LGA including Auburn, Bankstown, Canada Bay, Great Lakes, Kiama, Ku-ring-gai, Newcastle, Port Stephens and Strathfield LGAs. Activity data for the remaining 57 LGAs have been estimated by scaling the data from the nine LGAs in proportion to the urban population times the area (for grid cells with total dwellings greater than 50) in each LGA; and
  - Data from five golf courses including Castle Hill, Killara, Manly, Pennant Hills and Saint Michael's. Activity data for the remaining 111 golf courses were estimated by averaging the data from the five golf courses. The New South Wales Golf Course Superintendent's Association (NSWGCSA) provided assistance by contacting members to provide assistance.
- Load factors (USEPA, 2004c) and proportion of equipment in each power range (USEPA, 2005f).

Table 3.53 includes the type and number of commercial lawn mowing and garden equipment in the GMR based on activity data obtained through the council survey.

Table 3.53: Commercial lawn mowing and garden equipment – council equipment type and number during 2003 in the GMR

Equipment Type [1]	Number [1]
Brush Cutter, Edger and Hedge Trimmer	116
Chainsaw	160
Chippers and Stump Grinders	12
Commercial Lawnmower	48
Leaf Blowers and Vacuums	195
Mulchers	2
Other Lawn Mowing and Garden Equipment	35
Push Lawnmower	300
Ride-on Lawnmower	53
Rotary Tiller	13
Tractor	76
Turf Equipment	28
Council Lawn Mowing and Garden Equipment Total	1,038

[1] Data Source: (Council Survey). The total number of lawn mowing and garden equipment obtained from the Council Survey are ~8.8 times these values. The rationale is discussed in Section 3.6.3.

Table 3.54 includes the type and number of commercial lawn mowing and garden equipment in the GMR based on activity data obtained through the golf course survey.

Table 3.54: Commercial lawn mowing and garden equipment – golf course equipment type and number during 2003 in the GMR

Equipment Type [1]	Number [1]
Brush Cutter, Edger and Hedge Trimmer	32
Chainsaw	16
Chippers and Stump Grinders	3
Commercial Lawnmower	39
Golf Carts	31
Leaf Blowers and Vacuums	18
Other Lawn Mowing and Garden Equipment	49
Push Lawnmower	37
Ride-on Lawnmower	11
Tractor	28
Golf Course Lawn Mowing and Garden Equipment Total	264

[1] Data Source: (Golf Course Survey). The total number of lawn mowing and garden equipment obtained from the Golf Course Survey are ~23.2 times these values. The rationale is discussed in Section 3.6.3.

Table 3.55 includes the number of commercial lawn mowing and garden equipment with a given fuel type in the GMR based on activity data obtained through the council survey.

Table 3.55: Commercial lawn mowing and garden equipment – council fuel type and number during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Number [1]	Proportion of Number (%)[1]
Lawn Mower	2 - Stroke Petrol	253	24.4%
Lawn Mower	4 - Stroke Petrol	59	5.7%
Lawn Mower	Diesel	89	8.6%
Lawn Mower	All	401	38.6%
Garden Equipment	2 - Stroke Petrol	489	47.1%
Garden Equipment	4 - Stroke Petrol	84	8.1%
Garden Equipment	Diesel	64	6.2%
Garden Equipment	All	637	61.4%
All	2 - Stroke Petrol	742	71.5%
All	4 - Stroke Petrol	143	13.8%
All	Diesel	153	14.7%
All	All	1,038	100.0%

[1] Data Source: (Council Survey). The total number of lawn mowing and garden equipment obtained from the Council Survey are ~8.8 times these values. The rationale is discussed in Section 3.6.3.

Table 3.56 includes the number of commercial lawn mowing and garden equipment with a given fuel type in the GMR based on activity data obtained through the golf course survey.

Table 3.56: Commercial lawn mowing and garden equipment – golf course fuel type and number during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Number [1]	Proportion of Number (%)[1]
Lawn Mower	2 - Stroke Petrol	30	11.4%
Lawn Mower	4 - Stroke Petrol	18	6.8%
Lawn Mower	Diesel	39	14.8%
Lawn Mower	All	87	33.0%
Garden Equipment	2 - Stroke Petrol	66	25.0%
Garden Equipment	4 - Stroke Petrol	75	28.4%
Garden Equipment	Diesel	36	13.6%
Garden Equipment	All	177	67.0%
All	2 - Stroke Petrol	96	36.4%
All	4 - Stroke Petrol	93	35.2%
All	Diesel	75	28.4%
All	All	264	100.0%

[1] Data Source: (Golf Course Survey). The total number of lawn mowing and garden equipment obtained from the Golf Course Survey are ~23.2 times these values. The rationale is discussed in Section 3.6.3.

Table 3.57 includes the number of commercial lawn mowing and garden equipment with a given engine power range in the GMR based on activity data obtained through the council survey.

Table 3.57: Commercial lawn mowing and garden equipment – council engine power range and number during 2003 in the GMR

Power Range (kW) [1]	Number of 2 - Stroke Petrol [2]	Number of 4 - Stroke Petrol [2]	Number of Diesel [2]	Total [2]
0.75 to 2.25	295	4	-	299
2.25 to 4.5	441	70	-	511
4.5 to 8.2	6	9	30	45
8.2 to 12	-	39	1	40
12 to 18.7	-	20	87	107
18.7 to 29.9	-	-	21	21
29.9 to 37.3	-	-	3	3
37.3 to 56	-	1	2	3
56 to 74.6	-	-	8	8
74.6 to 130.5	-	-	1	1
Total	742	143	153	1,038

[1] Data Source: (USEPA, 2005f).
[2] Data Source: (Council Survey). The total number of lawn mowing and garden equipment obtained from the Council Survey are ~8.8 times these values. The rationale is discussed in Section 3.6.3.

Figure 3.7 shows the proportion of commercial lawn mowing and garden equipment with a given fuel type and engine power range in the GMR based on activity data obtained through the council survey.

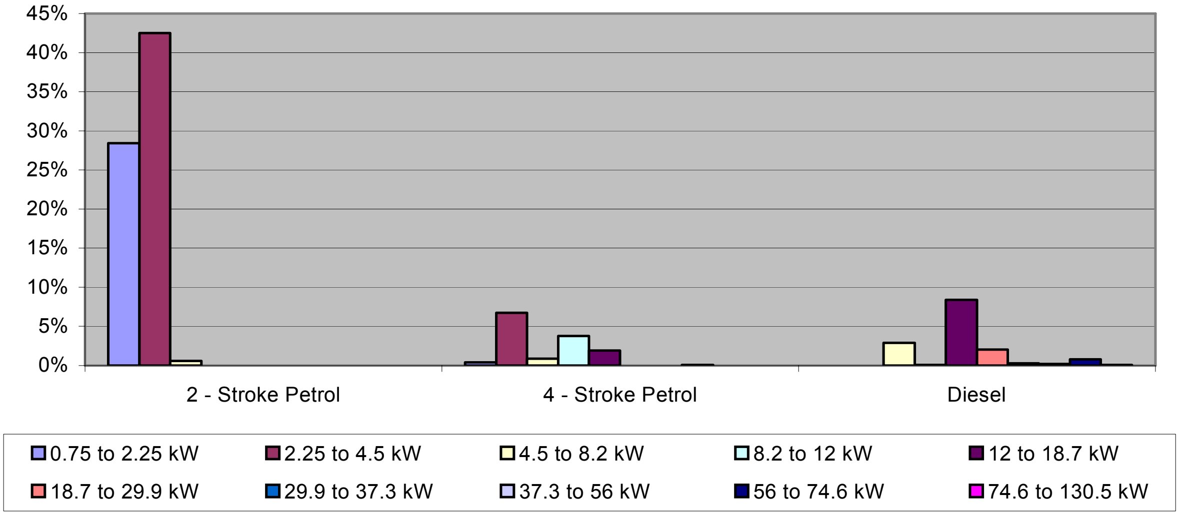

Figure 3.7: Proportion of fuel type and engine power range for commercial lawn mowing and garden equipment during 2003 in the GMR - council survey

Table 3.58 includes the number of commercial lawn mowing and garden equipment with a given engine power range in the GMR based on activity data obtained through the golf course survey.

Table 3.58: Commercial lawn mowing and garden equipment – golf course engine power range and number during 2003 in the GMR

Power Range (kW) [1]	Number of 2 - Stroke Petrol [2]	Number of 4 - Stroke Petrol [2]	Number of Diesel [2]	Total [2]
0 to 0.75 kW	-	1	-	1
0.75 to 2.25 kW	77	9	-	86
2.25 to 4.5 kW	19	27	-	46
4.5 to 8.2 kW	-	47	-	47
8.2 to 12 kW	-	6	-	6
12 to 18.7 kW	-	3	52	55
18.7 to 29.9 kW	-	-	11	11
29.9 to 37.3 kW	-	-	2	2
37.3 to 56 kW	-	-	7	7
56 to 74.6 kW	-	-	3	3
Total	96	93	75	264

[1] Data Source: (USEPA, 2005f).
[2] Data Source: (Golf Course Survey). The total number of lawn mowing and garden equipment obtained from the Golf Course Survey are ~23.2 times these values. The rationale is discussed in Section 3.6.3.

Figure 3.8 shows the proportion of commercial lawn mowing and garden equipment with a given fuel type and engine power range in the GMR based on activity data obtained through the golf course survey.

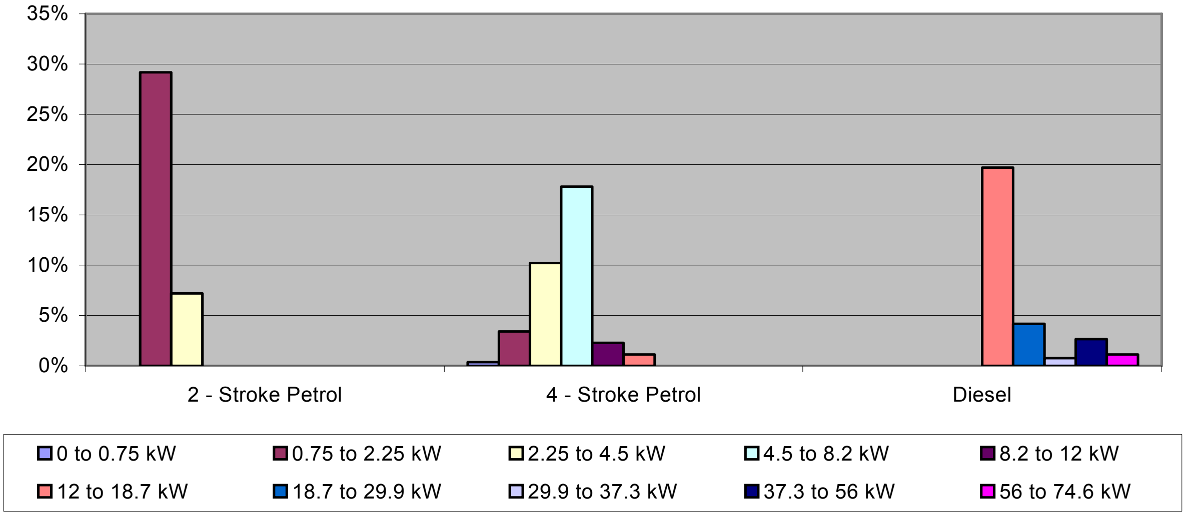

Figure 3.8: Proportion of fuel type and engine power range for commercial lawn mowing and garden equipment during 2003 in the GMR - golf course survey

Table 3.59 includes detailed activity data for lawn mowing and garden equipment in the GMR based on activity data obtained through the council survey.

Table 3.59: Commercial lawn mowing and garden equipment – detailed council activity data during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Power Range (kW) [2]	Number [1]	Proportion of Number (%) [1]	Annual Usage (hours/year) [1]
Brush Cutter, Edger and Hedge Trimmer	2 – Stroke Petrol	0.75 to 2.25	108	10.4%	1,417
Brush Cutter, Edger and Hedge Trimmer	2 – Stroke Petrol	2.25 to 4.5	8	0.8%	1,380
Chainsaw	2 – Stroke Petrol	0.75 to 2.25	36	3.5%	818
Chainsaw	2 – Stroke Petrol	2.25 to 4.5	124	11.9%	810
Leaf Blowers and Vacuums	2 – Stroke Petrol	0.75 to 2.25	143	13.8%	976
Leaf Blowers and Vacuums	2 – Stroke Petrol	2.25 to 4.5	52	5.0%	972
Other Lawn Mowing and Garden Equipment	2 – Stroke Petrol	0.75 to 2.25	3	0.3%	1,668
Other Lawn Mowing and Garden Equipment	2 – Stroke Petrol	2.25 to 4.5	9	0.9%	1,546
Other Lawn Mowing and Garden Equipment	2 – Stroke Petrol	4.5 to 8.2	6	0.6%	1,484
Push Lawnmower	2 – Stroke Petrol	0.75 to 2.25	5	0.5%	974
Push Lawnmower	2 – Stroke Petrol	2.25 to 4.5	248	23.9%	960
Chippers and Stump Grinders	4 – Stroke Petrol	8.2 to 12	3	0.3%	867
Chippers and Stump Grinders	4 – Stroke Petrol	12 to 18.7	4	0.4%	858
Chippers and Stump Grinders	4 – Stroke Petrol	37.3 to 56	1	0.1%	780
Mulchers	4 – Stroke Petrol	0.75 to 2.25	1	0.1%	104
Mulchers	4 – Stroke Petrol	2.25 to 4.5	1	0.1%	104
Other Lawn Mowing and Garden Equipment	4 – Stroke Petrol	0.75 to 2.25	2	0.2%	1,820
Other Lawn Mowing and Garden Equipment	4 – Stroke Petrol	2.25 to 4.5	7	0.7%	1,690
Other Lawn Mowing and Garden Equipment	4 – Stroke Petrol	4.5 to 8.2	4	0.4%	1,820
Push Lawnmower	4 – Stroke Petrol	0.75 to 2.25	1	0.1%	60
Push Lawnmower	4 – Stroke Petrol	2.25 to 4.5	46	4.4%	299
Ride-on Lawnmower	4 – Stroke Petrol	4.5 to 8.2	2	0.2%	1,820
Ride-on Lawnmower	4 – Stroke Petrol	8.2 to 12	7	0.7%	1,820
Ride-on Lawnmower	4 – Stroke Petrol	12 to 18.7	3	0.3%	1,820
Rotary Tiller	4 – Stroke Petrol	2.25 to 4.5	13	1.3%	294
Tractor	4 – Stroke Petrol	4.5 to 8.2	2	0.2%	65
Tractor	4 – Stroke Petrol	8.2 to 12	27	2.6%	111
Tractor	4 – Stroke Petrol	12 to 18.7	9	0.9%	134
Turf Equipment	4 – Stroke Petrol	2.25 to 4.5	3	0.3%	503

Equipment Type [1]	Fuel Type [1]	Power Range (kW) [2]	Number [1]	Proportion of Number (%) [1]	Annual Usage (hours/year) [1]
Turf Equipment	4 – Stroke Petrol	4.5 to 8.2	1	0.1%	494
Turf Equipment	4 – Stroke Petrol	8.2 to 12	2	0.2%	273
Turf Equipment	4 – Stroke Petrol	12 to 18.7	4	0.4%	390
Chippers and Stump Grinders	Diesel	56 to 74.6	4	0.4%	1,482
Commercial Lawnmower	Diesel	4.5 to 8.2	8	0.8%	1,452
Commercial Lawnmower	Diesel	12 to 18.7	24	2.3%	1,505
Commercial Lawnmower	Diesel	18.7 to 29.9	14	1.3%	1,454
Commercial Lawnmower	Diesel	29.9 to 37.3	1	0.1%	1,520
Commercial Lawnmower	Diesel	37.3 to 56	1	0.1%	1,520
Other Lawn Mowing and Garden Equipment	Diesel	12 to 18.7	3	0.3%	1,907
Other Lawn Mowing and Garden Equipment	Diesel	37.3 to 56	1	0.1%	1,820
Ride-on Lawnmower	Diesel	4.5 to 8.2	22	2.1%	953
Ride-on Lawnmower	Diesel	12 to 18.7	19	1.8%	959
Tractor	Diesel	8.2 to 12	1	0.1%	910
Tractor	Diesel	12 to 18.7	37	3.6%	1,350
Turf Equipment	Diesel	12 to 18.7	4	0.4%	1,040
Turf Equipment	Diesel	18.7 to 29.9	7	0.7%	1,003
Turf Equipment	Diesel	29.9 to 37.3	2	0.2%	910
Turf Equipment	Diesel	56 to 74.6	4	0.4%	1,040
Turf Equipment	Diesel	74.6 to 130.5	1	0.1%	780
All	All	All	1,038	100.0%	-

[1] Data Source: (Council Survey). The total number of lawn mowing and garden equipment obtained from the Council Survey are ~8.8 times these values. The rationale is discussed in Section 3.6.3.
[2] Data Source: (USEPA, 2005f).

Table 3.60 includes detailed activity data for lawn mowing and garden equipment in the GMR based on activity data obtained through the golf course survey.

Table 3.60: Commercial lawn mowing and garden equipment – detailed golf course activity data during 2003 in the GMR

Equipment Type [1]	Fuel Type [1]	Power Range (kW) [2]	Number [1]	Proportion of Number (%) [1]	Annual Usage (hours/year) [1]
Brush Cutter, Edger and Hedge Trimmer	2 - Stroke Petrol	0.75 to 2.25	30	11.4%	643
Brush Cutter, Edger and Hedge Trimmer	2 - Stroke Petrol	2.25 to 4.5	2	0.8%	455
Chainsaw	2 - Stroke Petrol	0.75 to 2.25	4	1.5%	85
Chainsaw	2 - Stroke Petrol	2.25 to 4.5	12	4.5%	69
Leaf Blowers and Vacuums	2 - Stroke Petrol	0.75 to 2.25	13	4.9%	622
Leaf Blowers and Vacuums	2 - Stroke Petrol	2.25 to 4.5	5	1.9%	598
Push Lawnmower	2 - Stroke Petrol	0.75 to 2.25	30	11.4%	418
Golf Carts	4 - Stroke Petrol	4.5 to 8.2	31	11.7%	1,072
Other Lawn Mowing and Garden Equipment	4 - Stroke Petrol	0 to 0.75	1	0.4%	300
Other Lawn Mowing and Garden Equipment	4 - Stroke Petrol	0.75 to 2.25	9	3.4%	269
Other Lawn Mowing and Garden Equipment	4 - Stroke Petrol	2.25 to 4.5	20	7.6%	263
Other Lawn Mowing and Garden Equipment	4 - Stroke Petrol	4.5 to 8.2	14	5.3%	296
Push Lawnmower	4 - Stroke Petrol	2.25 to 4.5	7	2.7%	828
Ride-on Lawnmower	4 - Stroke Petrol	4.5 to 8.2	2	0.8%	791
Ride-on Lawnmower	4 - Stroke Petrol	8.2 to 12	6	2.3%	683
Ride-on Lawnmower	4 - Stroke Petrol	12 to 18.7	3	1.1%	647
Chippers and Stump Grinders	Diesel	56 to 74.6	3	1.1%	221
Commercial Lawnmower	Diesel	12 to 18.7	21	8.0%	825
Commercial Lawnmower	Diesel	18.7 to 29.9	11	4.2%	817
Commercial Lawnmower	Diesel	29.9 to 37.3	2	0.8%	684
Commercial Lawnmower	Diesel	37.3 to 56	5	1.9%	840
Other Lawn Mowing and Garden Equipment	Diesel	12 to 18.7	3	1.1%	780
Other Lawn Mowing and Garden Equipment	Diesel	37.3 to 56	2	0.8%	650
Tractor	Diesel	12 to 18.7	28	10.6%	554
All	All	All	264	100.0%	-

[1] Data Source: (Golf Course Survey). The total number of lawn mowing and garden equipment obtained from the Golf Course Survey are ~23.2 times these values. The rationale is discussed in Section 3.6.3.
[2] Data Source: (USEPA, 2005f).

Table C1.1 and Figure C1.1 in Appendix C include a comparison between number and sales of 2-stroke and 4-stroke petrol domestic and commercial lawn mowing and garden equipment in the GMR and NSW respectively.

3.6.4 Emission and Speciation Factors

The emission and speciation factors for all substances from commercial lawn mowing and garden equipment are detailed in Table 3.61.

Table 3.61: Emission and speciation factors for all substances from commercial lawn mowing and garden equipment

Substance	Equipment/ Fuel Type		Emission Factor Source
CO, NO_x[1], PM_{10}, SO_2 & Total VOC	All		(USEPA, 2005e)
$PM_{2.5}$ & TSP	2-stroke & 4-stroke petrol		(USEPA, 2004a & USEPA, 2004b) & (Norbeck et. al., 1998)
	Diesel		(USEPA, 2005e) & (Klimont et. al., 2002)
Organic air toxics	2-stroke & 4-stroke petrol		Appendix D (ERG, 2003)
	Diesel		(Pechan, 2006) replacing Profile Number 1201 (USEPA, 2002)
Metal air toxics	2-stroke & 4-stroke petrol		(Environment Australia, 1999e)
	Diesel		(Environment Australia, 2000)
PAH	All	PM phase	Appendix D (ERG, 2003)
		VOC phase	(Khalili et. al., 1995)
PCDD/PCDF	All		Appendix D (ERG, 2003)
Speciated VOC & Methane	2-stroke & 4-stroke petrol [2]		Profile Number 1203 (USEPA, 2002)
	Diesel		(Pechan, 2006) replacing Profile Number 1201 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).
[2] Profile Number 0000 (USEPA, 2002) for “Unidentified” VOC.

3.6.5 Spatial Distribution of Emissions

Emissions from commercial lawn mowing and garden equipment have been spatially distributed as follows:

- For LGAs, total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the GMR in proportion to total dwellings in each grid cell with greater than 50 dwellings; and
- For golf courses, total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the GMR where the golf courses are located.

Figure 3.9 shows the spatial distribution of commercial lawn mowing and garden equipment in the GMR.

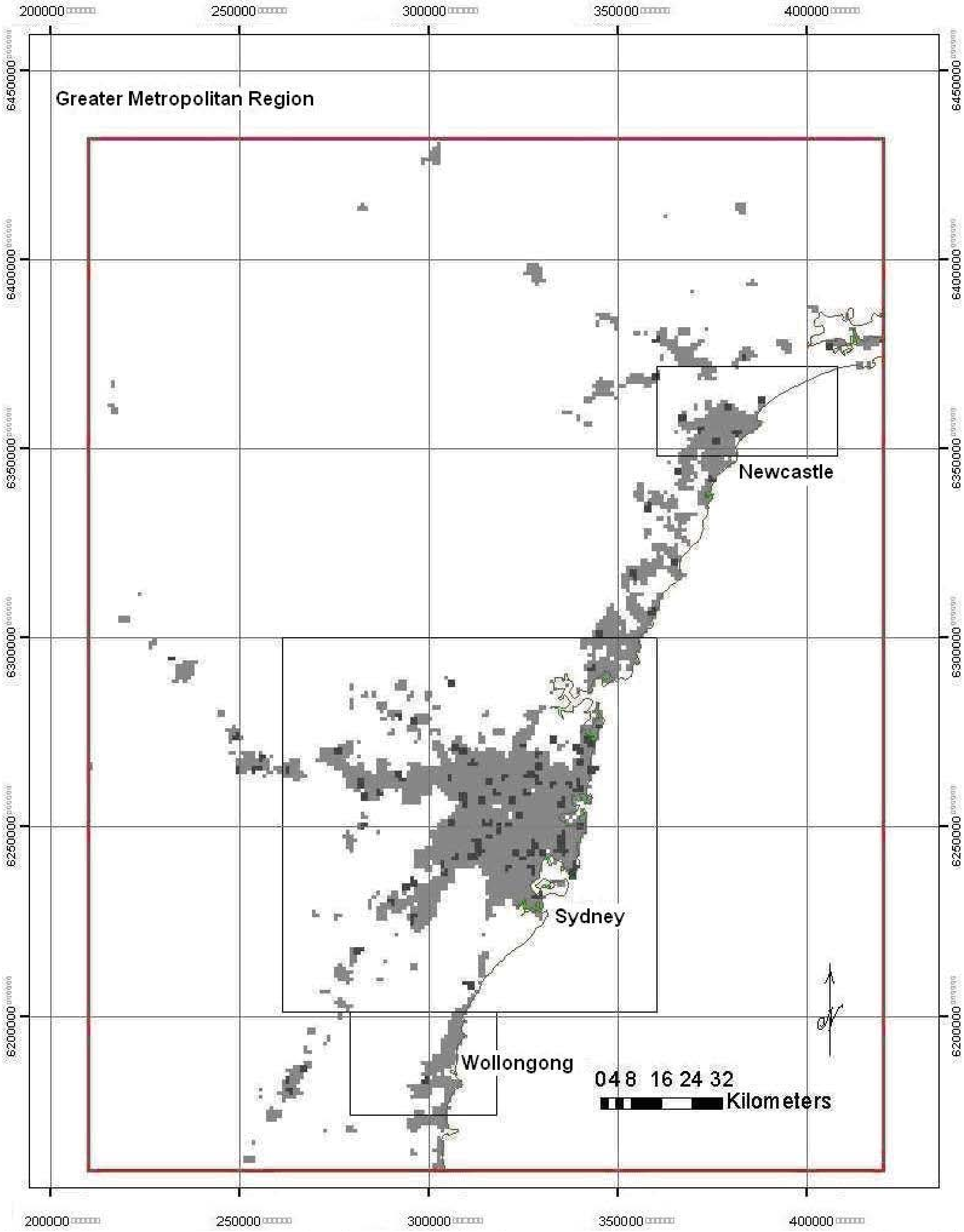

Figure 3.9: Spatial distribution of commercial lawn mowing and garden equipment in the GMR

3.6.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for commercial lawn mowing and garden equipment:

- Monthly - assumed to vary for each month of the year (Domestic Survey);
- Weekly (i.e. Weekday and Weekend day) - assumed to occur only on weekdays (Commercial Survey); and
- Daily – assumed to be constant between 8 am and 5 pm (Commercial Survey).

Tables 3.62, 3.63 and 3.64 detail the temporal emissions variation profiles that have been used for commercial lawn mowing and garden equipment.

Table 3.62: Monthly temporal emissions variation profile for commercial lawn mowing and garden equipment

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	2.0	11.11%	July	1.0	5.56%
February	2.0	11.11%	August	1.0	5.56%
March	1.5	8.33%	September	1.5	8.33%
April	1.5	8.33%	October	1.5	8.33%
May	1.5	8.33%	November	1.5	8.33%
June	1.0	5.56%	December	2.0	11.11%

Table 3.63: Weekly temporal emissions variation profile for commercial lawn mowing and garden equipment

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	100%	Weekend day	0	0%

Table 3.64: Daily temporal emissions variation profile for commercial lawn mowing and garden equipment

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0	0%	0	0%	1 pm	1	11.11%	0	0%
2 am	0	0%	0	0%	2 pm	1	11.11%	0	0%
3 am	0	0%	0	0%	3 pm	1	11.11%	0	0%
4 am	0	0%	0	0%	4 pm	1	11.11%	0	0%
5 am	0	0%	0	0%	5 pm	0	0%	0	0%
6 am	0	0%	0	0%	6 pm	0	0%	0	0%
7 am	0	0%	0	0%	7 pm	0	0%	0	0%
8 am	1	11.11%	0	0%	8 pm	0	0%	0	0%
9 am	1	11.11%	0	0%	9 pm	0	0%	0	0%
10 am	1	11.11%	0	0%	10 pm	0	0%	0	0%
11 am	1	11.11%	0	0%	11 pm	0	0%	0	0%
12 noon	1	11.11%	0	0%	12 midnight	0	0%	0	0%

3.6.7 Emission Estimates

Table 3.65 presents total estimated annual emissions (for selected substances) from commercial lawn mowing and garden equipment for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from commercial lawn mowing and garden equipment are presented in Appendix B.

Table 3.65: Total estimated annual emissions from commercial lawn mowing and garden equipment in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	3.61	3.55×10^{-01}	1.67×10^{-01}	1.22	5.35
ACETALDEHYDE	$4.54 \times 10^{+01}$	4.47	2.10	$1.54 \times 10^{+01}$	$6.74 \times 10^{+01}$
BENZENE	$3.08 \times 10^{+01}$	3.03	1.42	$1.04 \times 10^{+01}$	$4.56 \times 10^{+01}$
CARBON MONOXIDE	$7.62 \times 10^{+03}$	$7.49 \times 10^{+02}$	$3.52 \times 10^{+02}$	$2.57 \times 10^{+03}$	$1.13 \times 10^{+04}$
FORMALDEHYDE	$2.81 \times 10^{+01}$	2.77	1.30	9.51	$4.17 \times 10^{+01}$
ISOMERS OF XYLENE	$9.46 \times 10^{+01}$	9.30	4.38	$3.20 \times 10^{+01}$	$1.40 \times 10^{+02}$
LEAD AND COMPOUNDS	1.08×10^{-02}	1.06×10^{-03}	5.00×10^{-04}	3.65×10^{-03}	1.60×10^{-02}
OXIDES OF NITROGEN	$1.81 \times 10^{+02}$	$1.78 \times 10^{+01}$	8.38	$6.12 \times 10^{+01}$	$2.69 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$1.04 \times 10^{+02}$	$1.02 \times 10^{+01}$	4.79	$3.50 \times 10^{+01}$	$1.54 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	$9.63 \times 10^{+01}$	9.46	4.45	$3.25 \times 10^{+01}$	$1.43 \times 10^{+02}$
POLYCYCLIC AROMATIC HYDROCARBONS	5.28	5.19×10^{-01}	2.44×10^{-01}	1.79	7.83
SULFUR DIOXIDE	6.34	6.23×10^{-01}	2.93×10^{-01}	2.14	9.40
TETRACHLOROETHYLENE	7.47×10^{-01}	7.34×10^{-02}	3.46×10^{-02}	2.53×10^{-01}	1.11
TOLUENE	$8.90 \times 10^{+01}$	8.75	4.12	$3.01 \times 10^{+01}$	$1.32 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$1.09 \times 10^{+02}$	$1.07 \times 10^{+01}$	5.05	$3.69 \times 10^{+01}$	$1.62 \times 10^{+02}$
TOTAL VOCS	$1.11 \times 10^{+03}$	$1.09 \times 10^{+02}$	$5.13 \times 10^{+01}$	$3.75 \times 10^{+02}$	$1.64 \times 10^{+03}$
TRICHLOROETHYLENE	4.59×10^{-01}	4.51×10^{-02}	2.12×10^{-02}	1.55×10^{-01}	6.80×10^{-01}

Table 3.66 presents total estimated annual emissions (for selected substances) from commercia lawn mowing and garden equipment by fuel type for the GMR.

Table 3.66: Total estimated annual emissions from commercial lawn mowing and garden equipment by fuel type

Substance	Emissions (tonnes/year)			
	2-Stroke Petrol	4-Stroke Petrol	Diesel	Total
1,3 BUTADIENE	2.34	2.53	4.78×10^{-01}	5.35
ACETALDEHYDE	1.82	1.09	$6.45 \times 10^{+01}$	$6.74 \times 10^{+01}$
BENZENE	$2.75 \times 10^{+01}$	$1.39 \times 10^{+01}$	4.23	$4.56 \times 10^{+01}$
CARBON MONOXIDE	$6.16 \times 10^{+03}$	$2.68 \times 10^{+03}$	$2.46 \times 10^{+03}$	$1.13 \times 10^{+04}$
FORMALDEHYDE	2.77	4.56	$3.44 \times 10^{+01}$	$4.17 \times 10^{+01}$
ISOMERS OF XYLENE	$1.17 \times 10^{+02}$	$1.80 \times 10^{+01}$	4.87	$1.40 \times 10^{+02}$
LEAD AND COMPOUNDS	1.30×10^{-02}	2.94×10^{-04}	2.68×10^{-03}	1.60×10^{-02}
OXIDES OF NITROGEN	$1.44 \times 10^{+02}$	$6.50 \times 10^{+01}$	$5.92 \times 10^{+01}$	$2.69 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$1.02 \times 10^{+02}$	$2.50 \times 10^{+01}$	$2.68 \times 10^{+01}$	$1.54 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	$9.45 \times 10^{+01}$	$2.33 \times 10^{+01}$	$2.49 \times 10^{+01}$	$1.43 \times 10^{+02}$
POLYCYCLIC AROMATIC HYDROCARBONS	2.52	3.17	2.14	7.83
SULFUR DIOXIDE	5.13	2.22	2.04	9.40
TETRACHLOROETHYLENE	8.82×10^{-01}	2.25×10^{-01}	-	1.11
TOLUENE	$1.07 \times 10^{+02}$	$1.91 \times 10^{+01}$	6.14	$1.32 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$1.07 \times 10^{+02}$	$2.63 \times 10^{+01}$	$2.82 \times 10^{+01}$	$1.62 \times 10^{+02}$
TOTAL VOCS	$1.09 \times 10^{+03}$	$2.66 \times 10^{+02}$	$2.85 \times 10^{+02}$	$1.64 \times 10^{+03}$
TRICHLOROETHYLENE	5.42×10^{-01}	1.38×10^{-01}	-	6.80×10^{-01}

Tables 3.67 and 3.68 present total estimated daily emissions (for selected substances) from commercial lawn mowing and garden equipment for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday and July weekday day daily emissions.

Table 3.67: Total estimated daily emissions from commercial lawn mowing and garden equipment in each region for typical January weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.74×10^{-02}	1.71×10^{-03}	8.07×10^{-04}	5.89×10^{-03}	2.59×10^{-02}
ACETALDEHYDE	2.19×10^{-01}	2.16×10^{-02}	1.02×10^{-02}	7.42×10^{-02}	3.25×10^{-01}
BENZENE	1.49×10^{-01}	1.46×10^{-02}	6.88×10^{-03}	5.03×10^{-02}	2.20×10^{-01}
CARBON MONOXIDE	$3.68 \times 10^{+01}$	3.62	1.70	$1.24 \times 10^{+01}$	$5.46 \times 10^{+01}$
FORMALDEHYDE	1.36×10^{-01}	1.34×10^{-02}	6.29×10^{-03}	4.59×10^{-02}	2.02×10^{-01}
ISOMERS OF XYLENE	4.57×10^{-01}	4.49×10^{-02}	2.11×10^{-02}	1.54×10^{-01}	6.78×10^{-01}
LEAD AND COMPOUNDS	5.22×10^{-05}	5.13×10^{-06}	2.41×10^{-06}	1.76×10^{-05}	7.74×10^{-05}
OXIDES OF NITROGEN	8.75×10^{-01}	8.60×10^{-02}	4.05×10^{-02}	2.96×10^{-01}	1.30
PARTICULATE MATTER < 10 µm	5.01×10^{-01}	4.92×10^{-02}	2.32×10^{-02}	1.69×10^{-01}	7.42×10^{-01}
PARTICULATE MATTER < 2.5 µm	4.65×10^{-01}	4.57×10^{-02}	2.15×10^{-02}	1.57×10^{-01}	6.89×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
SULFUR DIOXIDE	3.06×10^{-02}	3.01×10^{-03}	1.42×10^{-03}	1.03×10^{-02}	4.54×10^{-02}
TETRACHLOROETHYLENE	3.61×10^{-03}	3.55×10^{-04}	1.67×10^{-04}	1.22×10^{-03}	5.35×10^{-03}
TOLUENE	4.30×10^{-01}	4.23×10^{-02}	1.99×10^{-02}	1.45×10^{-01}	6.38×10^{-01}
TOTAL SUSPENDED PARTICULATES	5.27×10^{-01}	5.18×10^{-02}	2.44×10^{-02}	1.78×10^{-01}	7.81×10^{-01}
TOTAL VOCS	5.35	5.26×10^{-01}	2.48×10^{-01}	1.81	7.94
TRICHLOROETHYLENE	2.22×10^{-03}	2.18×10^{-04}	1.03×10^{-04}	7.50×10^{-04}	3.29×10^{-03}

Table 3.68: Total estimated daily emissions from commercial lawn mowing and garden equipment in each region for typical July weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	8.72×10^{-03}	8.57×10^{-04}	4.03×10^{-04}	2.95×10^{-03}	1.29×10^{-02}
ACETALDEHYDE	1.10×10^{-01}	1.08×10^{-02}	5.08×10^{-03}	3.71×10^{-02}	1.63×10^{-01}
BENZENE	7.44×10^{-02}	7.31×10^{-03}	3.44×10^{-03}	2.51×10^{-02}	1.10×10^{-01}
CARBON MONOXIDE	$1.84 \times 10^{+01}$	1.81	8.51×10^{-01}	6.22	$2.73 \times 10^{+01}$
FORMALDEHYDE	6.80×10^{-02}	6.68×10^{-03}	3.14×10^{-03}	2.30×10^{-02}	1.01×10^{-01}
ISOMERS OF XYLENE	2.29×10^{-01}	2.25×10^{-02}	1.06×10^{-02}	7.72×10^{-02}	3.39×10^{-01}
LEAD AND COMPOUNDS	2.61×10^{-05}	2.57×10^{-06}	1.21×10^{-06}	8.82×10^{-06}	3.87×10^{-05}
OXIDES OF NITROGEN	4.38×10^{-01}	4.30×10^{-02}	2.02×10^{-02}	1.48×10^{-01}	6.49×10^{-01}
PARTICULATE MATTER < 10 µm	2.50×10^{-01}	2.46×10^{-02}	1.16×10^{-02}	8.46×10^{-02}	3.71×10^{-01}
PARTICULATE MATTER < 2.5 µm	2.33×10^{-01}	2.29×10^{-02}	1.08×10^{-02}	7.86×10^{-02}	3.45×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	1.28×10^{-02}	1.25×10^{-03}	5.90×10^{-04}	4.31×10^{-03}	1.89×10^{-02}
SULFUR DIOXIDE	1.53×10^{-02}	1.50×10^{-03}	7.08×10^{-04}	5.17×10^{-03}	2.27×10^{-02}
TETRACHLOROETHYLENE	1.80×10^{-03}	1.77×10^{-04}	8.35×10^{-05}	6.10×10^{-04}	2.68×10^{-03}
TOLUENE	2.15×10^{-01}	2.11×10^{-02}	9.95×10^{-03}	7.27×10^{-02}	3.19×10^{-01}
TOTAL SUSPENDED PARTICULATES	2.64×10^{-01}	2.59×10^{-02}	1.22×10^{-02}	8.91×10^{-02}	3.91×10^{-01}
TOTAL VOCS	2.68	2.63×10^{-01}	1.24×10^{-01}	9.05×10^{-01}	3.97
TRICHLOROETHYLENE	1.11×10^{-03}	1.09×10^{-04}	5.13×10^{-05}	3.75×10^{-04}	1.64×10^{-03}

3.6.8 Emission Projection Methodology

Emission projection factors for commercial lawn mowing and garden equipment use commercial and services oil consumption growth as the surrogate. Emission projection factors for commercial lawn mowing and garden equipment were developed using the following data:

- Commercial and services oil consumption growth data (ABARE, 2005c).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.69 presents the emission projection factors for commercial lawn mowing and garden equipment.

Table 3.69: Emission projection factors for commercial lawn mowing and garden equipment

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0135	2018	1.2227
2005	1.0272	2019	1.2392
2006	1.0410	2020	1.2559
2007	1.0551	2021	1.2728
2008	1.0693	2022	1.2900
2009	1.0837	2023	1.3074
2010	1.0984	2024	1.3251
2011	1.1132	2025	1.3429
2012	1.1282	2026	1.3611
2013	1.1434	2027	1.3794
2014	1.1589	2028	1.3980
2015	1.1745	2029	1.4169
2016	1.1903	2030	1.4360
2017	1.2064	2031	1.4554

[1] Data Source: (ABARE, 2005c), http://www.abareconomics.com/data_services/excel/TPEC 05.xls?prodid=13183.

3.7 Liquid Fuel Combustion

3.7.1 Emission Source Description

Emissions of combustion products from domestic liquid fuel combustion originate when different fuels are combusted in different appliances. The domestic liquid combustion fuels and appliances included in the domestic-commercial air emissions inventory include space heaters using lighting kerosene only.

3.7.2 Emission Estimation Methodology

Emissions from domestic liquid fuel combustion have been estimated using the preferred method (USEPA, 1999), which requires fuel consumption data to be obtained from either local distributors, Australian Bureau of Agriculture and Resource Economics (ABARE) or domestic survey for each fuel type. Fuel consumption data have been combined with volume based emission factors to estimate emissions for each substance. Emissions from domestic liquid fuel combustion have been calculated using the following formula:

$$E_i = EF_i \times SF_i \times LF$$

where:

E_i	=	Emission of substance i	(kg/year)
EF_i	=	Volume based emission factor for substance i	(kg/kilolitres fuel)
SF_i	=	NO_x, VOC or PM speciation factor for substance i	(%)
LF	=	Liquid fuel consumption	(kilolitres/year)

3.7.3 Activity Data

Activity data required for estimating emissions from domestic liquid fuel combustion includes:

- 1 km by 1 km gridded population data for the GMR (ABS, 2001 & TPDC, 2004). The total population in the GMR during 2003 was 5,091,366;
- Residential lighting kerosene consumption for NSW and ACT from ABARE, 2005b; and
- Appliance type, fuel type, fuel consumption, frequency, duration and seasonal variation of liquid fuel combustion appliances use from the domestic survey. Specific details about the information obtained are included in the domestic questionnaire survey form for domestic liquid combustion, which is included in Section 4 of Appendix A.

Table 3.70 includes the domestic liquid fuel type and volume of domestic liquid fuel consumed in the GMR that was obtained from ABARE, 2005b and the domestic survey.

Table 3.70: Domestic liquid fuel combustion activity data during 2003 in the GMR

Domestic Liquid Fuel Type	Volume of Fuel Consumed (kilolitres/year)	Data Source
Lighting Kerosene	15,379 [1]	(Domestic Survey)

[1] Annual lighting kerosene consumption for NSW and ACT residential use during 2003-04 is 24,044 kilolitres/year (ABARE, 2005b). Energy content of lighting kerosene is 36.6 mega joules/litres (ABARE, 2005d).

3.7.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic liquid fuel combustion are detailed in Table 3.71.

Table 3.71: Emission and speciation factors for all substances from domestic liquid fuel combustion

Substance	Emission Factor Source
CO, NO_x[1], PM_{10}, SO_2 & Total VOC	(USEPA, 1998b) [2]
$PM_{2.5}$ & TSP	(USEPA, 1998b) & (Klimont et. al., 2002)
Organic air toxics	(USEPA, 1998b)
Metal air toxics	(USEPA, 1998b)
PAH	(Environment Australia, 1999f) & (USEPA, 1998b)
Speciated VOC & Methane	Profile Number 0002 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).
[2] It has been assumed that the sulfur content of lighting kerosene is 0.05% (Caltex Australia Petroleum Pty. Ltd., 2006), Heating Oil Description, http://www.caltex.com.au/products_oil_detail.asp?id=183&area=1.

3.7.5 Spatial Distribution of Emissions

Emissions from domestic liquid fuel combustion have been spatially distributed according to population (USEPA, 1999). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the GMR in proportion to the population in each grid cell. Figure 3.1, Section 3.1.5 shows the spatial distribution of population in the GMR.

3.7.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic liquid fuel combustion:

- Monthly - assumed to vary for each month of the year (Domestic Survey);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (Domestic Survey); and
- Daily – assumed to vary for each hour of the day (Carnovale et. al., 1996).

Tables 3.72, 3.73 and 3.74 detail the temporal emissions variation profiles that have been used for domestic liquid fuel combustion.

Table 3.72: Monthly temporal emissions variation profile for domestic liquid fuel combustion

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	0.0	0%	July	2.5	25%
February	0.0	0%	August	2.5	25%
March	0.0	0%	September	1.0	10%
April	0.0	0%	October	0.0	0%
May	2.0	20%	November	0.0	0%
June	2.0	20%	December	0.0	0%

Table 3.73: Weekly temporal emissions variation profile for domestic liquid fuel combustion

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

Table 3.74: Daily temporal emissions variation profile for domestic liquid fuel combustion

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0.0200	1.96%	0.0200	1.96%	1 pm	0.0305	2.99%	0.0305	2.99%
2 am	0.0185	1.82%	0.0185	1.82%	2 pm	0.0370	3.63%	0.0370	3.63%
3 am	0.0185	1.82%	0.0185	1.82%	3 pm	0.0575	5.65%	0.0575	5.65%
4 am	0.0170	1.67%	0.0170	1.67%	4 pm	0.0740	7.27%	0.0740	7.27%
5 am	0.0175	1.72%	0.0175	1.72%	5 pm	0.1065	10.46%	0.1065	10.46%
6 am	0.0215	2.11%	0.0215	2.11%	6 pm	0.1100	10.80%	0.1100	10.80%
7 am	0.0215	2.11%	0.0215	2.11%	7 pm	0.1090	10.70%	0.1090	10.70%
8 am	0.0190	1.87%	0.0190	1.87%	8 pm	0.1035	10.16%	0.1035	10.16%
9 am	0.0190	1.87%	0.0190	1.87%	9 pm	0.0750	7.36%	0.0750	7.36%
10 am	0.0190	1.87%	0.0190	1.87%	10 pm	0.0475	4.66%	0.0475	4.66%
11 am	0.0175	1.72%	0.0175	1.72%	11 pm	0.0185	1.82%	0.0185	1.82%
12 noon	0.0220	2.16%	0.0220	2.16%	12 midnight	0.0185	1.82%	0.0185	1.82%

3.7.7 Emission Estimates

Table 3.75 presents total estimated annual emissions (for selected substances) from domestic liquid fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic liquid fuel combustion are presented in Appendix B.

Table 3.75: Total estimated annual emissions from domestic liquid fuel combustion in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	3.10×10^{-04}	2.04×10^{-05}	1.49×10^{-05}	4.87×10^{-05}	3.94×10^{-04}
CARBON MONOXIDE	7.26	4.78×10^{-01}	3.48×10^{-01}	1.14	9.23
FORMALDEHYDE	4.79×10^{-02}	3.15×10^{-03}	2.29×10^{-03}	7.50×10^{-03}	6.08×10^{-02}
ISOMERS OF XYLENE	1.58×10^{-04}	1.04×10^{-05}	7.57×10^{-06}	2.48×10^{-05}	2.01×10^{-04}
LEAD AND COMPOUNDS	2.19×10^{-03}	1.44×10^{-04}	1.05×10^{-04}	3.43×10^{-04}	2.78×10^{-03}
OXIDES OF NITROGEN	$2.61 \times 10^{+01}$	1.72	1.25	4.10	$3.32 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	5.81×10^{-01}	3.83×10^{-02}	2.78×10^{-02}	9.11×10^{-02}	7.38×10^{-01}
PARTICULATE MATTER < 2.5 µm	1.45×10^{-01}	9.57×10^{-03}	6.96×10^{-03}	2.28×10^{-02}	1.85×10^{-01}
POLYCYCLIC AROMATIC HYDROCARBONS	1.69×10^{-03}	1.12×10^{-04}	8.12×10^{-05}	2.66×10^{-04}	2.15×10^{-03}
SULFUR DIOXIDE	$1.03 \times 10^{+01}$	6.79×10^{-01}	4.94×10^{-01}	1.62	$1.31 \times 10^{+01}$
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	8.99×10^{-03}	5.92×10^{-04}	4.31×10^{-04}	1.41×10^{-03}	1.14×10^{-02}
TOTAL SUSPENDED PARTICULATES	6.12×10^{-01}	4.03×10^{-02}	2.93×10^{-02}	9.59×10^{-02}	7.77×10^{-01}
TOTAL VOCS	1.04	6.82×10^{-02}	4.96×10^{-02}	1.62×10^{-01}	1.32
TRICHLOROETHYLENE	-	-	-	-	-

Tables 3.76 and 3.77 present total estimated daily emissions (for selected substances) from domestic liquid fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.76: Total estimated daily emissions from domestic liquid fuel combustion in each region for typical January weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	0	0	0	0	0
CARBON MONOXIDE	0	0	0	0	0
FORMALDEHYDE	0	0	0	0	0
ISOMERS OF XYLENE	0	0	0	0	0
LEAD AND COMPOUNDS	0	0	0	0	0
OXIDES OF NITROGEN	0	0	0	0	0
PARTICULATE MATTER < 10 µm	0	0	0	0	0
PARTICULATE MATTER < 2.5 µm	0	0	0	0	0
POLYCYCLIC AROMATIC HYDROCARBONS	0	0	0	0	0
SULFUR DIOXIDE	0	0	0	0	0
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	0	0	0	0	0
TOTAL SUSPENDED PARTICULATES	0	0	0	0	0
TOTAL VOCS	0	0	0	0	0
TRICHLOROETHYLENE	-	-	-	-	-

Table 3.77: Total estimated daily emissions from domestic liquid fuel combustion in each region for typical July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	2.50×10^{-06}	1.65×10^{-07}	1.20×10^{-07}	3.92×10^{-07}	3.18×10^{-06}
CARBON MONOXIDE	5.86×10^{-02}	3.86×10^{-03}	2.81×10^{-03}	9.18×10^{-03}	7.44×10^{-02}
FORMALDEHYDE	3.86×10^{-04}	2.54×10^{-05}	1.85×10^{-05}	6.05×10^{-05}	4.90×10^{-04}
ISOMERS OF XYLENE	1.27×10^{-06}	8.40×10^{-08}	6.11×10^{-08}	2.00×10^{-07}	1.62×10^{-06}
LEAD AND COMPOUNDS	1.77×10^{-05}	1.16×10^{-06}	8.46×10^{-07}	2.77×10^{-06}	2.24×10^{-05}
OXIDES OF NITROGEN	2.11×10^{-01}	1.39×10^{-02}	1.01×10^{-02}	3.31×10^{-02}	2.68×10^{-01}
PARTICULATE MATTER < 10 µm	4.69×10^{-03}	3.09×10^{-04}	2.24×10^{-04}	7.35×10^{-04}	5.95×10^{-03}
PARTICULATE MATTER < 2.5 µm	1.17×10^{-03}	7.72×10^{-05}	5.61×10^{-05}	1.84×10^{-04}	1.49×10^{-03}
POLYCYCLIC AROMATIC HYDROCARBONS	1.37×10^{-05}	9.00×10^{-07}	6.55×10^{-07}	2.14×10^{-06}	1.74×10^{-05}
SULFUR DIOXIDE	8.32×10^{-02}	5.48×10^{-03}	3.98×10^{-03}	1.30×10^{-02}	1.06×10^{-01}
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	7.25×10^{-05}	4.78×10^{-06}	3.47×10^{-06}	1.14×10^{-05}	9.21×10^{-05}
TOTAL SUSPENDED PARTICULATES	4.93×10^{-03}	3.25×10^{-04}	2.36×10^{-04}	7.73×10^{-04}	6.27×10^{-03}
TOTAL VOCS	8.35×10^{-03}	5.50×10^{-04}	4.00×10^{-04}	1.31×10^{-03}	1.06×10^{-02}
TRICHLOROETHYLENE	-	-	-	-	-

3.7.8 Emission Projection Methodology

Emission projection factors for domestic liquid fuel combustion use residential oil consumption growth as the surrogate. Emission projection factors for domestic liquid fuel combustion were developed using the following data:

- Residential oil consumption growth data (ABARE, 2005c).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.78 presents the emission projection factors for domestic liquid fuel combustion.

Table 3.78: Emission projection factors for domestic liquid fuel combustion

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0223	2018	1.3913
2005	1.0450	2019	1.4223
2006	1.0683	2020	1.4540
2007	1.0921	2021	1.4863
2008	1.1164	2022	1.5194
2009	1.1412	2023	1.5532
2010	1.1666	2024	1.5878
2011	1.1926	2025	1.6232
2012	1.2192	2026	1.6593
2013	1.2463	2027	1.6962
2014	1.2740	2028	1.7340
2015	1.3024	2029	1.7726
2016	1.3314	2030	1.8121
2017	1.3610	2031	1.8524

[1] Data Source: (ABARE, 2005c), http://www.abareconomics.com/data_services/excel/TPEC 05.xls?prodid=13183.

3.8 Natural Gas Leakage

3.8.1 Emission Source Description

Emissions from natural gas leakage occur through losses from the natural gas reticulation system. These losses are the result of leaking fittings and the deterioration of piping in the reticulation system. Natural gas leakage is a source of VOC and hydrogen sulfide emissions.

3.8.2 Emission Estimation Methodology

Emissions from natural gas leakage have been estimated using the preferred method (Environment Australia, 1999g), which requires leakage data to be obtained from local distributors (i.e. The Australian Gas Light Company (AGL)). The Australian Gas Light Company estimates leakage using a mass balance, where metered volumes of gas supplied to customers are subtracted from the metered volume of gas supplied to the reticulation system. The estimated leakage data have been combined with speciation factors to estimate emissions for each substance. Emissions from natural gas leakage have been calculated using the following formula:

$$E_i = SF_i \times L$$

where:

E_i	=	Emission of substance i	(kg/year)
SF_i	=	VOC speciation factor of substance i	(%)
L	=	Natural gas leakage	(kg/year)

3.8.3 Activity Data

Activity data required for estimating emissions from natural gas leakage includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572. Emissions from natural gas leakage have been spatially distributed according to grid cells with more than 50 dwellings. Section 3.8.5 provides specific details; and
- Natural gas leakage data and usage patterns for the GMR from AGL, 2003.

Table 3.79 includes the natural gas leakage data in the GMR that was obtained from AGL, 2003.

Table 3.79: Natural gas leakage activity data during 2003 in the GMR

Fuel Type	Volume of Leakage (m^3/year)	Data Source
Natural Gas	31,907,216 [1]	(AGL, 2003)

[1] Calculated from annual natural gas leakage of 1,238 tera joules in the GMR (AGL, 2003) and energy content of natural gas of 38.8 mega joules/m^3 (ABARE, 2005d).

3.8.4 Emission and Speciation Factors

The emission and speciation factors for all substances from natural gas leakage are detailed in Table 3.80.

Table 3.80: Emission and speciation factors for all substances from natural gas leakage

Substance	Emission Factor Source
Total VOC	(Chemwatch, 2002)
Speciated VOC & Methane	(Chemwatch, 2002)
Hydrogen Sulfide	(Environment Australia, 1999g)

3.8.5 Spatial Distribution of Emissions

Emissions from natural gas leakage have been spatially distributed according to total dwellings. Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the natural gas reticulation area in proportion to total dwellings in each grid cell with greater than 50 dwellings. Figure 3.10 shows the spatial distribution of total dwellings within the natural gas reticulation area in the GMR.

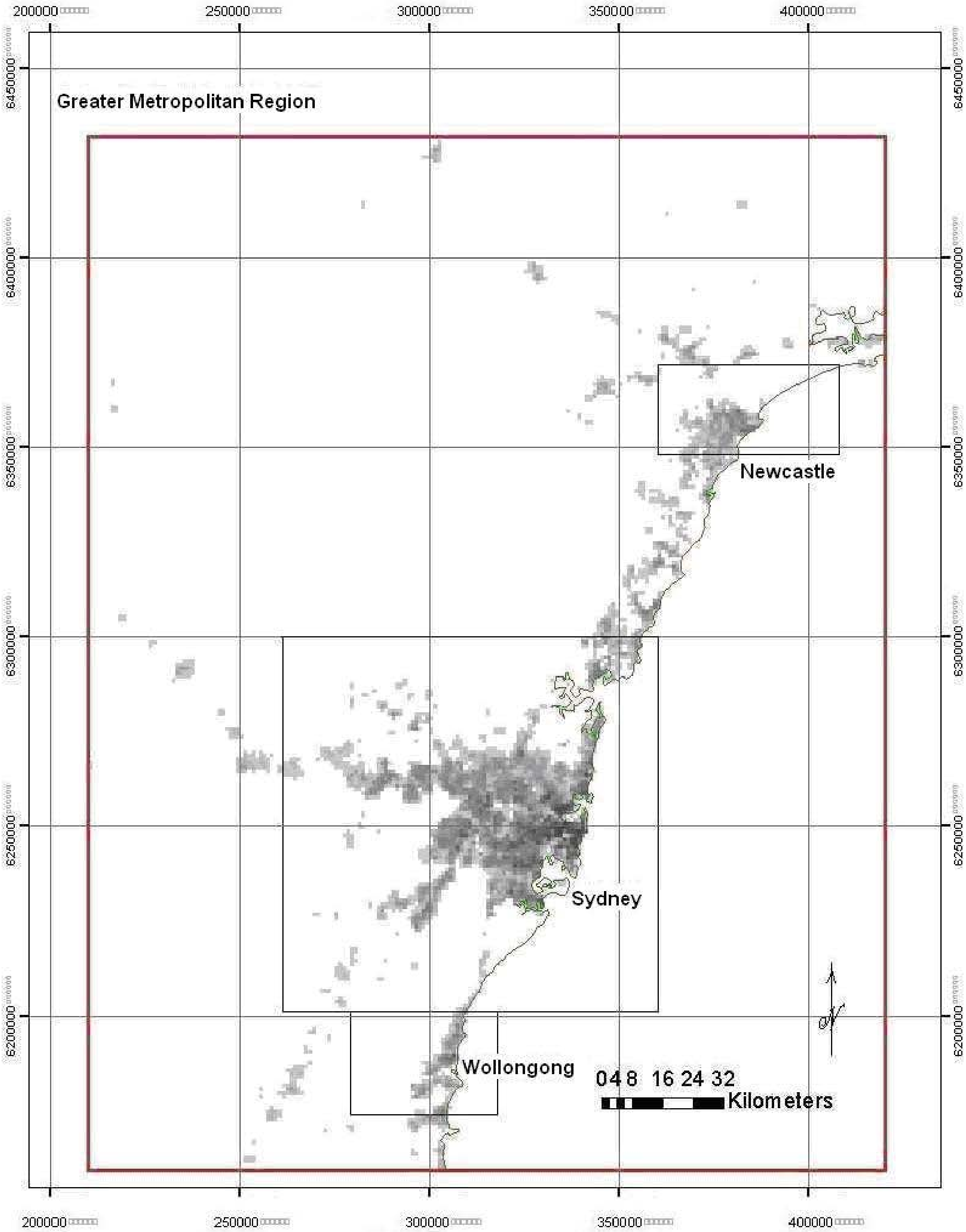

Figure 3.10: Spatial distribution of total dwellings within the natural gas reticulation area in the GMR

3.8.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for natural gas leakage:

- Monthly - assumed to vary for each month of the year (AGL, 2003);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (AGL, 2003); and
- Daily – assumed to be constant for each hour of the day (AGL, 2003).

Tables 3.81, 3.82 and 3.83 detail the temporal emissions variation profiles that have been used for natural gas leakage.

Table 3.81: Monthly temporal emissions variation profile for natural gas leakage

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	1.00	7.07%	July	1.53	10.80%
February	0.97	6.85%	August	1.38	9.76%
March	1.12	7.90%	September	1.23	8.70%
April	1.09	7.68%	October	1.15	8.13%
May	1.30	9.18%	November	1.07	7.56%
June	1.30	9.22%	December	1.01	7.15%

Table 3.82: Weekly temporal emissions variation profile for natural gas leakage

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

Table 3.83: Daily temporal emissions variation profile for natural gas leakage

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	1	4.17%	1	4.17%	1 pm	1	4.17%	1	4.17%
2 am	1	4.17%	1	4.17%	2 pm	1	4.17%	1	4.17%
3 am	1	4.17%	1	4.17%	3 pm	1	4.17%	1	4.17%
4 am	1	4.17%	1	4.17%	4 pm	1	4.17%	1	4.17%
5 am	1	4.17%	1	4.17%	5 pm	1	4.17%	1	4.17%
6 am	1	4.17%	1	4.17%	6 pm	1	4.17%	1	4.17%
7 am	1	4.17%	1	4.17%	7 pm	1	4.17%	1	4.17%
8 am	1	4.17%	1	4.17%	8 pm	1	4.17%	1	4.17%
9 am	1	4.17%	1	4.17%	9 pm	1	4.17%	1	4.17%
10 am	1	4.17%	1	4.17%	10 pm	1	4.17%	1	4.17%
11 am	1	4.17%	1	4.17%	11 pm	1	4.17%	1	4.17%
12 noon	1	4.17%	1	4.17%	12 midnight	1	4.17%	1	4.17%

3.8.7 Emission Estimates

Table 3.84 presents total estimated annual emissions (for selected substances) from natural gas leakage for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from natural gas leakage are presented in Appendix B.

Table 3.84: Total estimated annual emissions from natural gas leakage in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	-	-	-	-	-
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$1.57 \times 10^{+03}$	$1.09 \times 10^{+02}$	$7.97 \times 10^{+01}$	$2.31 \times 10^{+02}$	$1.99 \times 10^{+03}$
TRICHLOROETHYLENE	-	-	-	-	-

Tables 3.85 and 3.86 present total estimated daily emissions (for selected substances) from natural gas leakage for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.85: Total estimated daily emissions from natural gas leakage in each region for typical January weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	-	-	-	-	-
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	3.58	2.48×10^{-01}	1.82×10^{-01}	5.26×10^{-01}	4.53
TRICHLOROETHYLENE	-	-	-	-	-

Table 3.86: Total estimated daily emissions from natural gas leakage in each region for typical July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	-	-	-	-	-
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	-	-	-	-	-
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	5.47	3.79×10^{-01}	2.77×10^{-01}	8.04×10^{-01}	6.93
TRICHLOROETHYLENE	-	-	-	-	-

3.8.8 Emission Projection Methodology

Emission projection factors for natural gas leakage use total gas consumption growth as the surrogate. Emission projection factors for natural gas leakage were developed using the following data:

- ❑ Total gas consumption growth data (ABARE, 2005c).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.87 presents the emission projection factors for natural gas leakage.

Table 3.87: Emission projection factors for natural gas leakage

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0220	2018	1.3870
2005	1.0446	2019	1.4175
2006	1.0676	2020	1.4488
2007	1.0911	2021	1.4807
2008	1.1152	2022	1.5134
2009	1.1398	2023	1.5468
2010	1.1649	2024	1.5809
2011	1.1906	2025	1.6157
2012	1.2169	2026	1.6513
2013	1.2437	2027	1.6877
2014	1.2711	2028	1.7249
2015	1.2991	2029	1.7630
2016	1.3278	2030	1.8018
2017	1.3570	2031	1.8416

[1] Data Source: (ABARE, 2005c), http://www.abareconomics.com/data_services/excel/TPEC 05.xls?prodid=13183.

3.9 Solid Fuel Combustion

3.9.1 Emission Source Description

Emissions of combustion products from domestic solid fuel combustion originate when different fuels are combusted in different appliances, including:

- Barbecues using briquettes.
- Barbecues using wood;
- Controlled heaters using wood – This includes appliances with plates attached and marked in accordance with Standards Australia, 1992a and Standards Australia, 1992b or Standards Australia, 1999a and Standards Australia 1999b;
- Conventional heaters using wood – This includes appliances other than controlled heaters using wood;
- Fireplaces using wood; and
- Heaters using coal.

The domestic solid fuels and appliances included in the domestic-commercial air emissions inventory include all fireplaces and heaters using coal and firewood. Emissions from barbecues that use firewood and briquettes have been separately estimated for the entire GMR and the results are presented in Section 3.2.

3.9.2 Emission Estimation Methodology

Emissions from domestic solid fuel combustion have been estimated using the preferred method (Environment Australia, 1999h), which requires fuel consumption data to be obtained from a domestic survey for each fuel and heater type. Fuel consumption data for each fuel and heater type have been combined with mass based emission factors to estimate emissions for each substance. Emissions from domestic solid fuel combustion have been calculated using the following formula:

$$E_{i,j,k} = EF_{i,j,k} \times SF_{i,j,k} \times F_{j,k}$$

where:

$E_{i,j,k}$	=	Emission of substance i from fuel type j and heater type k	(kg/year)
$EF_{i,j,k}$	=	Mass based emission factor of substance i for fuel type j and heater type k	(kg/kg fuel)
$SF_{i,j,k}$	=	NO_x, VOC or PM speciation factor of substance i for fuel type j and heater type k	(%)
$F_{j,k}$	=	Fuel consumption for fuel type j and heater type k	(kg/year)

3.9.3 Activity Data

Activity data required for estimating emissions from domestic solid fuel combustion includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572;
- 1 km by 1 km gridded free standing[3] dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of free standing dwellings in the GMR during 2003 was 1,373,772;
- Appliance type, fuel type, fuel consumption, frequency, duration and seasonal variation of heater use from the domestic survey. Specific details about the information obtained are included in the domestic questionnaire survey form for domestic solid fuel combustion, which is included in Section 3 of Appendix A; and
- Domestic firewood and coal consumption for NSW and ACT from ABARE, 2005b.

[3] Free standing dwellings include separate dwellings plus semi detached dwellings.

Table 3.88 includes the heater fuel type, the quantity of heater fuel consumed, the number of households with a heater and the proportion of total and free standing dwellings with a heater in the GMR that was obtained through the domestic survey and ABARE, 2005b.

Table 3.88: Domestic solid fuel combustion activity data during 2003 in the GMR

Heater Type [1]	Fuel Type [1]	Total Quantity of Fuel Consumed (tonnes/year) [1]	Quantity of Fuel Consumed per Household (tonnes/household/year) [1]	Number of Households [1]	Proportion of Households (%) [1,2]
Fireplace	Wood	87,400	1.55	56,387	3.0 (4.1)
Conventional [3]	Wood	11,277	3.00	3,759	0.2 (0.3)
Controlled [4]	Wood	347,721	3.43	101,497	5.4 (7.4)
All Types	Wood	446,398 [5]	2.76	161,643	8.6 (11.8)
All Types	Coal	1,880 [6]	0.5	3,759	0.2 (0.3)

[1] Data Source: (Domestic Survey).
[2] Calculated from 1,879,572 total dwellings (ABS, 2001 & TPDC, 2004). Values in parentheses calculated from 1,373,772 free standing dwellings (ABS, 2001 & TPDC, 2004).
[3] This includes appliances other than controlled heaters using wood.
[4] This includes appliances with plates attached and marked in accordance with Standards Australia, 1992a and Standards Australia, 1992b or Standards Australia, 1999a and Standards Australia 1999b.
[5] Assuming rural areas in NSW have 1.66 times the wood heater ownership and consume 1.19 times the wood when compared to metropolitan areas (Environment Australia, 2002), and the number of dwellings inside and outside the GMR are 1,879,572 (ABS, 2001 & TPDC, 2004) and 670,267 (ABS, 2001, ABS, 2004 & TPDC, 2004) respectively, the annual NSW residential wood consumption has been estimated to be 761,507 tonnes/year, using the results of the domestic survey (Note: This includes barbecues using wood). Annual wood consumption for NSW and ACT residential use during 2003-04 is 814,198 tonnes/year (ABARE, 2005b). Assuming the population in NSW is ~95% of NSW and ACT (ABS, 2001, ABS, 2004 & TPDC, 2004), annual wood consumption for NSW residential use has been estimated to be 776,885 tonnes/year (ABARE, 2005b), using ABARE data. The NSW residential wood consumption derived from the domestic survey is within ~2% of the ABARE data. Energy content of wood/woodwaste is 16.2 giga joules/tonnes (dry basis) (ABARE, 2005d).
[6] Annual coal consumption for NSW and ACT residential use during 2003-04 is 2,128 tonnes/year (ABARE, 2005b). Energy content of black coal is 23.5 giga joules/tonnes (ABARE, 2005d).

3.9.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic solid fuel combustion are detailed in Table 3.89.

Table 3.89: Emission and speciation factors for all substances from domestic solid fuel combustion

Substance	Heater	Fuel	Emission Factor Source
CO, NO_x [1], PM_{10}, SO_2 & Total VOC	Fireplace	Wood	(USEPA, 1996b)
	Conventional	Wood	(USEPA, 1996c)
	Controlled	Wood	(USEPA, 1996c)
	All Types	Coal	(USEPA, 1996d)
$PM_{2.5}$ & TSP	Fireplace	Wood	(Houck et. al., 1998) & (Houck et. al., 1998)
	Conventional	Wood	(Houck et. al., 1998) & (Houck et. al., 1998)
	Controlled	Wood	(Houck et. al., 1998) & (Houck et. al., 1998)
	All Types	Coal	(USEPA, 1996e) & (Houck et. al., 1998)
Organic air toxics	Fireplace	Wood	(Environment Australia, 1999h) & (Environment Australia, 2002)
	Conventional	Wood	(Environment Australia, 1999h) & (USEPA, 1996c)
	Controlled	Wood	(Environment Australia, 1999h) & (USEPA, 1996c)
	All Types	Coal	(Environment Australia, 1999h)
Metal air toxics	Fireplace	Wood	(Environment Australia, 1999h)
	Conventional	Wood	(Environment Australia, 1999h) & (USEPA, 1996c)
	Controlled	Wood	(Environment Australia, 1999h) & (USEPA, 1996c)
	All Types	Coal	(Environment Australia, 1999h) & (USEPA, 1996d)
PAH	Fireplace	Wood	(Environment Australia, 1999h) & (USEPA, 1996c)
	Conventional	Wood	(USEPA, 1996c)

Substance	Heater	Fuel	Emission Factor Source
	Controlled	Wood	(USEPA, 1996c)
	All Types	Coal	(USEPA, 1996d)
PCDD/PCDF	Fireplace	Wood	(Environment Australia, 2002) & (Bawden et. al., 2004b)
	Conventional	Wood	(Environment Australia, 2002) & (Bawden et. al., 2004b)
	Controlled	Wood	(Environment Australia, 2002) & (Bawden et. al., 2004b)
	All Types	Coal	NA
Speciated VOC & Methane	Fireplace	Wood [2]	Profile Number 1084 (USEPA, 2002)
	Conventional	Wood [2]	Profile Number 1084 (USEPA, 2002)
	Controlled	Wood [2]	Profile Number 1084 (USEPA, 2002)
	All Types	Coal	Profile Number 1085 (USEPA, 2002)

[1] The default NO_x speciation profile used in the inventory is 5% NO_2 and 95% NO (USEPA, 2005a).
[2] Profile Number 0000 (USEPA, 2002) for "Unidentified" VOC.

3.9.5 Spatial Distribution of Emissions

Emissions from domestic solid fuel combustion have been spatially distributed according to free standing dwellings (Environment Australia, 1999h). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell within the GMR in proportion to the free standing dwellings in each grid cell. Figure 3.6, Section 3.5.5 shows the spatial distribution of free standing dwellings in the GMR.

3.9.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic solid fuel combustion:

- Monthly - assumed to vary for each month of the year (Domestic Survey);
- Weekly (i.e. Weekday and Weekend day) - assumed to be ~1.45 times higher on weekend days compared with weekdays (Domestic Survey); and
- Daily – assumed to vary for each hour of the day (Carnovale et. al., 1996).

Tables 3.90, 3.91 and 3.92 detail the temporal emissions variation profiles that have been used for domestic solid fuel combustion.

Table 3.90: Monthly temporal emissions variation profile for domestic solid fuel combustion

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	0.0960	0.96%	July	2.6920	26.92%
February	0.0960	0.96%	August	2.5480	25.48%
March	0.0490	0.49%	September	1.2980	12.98%
April	0.1440	1.44%	October	0.0960	0.96%
May	1.0100	10.10%	November	0.0960	0.96%
June	1.7790	17.79%	December	0.0960	0.96%

Table 3.91: Weekly temporal emissions variation profile for domestic solid fuel combustion

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	63.51%	Weekend day	2.9	36.49%

Table 3.92: Daily temporal emissions variation profile for domestic solid fuel combustion

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0.0200	1.96%	0.020	1.96%	1 pm	0.0305	2.99%	0.0305	2.99%
2 am	0.0185	1.82%	0.0185	1.82%	2 pm	0.0370	3.63%	0.0370	3.63%
3 am	0.0185	1.82%	0.0185	1.82%	3 pm	0.0575	5.65%	0.0575	5.65%
4 am	0.0170	1.67%	0.0170	1.67%	4 pm	0.0740	7.27%	0.0740	7.27%
5 am	0.0175	1.72%	0.0175	1.72%	5 pm	0.1065	10.46%	0.1065	10.46%
6 am	0.0215	2.11%	0.0215	2.11%	6 pm	0.1100	10.80%	0.1100	10.80%
7 am	0.0215	2.11%	0.0215	2.11%	7 pm	0.1090	10.70%	0.1090	10.70%
8 am	0.0190	1.87%	0.0190	1.87%	8 pm	0.1035	10.16%	0.1035	10.16%
9 am	0.0190	1.87%	0.0190	1.87%	9 pm	0.0750	7.36%	0.0750	7.36%
10 am	0.0190	1.87%	0.0190	1.87%	10 pm	0.0475	4.66%	0.0475	4.66%
11 am	0.0175	1.72%	0.0175	1.72%	11 pm	0.0185	1.82%	0.0185	1.82%
12 noon	0.0220	2.16%	0.0220	2.16%	12 midnight	0.0185	1.82%	0.0185	1.82%

3.9.7 Emission Estimates

Table 3.93 presents total estimated annual emissions (for selected substances) from domestic solid fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic solid fuel combustion are presented in Appendix B.

Table 3.93: Total estimated annual emissions from domestic solid fuel combustion in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	$2.37 \times 10^{+01}$	2.00	1.31	4.49	$3.15 \times 10^{+01}$
ACETALDEHYDE	$7.22 \times 10^{+02}$	$6.11 \times 10^{+01}$	$3.98 \times 10^{+01}$	$1.37 \times 10^{+02}$	$9.60 \times 10^{+02}$
BENZENE	$4.63 \times 10^{+02}$	$3.91 \times 10^{+01}$	$2.55 \times 10^{+01}$	$8.78 \times 10^{+01}$	$6.15 \times 10^{+02}$
CARBON MONOXIDE	$2.79 \times 10^{+04}$	$2.36 \times 10^{+03}$	$1.54 \times 10^{+03}$	$5.29 \times 10^{+03}$	$3.71 \times 10^{+04}$
FORMALDEHYDE	$7.77 \times 10^{+02}$	$6.57 \times 10^{+01}$	$4.29 \times 10^{+01}$	$1.48 \times 10^{+02}$	$1.03 \times 10^{+03}$
ISOMERS OF XYLENE	$7.19 \times 10^{+01}$	6.08	3.96	$1.36 \times 10^{+01}$	$9.55 \times 10^{+01}$
LEAD AND COMPOUNDS	5.08×10^{-02}	4.30×10^{-03}	2.80×10^{-03}	9.65×10^{-03}	6.76×10^{-02}
OXIDES OF NITROGEN	$3.61 \times 10^{+02}$	$3.05 \times 10^{+01}$	$1.99 \times 10^{+01}$	$6.85 \times 10^{+01}$	$4.80 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$4.64 \times 10^{+03}$	$3.93 \times 10^{+02}$	$2.56 \times 10^{+02}$	$8.81 \times 10^{+02}$	$6.17 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	$4.50 \times 10^{+03}$	$3.81 \times 10^{+02}$	$2.48 \times 10^{+02}$	$8.55 \times 10^{+02}$	$5.99 \times 10^{+03}$
POLYCYCLIC AROMATIC HYDROCARBONS	$6.92 \times 10^{+01}$	5.85	3.82	$1.31 \times 10^{+01}$	$9.20 \times 10^{+01}$
SULFUR DIOXIDE	$7.27 \times 10^{+01}$	6.14	4.01	$1.38 \times 10^{+01}$	$9.66 \times 10^{+01}$
TETRACHLOROETHYLENE	1.19	1.00×10^{-01}	6.55×10^{-02}	2.25×10^{-01}	1.58
TOLUENE	$1.48 \times 10^{+02}$	$1.25 \times 10^{+01}$	8.16	$2.81 \times 10^{+01}$	$1.97 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$4.89 \times 10^{+03}$	$4.13 \times 10^{+02}$	$2.69 \times 10^{+02}$	$9.28 \times 10^{+02}$	$6.50 \times 10^{+03}$
TOTAL VOCS	$9.52 \times 10^{+03}$	$8.05 \times 10^{+02}$	$5.25 \times 10^{+02}$	$1.81 \times 10^{+03}$	$1.27 \times 10^{+04}$
TRICHLOROETHYLENE	7.29×10^{-01}	6.17×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.69×10^{-01}

Table 3.94 presents total estimated annual emissions (for selected substances) from domestic solid fuel combustion by heater type for the GMR.

Table 3.94: Total estimated annual emissions from domestic solid fuel combustion by heater type

Substance	Emissions (tonnes/year)					
	Open Fireplace	Conventional Heater	Controlled Heater	Wood All Types	Coal Heater	Total
1,3 BUTADIENE	$3.15 \times 10^{+01}$	-	-	$3.15 \times 10^{+01}$	-	$3.15 \times 10^{+01}$
ACETALDEHYDE	$7.75 \times 10^{+02}$	$2.31 \times 10^{+01}$	$1.62 \times 10^{+02}$	$9.60 \times 10^{+02}$	5.36×10^{-04}	$9.60 \times 10^{+02}$
BENZENE	$3.50 \times 10^{+02}$	$1.09 \times 10^{+01}$	$2.55 \times 10^{+02}$	$6.15 \times 10^{+02}$	1.22×10^{-03}	$6.15 \times 10^{+02}$
CARBON MONOXIDE	$1.10 \times 10^{+04}$	$1.30 \times 10^{+03}$	$2.45 \times 10^{+04}$	$3.68 \times 10^{+04}$	$2.59 \times 10^{+02}$	$3.71 \times 10^{+04}$
FORMALDEHYDE	$8.35 \times 10^{+02}$	$2.49 \times 10^{+01}$	$1.74 \times 10^{+02}$	$1.03 \times 10^{+03}$	2.26×10^{-04}	$1.03 \times 10^{+03}$
ISOMERS OF XYLENE	$6.21 \times 10^{+01}$	1.14	$3.23 \times 10^{+01}$	$9.55 \times 10^{+01}$	3.48×10^{-05}	$9.55 \times 10^{+01}$
LEAD AND COMPOUNDS	2.63×10^{-02}	2.18×10^{-03}	3.07×10^{-02}	5.92×10^{-02}	8.36×10^{-03}	6.76×10^{-02}
OXIDES OF NITROGEN	$1.14 \times 10^{+02}$	$1.58 \times 10^{+01}$	$3.48 \times 10^{+02}$	$4.77 \times 10^{+02}$	2.82	$4.80 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$1.51 \times 10^{+03}$	$1.73 \times 10^{+02}$	$4.49 \times 10^{+03}$	$6.17 \times 10^{+03}$	2.16	$6.17 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	$1.47 \times 10^{+03}$	$1.67 \times 10^{+02}$	$4.35 \times 10^{+03}$	$5.99 \times 10^{+03}$	1.24	$5.99 \times 10^{+03}$
POLYCYCLIC AROMATIC HYDROCARBONS	6.99×10^{-02}	4.12	$8.78 \times 10^{+01}$	$9.20 \times 10^{+01}$	2.11×10^{-03}	$9.20 \times 10^{+01}$
SULFUR DIOXIDE	$1.75 \times 10^{+01}$	2.26	$6.95 \times 10^{+01}$	$8.93 \times 10^{+01}$	7.33	$9.66 \times 10^{+01}$
TETRACHLOROETHYLENE	1.28	3.79×10^{-02}	2.64×10^{-01}	1.58	4.04×10^{-05}	1.58
TOLUENE	$1.02 \times 10^{+02}$	4.12	$9.04 \times 10^{+01}$	$1.97 \times 10^{+02}$	2.26×10^{-04}	$1.97 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	$1.59 \times 10^{+03}$	$1.82 \times 10^{+02}$	$4.72 \times 10^{+03}$	$6.49 \times 10^{+03}$	2.28	$6.50 \times 10^{+03}$
TOTAL VOCS	$1.00 \times 10^{+04}$	$2.99 \times 10^{+02}$	$2.35 \times 10^{+03}$	$1.27 \times 10^{+04}$	9.40	$1.27 \times 10^{+04}$
TRICHLOROETHYLENE	7.84×10^{-01}	2.33×10^{-02}	1.62×10^{-01}	9.69×10^{-01}	-	9.69×10^{-01}

Tables 3.95, 3.96, 3.97 and 3.98 present total estimated daily emissions (for selected substances) from domestic solid fuel combustion for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday, January weekend day, July weekday and July weekend day daily emissions.

Table 3.95: Total estimated daily emissions from domestic solid fuel combustion in each region for typical January weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	6.27×10^{-03}	5.30×10^{-04}	3.46×10^{-04}	1.19×10^{-03}	8.34×10^{-03}
ACETALDEHYDE	1.91×10^{-01}	1.62×10^{-02}	1.06×10^{-02}	3.63×10^{-02}	2.54×10^{-01}
BENZENE	1.23×10^{-01}	1.04×10^{-02}	6.76×10^{-03}	2.33×10^{-02}	1.63×10^{-01}
CARBON MONOXIDE	7.39	6.25×10^{-01}	4.08×10^{-01}	1.40	9.83
FORMALDEHYDE	2.06×10^{-01}	1.74×10^{-02}	1.14×10^{-02}	3.91×10^{-02}	2.74×10^{-01}
ISOMERS OF XYLENE	1.90×10^{-02}	1.61×10^{-03}	1.05×10^{-03}	3.62×10^{-03}	2.53×10^{-02}
LEAD AND COMPOUNDS	1.35×10^{-05}	1.14×10^{-06}	7.43×10^{-07}	2.56×10^{-06}	1.79×10^{-05}
OXIDES OF NITROGEN	9.57×10^{-02}	8.09×10^{-03}	5.28×10^{-03}	1.82×10^{-02}	1.27×10^{-01}
PARTICULATE MATTER < 10 µm	1.23	1.04×10^{-01}	6.79×10^{-02}	2.34×10^{-01}	1.64
PARTICULATE MATTER < 2.5 µm	1.19	1.01×10^{-01}	6.58×10^{-02}	2.27×10^{-01}	1.59
POLYCYCLIC AROMATIC HYDROCARBONS	1.83×10^{-02}	1.55×10^{-03}	1.01×10^{-03}	3.48×10^{-03}	2.44×10^{-02}
SULFUR DIOXIDE	1.93×10^{-02}	1.63×10^{-03}	1.06×10^{-03}	3.66×10^{-03}	2.56×10^{-02}
TETRACHLOROETHYLENE	3.15×10^{-04}	2.66×10^{-05}	1.74×10^{-05}	5.97×10^{-05}	4.18×10^{-04}
TOLUENE	3.92×10^{-02}	3.32×10^{-03}	2.16×10^{-03}	7.45×10^{-03}	5.22×10^{-02}
TOTAL SUSPENDED PARTICULATES	1.30	1.10×10^{-01}	7.14×10^{-02}	2.46×10^{-01}	1.72
TOTAL VOCS	2.52	2.13×10^{-01}	1.39×10^{-01}	4.79×10^{-01}	3.36
TRICHLOROETHYLENE	1.93×10^{-04}	1.63×10^{-05}	1.07×10^{-05}	3.67×10^{-05}	2.57×10^{-04}

Table 3.96: Total estimated daily emissions from domestic solid fuel combustion in each region for typical January weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.04×10^{-02}	8.76×10^{-04}	5.71×10^{-04}	1.97×10^{-03}	1.38×10^{-02}
ACETALDEHYDE	3.16×10^{-01}	2.67×10^{-02}	1.74×10^{-02}	6.00×10^{-02}	4.20×10^{-01}
BENZENE	2.03×10^{-01}	1.71×10^{-02}	1.12×10^{-02}	3.85×10^{-02}	2.69×10^{-01}
CARBON MONOXIDE	$1.22 \times 10^{+01}$	1.03	6.73×10^{-01}	2.32	$1.62 \times 10^{+01}$
FORMALDEHYDE	3.40×10^{-01}	2.88×10^{-02}	1.88×10^{-02}	6.46×10^{-02}	4.53×10^{-01}
ISOMERS OF XYLENE	3.15×10^{-02}	2.66×10^{-03}	1.73×10^{-03}	5.97×10^{-03}	4.18×10^{-02}
LEAD AND COMPOUNDS	2.22×10^{-05}	1.88×10^{-06}	1.23×10^{-06}	4.22×10^{-06}	2.96×10^{-05}
OXIDES OF NITROGEN	1.58×10^{-01}	1.34×10^{-02}	8.72×10^{-03}	3.00×10^{-02}	2.10×10^{-01}
PARTICULATE MATTER < 10 µm	2.03	1.72×10^{-01}	1.12×10^{-01}	3.86×10^{-01}	2.70
PARTICULATE MATTER < 2.5 µm	1.97	1.67×10^{-01}	1.09×10^{-01}	3.74×10^{-01}	2.62
POLYCYCLIC AROMATIC HYDROCARBONS	3.03×10^{-02}	2.56×10^{-03}	1.67×10^{-03}	5.75×10^{-03}	4.03×10^{-02}
SULFUR DIOXIDE	3.18×10^{-02}	2.69×10^{-03}	1.75×10^{-03}	6.04×10^{-03}	4.23×10^{-02}
TETRACHLOROETHYLENE	5.20×10^{-04}	4.39×10^{-05}	2.87×10^{-05}	9.87×10^{-05}	6.91×10^{-04}
TOLUENE	6.48×10^{-02}	5.48×10^{-03}	3.57×10^{-03}	1.23×10^{-02}	8.62×10^{-02}
TOTAL SUSPENDED PARTICULATES	2.14	1.81×10^{-01}	1.18×10^{-01}	4.06×10^{-01}	2.84
TOTAL VOCS	4.17	3.53×10^{-01}	2.30×10^{-01}	7.92×10^{-01}	5.54
TRICHLOROETHYLENE	3.19×10^{-04}	2.70×10^{-05}	1.76×10^{-05}	6.06×10^{-05}	4.24×10^{-04}

Table 3.97: Total estimated daily emissions from domestic solid fuel combustion in each region for typical July weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.76×10^{-01}	1.49×10^{-02}	9.70×10^{-03}	3.34×10^{-02}	2.34×10^{-01}
ACETALDEHYDE	5.37	4.54×10^{-01}	2.96×10^{-01}	1.02	7.14
BENZENE	3.44	2.91×10^{-01}	1.90×10^{-01}	6.53×10^{-01}	4.57
CARBON MONOXIDE	$2.07 \times 10^{+02}$	$1.75 \times 10^{+01}$	$1.14 \times 10^{+01}$	$3.94 \times 10^{+01}$	$2.76 \times 10^{+02}$
FORMALDEHYDE	5.78	4.89×10^{-01}	3.19×10^{-01}	1.10	7.68
ISOMERS OF XYLENE	5.34×10^{-01}	4.52×10^{-02}	2.95×10^{-02}	1.01×10^{-01}	7.10×10^{-01}
LEAD AND COMPOUNDS	3.78×10^{-04}	3.19×10^{-05}	2.08×10^{-05}	7.17×10^{-05}	5.02×10^{-04}
OXIDES OF NITROGEN	2.68	2.27×10^{-01}	1.48×10^{-01}	5.09×10^{-01}	3.57
PARTICULATE MATTER < 10 µm	$3.45 \times 10^{+01}$	2.92	1.90	6.55	$4.59 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$3.35 \times 10^{+01}$	2.83	1.85	6.35	$4.45 \times 10^{+01}$
POLYCYCLIC AROMATIC HYDROCARBONS	5.14×10^{-01}	4.35×10^{-02}	2.84×10^{-02}	9.76×10^{-02}	6.84×10^{-01}
SULFUR DIOXIDE	5.40×10^{-01}	4.57×10^{-02}	2.98×10^{-02}	1.03×10^{-01}	7.18×10^{-01}
TETRACHLOROETHYLENE	8.82×10^{-03}	7.46×10^{-04}	4.87×10^{-04}	1.67×10^{-03}	1.17×10^{-02}
TOLUENE	1.10	9.30×10^{-02}	6.07×10^{-02}	2.09×10^{-01}	1.46
TOTAL SUSPENDED PARTICULATES	$3.63 \times 10^{+01}$	3.07	2.00	6.90	$4.83 \times 10^{+01}$
TOTAL VOCS	$7.08 \times 10^{+01}$	5.99	3.90	$1.34 \times 10^{+01}$	$9.41 \times 10^{+01}$
TRICHLOROETHYLENE	5.42×10^{-03}	4.58×10^{-04}	2.99×10^{-04}	1.03×10^{-03}	7.21×10^{-03}

Table 3.98: Total estimated daily emissions from domestic solid fuel combustion in each region for typical July weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	2.91×10^{-01}	2.46×10^{-02}	1.60×10^{-02}	5.52×10^{-02}	3.86×10^{-01}
ACETALDEHYDE	8.87	7.50×10^{-01}	4.89×10^{-01}	1.68	$1.18 \times 10^{+01}$
BENZENE	5.68	4.80×10^{-01}	3.13×10^{-01}	1.08	7.55
CARBON MONOXIDE	$3.42 \times 10^{+02}$	$2.90 \times 10^{+01}$	$1.89 \times 10^{+01}$	$6.50 \times 10^{+01}$	$4.55 \times 10^{+02}$
FORMALDEHYDE	9.54	8.07×10^{-01}	5.26×10^{-01}	1.81	$1.27 \times 10^{+01}$
ISOMERS OF XYLENE	8.82×10^{-01}	7.46×10^{-02}	4.87×10^{-02}	1.67×10^{-01}	1.17
LEAD AND COMPOUNDS	6.24×10^{-04}	5.28×10^{-05}	3.44×10^{-05}	1.18×10^{-04}	8.29×10^{-04}
OXIDES OF NITROGEN	4.43	3.75×10^{-01}	2.44×10^{-01}	8.41×10^{-01}	5.89
PARTICULATE MATTER < 10 µm	$5.70 \times 10^{+01}$	4.82	3.14	$1.08 \times 10^{+01}$	$7.58 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$5.53 \times 10^{+01}$	4.67	3.05	$1.05 \times 10^{+01}$	$7.35 \times 10^{+01}$
POLYCYCLIC AROMATIC HYDROCARBONS	8.50×10^{-01}	7.18×10^{-02}	4.68×10^{-02}	1.61×10^{-01}	1.13
SULFUR DIOXIDE	8.92×10^{-01}	7.54×10^{-02}	4.92×10^{-02}	1.69×10^{-01}	1.19
TETRACHLOROETHYLENE	1.46×10^{-02}	1.23×10^{-03}	8.04×10^{-04}	2.77×10^{-03}	1.94×10^{-02}
TOLUENE	1.82	1.54×10^{-01}	1.00×10^{-01}	3.45×10^{-01}	2.42
TOTAL SUSPENDED PARTICULATES	$6.00 \times 10^{+01}$	5.07	3.31	$1.14 \times 10^{+01}$	$7.98 \times 10^{+01}$
TOTAL VOCS	$1.17 \times 10^{+02}$	9.89	6.45	$2.22 \times 10^{+01}$	$1.55 \times 10^{+02}$
TRICHLOROETHYLENE	8.95×10^{-03}	7.57×10^{-04}	4.94×10^{-04}	1.70×10^{-03}	1.19×10^{-02}

3.9.8 Emission Projection Methodology

Emission projection factors for domestic solid fuel combustion use residential biomass consumption growth as the surrogate. Emission projection factors for domestic solid fuel combustion were developed using the following data:

- ❑ Residential biomass consumption growth data (ABARE, 2005c).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.99 presents the emission projection factors for domestic solid fuel combustion.

Table 3.99: Emission projection factors for domestic solid fuel combustion

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0007	2018	1.0100
2005	1.0013	2019	1.0107
2006	1.0020	2020	1.0114
2007	1.0027	2021	1.0120
2008	1.0033	2022	1.0127
2009	1.0040	2023	1.0134
2010	1.0047	2024	1.0141
2011	1.0053	2025	1.0147
2012	1.0060	2026	1.0154
2013	1.0067	2027	1.0161
2014	1.0073	2028	1.0168
2015	1.0080	2029	1.0174
2016	1.0087	2030	1.0181
2017	1.0094	2031	1.0188

[1] Data Source: (ABARE, 2005c), http://www.abareconomics.com/data_services/excel/TPEC 05.xls?prodid=13183.

3.10 Surface Coating

3.10.1 Emission Source Description

Emissions of VOCs from domestic-commercial-industrial surface coating originate from a number of sources as the surface coating dries or thinners evaporate, including:

- Architectural and decorative paints, enamels, clears and thinners;
- Heavy duty coatings and thinners;
- Industrial paints, enamels, clears and thinners; and
- Timber finishes (excluding wood preservatives).

The domestic-commercial-industrial surface coating product groupings and subcategories included in the domestic-commercial air emissions inventory are listed in Table 3.100, with the following exceptions:

- Automotive surface coating and thinners (i.e. motor vehicle refinishing) have been separately estimated as part of the commercial air emissions inventory (DECC, 2007a); and
- Domestic coating and related products that are grouped in the aerosols and solvents source category have been separately estimated for the entire GMR and the results are presented in Section 3.1.

Table 3.100: Domestic-commercial-industrial surface coating product groups and subcategories

Architectural and Decorative Paints, Enamels, Clears and Thinners [1]	Heavy Duty Coatings and Thinners [1]
Solvent thinned Thinners for architectural and decorative paints, enamels and clears Water thinned	Marine coatings (i.e. primers, undercoats, varnishes etc.) Road marking paint Single pack products Thinners for heavy duty coatings Two pack products Zinc rich products
Industrial Paints, Enamels, Clears and Thinners [1]	**Timber Finishes (Excluding Wood Preservatives) [1]**
Automotive Automotive thinners Fast dry alkyd top coats and primers Nitrocellulose lacquers Thinners for industrial paints, enamels and clears	Architectural and decorative Floor finishes Industrial

[1] Data Source: (APMF, 2005).

3.10.2 Emission Estimation Methodology

Emissions from domestic-commercial-industrial surface coating have been estimated using the preferred method (Environment Australia, 2003), which requires surface coating consumption data to be obtained from the Australian Paint Manufacturer's Federation (APMF). Surface coating consumption data have been combined with the fraction of VOC in the surface coating to estimate emissions of total VOCs and speciated VOCs. The volume of each surface coating consumed in NSW (APMF, 2005) was multiplied by the proportion of population in the GMR to NSW (ABS, 2001, ABS, 2004 & TPDC, 2004)) to determine the amount consumed in the GMR. Emissions from domestic-commercial-industrial surface coating have been calculated using the following formula:

$$E_{i,j} = SF_{i,j} \times VC_j \times C_j$$

where:

$E_{i,j}$	=	Emission of substance i from surface coating type j	(kg/year)
$SF_{i,j}$	=	VOC speciation factor of substance i and surface coating type j	(%)
VC_j	=	VOC content of surface coating type j	(kg/litres)
C_j	=	Consumption of surface coating type j	(litres/year)

3.10.3 Activity Data

Activity data required for estimating emissions from domestic-commercial-industrial surface coating includes:

- 1 km by 1 km gridded total dwelling data for the GMR (ABS, 2001 & TPDC, 2004). The number of total dwellings in the GMR during 2003 was 1,879,572;
- 1 km by 1 km gridded population data for the GMR (ABS, 2001 & TPDC, 2004). The total population in the GMR during 2003 was 5,091,366; and
- Surface coating consumption data from APMF, 2005.

Table 3.101 includes the domestic-commercial-industrial surface coating consumption data that was obtained from APMF, 2005.

Table 3.101: Domestic-commercial-industrial surface coating activity data during 2003 in the GMR

<table>
<tr><th colspan="2">Surface Coating Type [1]</th><th rowspan="2">Consumption (litres/year) [1]</th></tr>
<tr><th colspan="2">Architectural and Decorative Paints, Enamels, Clears and Thinners [1]</th></tr>
<tr><td colspan="2">Solvent thinned</td><td>4,414,574</td></tr>
<tr><td colspan="2">Thinners for architectural and decorative paints, enamels and clears</td><td>294,745</td></tr>
<tr><td colspan="2">Water thinned</td><td>30,173,351</td></tr>
<tr><th>Heavy Duty Coatings [1]</th><th>Industrial Paints, Enamels and Clears [1]</th><th>Consumption (litres/year) [1]</th></tr>
<tr><td>Marine coatings (i.e. primers, undercoats, varnishes etc.)
Road marking paint
Single pack products
Two pack products
Zinc rich products</td><td>Fast dry alkyd top coats and primers
Nitrocellulose lacquers</td><td>13,947,069 [2]</td></tr>
<tr><th>Heavy Duty Thinners [1]</th><th>Industrial Thinners [1]</th><th>Consumption (litres/year) [1]</th></tr>
<tr><td>Thinners for heavy duty coatings</td><td>Thinners for industrial paints, enamels and clears</td><td>3,903,075 [3]</td></tr>
<tr><th colspan="2">Timber Finishes (Excluding Wood Preservatives) [1]</th><th>Consumption (litres/year) [1]</th></tr>
<tr><td colspan="2">Architectural and decorative</td><td>925,398</td></tr>
<tr><td colspan="2">Floor finishes
Industrial</td><td>1,894,084</td></tr>
<tr><td colspan="2">Total Consumption of Surface Coating</td><td>55,552,295 [4]</td></tr>
</table>

[1] Data Source: (APMF, 2005).
[2] Annual consumption of heavy duty coatings, and industrial paints, enamels and clears of 2,945,000 litres/year was estimated as part of the industrial survey and VOC emissions are reported for this source in the industrial air emissions inventory (DECC, 2007b). The annual consumption of heavy duty coatings, and industrial paints, enamels and clears of 11,002,069 litres/year has been used to estimate VOC emissions in the domestic-commercial air emissions inventory.
[3] Annual consumption of heavy duty thinners, and industrial thinners of 258,421 litres/year was estimated as part of the industrial survey and VOC emissions are reported for this source in the industrial air emissions inventory (DECC, 2007b). The annual consumption of heavy duty thinners, and industrial thinners of 3,644,654 litres/year has been used to estimate VOC emissions in the domestic-commercial air emissions inventory.
[4] The total annual consumption of surface coating that has been used to estimate VOC emissions in the domestic-commercial air emissions inventory is 52,348,874 litres/year.

3.10.4 Emission and Speciation Factors

The emission and speciation factors for all substances from domestic-commercial-industrial surface coating are detailed in Table 3.102.

Table 3.102: Emission and speciation factors for all substances from domestic-commercial-industrial surface coating

Surface Coating Type		Emission/Speciation Factor	
Architectural and Decorative Paints, Enamels, Clears and Thinners		**VOC [1] (kg VOC/litres surface coating)**	**Organic air toxics and Speciated VOC**
Solvent thinned		0.45	Profile Number 1003 (USEPA, 2002)
Thinners for architectural and decorative paints, enamels and clears		0.95	Profile Number 1016 (USEPA, 2002)
Water thinned		0.1	Profile Number 1013 (USEPA, 2002)
Heavy Duty Coatings	**Industrial Paints, Enamels and Clears**	**VOC [1] (kg VOC/litres surface coating)**	**Organic air toxics and Speciated VOC**
Marine coatings (i.e. primers, undercoats, varnishes etc.) Road marking paint Single pack products Two pack products Zinc rich products	Fast dry alkyd top coats and primers Nitrocellulose lacquers	0.6	Profile Number 6002 (USEPA, 2002)
Heavy Duty Thinners	**Industrial Thinners**	**VOC [1] (kg VOC/litres surface coating)**	**Organic air toxics and Speciated VOC**
Thinners for heavy duty coatings	Thinners for industrial paints, enamels and clears	0.95	Profile Number 1016 (USEPA, 2002)
Timber Finishes (Excluding Wood Preservatives)		**VOC [1] (kg VOC/litres surface coating)**	**Organic air toxics and Speciated VOC**
Architectural and decorative		0.55	Profile Number 0127 (USEPA, 2002)
Floor finishes Industrial		0.55	Profile Number 0127 (USEPA, 2002)

[1] Data Source: (Environment Australia, 2003).

3.10.5 Spatial Distribution of Emissions

Emissions from domestic-commercial-industrial surface coating have been spatially distributed according to total dwellings (Environment Australia, 2003). Total emissions of each substance have been spatially distributed to each 1 km by 1 km grid cell in proportion to the total dwellings in each grid cell. Figure 3.2, Section 3.2.5 shows the spatial distribution of total dwellings in the GMR.

3.10.6 Temporal Variation of Emissions

The following temporal emissions variation profiles have been used for domestic-commercial-industrial surface coating:

- Monthly - assumed to be constant for each month of the year (Carnovale et. al., 1996);
- Weekly (i.e. Weekday and Weekend day) - assumed to be constant for each day of the week (Carnovale et. al., 1996); and
- Daily – assumed to be constant between 8 am and 6 pm (Carnovale et. al., 1996).

Tables 3.103, 3.104 and 3.105 detail the temporal emissions variation profiles that have been used for domestic-commercial-industrial surface coating.

Table 3.103: Monthly temporal emissions variation profile for domestic-commercial-industrial surface coating

Month	Monthly Temporal Factor		Month	Monthly Temporal Factor	
January	1	8.33%	July	1	8.33%
February	1	8.33%	August	1	8.33%
March	1	8.33%	September	1	8.33%
April	1	8.33%	October	1	8.33%
May	1	8.33%	November	1	8.33%
June	1	8.33%	December	1	8.33%

Table 3.104: Weekly temporal emissions variation profile for domestic-commercial-industrial surface coating

Day Type	Weekly Temporal Factor		Day Type	Weekly Temporal Factor	
Weekday	5	71.43%	Weekend day	2	28.57%

Table 3.105: Daily temporal emissions variation profile for domestic-commercial-industrial surface coating

Hour	Weekday Temporal Factor		Weekend day Temporal Factor		Hour	Weekday Temporal Factor		Weekend day Temporal Factor	
1 am	0	0%	0	0%	1 pm	1	10%	1	10%
2 am	0	0%	0	0%	2 pm	1	10%	1	10%
3 am	0	0%	0	0%	3 pm	1	10%	1	10%
4 am	0	0%	0	0%	4 pm	1	10%	1	10%
5 am	0	0%	0	0%	5 pm	1	10%	1	10%
6 am	0	0%	0	0%	6 pm	0	0%	0	0%
7 am	0	0%	0	0%	7 pm	0	0%	0	0%
8 am	1	10%	1	10%	8 pm	0	0%	0	0%
9 am	1	10%	1	10%	9 pm	0	0%	0	0%
10 am	1	10%	1	10%	10 pm	0	0%	0	0%
11 am	1	10%	1	10%	11 pm	0	0%	0	0%
12 noon	1	10%	1	10%	12 midnight	0	0%	0	0%

3.10.7 Emission Estimates

Table 3.106 presents total estimated annual emissions (for selected substances) from domestic-commercial-industrial surface coating for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. Total estimated annual emissions of all substances from domestic-commercial-industrial surface coating are presented in Appendix B.

Table 3.106: Total estimated annual emissions from domestic-commercial-industrial surface coating in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	8.43	5.86×10^{-01}	4.24×10^{-01}	1.42	$1.09 \times 10^{+01}$
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	$1.06 \times 10^{+03}$	$7.33 \times 10^{+01}$	$5.31 \times 10^{+01}$	$1.78 \times 10^{+02}$	$1.36 \times 10^{+03}$
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	$1.82 \times 10^{+03}$	$1.26 \times 10^{+02}$	$9.14 \times 10^{+01}$	$3.07 \times 10^{+02}$	$2.34 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$1.31 \times 10^{+04}$	$9.11 \times 10^{+02}$	$6.60 \times 10^{+02}$	$2.21 \times 10^{+03}$	$1.69 \times 10^{+04}$
TRICHLOROETHYLENE	-	-	-	-	-

Table 3.107 presents total estimated annual emissions (for selected substances) from domestic-commercial-industrial surface coating by surface coating type for the GMR.

Table 3.107: Total estimated annual emissions from domestic-commercial-industrial surface coating by surface coating type

Substance	Emissions (tonnes/year)							
	Architectural and Decorative Surface Coating - Solvent Thinned Coating	Architectural and Decorative Surface Coating - Water Thinned Coating	Architectural and Decorative Surface Coating - Timber Finishes	Architectural and Decorative Surface Coating - Thinners	Heavy Duty and Industrial Surface Coating - Solvent Thinned Coating	Heavy Duty and Industrial Surface Coating - Timber Finishes	Heavy Duty and Industrial Surface Coating - Thinners	Domestic, Commercial & Industrial Surface Coating Total
1,3 BUTADIENE	-	-	-	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-	-	-	-
BENZENE	-	$1.09 \times 10^{+01}$	-	-	-	-	-	$1.09 \times 10^{+01}$
CARBON MONOXIDE	-	-	-	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-	-	-	-
ISOMERS OF XYLENE	$1.62 \times 10^{+02}$	-	-	7.62	$1.10 \times 10^{+03}$	-	$9.42 \times 10^{+01}$	$1.36 \times 10^{+03}$
LEAD AND COMPOUNDS	-	-	-	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-	-	-	-
POLCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-	-	-	-
TOLUENE	$7.53 \times 10^{+02}$	-	-	$4.27 \times 10^{+01}$	$1.02 \times 10^{+03}$	-	$5.28 \times 10^{+02}$	$2.34 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-	-	-	-
TOTAL VOCS	$1.99 \times 10^{+03}$	$3.02 \times 10^{+03}$	$5.09 \times 10^{+02}$	$2.80 \times 10^{+02}$	$6.60 \times 10^{+03}$	$1.04 \times 10^{+03}$	$3.46 \times 10^{+03}$	$1.69 \times 10^{+04}$
TRICHLOROETHYLENE	-	-	-	-	-	-	-	-

Table 3.108 presents total estimated daily emissions (for selected substances) from domestic-commercial-industrial surface coating for the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday/weekend day and July weekday/weekend day daily emissions.

Table 3.108: Total estimated daily emissions from domestic-commercial-industrial surface coating in each region for typical January weekday/weekend day and July weekday/weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	-	-	-	-	-
ACETALDEHYDE	-	-	-	-	-
BENZENE	2.31×10^{-02}	1.61×10^{-03}	1.16×10^{-03}	3.90×10^{-03}	2.98×10^{-02}
CARBON MONOXIDE	-	-	-	-	-
FORMALDEHYDE	-	-	-	-	-
ISOMERS OF XYLENE	2.89	2.01×10^{-01}	1.45×10^{-01}	4.88×10^{-01}	3.73
LEAD AND COMPOUNDS	-	-	-	-	-
OXIDES OF NITROGEN	-	-	-	-	-
PARTICULATE MATTER < 10 µm	-	-	-	-	-
PARTICULATE MATTER < 2.5 µm	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS	-	-	-	-	-
SULFUR DIOXIDE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TOLUENE	4.98	3.46×10^{-01}	2.51×10^{-01}	8.41×10^{-01}	6.42
TOTAL SUSPENDED PARTICULATES	-	-	-	-	-
TOTAL VOCS	$3.59 \times 10^{+01}$	2.50	1.81	6.07	$4.63 \times 10^{+01}$
TRICHLOROETHYLENE	-	-	-	-	-

3.10.8 Emission Projection Methodology

Emission projection factors for domestic-commercial-industrial surface coating use dwelling growth as the surrogate. Emission projection factors for domestic-commercial-industrial surface coating were developed using the following data:

- Dwelling growth data (ABS, 2001 & TPDC, 2004).

Emission projection factors have been developed for every year from 2004 to 2031 (emissions for the base year 2003 are based on the activity data obtained coupled with the emission estimation techniques). Table 3.109 presents the emission projection factors for domestic-commercial-industrial surface coating.

Table 3.109: Emission projection factors for domestic-commercial-industrial surface coating

Year	Emission Projection Factors [1]	Year	Emission Projection Factors [1]
2004	1.0125	2018	1.2026
2005	1.0249	2019	1.2158
2006	1.0374	2020	1.2290
2007	1.0513	2021	1.2422
2008	1.0652	2022	1.2558
2009	1.0791	2023	1.2695
2010	1.0930	2024	1.2831
2011	1.1070	2025	1.2967
2012	1.1208	2026	1.3103
2013	1.1346	2027	1.3238
2014	1.1485	2028	1.3374
2015	1.1623	2029	1.3509
2016	1.1761	2030	1.3644
2017	1.1894	2031	1.3780

[1] Data Source: (ABS, 2001 & TPDC, 2004).

4 Emissions Summary

The domestic-commercial air emissions inventory has been developed for the 2003 calendar year, which incorporates an area covering greater Sydney, Newcastle and Wollongong, known as the Greater Metropolitan Region (GMR).

The domestic-commercial air emissions inventory includes emissions from the following sources:

- Aerosols and solvents (domestic & commercial);
- Barbecues (domestic);
- Cutback bitumen;
- Gaseous fuel combustion (domestic);
- Lawn mowing and garden equipment (domestic);
- Lawn mowing and garden equipment (public open space);
- Liquid fuel combustion (domestic);
- Natural gas leakage;
- Solid fuel combustion (domestic); and
- Surface coating (domestic, commercial & industrial).

The pollutants inventoried include criteria pollutants specified in the Air NEPM (NEPC, 2003), air toxics associated with the National Pollutant Inventory (NEPC, 2000) and the Air Toxics NEPM (NEPC, 2004) and any other pollutants associated with state specific programs, i.e. Load Based Licensing (Protection of the Environment Operations (General) Regulation 1998 (PCO, 1998)) and Protection of the Environment Operations (Clean Air) Regulation 2002 (PCO, 2005).

Table 4.1 shows total estimated annual emissions (for selected substances) from all domestic-commercial sources in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions.

Figure 4.1 shows the proportion of total estimated annual emissions (for selected substances) from all domestic-commercial sources in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions.

Tables 4.2, 4.3, 4.4 and 4.5 show total estimated daily emissions[4] (for selected substances) from all domestic-commercial sources in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday, January weekend day, July weekday and July weekend day daily emissions.

Figures 4.2, 4.3, 4.4 and 4.5 show the proportion of total estimated daily emissions (for selected substances) from all domestic-commercial sources in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions. These estimates are representative of typical January weekday, January weekend day, July weekday and July weekend day daily emissions.

[4] Daily emissions for sources that don't vary monthly use 261 weekdays and 104 weekend days during 2003. Daily emissions in January and July for sources that vary monthly use 23 weekdays and 8 weekend days during 2003.

Table 4.1: Total estimated annual emissions from domestic-commercial sources in each region

Substance	Emissions (tonnes/year)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	$4.22 \times 10^{+01}$	3.61	2.29	8.53	$5.66 \times 10^{+01}$
ACETALDEHYDE	$7.83 \times 10^{+02}$	$6.68 \times 10^{+01}$	$4.28 \times 10^{+01}$	$1.55 \times 10^{+02}$	$1.05 \times 10^{+03}$
BENZENE	$5.74 \times 10^{+02}$	$4.87 \times 10^{+01}$	$3.13 \times 10^{+01}$	$1.13 \times 10^{+02}$	$7.67 \times 10^{+02}$
CARBON MONOXIDE	$6.72 \times 10^{+04}$	$5.78 \times 10^{+03}$	$3.64 \times 10^{+03}$	$1.39 \times 10^{+04}$	$9.05 \times 10^{+04}$
FORMALDEHYDE	$8.41 \times 10^{+02}$	$7.13 \times 10^{+01}$	$4.61 \times 10^{+01}$	$1.63 \times 10^{+02}$	$1.12 \times 10^{+03}$
ISOMERS OF XYLENE	$2.07 \times 10^{+03}$	$1.53 \times 10^{+02}$	$1.05 \times 10^{+02}$	$3.71 \times 10^{+02}$	$2.70 \times 10^{+03}$
LEAD AND COMPOUNDS	1.14×10^{-01}	9.65×10^{-03}	6.15×10^{-03}	2.30×10^{-02}	1.53×10^{-01}
OXIDES OF NITROGEN	$1.36 \times 10^{+03}$	$1.05 \times 10^{+02}$	$6.83 \times 10^{+01}$	$2.62 \times 10^{+02}$	$1.79 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	$4.99 \times 10^{+03}$	$4.23 \times 10^{+02}$	$2.74 \times 10^{+02}$	$9.61 \times 10^{+02}$	$6.65 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	$4.83 \times 10^{+03}$	$4.08 \times 10^{+02}$	$2.65 \times 10^{+02}$	$9.29 \times 10^{+02}$	$6.43 \times 10^{+03}$
POLYCYCLIC AROMATIC HYDROCARBONS	$1.70 \times 10^{+02}$	$1.29 \times 10^{+01}$	8.72	$3.03 \times 10^{+01}$	$2.22 \times 10^{+02}$
SULFUR DIOXIDE	$1.08 \times 10^{+02}$	8.87	5.76	$2.08 \times 10^{+01}$	$1.43 \times 10^{+02}$
TETRACHLOROETHYLENE	$5.68 \times 10^{+01}$	3.85	2.75	9.19	$7.26 \times 10^{+01}$
TOLUENE	$3.21 \times 10^{+03}$	$2.31 \times 10^{+02}$	$1.62 \times 10^{+02}$	$5.58 \times 10^{+02}$	$4.16 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	$5.25 \times 10^{+03}$	$4.45 \times 10^{+02}$	$2.88 \times 10^{+02}$	$1.01 \times 10^{+03}$	$7.00 \times 10^{+03}$
TOTAL VOCS	$5.19 \times 10^{+04}$	$3.79 \times 10^{+03}$	$2.62 \times 10^{+03}$	$8.97 \times 10^{+03}$	$6.73 \times 10^{+04}$
TRICHLOROETHYLENE	4.13	3.39×10^{-01}	2.17×10^{-01}	8.22×10^{-01}	5.50

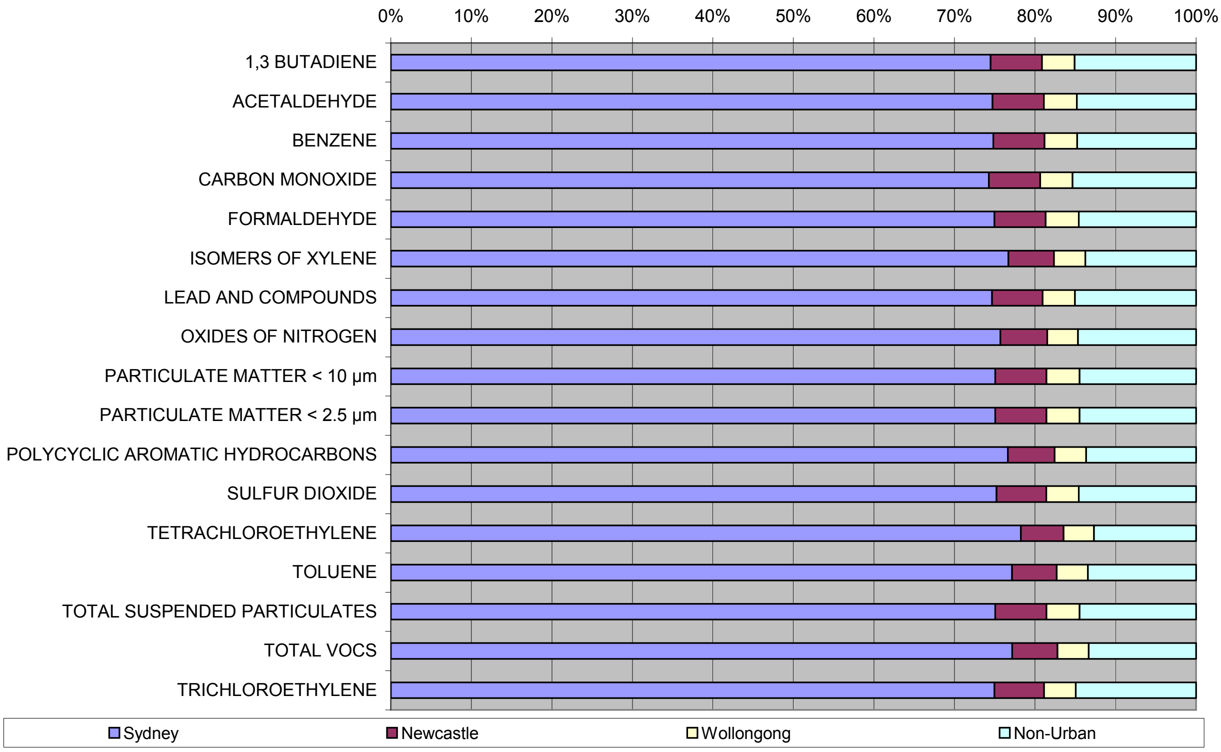

Figure 4.1: Proportion of total estimated annual emissions from domestic-commercial sources in each region

Table 4.2: Total estimated daily emissions from domestic-commercial sources in each region for typical January weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	5.16×10^{-02}	4.60×10^{-03}	2.69×10^{-03}	1.24×10^{-02}	7.12×10^{-02}
ACETALDEHYDE	4.42×10^{-01}	4.03×10^{-02}	2.24×10^{-02}	1.16×10^{-01}	6.21×10^{-01}
BENZENE	4.31×10^{-01}	3.79×10^{-02}	2.23×10^{-02}	1.03×10^{-01}	5.94×10^{-01}
CARBON MONOXIDE	$1.04 \times 10^{+02}$	9.25	5.38	$2.51 \times 10^{+01}$	$1.43 \times 10^{+02}$
FORMALDEHYDE	4.14×10^{-01}	3.64×10^{-02}	2.15×10^{-02}	9.80×10^{-02}	5.70×10^{-01}
ISOMERS OF XYLENE	5.34	3.94×10^{-01}	2.67×10^{-01}	9.84×10^{-01}	6.98
LEAD AND COMPOUNDS	1.64×10^{-04}	1.43×10^{-05}	8.47×10^{-06}	3.84×10^{-05}	2.25×10^{-04}
OXIDES OF NITROGEN	2.72	2.14×10^{-01}	1.32×10^{-01}	5.98×10^{-01}	3.66
PARTICULATE MATTER < 10 µm	2.22	1.92×10^{-01}	1.17×10^{-01}	4.91×10^{-01}	3.02
PARTICULATE MATTER < 2.5 µm	2.10	1.82×10^{-01}	1.11×10^{-01}	4.65×10^{-01}	2.86
POLYCYCLIC AROMATIC HYDROCARBONS	2.96×10^{-01}	2.10×10^{-02}	1.44×10^{-02}	5.23×10^{-02}	3.83×10^{-01}
SULFUR DIOXIDE	8.71×10^{-02}	7.51×10^{-03}	4.43×10^{-03}	2.06×10^{-02}	1.20×10^{-01}
TETRACHLOROETHYLENE	1.51×10^{-01}	1.02×10^{-02}	7.29×10^{-03}	2.46×10^{-02}	1.93×10^{-01}
TOLUENE	8.29	5.92×10^{-01}	4.14×10^{-01}	1.46	$1.08 \times 10^{+01}$
TOTAL SUSPENDED PARTICULATES	2.33	2.02×10^{-01}	1.23×10^{-01}	5.16×10^{-01}	3.17
TOTAL VOCS	$1.17 \times 10^{+02}$	8.26	5.75	$2.01 \times 10^{+01}$	$1.51 \times 10^{+02}$
TRICHLOROETHYLENE	8.67×10^{-03}	7.18×10^{-04}	4.41×10^{-04}	1.89×10^{-03}	1.17×10^{-02}

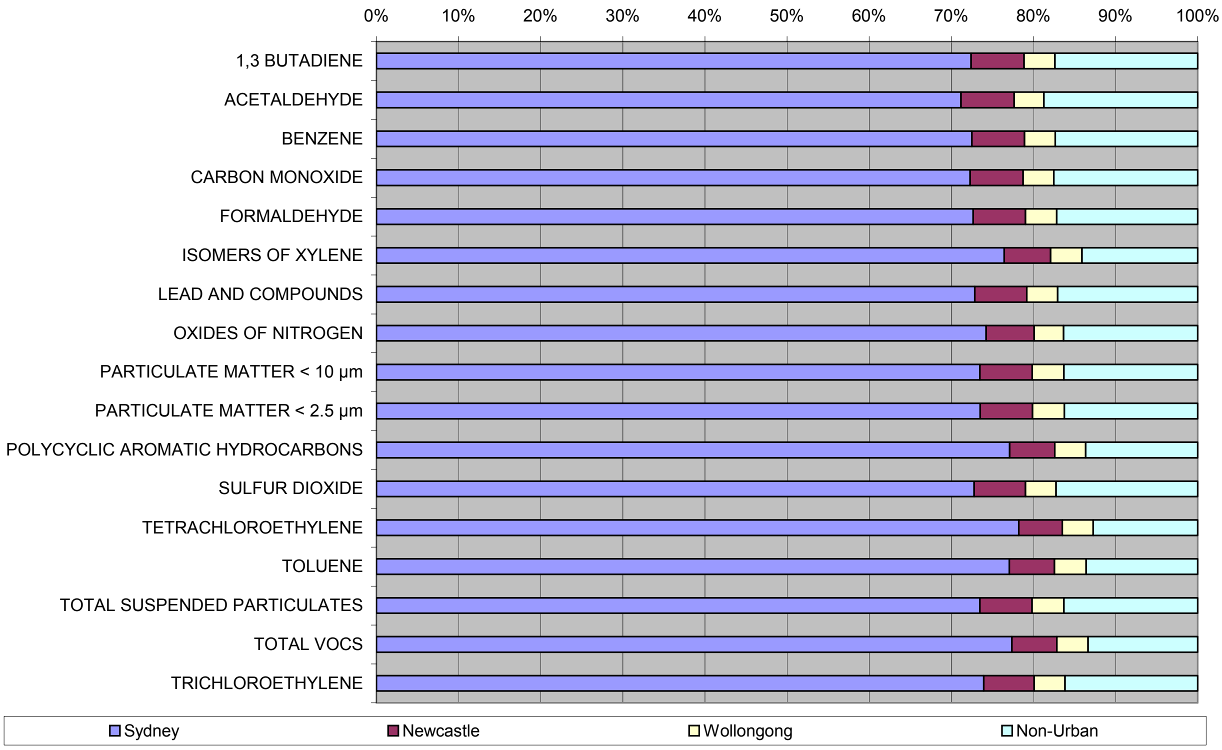

Figure 4.2: Proportion of total estimated daily emissions from domestic-commercial sources in each region for typical January weekday

Table 4.3: Total estimated daily emissions from domestic-commercial sources in each region for typical January weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.37×10^{-01}	1.15×10^{-02}	7.53×10^{-03}	2.59×10^{-02}	1.82×10^{-01}
ACETALDEHYDE	4.40×10^{-01}	3.71×10^{-02}	2.42×10^{-02}	8.33×10^{-02}	5.85×10^{-01}
BENZENE	8.14×10^{-01}	6.82×10^{-02}	4.47×10^{-02}	1.54×10^{-01}	1.08
CARBON MONOXIDE	$2.80 \times 10^{+02}$	$2.37 \times 10^{+01}$	$1.54 \times 10^{+01}$	$5.31 \times 10^{+01}$	$3.72 \times 10^{+02}$
FORMALDEHYDE	5.78×10^{-01}	4.83×10^{-02}	3.17×10^{-02}	1.09×10^{-01}	7.67×10^{-01}
ISOMERS OF XYLENE	7.54	5.74×10^{-01}	3.93×10^{-01}	1.33	9.84
LEAD AND COMPOUNDS	4.12×10^{-04}	3.44×10^{-05}	2.26×10^{-05}	7.76×10^{-05}	5.47×10^{-04}
OXIDES OF NITROGEN	2.91	2.17×10^{-01}	1.49×10^{-01}	5.02×10^{-01}	3.78
PARTICULATE MATTER < 10 µm	3.79	3.18×10^{-01}	2.08×10^{-01}	7.15×10^{-01}	5.03
PARTICULATE MATTER < 2.5 µm	3.58	3.01×10^{-01}	1.97×10^{-01}	6.76×10^{-01}	4.76
POLYCYCLIC AROMATIC HYDROCARBONS	3.57×10^{-01}	2.59×10^{-02}	1.80×10^{-02}	6.02×10^{-02}	4.61×10^{-01}
SULFUR DIOXIDE	1.51×10^{-01}	1.24×10^{-02}	8.18×10^{-03}	2.80×10^{-02}	1.99×10^{-01}
TETRACHLOROETHYLENE	1.70×10^{-01}	1.17×10^{-02}	8.36×10^{-03}	2.76×10^{-02}	2.18×10^{-01}
TOLUENE	$1.03 \times 10^{+01}$	7.59×10^{-01}	5.30×10^{-01}	1.79	$1.34 \times 10^{+01}$
TOTAL SUSPENDED PARTICULATES	3.98	3.34×10^{-01}	2.19×10^{-01}	7.52×10^{-01}	5.29
TOTAL VOCS	$1.40 \times 10^{+02}$	$1.02 \times 10^{+01}$	7.09	$2.38 \times 10^{+01}$	$1.81 \times 10^{+02}$
TRICHLOROETHYLENE	2.02×10^{-02}	1.66×10^{-03}	1.10×10^{-03}	3.76×10^{-03}	2.67×10^{-02}

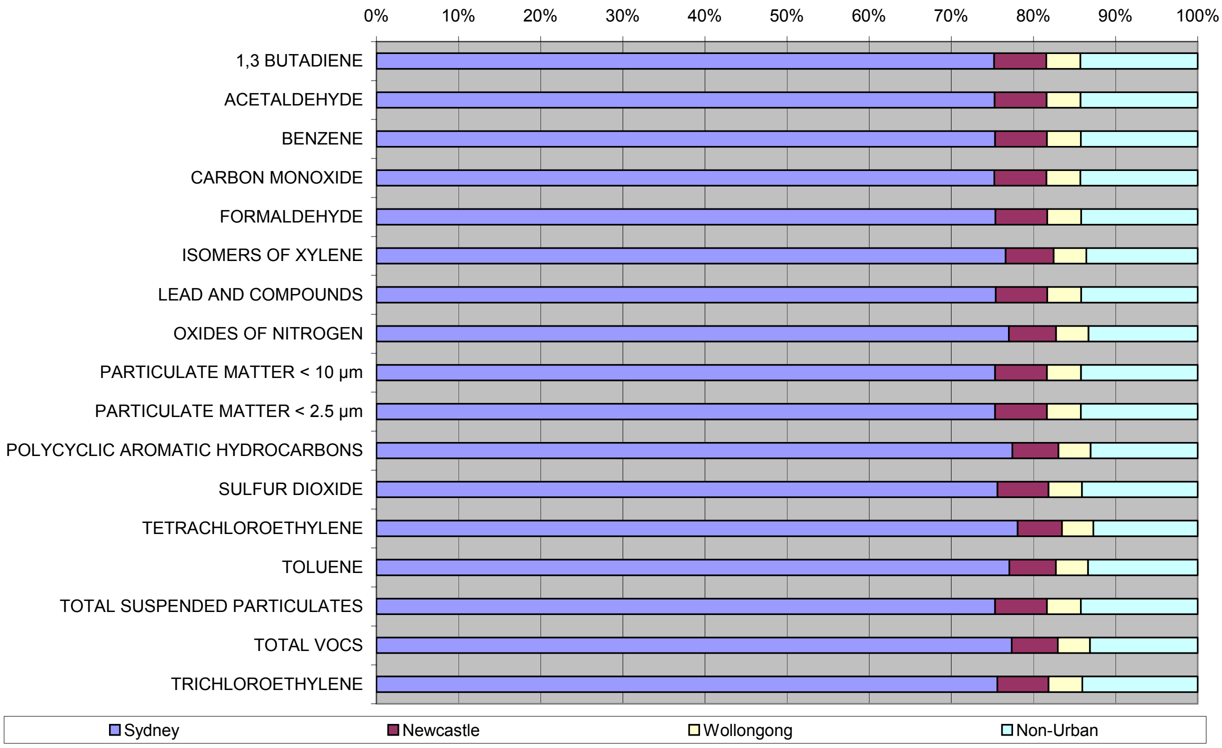

Figure 4.3: Proportion of total estimated daily emissions from domestic-commercial sources in each region for typical January weekend day

Table 4.4: Total estimated daily emissions from domestic-commercial sources in each region for typical July weekday

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	1.99×10^{-01}	1.69×10^{-02}	1.09×10^{-02}	3.90×10^{-02}	2.65×10^{-01}
ACETALDEHYDE	5.50	4.66×10^{-01}	3.02×10^{-01}	1.06	7.32
BENZENE	3.61	3.06×10^{-01}	1.98×10^{-01}	6.96×10^{-01}	4.81
CARBON MONOXIDE	$2.56 \times 10^{+02}$	$2.19 \times 10^{+01}$	$1.40 \times 10^{+01}$	$5.13 \times 10^{+01}$	$3.43 \times 10^{+02}$
FORMALDEHYDE	5.90	4.99×10^{-01}	3.25×10^{-01}	1.13	7.86
ISOMERS OF XYLENE	5.25	3.83×10^{-01}	2.64×10^{-01}	9.34×10^{-01}	6.83
LEAD AND COMPOUNDS	4.83×10^{-04}	4.05×10^{-05}	2.61×10^{-05}	9.43×10^{-05}	6.43×10^{-04}
OXIDES OF NITROGEN	5.66	4.40×10^{-01}	2.91×10^{-01}	1.06	7.45
PARTICULATE MATTER < 10 µm	$3.51 \times 10^{+01}$	2.97	1.93	6.70	$4.67 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$3.40 \times 10^{+01}$	2.88	1.87	6.49	$4.53 \times 10^{+01}$
POLYCYCLIC AROMATIC HYDROCARBONS	7.68×10^{-01}	6.08×10^{-02}	4.06×10^{-02}	1.40×10^{-01}	1.01
SULFUR DIOXIDE	6.69×10^{-01}	5.49×10^{-02}	3.60×10^{-02}	1.26×10^{-01}	8.86×10^{-01}
TETRACHLOROETHYLENE	1.55×10^{-01}	1.05×10^{-02}	7.50×10^{-03}	2.50×10^{-02}	1.98×10^{-01}
TOLUENE	8.79	6.31×10^{-01}	4.43×10^{-01}	1.53	$1.14 \times 10^{+01}$
TOTAL SUSPENDED PARTICULATES	$3.70 \times 10^{+01}$	3.13	2.03	7.05	$4.92 \times 10^{+01}$
TOTAL VOCS	$1.80 \times 10^{+02}$	$1.36 \times 10^{+01}$	9.27	$3.17 \times 10^{+01}$	$2.35 \times 10^{+02}$
TRICHLOROETHYLENE	1.09×10^{-02}	8.89×10^{-04}	5.72×10^{-04}	2.15×10^{-03}	1.45×10^{-02}

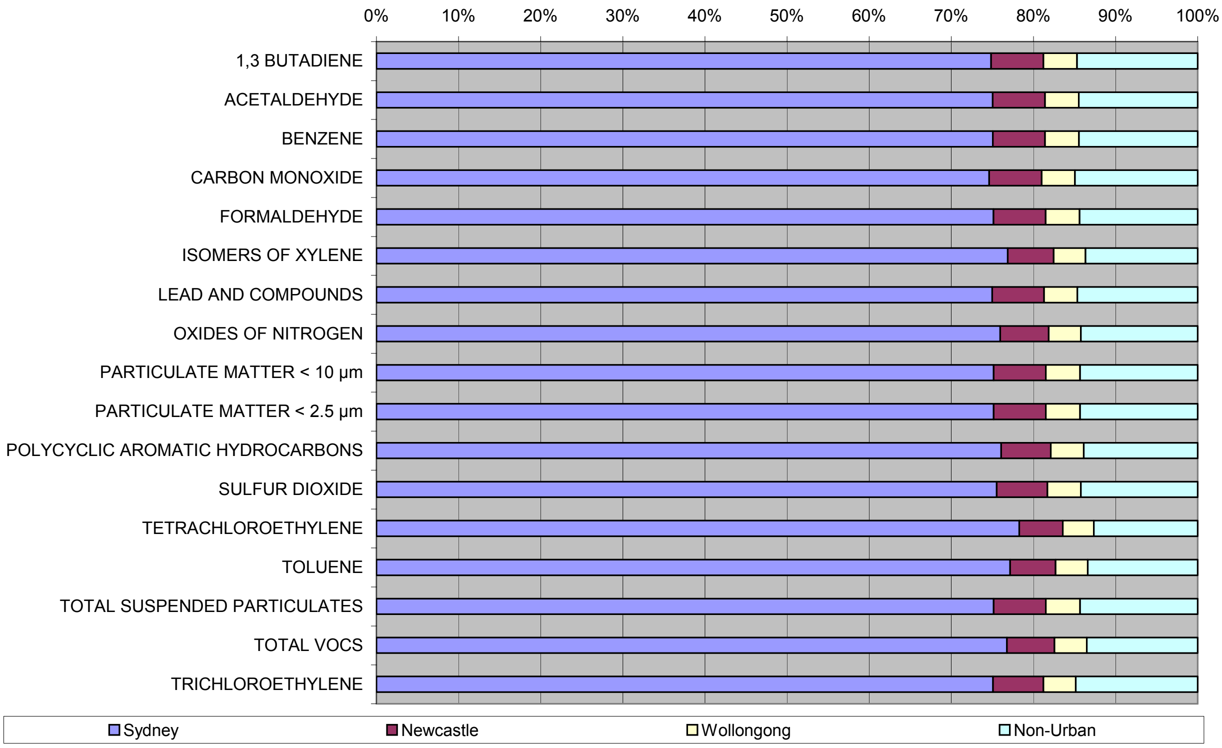

Figure 4.4: Proportion of total estimated daily emissions from domestic-commercial sources in each region for typical July weekday

Table 4.5: Total estimated daily emissions from domestic-commercial sources in each region for typical July weekend day

Substance	Emissions (tonnes/day)				
	Sydney	Newcastle	Wollongong	Non-Urban	GMR
1,3 BUTADIENE	3.54×10^{-01}	2.99×10^{-02}	1.95×10^{-02}	6.72×10^{-02}	4.70×10^{-01}
ACETALDEHYDE	8.93	7.55×10^{-01}	4.93×10^{-01}	1.70	$1.19 \times 10^{+01}$
BENZENE	6.01	5.07×10^{-01}	3.31×10^{-01}	1.14	7.98
CARBON MONOXIDE	$4.77 \times 10^{+02}$	$4.03 \times 10^{+01}$	$2.63 \times 10^{+01}$	$9.06 \times 10^{+01}$	$6.34 \times 10^{+02}$
FORMALDEHYDE	9.69	8.18×10^{-01}	5.34×10^{-01}	1.84	$1.29 \times 10^{+01}$
ISOMERS OF XYLENE	6.70	5.02×10^{-01}	3.46×10^{-01}	1.17	8.72
LEAD AND COMPOUNDS	8.52×10^{-04}	7.12×10^{-05}	4.67×10^{-05}	1.60×10^{-04}	1.13×10^{-03}
OXIDES OF NITROGEN	7.51	5.89×10^{-01}	3.96×10^{-01}	1.34	9.84
PARTICULATE MATTER < 10 µm	$5.80 \times 10^{+01}$	4.90	3.20	$1.10 \times 10^{+01}$	$7.71 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$5.62 \times 10^{+01}$	4.75	3.10	$1.07 \times 10^{+01}$	$7.47 \times 10^{+01}$
POLYCYCLIC AROMATIC HYDROCARBONS	1.13	9.11×10^{-02}	6.06×10^{-02}	2.07×10^{-01}	1.49
SULFUR DIOXIDE	1.05	8.67×10^{-02}	5.71×10^{-02}	1.96×10^{-01}	1.39
TETRACHLOROETHYLENE	1.70×10^{-01}	1.17×10^{-02}	8.35×10^{-03}	2.76×10^{-02}	2.18×10^{-01}
TOLUENE	$1.05 \times 10^{+01}$	7.74×10^{-01}	5.41×10^{-01}	1.82	$1.37 \times 10^{+01}$
TOTAL SUSPENDED PARTICULATES	$6.11 \times 10^{+01}$	5.16	3.37	$1.16 \times 10^{+01}$	$8.12 \times 10^{+01}$
TOTAL VOCS	$2.38 \times 10^{+02}$	$1.84 \times 10^{+01}$	$1.24 \times 10^{+01}$	$4.22 \times 10^{+01}$	$3.10 \times 10^{+02}$
TRICHLOROETHYLENE	2.01×10^{-02}	1.66×10^{-03}	1.09×10^{-03}	3.74×10^{-03}	2.66×10^{-02}

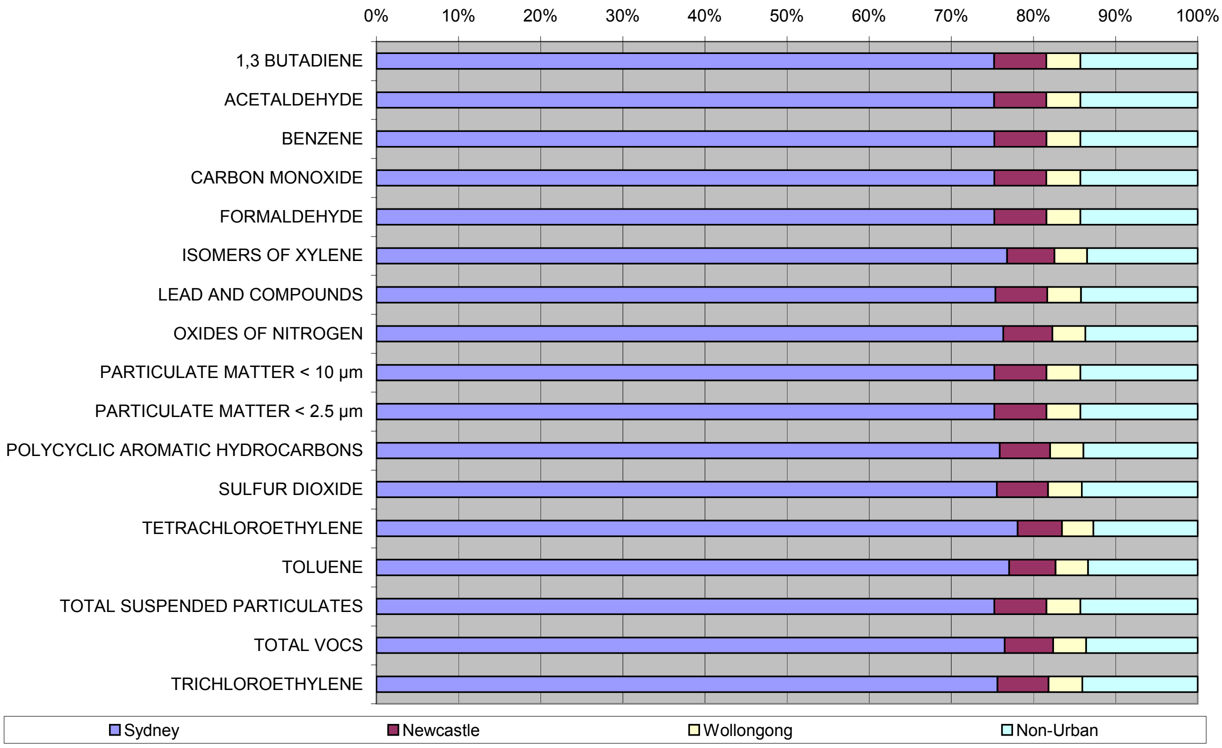

Figure 4.5: Proportion of total estimated daily emissions from domestic-commercial sources in each region for typical July weekend day

Tables 4.6, 4.7, 4.8, 4.9 and 4.10 show total estimated annual emissions (for selected substances) from each domestic-commercial source type in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions respectively.

Figures 4.6, 4.7, 4.8, 4.9 and 4.10 show the proportion of total estimated annual emissions (for selected substances) from each domestic-commercial source type in the GMR, Sydney, Newcastle, Wollongong and Non-Urban regions respectively.

Table 4.6: Total estimated annual emissions by domestic-commercial source type in the GMR

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.37×10^{-01}	-	-	$1.96 \times 10^{+01}$	5.35	-	-	$3.15 \times 10^{+01}$	-	$5.66 \times 10^{+01}$
ACETALDEHYDE	-	3.38	-	-	$1.75 \times 10^{+01}$	$6.74 \times 10^{+01}$	-	-	$9.60 \times 10^{+02}$	-	$1.05 \times 10^{+03}$
BENZENE	1.09×10^{-02}	1.62	-	4.05	$8.98 \times 10^{+01}$	$4.56 \times 10^{+01}$	3.94×10^{-04}	-	$6.15 \times 10^{+02}$	$1.09 \times 10^{+01}$	$7.67 \times 10^{+02}$
CARBON MONOXIDE	-	$2.31 \times 10^{+02}$	-	$3.24 \times 10^{+02}$	$4.16 \times 10^{+04}$	$1.13 \times 10^{+04}$	9.23	-	$3.71 \times 10^{+04}$	-	$9.05 \times 10^{+04}$
FORMALDEHYDE	2.86	3.87	-	8.11	$3.18 \times 10^{+01}$	$4.17 \times 10^{+01}$	6.08×10^{-02}	-	$1.03 \times 10^{+03}$	-	$1.12 \times 10^{+03}$
ISOMERS OF XYLENE	$4.77 \times 10^{+02}$	5.52×10^{-01}	$9.38 \times 10^{+01}$	-	$5.30 \times 10^{+02}$	$1.40 \times 10^{+02}$	2.01×10^{-04}	-	$9.55 \times 10^{+01}$	$1.36 \times 10^{+03}$	$2.70 \times 10^{+03}$
LEAD AND COMPOUNDS	-	6.65×10^{-03}	-	4.10×10^{-03}	5.62×10^{-02}	1.60×10^{-02}	2.78×10^{-03}	-	6.76×10^{-02}	-	1.53×10^{-01}
OXIDES OF NITROGEN	-	$7.04 \times 10^{+01}$	-	$7.62 \times 10^{+02}$	$1.77 \times 10^{+02}$	$2.69 \times 10^{+02}$	$3.32 \times 10^{+01}$	-	$4.80 \times 10^{+02}$	-	$1.79 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	-	$1.23 \times 10^{+01}$	-	$6.08 \times 10^{+01}$	$2.51 \times 10^{+02}$	$1.54 \times 10^{+02}$	7.38×10^{-01}	-	$6.17 \times 10^{+03}$	-	$6.65 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	-	6.87	-	$6.08 \times 10^{+01}$	$2.31 \times 10^{+02}$	$1.43 \times 10^{+02}$	1.85×10^{-01}	-	$5.99 \times 10^{+03}$	-	$6.43 \times 10^{+03}$
POLCYCLIC AROMATIC HYDROCARBONS	$1.07 \times 10^{+02}$	1.23×10^{-01}	-	5.32×10^{-03}	$1.50 \times 10^{+01}$	7.83	2.15×10^{-03}	-	$9.20 \times 10^{+01}$	-	$2.22 \times 10^{+02}$
SULFUR DIOXIDE	-	3.99	-	4.86	$1.50 \times 10^{+01}$	9.40	$1.31 \times 10^{+01}$	-	$9.66 \times 10^{+01}$	-	$1.43 \times 10^{+02}$
TETRACHLOROETHYLENE	$6.54 \times 10^{+01}$	5.10×10^{-03}	-	-	4.44	1.11	-	-	1.58	-	$7.26 \times 10^{+01}$
TOLUENE	$9.95 \times 10^{+02}$	9.61×10^{-01}	-	2.03	$4.90 \times 10^{+02}$	$1.32 \times 10^{+02}$	1.14×10^{-02}	-	$1.97 \times 10^{+02}$	$2.34 \times 10^{+03}$	$4.16 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	$1.30 \times 10^{+01}$	-	$6.08 \times 10^{+01}$	$2.64 \times 10^{+02}$	$1.62 \times 10^{+02}$	7.77×10^{-01}	-	$6.50 \times 10^{+03}$	-	$7.00 \times 10^{+03}$
TOTAL VOCS	$2.62 \times 10^{+04}$	$5.13 \times 10^{+01}$	$2.37 \times 10^{+03}$	$4.46 \times 10^{+01}$	$5.42 \times 10^{+03}$	$1.64 \times 10^{+03}$	1.32	$1.99 \times 10^{+03}$	$1.27 \times 10^{+04}$	$1.69 \times 10^{+04}$	$6.73 \times 10^{+04}$
TRICHLOROETHYLENE	1.12	3.11×10^{-03}	-	-	2.73	6.80×10^{-01}	-	-	9.69×10^{-01}	-	5.50

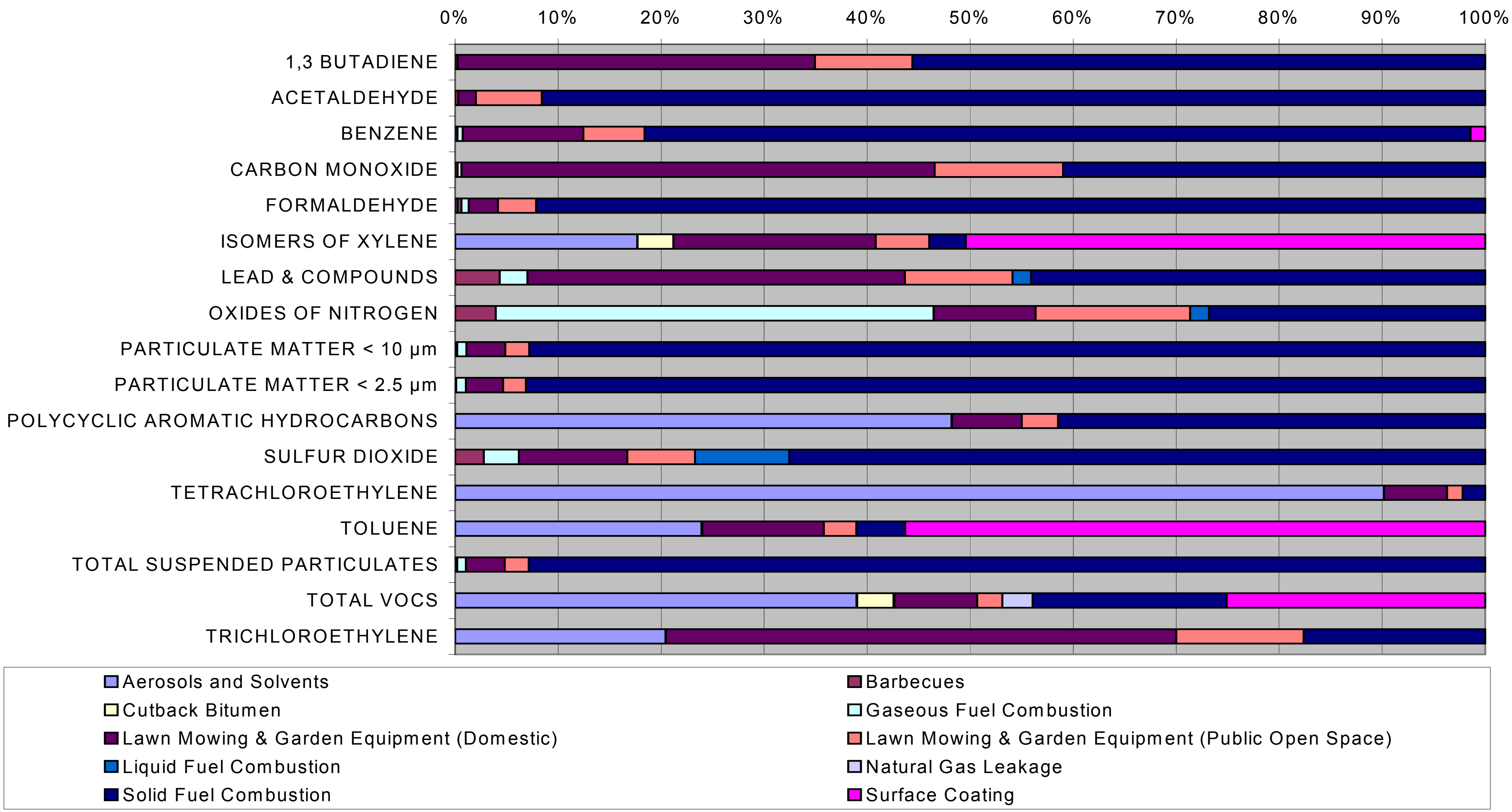

Figure 4.6: Proportion of total estimated annual emissions by domestic-commercial source type in the GMR

Table 4.7: Total estimated annual emissions by domestic-commercial source type in the Sydney region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.06×10^{-01}	-	-	$1.48 \times 10^{+01}$	3.61	-	-	$2.37 \times 10^{+01}$	-	$4.22 \times 10^{+01}$
ACETALDEHYDE	-	2.62	-	-	$1.32 \times 10^{+01}$	$4.54 \times 10^{+01}$	-	-	$7.22 \times 10^{+02}$	-	$7.83 \times 10^{+02}$
BENZENE	8.62×10^{-03}	1.26	-	3.19	$6.75 \times 10^{+01}$	$3.08 \times 10^{+01}$	3.10×10^{-04}	-	$4.63 \times 10^{+02}$	8.43	$5.74 \times 10^{+02}$
CARBON MONOXIDE	-	$1.79 \times 10^{+02}$	-	$2.55 \times 10^{+02}$	$3.13 \times 10^{+04}$	$7.62 \times 10^{+03}$	7.26	-	$2.79 \times 10^{+04}$	-	$6.72 \times 10^{+04}$
FORMALDEHYDE	2.25	3.01	-	6.38	$2.39 \times 10^{+01}$	$2.81 \times 10^{+01}$	4.79×10^{-02}	-	$7.77 \times 10^{+02}$	-	$8.41 \times 10^{+02}$
ISOMERS OF XYLENE	$3.75 \times 10^{+02}$	4.28×10^{-01}	$7.21 \times 10^{+01}$	-	$3.98 \times 10^{+02}$	$9.46 \times 10^{+01}$	1.58×10^{-04}	-	$7.19 \times 10^{+01}$	$1.06 \times 10^{+03}$	$2.07 \times 10^{+03}$
LEAD AND COMPOUNDS	-	5.16×10^{-03}	-	3.22×10^{-03}	4.22×10^{-02}	1.08×10^{-02}	2.19×10^{-03}	-	5.08×10^{-02}	-	1.14×10^{-01}
OXIDES OF NITROGEN	-	$5.46 \times 10^{+01}$	-	$5.99 \times 10^{+02}$	$1.33 \times 10^{+02}$	$1.81 \times 10^{+02}$	$2.61 \times 10^{+01}$	-	$3.61 \times 10^{+02}$	-	$1.36 \times 10^{+03}$
PARTICULATE MATTER < 10 µm	-	9.57	-	$4.78 \times 10^{+01}$	$1.89 \times 10^{+02}$	$1.04 \times 10^{+02}$	5.81×10^{-01}	-	$4.64 \times 10^{+03}$	-	$4.99 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	-	5.33	-	$4.78 \times 10^{+01}$	$1.73 \times 10^{+02}$	$9.63 \times 10^{+01}$	1.45×10^{-01}	-	$4.50 \times 10^{+03}$	-	$4.83 \times 10^{+03}$
POLCYCLIC AROMATIC HYDROCARBONS	$8.41 \times 10^{+01}$	9.56×10^{-02}	-	4.19×10^{-03}	$1.13 \times 10^{+01}$	5.28	1.69×10^{-03}	-	$6.92 \times 10^{+01}$	-	$1.70 \times 10^{+02}$
SULFUR DIOXIDE	-	3.09	-	3.83	$1.13 \times 10^{+01}$	6.34	$1.03 \times 10^{+01}$	-	$7.27 \times 10^{+01}$	-	$1.08 \times 10^{+02}$
TETRACHLOROETHYLENE	$5.15 \times 10^{+01}$	3.95×10^{-03}	-	-	3.34	7.47×10^{-01}	-	-	1.19	-	$5.68 \times 10^{+01}$
TOLUENE	$7.83 \times 10^{+02}$	7.46×10^{-01}	-	1.60	$3.69 \times 10^{+02}$	$8.90 \times 10^{+01}$	8.99×10^{-03}	-	$1.48 \times 10^{+02}$	$1.82 \times 10^{+03}$	$3.21 \times 10^{+03}$
TOTAL SUSPENDED PARTICULATES	-	$1.01 \times 10^{+01}$	-	$4.78 \times 10^{+01}$	$1.99 \times 10^{+02}$	$1.09 \times 10^{+02}$	6.12×10^{-01}	-	$4.89 \times 10^{+03}$	-	$5.25 \times 10^{+03}$
TOTAL VOCS	$2.06 \times 10^{+04}$	$3.98 \times 10^{+01}$	$1.83 \times 10^{+03}$	$3.51 \times 10^{+01}$	$4.08 \times 10^{+03}$	$1.11 \times 10^{+03}$	1.04	$1.57 \times 10^{+03}$	$9.52 \times 10^{+03}$	$1.31 \times 10^{+04}$	$5.19 \times 10^{+04}$
TRICHLOROETHYLENE	8.84×10^{-01}	2.42×10^{-03}	-	-	2.05	4.59×10^{-01}	-	-	7.29×10^{-01}	-	4.13

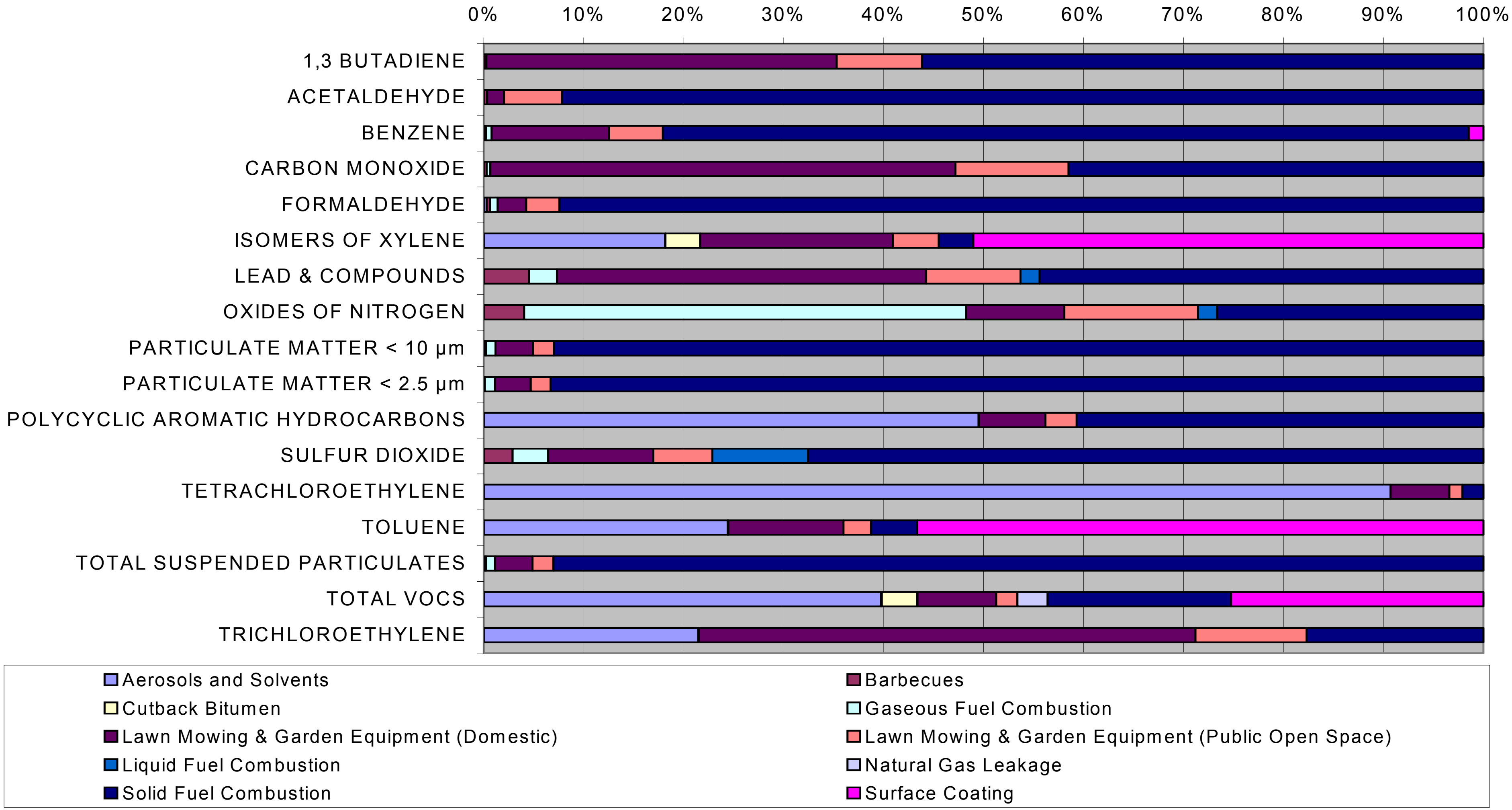

Figure 4.7: Proportion of total estimated annual emissions by domestic-commercial source type in the Sydney region

Table 4.8: Total estimated annual emissions by domestic-commercial source type in the Newcastle region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	7.39×10^{-03}	-	-	1.25	3.55×10^{-01}	-	-	2.00	-	3.61
ACETALDEHYDE	-	1.82×10^{-01}	-	-	1.12	4.47	-	-	$6.11 \times 10^{+01}$	-	$6.68 \times 10^{+01}$
BENZENE	5.68×10^{-04}	8.76×10^{-02}	-	2.10×10^{-01}	5.71	3.03	2.04×10^{-05}	-	$3.91 \times 10^{+01}$	5.86×10^{-01}	$4.87 \times 10^{+01}$
CARBON MONOXIDE	-	$1.25 \times 10^{+01}$	-	$1.68 \times 10^{+01}$	$2.64 \times 10^{+03}$	$7.49 \times 10^{+02}$	4.78×10^{-01}	-	$2.36 \times 10^{+03}$	-	$5.78 \times 10^{+03}$
FORMALDEHYDE	1.49×10^{-01}	2.09×10^{-01}	-	4.21×10^{-01}	2.02	2.77	3.15×10^{-03}	-	$6.57 \times 10^{+01}$	-	$7.13 \times 10^{+01}$
ISOMERS OF XYLENE	$2.47 \times 10^{+01}$	2.98×10^{-02}	5.64	-	$3.37 \times 10^{+01}$	9.30	1.04×10^{-05}	-	6.08	$7.33 \times 10^{+01}$	$1.53 \times 10^{+02}$
LEAD AND COMPOUNDS	-	3.59×10^{-04}	-	2.12×10^{-04}	3.57×10^{-03}	1.06×10^{-03}	1.44×10^{-04}	-	4.30×10^{-03}	-	9.65×10^{-03}
OXIDES OF NITROGEN	-	3.80	-	$3.95 \times 10^{+01}$	$1.13 \times 10^{+01}$	$1.78 \times 10^{+01}$	1.72	-	$3.05 \times 10^{+01}$	-	$1.05 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	-	6.65×10^{-01}	-	3.15	$1.59 \times 10^{+01}$	$1.02 \times 10^{+01}$	3.83×10^{-02}	-	$3.93 \times 10^{+02}$	-	$4.23 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	3.71×10^{-01}	-	3.15	$1.47 \times 10^{+01}$	9.46	9.57×10^{-03}	-	$3.81 \times 10^{+02}$	-	$4.08 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	5.54	6.65×10^{-03}	-	2.76×10^{-04}	9.54×10^{-01}	5.19×10^{-01}	1.12×10^{-04}	-	5.85	-	$1.29 \times 10^{+01}$
SULFUR DIOXIDE	-	2.15×10^{-01}	-	2.52×10^{-01}	9.57×10^{-01}	6.23×10^{-01}	6.79×10^{-01}	-	6.14	-	8.87
TETRACHLOROETHYLENE	3.39	2.75×10^{-04}	-	-	2.82×10^{-01}	7.34×10^{-02}	-	-	1.00×10^{-01}	-	3.85
TOLUENE	$5.16 \times 10^{+01}$	5.18×10^{-02}	-	1.05×10^{-01}	$3.12 \times 10^{+01}$	8.75	5.92×10^{-04}	-	$1.25 \times 10^{+01}$	$1.26 \times 10^{+02}$	$2.31 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	7.00×10^{-01}	-	3.15	$1.68 \times 10^{+01}$	$1.07 \times 10^{+01}$	4.03×10^{-02}	-	$4.13 \times 10^{+02}$	-	$4.45 \times 10^{+02}$
TOTAL VOCS	$1.36 \times 10^{+03}$	2.76	$1.43 \times 10^{+02}$	2.31	$3.45 \times 10^{+02}$	$1.09 \times 10^{+02}$	6.82×10^{-02}	$1.09 \times 10^{+02}$	$8.05 \times 10^{+02}$	$9.11 \times 10^{+02}$	$3.79 \times 10^{+03}$
TRICHLOROETHYLENE	5.82×10^{-02}	1.68×10^{-04}	-	-	1.73×10^{-01}	4.51×10^{-02}	-	-	6.17×10^{-02}	-	3.39×10^{-01}

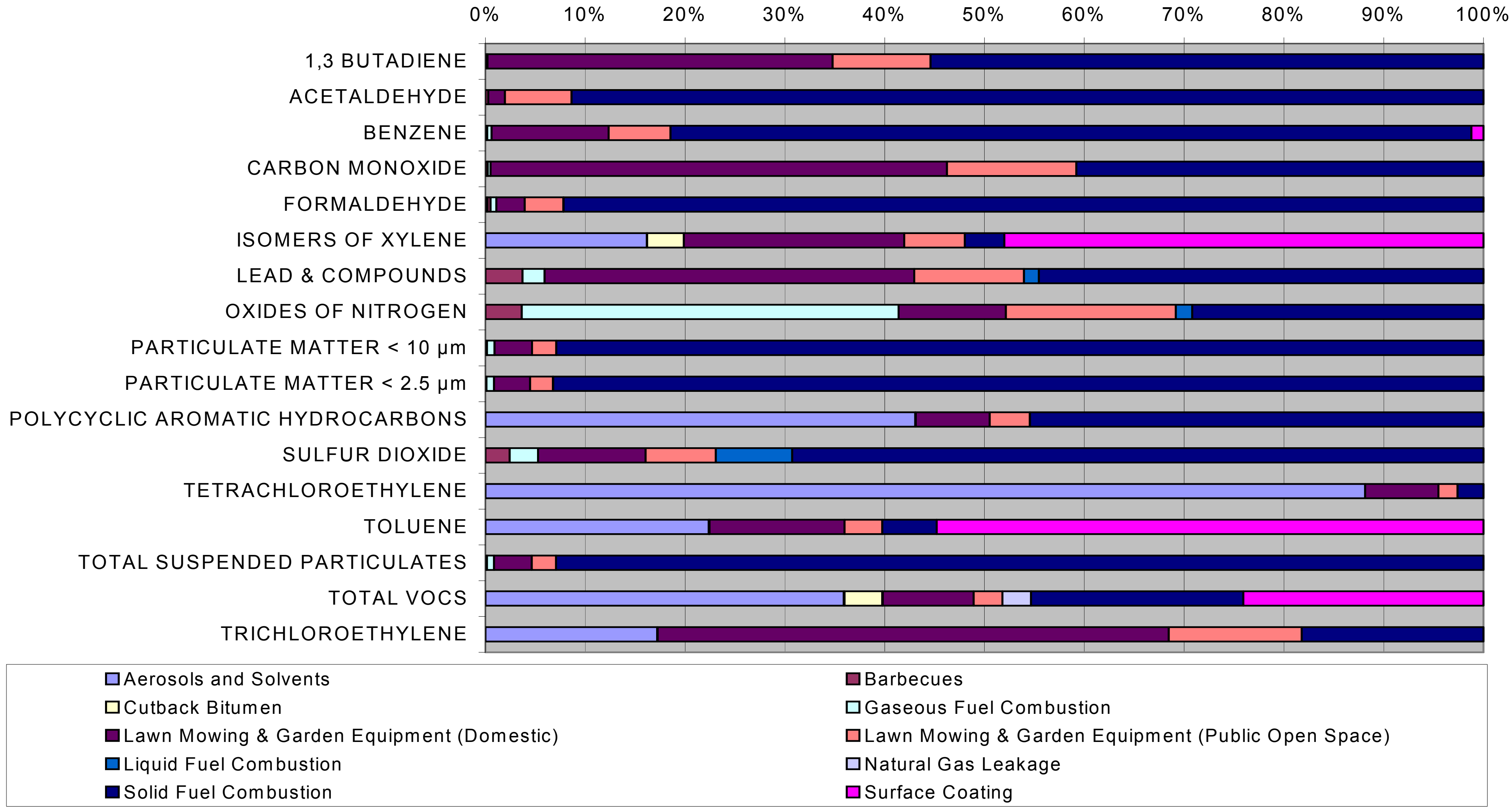

Figure 4.8: Proportion of total estimated annual emissions by domestic-commercial source type in the Newcastle region

Table 4.9: Total estimated annual emissions by domestic-commercial source type in the Wollongong region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	5.35×10^{-03}	-	-	8.14×10^{-01}	1.67×10^{-01}	-	-	1.31	-	2.29
ACETALDEHYDE	-	1.32×10^{-01}	-	-	7.28×10^{-01}	2.10	-	-	$3.98 \times 10^{+01}$	-	$4.28 \times 10^{+01}$
BENZENE	4.13×10^{-04}	6.34×10^{-02}	-	1.53×10^{-01}	3.72	1.42	1.49×10^{-05}	-	$2.55 \times 10^{+01}$	4.24×10^{-01}	$3.13 \times 10^{+01}$
CARBON MONOXIDE	-	9.02	-	$1.22 \times 10^{+01}$	$1.72 \times 10^{+03}$	$3.52 \times 10^{+02}$	3.48×10^{-01}	-	$1.54 \times 10^{+03}$	-	$3.64 \times 10^{+03}$
FORMALDEHYDE	1.08×10^{-01}	1.51×10^{-01}	-	3.06×10^{-01}	1.32	1.30	2.29×10^{-03}	-	$4.29 \times 10^{+01}$	-	$4.61 \times 10^{+01}$
ISOMERS OF XYLENE	$1.80 \times 10^{+01}$	2.15×10^{-02}	3.35	-	$2.20 \times 10^{+01}$	4.38	7.57×10^{-06}	-	3.96	$5.31 \times 10^{+01}$	$1.05 \times 10^{+02}$
LEAD AND COMPOUNDS	-	2.60×10^{-04}	-	1.54×10^{-04}	2.33×10^{-03}	5.00×10^{-04}	1.05×10^{-04}	-	2.80×10^{-03}	-	6.15×10^{-03}
OXIDES OF NITROGEN	-	2.75	-	$2.87 \times 10^{+01}$	7.34	8.38	1.25	-	$1.99 \times 10^{+01}$	-	$6.83 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	-	4.81×10^{-01}	-	2.29	$1.04 \times 10^{+01}$	4.79	2.78×10^{-02}	-	$2.56 \times 10^{+02}$	-	$2.74 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	2.68×10^{-01}	-	2.29	9.57	4.45	6.96×10^{-03}	-	$2.48 \times 10^{+02}$	-	$2.65 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	4.03	4.81×10^{-03}	-	2.01×10^{-04}	6.22×10^{-01}	2.44×10^{-01}	8.12×10^{-05}	-	3.82	-	8.72
SULFUR DIOXIDE	-	1.56×10^{-01}	-	1.83×10^{-01}	6.24×10^{-01}	2.93×10^{-01}	4.94×10^{-01}	-	4.01	-	5.76
TETRACHLOROETHYLENE	2.47	1.99×10^{-04}	-	-	1.84×10^{-01}	3.46×10^{-02}	-	-	6.55×10^{-02}	-	2.75
TOLUENE	$3.75 \times 10^{+01}$	3.75×10^{-02}	-	7.64×10^{-02}	$2.03 \times 10^{+01}$	4.12	4.31×10^{-04}	-	8.16	$9.14 \times 10^{+01}$	$1.62 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	5.07×10^{-01}	-	2.29	$1.09 \times 10^{+01}$	5.05	2.93×10^{-02}	-	$2.69 \times 10^{+02}$	-	$2.88 \times 10^{+02}$
TOTAL VOCS	$9.89 \times 10^{+02}$	2.00	$8.49 \times 10^{+01}$	1.68	$2.25 \times 10^{+02}$	$5.13 \times 10^{+01}$	4.96×10^{-02}	$7.97 \times 10^{+01}$	$5.25 \times 10^{+02}$	$6.60 \times 10^{+02}$	$2.62 \times 10^{+03}$
TRICHLOROETHYLENE	4.24×10^{-02}	1.22×10^{-04}	-	-	1.13×10^{-01}	2.12×10^{-02}	-	-	4.02×10^{-02}	-	2.17×10^{-01}

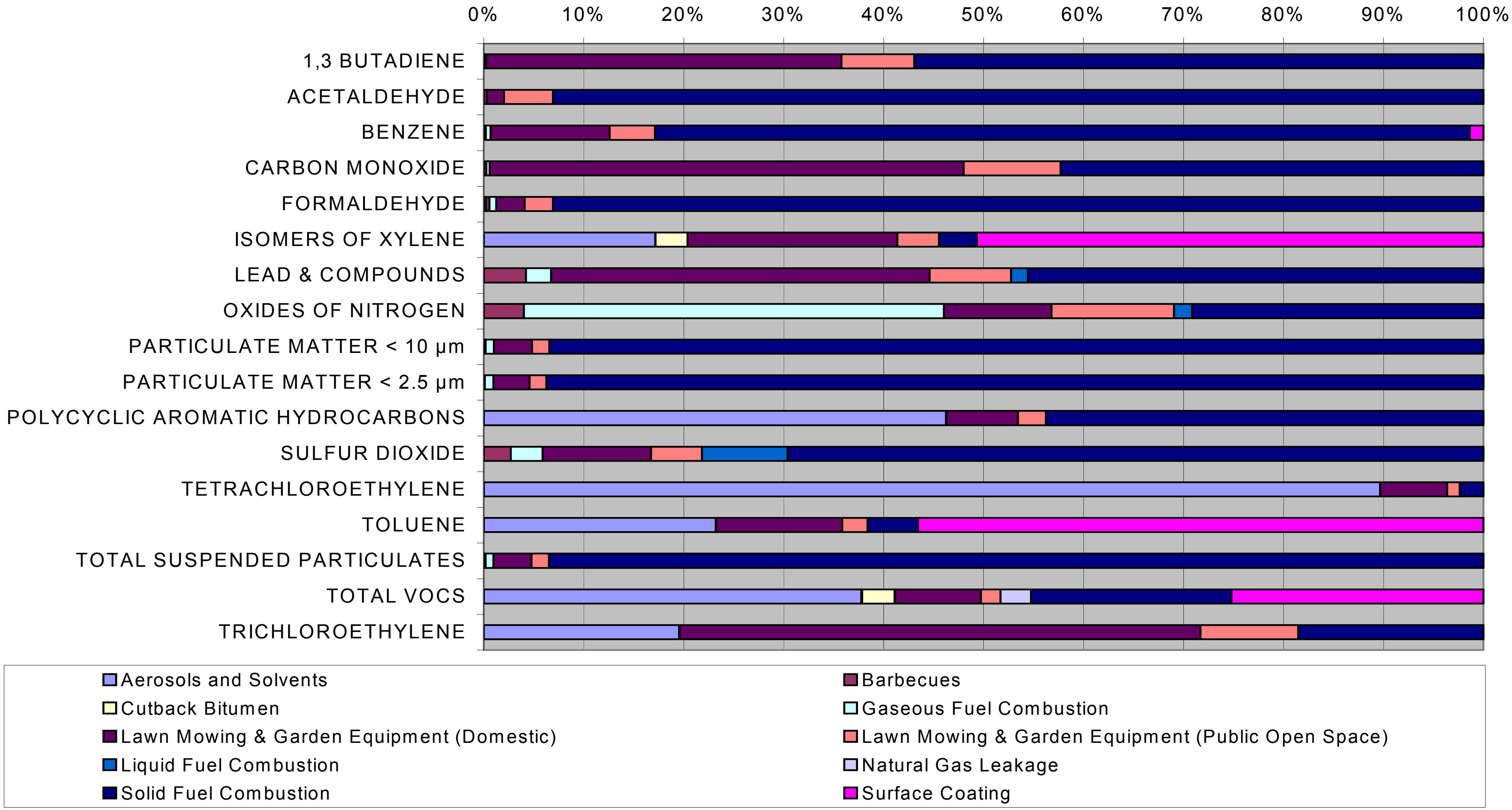

Figure 4.9: Proportion of total estimated annual emissions by domestic-commercial source type in the Wollongong region

Table 4.10: Total estimated annual emissions by domestic-commercial source type in the Non-Urban region

Substance	Emissions (tonnes/year)										
	Aerosols and Solvents	Barbecues	Cutback Bitumen	Gaseous Fuel Combustion	Lawn Mowing & Garden Equipment (Domestic)	Lawn Mowing & Garden Equipment (Public Open Space)	Liquid Fuel Combustion	Natural Gas Leakage	Solid Fuel Combustion	Surface Coating	Domestic-Commercial Total
1,3 BUTADIENE	-	1.80×10^{-02}	-	-	2.80	1.22	-	-	4.49	-	8.53
ACETALDEHYDE	-	4.43×10^{-01}	-	-	2.50	$1.54 \times 10^{+01}$	-	-	$1.37 \times 10^{+02}$	-	$1.55 \times 10^{+02}$
BENZENE	1.35×10^{-03}	2.13×10^{-01}	-	5.00×10^{-01}	$1.28 \times 10^{+01}$	$1.04 \times 10^{+01}$	4.87×10^{-05}	-	$8.78 \times 10^{+01}$	1.42	$1.13 \times 10^{+02}$
CARBON MONOXIDE	-	$3.03 \times 10^{+01}$	-	$4.00 \times 10^{+01}$	$5.94 \times 10^{+03}$	$2.57 \times 10^{+03}$	1.14	-	$5.29 \times 10^{+03}$	-	$1.39 \times 10^{+04}$
FORMALDEHYDE	3.53×10^{-01}	5.08×10^{-01}	-	1.00	4.54	9.51	7.50×10^{-03}	-	$1.48 \times 10^{+02}$	-	$1.63 \times 10^{+02}$
ISOMERS OF XYLENE	$5.88 \times 10^{+01}$	7.23×10^{-02}	$1.27 \times 10^{+01}$	-	$7.56 \times 10^{+01}$	$3.20 \times 10^{+01}$	2.48×10^{-05}	-	$1.36 \times 10^{+01}$	$1.78 \times 10^{+02}$	$3.71 \times 10^{+02}$
LEAD AND COMPOUNDS	-	8.71×10^{-04}	-	5.05×10^{-04}	8.02×10^{-03}	3.65×10^{-03}	3.43×10^{-04}	-	9.65×10^{-03}	-	2.30×10^{-02}
OXIDES OF NITROGEN	-	9.23	-	$9.40 \times 10^{+01}$	$2.53 \times 10^{+01}$	$6.12 \times 10^{+01}$	4.10	-	$6.85 \times 10^{+01}$	-	$2.62 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	-	1.62	-	7.50	$3.58 \times 10^{+01}$	$3.50 \times 10^{+01}$	9.11×10^{-02}	-	$8.81 \times 10^{+02}$	-	$9.61 \times 10^{+02}$
PARTICULATE MATTER < 2.5 µm	-	9.01×10^{-01}	-	7.50	$3.29 \times 10^{+01}$	$3.25 \times 10^{+01}$	2.28×10^{-02}	-	$8.55 \times 10^{+02}$	-	$9.29 \times 10^{+02}$
POLCYCLIC AROMATIC HYDROCARBONS	$1.32 \times 10^{+01}$	1.61×10^{-02}	-	6.57×10^{-04}	2.14	1.79	2.66×10^{-04}	-	$1.31 \times 10^{+01}$	-	$3.03 \times 10^{+01}$
SULFUR DIOXIDE	-	5.23×10^{-01}	-	6.00×10^{-01}	2.15	2.14	1.62	-	$1.38 \times 10^{+01}$	-	$2.08 \times 10^{+01}$
TETRACHLOROETHYLENE	8.08	6.68×10^{-04}	-	-	6.34×10^{-01}	2.53×10^{-01}	-	-	2.25×10^{-01}	-	9.19
TOLUENE	$1.23 \times 10^{+02}$	1.26×10^{-01}	-	2.50×10^{-01}	$7.00 \times 10^{+01}$	$3.01 \times 10^{+01}$	1.41×10^{-03}	-	$2.81 \times 10^{+01}$	$3.07 \times 10^{+02}$	$5.58 \times 10^{+02}$
TOTAL SUSPENDED PARTICULATES	-	1.70	-	7.50	$3.77 \times 10^{+01}$	$3.69 \times 10^{+01}$	9.59×10^{-02}	-	$9.28 \times 10^{+02}$	-	$1.01 \times 10^{+03}$
TOTAL VOCS	$3.24 \times 10^{+03}$	6.72	$3.21 \times 10^{+02}$	5.51	$7.74 \times 10^{+02}$	$3.75 \times 10^{+02}$	1.62×10^{-01}	$2.31 \times 10^{+02}$	$1.81 \times 10^{+03}$	$2.21 \times 10^{+03}$	$8.97 \times 10^{+03}$
TRICHLOROETHYLENE	1.39×10^{-01}	4.08×10^{-04}	-	-	3.89×10^{-01}	1.55×10^{-01}	-	-	1.38×10^{-01}	-	8.22×10^{-01}

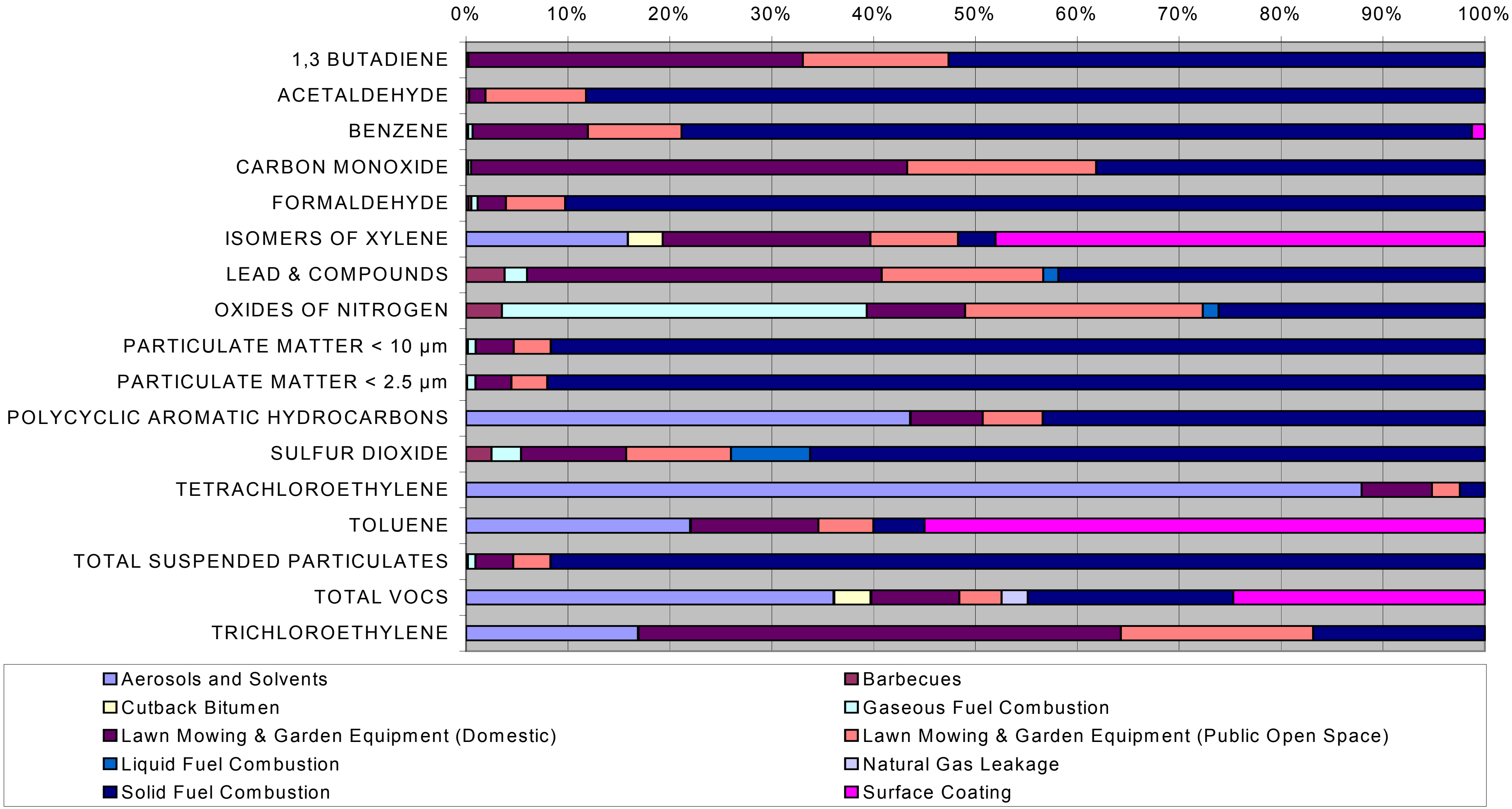

Figure 4.10: Proportion of total estimated annual emissions by domestic-commercial source type in the Non-Urban region

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Appendix A: Domestic Survey Questionnaire Form

Why a Domestic Survey
The domestic survey is the most accurate way to obtain information on activities affecting air emissions carried out by people at home.

What's covered in the survey
This survey will cover the usage of garden equipment, watercraft, and domestic fuel burning.

Confidentiality
The study team will not release any information you provide in a way which would enable an individual's or household's data to be identified.

Help Available
If you need help completing this form, you can contact the project team via email at AEI_Project_O2@environment.nsw.gov.au or by telephone on (02) 92125983.

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☐☐☐☐☐☐☐

NSW Department of Environment and Conservation

Air Emission Inventory For The Greater Metropolitan Region In NSW
Domestic Survey

The NSW Department of Environment and Conservation (DEC) seeks to collect some information from your household anonymously to assist us in developing means to improve the air quality in the NSW Greater Metropolitan Region. The focus of this survey is to establish the usage pattern for garden equipment, watercraft, and domestic fuel burning.

Telephone number listings have been used to generate a list of survey subjects at random in the Sydney, Newcastle and Wollongong areas. The survey takes about 15 minutes to complete and can be returned in the reply paid envelope supplied. Information collected is strictly confidential and will not be used in a manner that allows individual or household data to be identified. We appreciate your participation in this study.

If you would like more information about the study, you can contact the DEC Project Manager, Mr Nick Agapides on (02) 99956047 or email the project team at AEI_Project_DEC@environment.nsw.gov.au. You can also obtain more information about this study from the attached Fact Sheet or the DEC website at
http://www.environment.nsw.gov.au/decwhatsnewarchive/aeiproject.htm

What you need to do
- Use this form to record, to your best knowledge, details of the identified activities that take place at your home, or the usage of watercraft on waterways.
- Return the completed form in the supplied reply paid envelope.

How to answer
- Please use a black or blue pen.
- Please use block letters
- If you do not know how to answer, give the best answer you can.

1 Dwelling Description

Post code: ☐☐☐☐

Number of people in the household: ☐☐

Type of dwelling
- ☐ Separate house
- ☐ Semi detached, row or terrace houses and townhouses
- ☐ Flats, units or apartments
- ☐ Other dwellings. Please specify.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

2 Garden Equipment

This section is about the usage pattern of domestic garden equipment at your home. Please provide information in the appropriate space about the ownership and usage of garden equipment in your household, to the best of your knowledge. If you are unsure about a response, leave the space blank or write "not sure". If you use a lawn service or gardener to mow your lawn, please complete section 2a.

Product type	**1. Push Lawnmower**	**2. Ride-on Lawnmower**	**3. Brush-Cutter**	**4. Hedge Trimmers**	**5. Edgers**	**6. Chippers/ Mulchers**
Number of units owned *(E.g. 1)*						
Fuel type *(E.g. unleaded petrol, lead replacement petrol, petrol/oil mix or electricity)*						
Engine type *(2 stroke, 4 stroke, electric, injected or carburetted)*						
Average operating time in Spring *(Sep-Nov) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Summer *(Dec-Feb) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Autumn *(Mar-May) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Winter *(Jun-Aug) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Main operating time *(E.g. weekdays/weekends)*						
How old is this device? *(E.g. 2 years old)*						

(continue on next page)

(continued from previous page)

Product type	7. Compactors	8. High-pressure Cleaners	9. Blower	10. Chainsaw	11. Vacuums	12. Other (provide details) ________
Number of units owned *(E.g. 1)*						
Fuel type *(E.g. unleaded petrol, lead replacement petrol, petrol/oil mix or electricity)*						
Engine type *(2 stroke, 4 stroke, electric, injected or carburetted)*						
Average operating time in Spring *(Sep-Nov) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Summer *(Dec-Feb)(E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Autumn *(Mar-May) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Average operating time in Winter *(Jun-Aug) (E.g. 30 minutes each time)*						
Average operating frequency *(E.g. weekly, fortnightly, monthly)*						
Main operating time *(E.g. weekdays/weekends)*						
How old is this device? *(E.g. 2 years old)*						

2a Lawn Mowing Contractor

Please complete this section if you have someone (e.g. a gardener) mow your lawn for you.
(tick appropriate boxes)

i) How often does the person mow the lawn in spring? ☐ weekly ☐ fortnightly ☐ monthly ☐ never

ii) How often does the person mow the lawn in summer? ☐ weekly ☐ fortnightly ☐ monthly ☐ never

iii) How often does the person mow the lawn in autumn? ☐ weekly ☐ fortnightly ☐ monthly ☐ never

iv) How often does the person mow the lawn in winter? ☐ weekly ☐ fortnightly ☐ monthly ☐ never

v) How long (estimate) does it take to mow your lawn? ☐ 10 min ☐ 30 min ☐ 1 hr ☐ 2 hr ☐ 4 hr
☐ Other ____________________

vi) What other types of equipment does the person use? ☐ Push mower ☐ Ride-on lawn mower
☐ Edge trimmer
☐ Other ____________________

3 Solid Fuel (Wood or Coal)

Please complete this section if you have a combustion heater (using wood or coal), including slow combustion heater, air recirculation heater, potbelly stove, and open fireplace.

3a. What type of wood/coal heating do you have? *(if you have more than one wood heater, please select the main heating source)*	☐ Slow Combustion heater (With Australian Standard compliance plate) ☐ Slow Combustion heater (Without Australian Standard compliance plate) ☐ Air Recirculation heater ☐ Potbelly stove, Conventional heater (enclosed and control burn time by limiting the amount of air that can be used for combustion) ☐ Open fireplace (typically masonry and built into the wall structure)
3b. Which months do you use wood/coal for heating?	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
3c. How many times a week do you use wood/coal heating?	☐ Most days ☐ 4-5 times a weeks ☐ 2-3 times a week ☐ About once a week ☐ Less than once a week ☐ Week days ☐ Weekend days only
3d. When do you use wood/coal heating?	☐ Night time only ☐ Day and night
3e. How much firewood/coal do you typically use in a full year?	(Approximate in tons, trailer loads, or cubic metres) ________ tonnes ________ trailer loads (of approximately 2 m^3 each) ________ cubic metres
3f. Where do you get your firewood or coal?	☐ From a wood/coal merchant ☐ Collect from woodland ☐ From a service station or market ☐ Other ________
3g. What type of fuel do you normally use?	☐ Hard wood (e.g. eucalypt) ☐ Coal ☐ Softwood (e.g. pine)
3h. How old is this appliance?	☐ The heater was installed prior to 1996 ☐ The heater was Installed during or after 1996 This heater is approximately ________ years old. (Estimate if unsure)

4 Liquid Fuel Heating – Fuel Oil, Kerosene

Please complete this section if you use liquid fuel (fuel oil or kerosene) for heating at your home.

4a. Do you use fuel oil or kerosene, or any other liquid fuels for heating in your home?	☐ No. (Go to Section 5) ☐ Yes, fuel oil. ☐ Yes, kerosene ☐ Yes, other. (provide details) ________.
4b. How much fuel oil/kerosene was used last year? (number of litres)	
4c. Which months do you use fuel oil/kerosene for heating?	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
4d. How many times a week do you use fuel oil/kerosene heating?	☐ Most days ☐ 4-5 times a weeks ☐ 2-3 times a week ☐ About once a week ☐ Less than once a week
4e. When do you use fuel oil/kerosene heating?	☐ Night time only ☐ Day and night

5 Natural Gas Usage

Please complete this section if you have a natural gas or town gas connection to your home.

5a. Do you have natural gas or town gas connection in your home?	☐ No. (Go to Section 6) ☐ Yes, natural gas.
5b. What do you use the gas connection for	☐ Heating ☐ Cooking ☐ Hot water
5c. How much did you pay for gas usage for Summer quarter?	
5d. How much did you pay for gas usage for Winter quarter?	
5d. How much did you pay for gas usage for Spring and Autumn quarter?	

6 Cooking Appliances: Barbecues, Portable (camping) Stoves

Please complete this section if you use a barbecue or a portable stove outdoors at your home.

6a What type of appliance do you have?

☐ Barbecue (natural gas with piped connection)	☐ Barbecue (LPG)	☐ Barbecue (Briquettes)	☐ Barbecue (wood)
☐ Stove – (natural gas with piped connection)	☐ Portable stove (butane cartridge)		

Skip to section 7 if you use only electric barbecues or stoves at home.

6b Fuel usage pattern

Appliance	**Stove**	**Barbecue (gas fuel)**	**Barbecue (solid fuel)**	**Portable stove (gas fuel)**
Number of units owned? (*E.g. 1*)				
Average operating time in Spring (Sep-Nov) *(E.g. 60 minutes each time)*				
Average operating frequency (daily, weekly, fortnightly, monthly)				
Average operating time in Summer (Dec-Feb) *(E.g. 60 minutes each time)*				
Average operating frequency (daily, weekly, fortnightly, monthly)				

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Average operating time in Autumn (Mar-May) *(E.g. 60 minutes each time)*				
Average operating frequency (daily, weekly, fortnightly, monthly)				
Average operating time in Winter (Jun-Aug) *(E.g. 60 minutes each time)*				
Average operating frequency (daily, weekly, fortnightly, monthly)				
Main operating time (week days/weekends)				
How old is this device?				

7 Watercraft

Answer this section if you own a watercraft with motor (e.g. boat with inboard motor, sail boat with outboard motor, jet ski, etc.).

Watercraft 1 (*If you own more than one type, use Watercraft 2 on the next page for the second one*)

7a. What type of watercraft do you have?	☐ Dinghy with outboard motor ☐ Boat with outboard motor ☐ Boat with inboard motor ☐ Jet ski	
7b. What type of fuel does it use?	☐ Lead replacement Petrol ☐ Unleaded Petrol ☐ Diesel	
7c. What is the capacity of the engine? (*in cc or horsepower*)		
7d. What is type of engine is it? *(e.g. 2 stroke carburettor, 2 stroke injected, 4 stroke carburettor or 4 stroke injected.)*		
7d. How old is the engine?		
7e. Where do you normally use this watercraft?	☐ Port Stevens ☐ Lake Macquarie ☐ Broken Bay ☐ Port Jackson ☐ Nepean River ☐ Port Hacking ☐ Other River	☐ Hunter River ☐ Tuggerah Lake ☐ Hawkesbury River ☐ Parramatta River ☐ Botany Bay ☐ Lake Illawarra ☐ Open Ocean
7f. Which months do you use the watercraft?	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec	

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7g. In the months that you indicated, how often do you use the watercraft?	☐ Most days ☐ 2-3 times a weeks ☐ About once a week ☐ Less than once a month
7h. How long do you normally operate the engine on the days when you use the watercraft	☐ Less than 1hour ☐ 1-3 hours ☐ 3-6 hours ☐ Longer than 6 hours

Watercraft 2 (*If you have more than 2 watercraft, please contact the project team for additional forms, or to provide survey answers over the phone*)

7i. What type of watercraft do you have?	☐ Dinghy with outboard motor ☐ Boat with outboard motor ☐ Boat with inboard motor ☐ Jet ski
7j. What type of fuel does it use?	☐ Lead replacement Petrol ☐ Unleaded Petrol ☐ Diesel
7k. What is the capacity of the engine? (*in cc or horsepower*)	
7l. What is type of engine is it? (*e.g. 2 stroke carburettor, 2 stroke injected, 4 stroke carburettor or 4 stroke injected.*)	
7m. How old is the engine?	
7n. Where do you normally use this watercraft?	☐ Port Stevens ☐ Hunter River ☐ Lake Macquarie ☐ Tuggerah Lake ☐ Broken Bay ☐ Hawkesbury River ☐ Port Jackson ☐ Parramatta River ☐ Nepean River ☐ Botany Bay ☐ Port Hacking ☐ Lake Illawarra ☐ Other River ☐ Open Ocean
7o. Which months do you use the watercraft?	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
7p. In the months that you indicated, how often do you use the watercraft?	☐ Most days ☐ 2-3 times a weeks ☐ About once a week ☐ Less than once a month
7q. How long do you normally operate the engine on the days when you use the watercraft?	☐ Less than 1hour ☐ 1-3 hours ☐ 3-6 hours ☐ Longer than 6 hours

8 Follow Up

May we contact you to clarify your survey response? Yes/No. If yes, the contact person is: ________________

Contact Number: ____________________________ Preferred contact time: ________________________________

Thank you for completing this form. DEC Project Team

Appendix B: Estimated Annual Emissions of all Substances from Domestic-Commercial Sources

Table B1.1: Annual Emissions from Aerosols and Solvents

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
(1S)-(-)-ALPHA-PINENE	1.00	6.59×10^{-02}	4.79×10^{-02}	1.57×10^{-01}	1.27
(ACETATO)PHENYL MERCURY	1.00	6.60×10^{-02}	4.80×10^{-02}	1.57×10^{-01}	1.27
1,1,1-TRICHLOROETHANE	$7.06 \times 10^{+02}$	$4.65 \times 10^{+01}$	$3.38 \times 10^{+01}$	$1.11 \times 10^{+02}$	$8.97 \times 10^{+02}$
1,2,4-TRIMETHYLBENZENE	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
1,2-EPOXYBUTANE	1.43×10^{-01}	9.45×10^{-03}	6.87×10^{-03}	2.25×10^{-02}	1.82×10^{-01}
1,3-DICHLOROBENZENE	$2.91 \times 10^{+02}$	$1.92 \times 10^{+01}$	$1.40 \times 10^{+01}$	$4.57 \times 10^{+01}$	$3.70 \times 10^{+02}$
1,4-DIOXANE	1.99×10^{-02}	1.31×10^{-03}	9.51×10^{-04}	3.11×10^{-03}	2.52×10^{-02}
1-METHOXY-2-PROPANOL	$1.61 \times 10^{+01}$	1.06	7.70×10^{-01}	2.52	$2.04 \times 10^{+01}$
2,2,4-TRIMETHYL-1,3-PENTANEDIOL ISOBUTYRATE	2.34	1.54×10^{-01}	1.12×10^{-01}	3.66×10^{-01}	2.97
2,6-DIMETHYL-4-HEPTANONE	6.67×10^{-01}	4.40×10^{-02}	3.20×10^{-02}	1.05×10^{-01}	8.48×10^{-01}
2-ETHYL HEXANOL	4.78	3.15×10^{-01}	2.29×10^{-01}	7.49×10^{-01}	6.07
2-METHYL NAPHTHALENE	1.43×10^{-01}	9.45×10^{-03}	6.87×10^{-03}	2.25×10^{-02}	1.82×10^{-01}
2-METHYLHEXANE	1.86	1.23×10^{-01}	8.93×10^{-02}	2.92×10^{-01}	2.37
2-METHYLPENTANE	2.15	1.42×10^{-01}	1.03×10^{-01}	3.38×10^{-01}	2.74
2-NITROPROPANE	3.86×10^{-03}	2.54×10^{-04}	1.85×10^{-04}	6.05×10^{-04}	4.91×10^{-03}
2-PENTANONE	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
2-PROPOXYETHANOL	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
3-METHYLHEXANE	2.29	1.51×10^{-01}	1.10×10^{-01}	3.60×10^{-01}	2.92
4-METHYL-2-PENTANOL	1.88	1.24×10^{-01}	9.01×10^{-02}	2.95×10^{-01}	2.39
ACENAPHTHENE	1.43×10^{-01}	9.45×10^{-03}	6.87×10^{-03}	2.25×10^{-02}	1.82×10^{-01}
ACETAMIDE	2.51×10^{-04}	1.66×10^{-05}	1.20×10^{-05}	3.94×10^{-05}	3.19×10^{-04}
ACETIC ACID	$1.18 \times 10^{+01}$	7.77×10^{-01}	5.65×10^{-01}	1.85	$1.50 \times 10^{+01}$
ACETONE	$1.02 \times 10^{+03}$	$6.71 \times 10^{+01}$	$4.88 \times 10^{+01}$	$1.60 \times 10^{+02}$	$1.29 \times 10^{+03}$
ACETOPHENONE	1.55×10^{-02}	1.02×10^{-03}	7.45×10^{-04}	2.44×10^{-03}	1.98×10^{-02}
ACRYLIC ACID	7.18×10^{-06}	4.73×10^{-07}	3.44×10^{-07}	1.13×10^{-06}	9.12×10^{-06}
ALIPHATICS	$3.73 \times 10^{+02}$	$2.46 \times 10^{+01}$	$1.79 \times 10^{+01}$	$5.85 \times 10^{+01}$	$4.74 \times 10^{+02}$
AMYL ACETATE	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
AROMATIC 100	$6.03 \times 10^{+02}$	$3.97 \times 10^{+01}$	$2.89 \times 10^{+01}$	$9.45 \times 10^{+01}$	$7.66 \times 10^{+02}$
BENZENE	8.62×10^{-03}	5.68×10^{-04}	4.13×10^{-04}	1.35×10^{-03}	1.09×10^{-02}
BENZYL ALCOHOL	5.71	3.76×10^{-01}	2.73×10^{-01}	8.95×10^{-01}	7.25
BENZYLAMINE HYDROCHLORIDE	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
BIPHENYLOL	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
BUTOXY PROPANOL	9.14×10^{-01}	6.02×10^{-02}	4.38×10^{-02}	1.43×10^{-01}	1.16
BUTYL	1.33	8.79×10^{-02}	6.39×10^{-02}	2.09×10^{-01}	1.69
BUTYL CARBITOL	1.11	7.33×10^{-02}	5.33×10^{-02}	1.75×10^{-01}	1.41
BUTYL CELLOSOLVE	$2.22 \times 10^{+02}$	$1.47 \times 10^{+01}$	$1.07 \times 10^{+01}$	$3.49 \times 10^{+01}$	$2.83 \times 10^{+02}$
C10 PARAFFINS	2.34	1.54×10^{-01}	1.12×10^{-01}	3.66×10^{-01}	2.97
CAMPHOR	1.44	9.46×10^{-02}	6.88×10^{-02}	2.25×10^{-01}	1.82
CARBARYL	2.05	1.35×10^{-01}	9.80×10^{-02}	3.21×10^{-01}	2.60

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CARBITOL	7.70	5.07×10^{-01}	3.69×10^{-01}	1.21	9.79
CARBON TETRACHLORIDE	7.45×10^{-07}	4.91×10^{-08}	3.57×10^{-08}	1.17×10^{-07}	9.47×10^{-07}
CELLOSOLVE	2.00	1.32×10^{-01}	9.59×10^{-02}	3.14×10^{-01}	2.54
CELLOSOLVE ACETATE	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
CHLOROBENZENE	$1.30 \times 10^{+02}$	8.59	6.25	$2.05 \times 10^{+01}$	$1.66 \times 10^{+02}$
CHLOROFORM	1.80	1.19×10^{-01}	8.65×10^{-02}	2.83×10^{-01}	2.29
CHLOROPICRIN	$4.23 \times 10^{+01}$	2.79	2.03	6.63	$5.37 \times 10^{+01}$
CHLOROTOLUENE	$2.60 \times 10^{+02}$	$1.72 \times 10^{+01}$	$1.25 \times 10^{+01}$	$4.08 \times 10^{+01}$	$3.31 \times 10^{+02}$
CIS-1,3-DICHLOROPROPYLENE	$2.78 \times 10^{+02}$	$1.83 \times 10^{+01}$	$1.33 \times 10^{+01}$	$4.36 \times 10^{+01}$	$3.54 \times 10^{+02}$
COAL TAR	3.50	2.31×10^{-01}	1.68×10^{-01}	5.49×10^{-01}	4.45
COPPER NAPHTHENATE	2.05	1.35×10^{-01}	9.80×10^{-02}	3.21×10^{-01}	2.60
CORN OIL	3.47×10^{-02}	2.28×10^{-03}	1.66×10^{-03}	5.44×10^{-03}	4.41×10^{-02}
CREOSOTE	$2.46 \times 10^{+01}$	1.62	1.18	3.85	$3.12 \times 10^{+01}$
CYCLOHEXANE	2.34	1.54×10^{-01}	1.12×10^{-01}	3.67×10^{-01}	2.98
CYCLOHEXANONE	$3.84 \times 10^{+01}$	2.53	1.84	6.02	$4.88 \times 10^{+01}$
DIACETONE ALCOHOL	2.29	1.51×10^{-01}	1.10×10^{-01}	3.60×10^{-01}	2.91
DIAZINON	4.78	3.15×10^{-01}	2.29×10^{-01}	7.49×10^{-01}	6.07
DIBENZOFURANS	1.47×10^{-02}	9.68×10^{-04}	7.04×10^{-04}	2.30×10^{-03}	1.87×10^{-02}
DIETHANOLAMINE	4.31×10^{-01}	2.84×10^{-02}	2.06×10^{-02}	6.76×10^{-02}	5.47×10^{-01}
DIETHYLENE GLYCOL	$1.54 \times 10^{+02}$	$1.02 \times 10^{+01}$	7.38	$2.42 \times 10^{+01}$	$1.96 \times 10^{+02}$
DIMETHYL FORMAMIDE	6.34×10^{-02}	4.17×10^{-03}	3.04×10^{-03}	9.93×10^{-03}	8.05×10^{-02}
DIMETHYLAMINE	$4.91 \times 10^{+01}$	3.24	2.35	7.70	$6.24 \times 10^{+01}$
DIMETHYLCARBAMODITHIOIC ACID, POTASSIUM SALT	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
DIMETHYLETHER	$4.54 \times 10^{+01}$	2.99	2.17	7.11	$5.76 \times 10^{+01}$
D-LIMONENE	$6.89 \times 10^{+01}$	4.54	3.30	$1.08 \times 10^{+01}$	$8.75 \times 10^{+01}$
ETHANOLAMINE	$1.55 \times 10^{+01}$	1.02	7.42×10^{-01}	2.43	$1.97 \times 10^{+01}$
ETHYL ACETATE	$6.62 \times 10^{+01}$	4.36	3.17	$1.04 \times 10^{+01}$	$8.41 \times 10^{+01}$
ETHYL ALCOHOL	$5.59 \times 10^{+03}$	$3.68 \times 10^{+02}$	$2.68 \times 10^{+02}$	$8.76 \times 10^{+02}$	$7.10 \times 10^{+03}$
ETHYL ETHER	$4.81 \times 10^{+01}$	3.17	2.30	7.54	$6.11 \times 10^{+01}$
ETHYL-3-ETHOXYPROPIONATE	9.34	6.16×10^{-01}	4.48×10^{-01}	1.47	$1.19 \times 10^{+01}$
ETHYLBENZENE	3.78	2.49×10^{-01}	1.81×10^{-01}	5.93×10^{-01}	4.81
ETHYLENE	5.46	3.60×10^{-01}	2.61×10^{-01}	8.56×10^{-01}	6.93
ETHYLENE GLYCOL	$7.36 \times 10^{+01}$	4.85	3.53	$1.15 \times 10^{+01}$	$9.35 \times 10^{+01}$
ETHYLENE OXIDE	$2.75 \times 10^{+01}$	1.81	1.32	4.31	$3.49 \times 10^{+01}$
FORMALDEHYDE	2.25	1.49×10^{-01}	1.08×10^{-01}	3.53×10^{-01}	2.86
FORMIC ACID	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
FREON	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
FURFURYL ALCOHOL	2.87×10^{-01}	1.89×10^{-02}	1.37×10^{-02}	4.50×10^{-02}	3.64×10^{-01}
GAMMA-BUTYROLACTONE	2.00	1.32×10^{-01}	9.59×10^{-02}	3.14×10^{-01}	2.54
GLUTARALDEHYDE	$2.05 \times 10^{+01}$	1.35	9.80×10^{-01}	3.21	$2.60 \times 10^{+01}$
HEXACHLOROETHANE	3.16	2.08×10^{-01}	1.51×10^{-01}	4.95×10^{-01}	4.01
HYDROCHLORIC ACID	3.19×10^{-03}	2.10×10^{-04}	1.53×10^{-04}	4.99×10^{-04}	4.05×10^{-03}
HYDROGEN FLUORIDE	2.58×10^{-02}	1.70×10^{-03}	1.24×10^{-03}	4.05×10^{-03}	3.28×10^{-02}
ISOBUTANE	$1.09 \times 10^{+03}$	$7.18 \times 10^{+01}$	$5.22 \times 10^{+01}$	$1.71 \times 10^{+02}$	$1.39 \times 10^{+03}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOBUTYL ACETATE	$1.06 \times 10^{+01}$	6.99×10^{-01}	5.08×10^{-01}	1.66	$1.35 \times 10^{+01}$
ISOBUTYL ALCOHOL	7.02×10^{-01}	4.63×10^{-02}	3.36×10^{-02}	1.10×10^{-01}	8.92×10^{-01}
ISOMERS OF XYLENE	$3.75 \times 10^{+02}$	$2.47 \times 10^{+01}$	$1.80 \times 10^{+01}$	$5.88 \times 10^{+01}$	$4.77 \times 10^{+02}$
ISOPHORONE	1.72	1.14×10^{-01}	8.26×10^{-02}	2.70×10^{-01}	2.19
ISOPROPYL ACETATE	4.63	3.05×10^{-01}	2.22×10^{-01}	7.25×10^{-01}	5.88
ISOPROPYL ALCOHOL	$1.16 \times 10^{+03}$	$7.61 \times 10^{+01}$	$5.54 \times 10^{+01}$	$1.81 \times 10^{+02}$	$1.47 \times 10^{+03}$
KEROSENE/DIESEL/FUEL OIL	$4.97 \times 10^{+02}$	$3.27 \times 10^{+01}$	$2.38 \times 10^{+01}$	$7.79 \times 10^{+01}$	$6.31 \times 10^{+02}$
LACTOL SPIRITS	4.10	2.70×10^{-01}	1.97×10^{-01}	6.44×10^{-01}	5.22
MALATHION	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
METHOXYPROPANOL	1.73×10^{-02}	1.14×10^{-03}	8.31×10^{-04}	2.72×10^{-03}	2.20×10^{-02}
METHOXYPROPANOL ACETATE	6.67×10^{-01}	4.40×10^{-02}	3.20×10^{-02}	1.05×10^{-01}	8.48×10^{-01}
METHYL ACETATE	6.01	3.96×10^{-01}	2.88×10^{-01}	9.42×10^{-01}	7.63
METHYL ALCOHOL	$1.27 \times 10^{+03}$	$8.36 \times 10^{+01}$	$6.08 \times 10^{+01}$	$1.99 \times 10^{+02}$	$1.61 \times 10^{+03}$
METHYL AMYL KETONE	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
METHYL BROMIDE	$4.04 \times 10^{+02}$	$2.66 \times 10^{+01}$	$1.94 \times 10^{+01}$	$6.34 \times 10^{+01}$	$5.14 \times 10^{+02}$
METHYL CARBITOL	8.34	5.49×10^{-01}	3.99×10^{-01}	1.31	$1.06 \times 10^{+01}$
METHYL CELLOSOLVE	7.11	4.68×10^{-01}	3.40×10^{-01}	1.11	9.03
METHYL ETHYL KETONE	$9.21 \times 10^{+01}$	6.07	4.41	$1.44 \times 10^{+01}$	$1.17 \times 10^{+02}$
METHYL ISOAMYL KETONE	2.03	1.34×10^{-01}	9.73×10^{-02}	3.19×10^{-01}	2.58
METHYL ISOBUTYL KETONE	$1.38 \times 10^{+01}$	9.08×10^{-01}	6.60×10^{-01}	2.16	$1.75 \times 10^{+01}$
METHYL ISOTHIOCYANATE	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
METHYL SALICYLATE	2.80	1.85×10^{-01}	1.34×10^{-01}	4.39×10^{-01}	3.56
METHYLENE CHLORIDE	$6.63 \times 10^{+01}$	4.37	3.18	$1.04 \times 10^{+01}$	$8.43 \times 10^{+01}$
METHYLNAPHTHALENE	1.29	8.51×10^{-02}	6.19×10^{-02}	2.02×10^{-01}	1.64
METHYL-TERT- BUTYL ETHER	4.29×10^{-02}	2.82×10^{-03}	2.05×10^{-03}	6.72×10^{-03}	5.45×10^{-02}
MINERAL OIL	2.44	1.60×10^{-01}	1.17×10^{-01}	3.82×10^{-01}	3.09
MINERAL SPIRITS	$1.29 \times 10^{+03}$	$8.51 \times 10^{+01}$	$6.19 \times 10^{+01}$	$2.03 \times 10^{+02}$	$1.64 \times 10^{+03}$
MONOMETHYL ETHER DIPROPYLENE GLYCOL	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
MORPHOLINE	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
NAPHTHA	$1.39 \times 10^{+02}$	9.19	6.68	$2.19 \times 10^{+01}$	$1.77 \times 10^{+02}$
NAPHTHOL	9.93	6.54×10^{-01}	4.76×10^{-01}	1.56	$1.26 \times 10^{+01}$
NAPTHALENE	$8.40 \times 10^{+01}$	5.53	4.02	$1.32 \times 10^{+01}$	$1.07 \times 10^{+02}$
N-BUTANE	$2.07 \times 10^{+02}$	$1.36 \times 10^{+01}$	9.90	$3.24 \times 10^{+01}$	$2.63 \times 10^{+02}$
N-BUTYL ACETATE	$4.08 \times 10^{+01}$	2.69	1.95	6.39	$5.18 \times 10^{+01}$
N-BUTYL ALCOHOL	6.77	4.46×10^{-01}	3.24×10^{-01}	1.06	8.60
N-HEPTANE	$1.56 \times 10^{+02}$	$1.03 \times 10^{+01}$	7.46	$2.44 \times 10^{+01}$	$1.98 \times 10^{+02}$
N-HEXANE	$1.57 \times 10^{+02}$	$1.04 \times 10^{+01}$	7.53	$2.46 \times 10^{+01}$	$2.00 \times 10^{+02}$
N-HEXANOL	4.09	2.70×10^{-01}	1.96×10^{-01}	6.42×10^{-01}	5.20
NITROMETHANE	$2.05 \times 10^{+01}$	1.35	9.80×10^{-01}	3.21	$2.60 \times 10^{+01}$
N-PENTANE	1.58	1.04×10^{-01}	7.56×10^{-02}	2.47×10^{-01}	2.00
N-PROPYL ACETATE	6.67×10^{-01}	4.40×10^{-02}	3.20×10^{-02}	1.05×10^{-01}	8.48×10^{-01}
N-PROPYL ALCOHOL	4.53	2.99×10^{-01}	2.17×10^{-01}	7.11×10^{-01}	5.76
O-CHLOROTOLUENE	1.96	1.29×10^{-01}	9.39×10^{-02}	3.07×10^{-01}	2.49
O-DICHLOROBENZENE	8.48×10^{-03}	5.59×10^{-04}	4.06×10^{-04}	1.33×10^{-03}	1.08×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
OIL OF ORANGE	6.67	4.39×10^{-01}	3.20×10^{-01}	1.05	8.47
O-XYLENE	5.46	3.60×10^{-01}	2.61×10^{-01}	8.56×10^{-01}	6.93
PARAFFINS (C16-C34)	$5.04 \times 10^{+01}$	3.32	2.41	7.90	$6.40 \times 10^{+01}$
PARAFFINS/OLEFINS (C12-C16)	$3.55 \times 10^{+01}$	2.34	1.70	5.56	$4.51 \times 10^{+01}$
PARAFORMALDEHYDE	6.14	4.05×10^{-01}	2.94×10^{-01}	9.63×10^{-01}	7.80
P-DICHLOROBENZENE	$1.51 \times 10^{+02}$	9.98	7.26	$2.37 \times 10^{+01}$	$1.92 \times 10^{+02}$
PENTACHLORONITROBENZENE	6.82×10^{-01}	4.49×10^{-02}	3.27×10^{-02}	1.07×10^{-01}	8.67×10^{-01}
PEROXYACETIC ACID	2.05	1.35×10^{-01}	9.80×10^{-02}	3.21×10^{-01}	2.60
PETROLEUM ETHER	$1.97 \times 10^{+02}$	$1.30 \times 10^{+01}$	9.42	$3.08 \times 10^{+01}$	$2.50 \times 10^{+02}$
PINE OIL	$2.76 \times 10^{+02}$	$1.82 \times 10^{+01}$	$1.32 \times 10^{+01}$	$4.33 \times 10^{+01}$	$3.51 \times 10^{+02}$
POLYCYCLIC AROMATIC HYDROCARBONS	$8.41 \times 10^{+01}$	5.54	4.03	$1.32 \times 10^{+01}$	$1.07 \times 10^{+02}$
POLYETHYLENE GLYCOL	1.33	8.74×10^{-02}	6.36×10^{-02}	2.08×10^{-01}	1.69
PROPANE	$5.52 \times 10^{+02}$	$3.64 \times 10^{+01}$	$2.64 \times 10^{+01}$	$8.66 \times 10^{+01}$	$7.02 \times 10^{+02}$
PROPYLENE GLYCOL	1.81	1.19×10^{-01}	8.65×10^{-02}	2.83×10^{-01}	2.29
PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE	2.49	1.64×10^{-01}	1.19×10^{-01}	3.90×10^{-01}	3.16
PROPYLENE GLYCOL PHENYL ETHER	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
S-BUTYL ALCOHOL	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
SILICONE	1.40	9.23×10^{-02}	6.71×10^{-02}	2.20×10^{-01}	1.78
STODDARD SOLVENT	$7.04 \times 10^{+02}$	$4.64 \times 10^{+01}$	$3.37 \times 10^{+01}$	$1.10 \times 10^{+02}$	$8.94 \times 10^{+02}$
TENNECO 500-100	$6.69 \times 10^{+01}$	4.40	3.20	$1.05 \times 10^{+01}$	$8.49 \times 10^{+01}$
TERPENE ALCOHOL	3.34×10^{-01}	2.20×10^{-02}	1.60×10^{-02}	5.23×10^{-02}	4.24×10^{-01}
TETRACHLOROETHYLENE	$5.15 \times 10^{+01}$	3.39	2.47	8.08	$6.54 \times 10^{+01}$
TETRAETHYLENE GLYCOL	4.31×10^{-01}	2.84×10^{-02}	2.06×10^{-02}	6.76×10^{-02}	5.47×10^{-01}
TETRAHYDRO-2-FURANMETHANOL	4.42	2.91×10^{-01}	2.12×10^{-01}	6.93×10^{-01}	5.62
TETRAHYDROFURAN	$3.71 \times 10^{+01}$	2.45	1.78	5.82	$4.72 \times 10^{+01}$
TOLUENE	$7.83 \times 10^{+02}$	$5.16 \times 10^{+01}$	$3.75 \times 10^{+01}$	$1.23 \times 10^{+02}$	$9.95 \times 10^{+02}$
TOTAL VOCS	$2.06 \times 10^{+04}$	$1.36 \times 10^{+03}$	$9.89 \times 10^{+02}$	$3.24 \times 10^{+03}$	$2.62 \times 10^{+04}$
TRANS-1,3-DICHLOROPROPENE	$2.50 \times 10^{+02}$	$1.65 \times 10^{+01}$	$1.20 \times 10^{+01}$	$3.93 \times 10^{+01}$	$3.18 \times 10^{+02}$
TRICHLOROETHYLENE	8.84×10^{-01}	5.82×10^{-02}	4.24×10^{-02}	1.39×10^{-01}	1.12
TRIETHANOLAMINE	1.53	1.01×10^{-01}	7.31×10^{-02}	2.39×10^{-01}	1.94
TRIETHYLAMINE	6.37	4.20×10^{-01}	3.05×10^{-01}	9.99×10^{-01}	8.09
TRIETHYLENE GLYCOL MONOBUTYL ETHER	8.62×10^{-01}	5.68×10^{-02}	4.13×10^{-02}	1.35×10^{-01}	1.09
TRIETHYLENE TETRAMINE	1.43×10^{-01}	9.45×10^{-03}	6.87×10^{-03}	2.25×10^{-02}	1.82×10^{-01}
TRIMETHYLBENZENE	7.65×10^{-01}	5.04×10^{-02}	3.66×10^{-02}	1.20×10^{-01}	9.71×10^{-01}
TURPENTINE	$1.62 \times 10^{+01}$	1.06	7.74×10^{-01}	2.53	$2.05 \times 10^{+01}$
VINYL ACETATE	9.00×10^{-05}	5.93×10^{-06}	4.31×10^{-06}	1.41×10^{-05}	1.14×10^{-04}
WITCH HAZEL	$1.68 \times 10^{+01}$	1.11	8.05×10^{-01}	2.64	$2.14 \times 10^{+01}$
XYLENOL	3.06	2.01×10^{-01}	1.46×10^{-01}	4.79×10^{-01}	3.89

Table B1.2: Annual Emissions from Barbecues – Wood Combustion

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	2.42×10^{-03}	1.68×10^{-04}	1.22×10^{-04}	4.08×10^{-04}	3.11×10^{-03}
1,1,2-TRICHLOROETHANE	1.97×10^{-03}	1.37×10^{-04}	9.89×10^{-05}	3.32×10^{-04}	2.53×10^{-03}
1,2,4-TRIMETHYLBENZENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
1,3,5-TRIMETHYLBENZENE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
1,3-BUTADIENE	1.06×10^{-01}	7.39×10^{-03}	5.35×10^{-03}	1.80×10^{-02}	1.37×10^{-01}
1,4-BUTANEDIOL	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
1-BUTENE	2.76×10^{-01}	1.92×10^{-02}	1.39×10^{-02}	4.67×10^{-02}	3.56×10^{-01}
1-BUTYNE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
1-CHLOROBUTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
1-DECENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
1-HEXENE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
1-PENTENE	3.03×10^{-03}	2.11×10^{-04}	1.53×10^{-04}	5.12×10^{-04}	3.91×10^{-03}
2,2,4-TRIMETHYLPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2,2-DICHLORONITROANILINE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2,3-DIMETHYLBUTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2,4,4-TRIMETHYL-1-PENTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2,4-DIMETHYLHEXANE	3.37×10^{-04}	2.34×10^{-05}	1.70×10^{-05}	5.69×10^{-05}	4.34×10^{-04}
2,4-DIMETHYLPENTANE	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
2-BUTYNE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2-FURFURAL	2.08×10^{-03}	1.44×10^{-04}	1.05×10^{-04}	3.51×10^{-04}	2.68×10^{-03}
2-HEXENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2-METHYL-1-BUTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2-METHYL-2-PENTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
2-METHYL-3-HEXANONE	3.93×10^{-04}	2.73×10^{-05}	1.98×10^{-05}	6.64×10^{-05}	5.07×10^{-04}
2-METHYLPENTANE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
3-METHYLHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
3-METHYLPENTANE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
4-METHYLANILINE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
ACENAPHTHENE	1.29×10^{-03}	9.00×10^{-05}	6.51×10^{-05}	2.19×10^{-04}	1.67×10^{-03}
ACENAPHTHYLENE	2.74×10^{-02}	1.91×10^{-03}	1.38×10^{-03}	4.64×10^{-03}	3.54×10^{-02}
ACETALDEHYDE	2.62	1.82×10^{-01}	1.32×10^{-01}	4.42×10^{-01}	3.38
ACETIC ACID	4.10×10^{-03}	2.85×10^{-04}	2.06×10^{-04}	6.93×10^{-04}	5.29×10^{-03}
ACETIC ANHYDRIDE	1.97×10^{-03}	1.37×10^{-04}	9.89×10^{-05}	3.32×10^{-04}	2.53×10^{-03}
ACETONE	1.94	1.35×10^{-01}	9.75×10^{-02}	3.27×10^{-01}	2.50
ACETYLENE	4.83×10^{-03}	3.36×10^{-04}	2.43×10^{-04}	8.16×10^{-04}	6.23×10^{-03}
ACROLEIN	4.33×10^{-03}	3.01×10^{-04}	2.18×10^{-04}	7.31×10^{-04}	5.58×10^{-03}
ACRYLIC ACID	2.53×10^{-03}	1.76×10^{-04}	1.27×10^{-04}	4.27×10^{-04}	3.26×10^{-03}
ACRYLONITRILE	3.26×10^{-03}	2.27×10^{-04}	1.64×10^{-04}	5.50×10^{-04}	4.20×10^{-03}
ADIPIC ACID	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
ALIPHATICS	5.62×10^{-04}	3.91×10^{-05}	2.83×10^{-05}	9.49×10^{-05}	7.24×10^{-04}
ALKENE KETONE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ALPHA-PINENE	1.97×10^{-03}	1.37×10^{-04}	9.89×10^{-05}	3.32×10^{-04}	2.53×10^{-03}
ANILINE	4.44×10^{-03}	3.09×10^{-04}	2.23×10^{-04}	7.50×10^{-04}	5.72×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ANTHRACENE	1.81×10^{-03}	1.26×10^{-04}	9.12×10^{-05}	3.06×10^{-04}	2.34×10^{-03}
ANTHRAQUINONE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ANTIMONY AND COMPOUNDS	3.34×10^{-05}	2.32×10^{-06}	1.68×10^{-06}	5.64×10^{-06}	4.30×10^{-05}
ARSENIC AND COMPOUNDS	2.22×10^{-05}	1.54×10^{-06}	1.12×10^{-06}	3.75×10^{-06}	2.86×10^{-05}
BENZALDEHYDE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
BENZENE	1.18	8.21×10^{-02}	5.94×10^{-02}	2.00×10^{-01}	1.52
BENZO(A)ANTHRACENE	2.59×10^{-03}	1.80×10^{-04}	1.30×10^{-04}	4.37×10^{-04}	3.34×10^{-03}
BENZO(A)PYRENE	5.18×10^{-04}	3.60×10^{-05}	2.61×10^{-05}	8.75×10^{-05}	6.67×10^{-04}
BENZO(B)FLUORANTHENE	7.77×10^{-04}	5.40×10^{-05}	3.91×10^{-05}	1.31×10^{-04}	1.00×10^{-03}
BENZO(E)PYRENE	1.55×10^{-03}	1.08×10^{-04}	7.82×10^{-05}	2.62×10^{-04}	2.00×10^{-03}
BENZO(G,H,I)PERYLENE	5.18×10^{-04}	3.60×10^{-05}	2.61×10^{-05}	8.75×10^{-05}	6.67×10^{-04}
BENZO(K)FLUORANTHENE	2.59×10^{-04}	1.80×10^{-05}	1.30×10^{-05}	4.37×10^{-05}	3.34×10^{-04}
BENZOIC ACID	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
BENZYL CHLORIDE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
BETA-PINENE	1.29×10^{-03}	8.98×10^{-05}	6.50×10^{-05}	2.18×10^{-04}	1.67×10^{-03}
BIPHENYL	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
B-PHELLANDRENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
BROMODINITROBENZENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
BUTOXYBUTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
BUTOXYETHOXYETHANOL ACETATE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
BUTYL ACRYLATE	2.42×10^{-03}	1.68×10^{-04}	1.22×10^{-04}	4.08×10^{-04}	3.11×10^{-03}
BUTYL BENZOATE	1.18×10^{-03}	8.20×10^{-05}	5.94×10^{-05}	1.99×10^{-04}	1.52×10^{-03}
BUTYL CARBITOL	2.19×10^{-03}	1.52×10^{-04}	1.10×10^{-04}	3.70×10^{-04}	2.82×10^{-03}
BUTYL CELLOSOLVE	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
BUTYLCYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
BUTYLISOPROPYLPHTHALATE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
BUTYRALDEHYDE	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
C10 AROMATIC	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C10 OLEFINS	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
C2 ALKYL INDAN	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
C2 CYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C3 CYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C3/C4/C5 ALKYLBENZENES	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
C-3-HEXENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C4 SUBSTITUTED CYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C4 SUBSTITUTED CYCLOHEXANONE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C5 ESTER	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
C5 OLEFIN	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C5 PARAFFIN	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C5 SUBSTITUTED CYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C6 SUBSTITUTED CYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
C6H18O3SI3	5.06×10^{-04}	3.51×10^{-05}	2.54×10^{-05}	8.54×10^{-05}	6.52×10^{-04}
C-7 CYCLOPARAFFINS	3.99×10^{-03}	2.77×10^{-04}	2.01×10^{-04}	6.74×10^{-04}	5.14×10^{-03}
C7-C16 PARAFFINS	8.43×10^{-04}	5.86×10^{-05}	4.24×10^{-05}	1.42×10^{-04}	1.09×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
C-8 CYCLOPARAFFINS	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
C8 PARAFFIN	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
C8H24O4SI4	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
CADMIUM AND COMPOUNDS	2.78×10^{-05}	1.93×10^{-06}	1.40×10^{-06}	4.69×10^{-06}	3.58×10^{-05}
CAMPHENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
CARBITOL	2.58×10^{-03}	1.80×10^{-04}	1.30×10^{-04}	4.37×10^{-04}	3.33×10^{-03}
CARBON MONOXIDE	$3.73 \times 10^{+01}$	2.59	1.88	6.30	$4.81 \times 10^{+01}$
CARBON SULFIDE	5.06×10^{-04}	3.51×10^{-05}	2.54×10^{-05}	8.54×10^{-05}	6.52×10^{-04}
CARBON TETRACHLORIDE	3.65×10^{-03}	2.54×10^{-04}	1.84×10^{-04}	6.17×10^{-04}	4.71×10^{-03}
CARBONYL SULFIDE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
CELLOSOLVE	2.02×10^{-03}	1.41×10^{-04}	1.02×10^{-04}	3.42×10^{-04}	2.61×10^{-03}
CELLOSOLVE ACETATE	2.02×10^{-03}	1.41×10^{-04}	1.02×10^{-04}	3.42×10^{-04}	2.61×10^{-03}
CHLOROBENZENE	3.99×10^{-03}	2.77×10^{-04}	2.01×10^{-04}	6.74×10^{-04}	5.14×10^{-03}
CHLORODIFLUOROMETHANE	8.99×10^{-04}	6.25×10^{-05}	4.52×10^{-05}	1.52×10^{-04}	1.16×10^{-03}
CHLOROFORM	2.87×10^{-03}	1.99×10^{-04}	1.44×10^{-04}	4.84×10^{-04}	3.69×10^{-03}
CHLOROPENTAFLUOROETHANE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
CHLOROPRENE	1.91×10^{-03}	1.33×10^{-04}	9.61×10^{-05}	3.23×10^{-04}	2.46×10^{-03}
CHLOROTRIFLUOROMETHANE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
CHRYSENE	1.55×10^{-03}	1.08×10^{-04}	7.82×10^{-05}	2.62×10^{-04}	2.00×10^{-03}
COBALT AND COMPOUNDS	5.55×10^{-06}	3.86×10^{-07}	2.79×10^{-07}	9.38×10^{-07}	7.16×10^{-06}
CREOSOTE	2.08×10^{-03}	1.44×10^{-04}	1.05×10^{-04}	3.51×10^{-04}	2.68×10^{-03}
CRESOL	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
CYCLOHEXANE	5.06×10^{-03}	3.51×10^{-04}	2.54×10^{-04}	8.54×10^{-04}	6.52×10^{-03}
CYCLOHEXANOL	2.53×10^{-03}	1.76×10^{-04}	1.27×10^{-04}	4.27×10^{-04}	3.26×10^{-03}
CYCLOHEXANONE	2.98×10^{-03}	2.07×10^{-04}	1.50×10^{-04}	5.03×10^{-04}	3.84×10^{-03}
CYCLOHEXENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
CYCLOPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
CYCLOPENTENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
DENATURANT	5.62×10^{-04}	3.91×10^{-05}	2.83×10^{-05}	9.49×10^{-05}	7.24×10^{-04}
DIBUTYL PHTHALATE	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
DICHLOROBENZENES	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
DICHLORODIFLUOROMETHANE	1.97×10^{-03}	1.37×10^{-04}	9.89×10^{-05}	3.32×10^{-04}	2.53×10^{-03}
DICHLOROMETHANE	4.21×10^{-03}	2.93×10^{-04}	2.12×10^{-04}	7.12×10^{-04}	5.43×10^{-03}
DICHLOROTETRAFLUORETHANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
DIETHYLCYCLOHEXANE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
DIETHYLENE GLYCOL	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
DIISOPROPYL BENZENE	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
DIMETHYL FORMAMIDE	2.02×10^{-03}	1.41×10^{-04}	1.02×10^{-04}	3.42×10^{-04}	2.61×10^{-03}
DIMETHYL PHTHALATE	3.37×10^{-04}	2.34×10^{-05}	1.70×10^{-05}	5.69×10^{-05}	4.34×10^{-04}
DIMETHYLCYCLOHEXANE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
DIMETHYLCYCLOPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
DIMETHYLETHER	6.29×10^{-03}	4.37×10^{-04}	3.17×10^{-04}	1.06×10^{-03}	8.11×10^{-03}
DIMETHYLOCTANES	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
DIPROPYLENE GLYCOL	3.71×10^{-03}	2.58×10^{-04}	1.87×10^{-04}	6.26×10^{-04}	4.78×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
D-LIMONENE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
DODECENE	2.81×10^{-03}	1.95×10^{-04}	1.41×10^{-04}	4.75×10^{-04}	3.62×10^{-03}
EPICHLOROHYDRIN	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ETHANE	2.94	2.04×10^{-01}	1.48×10^{-01}	4.96×10^{-01}	3.79
ETHANOLAMINE	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
ETHYL ACETATE	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
ETHYL ACRYLATE	2.81×10^{-03}	1.95×10^{-04}	1.41×10^{-04}	4.75×10^{-04}	3.62×10^{-03}
ETHYL ALCOHOL	9.28	6.45×10^{-01}	4.67×10^{-01}	1.57	$1.20 \times 10^{+01}$
ETHYL CHLORIDE	1.63×10^{-03}	1.13×10^{-04}	8.20×10^{-05}	2.75×10^{-04}	2.10×10^{-03}
ETHYL ETHER	3.48×10^{-03}	2.42×10^{-04}	1.75×10^{-04}	5.88×10^{-04}	4.49×10^{-03}
ETHYL MERCAPTAN	1.85×10^{-03}	1.29×10^{-04}	9.33×10^{-05}	3.13×10^{-04}	2.39×10^{-03}
ETHYL STYRENE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
ETHYLBENZENE	3.65×10^{-03}	2.54×10^{-04}	1.84×10^{-04}	6.17×10^{-04}	4.71×10^{-03}
ETHYLCYCLOHEXANE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
ETHYLCYCLOPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ETHYLENE	9.23	6.42×10^{-01}	4.65×10^{-01}	1.56	$1.19 \times 10^{+01}$
ETHYLENE DIBROMIDE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ETHYLENE DICHLORIDE	3.26×10^{-03}	2.27×10^{-04}	1.64×10^{-04}	5.50×10^{-04}	4.20×10^{-03}
ETHYLENE GLYCOL	2.08×10^{-03}	1.44×10^{-04}	1.05×10^{-04}	3.51×10^{-04}	2.68×10^{-03}
ETHYLENE OXIDE	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
ETHYLENEAMINES	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
ETHYLHEPTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ETHYLHEXANE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
ETHYLISOPROPYL ETHER	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
ETHYLMETHYLCYCLOHEXANES	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
ETHYL-PHENYL-PHENYL-ETHANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ETHYLTOLUENE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
FLUORANTHENE	2.59×10^{-03}	1.80×10^{-04}	1.30×10^{-04}	4.37×10^{-04}	3.34×10^{-03}
FLUORENE	3.11×10^{-03}	2.16×10^{-04}	1.56×10^{-04}	5.25×10^{-04}	4.00×10^{-03}
FORMALDEHYDE	2.82	1.96×10^{-01}	1.42×10^{-01}	4.76×10^{-01}	3.63
FORMIC ACID	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
GLYOXAL	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
HEPTENE	2.87×10^{-03}	1.99×10^{-04}	1.44×10^{-04}	4.84×10^{-04}	3.69×10^{-03}
HEXADECANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
HEXAFLUOROETHANE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
HEXAMETHYLENEDIAMINE	3.76×10^{-03}	2.62×10^{-04}	1.89×10^{-04}	6.36×10^{-04}	4.85×10^{-03}
HEXYLENE GLYCOL	2.02×10^{-03}	1.41×10^{-04}	1.02×10^{-04}	3.42×10^{-04}	2.61×10^{-03}
ISOBUTANE	5.07×10^{-02}	3.53×10^{-03}	2.55×10^{-03}	8.57×10^{-03}	6.54×10^{-02}
ISOBUTYL ACRYLATE	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
ISOBUTYL ALCOHOL	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ISOBUTYL ISOBUTYRATE	2.19×10^{-03}	1.52×10^{-04}	1.10×10^{-04}	3.70×10^{-04}	2.82×10^{-03}
ISOBUTYRALDEHYDE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ISOMERS OF BUTENE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
ISOMERS OF BUTYLBENZENE	3.37×10^{-04}	2.34×10^{-05}	1.70×10^{-05}	5.69×10^{-05}	4.34×10^{-04}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOMERS OF C10H18	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ISOMERS OF DECANE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
ISOMERS OF DIETHYLBENZENE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
ISOMERS OF DODECANE	2.58×10^{-03}	1.80×10^{-04}	1.30×10^{-04}	4.37×10^{-04}	3.33×10^{-03}
ISOMERS OF ETHYLTOLUENE	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
ISOMERS OF HEPTADECANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ISOMERS OF HEPTANE	1.40×10^{-03}	9.76×10^{-05}	7.07×10^{-05}	2.37×10^{-04}	1.81×10^{-03}
ISOMERS OF HEXANE	3.03×10^{-03}	2.11×10^{-04}	1.53×10^{-04}	5.12×10^{-04}	3.91×10^{-03}
ISOMERS OF NONANE	1.07×10^{-03}	7.42×10^{-05}	5.37×10^{-05}	1.80×10^{-04}	1.38×10^{-03}
ISOMERS OF OCTADECANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ISOMERS OF OCTANE	8.43×10^{-04}	5.86×10^{-05}	4.24×10^{-05}	1.42×10^{-04}	1.09×10^{-03}
ISOMERS OF PENTADECANE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ISOMERS OF PENTANE	6.24×10^{-03}	4.33×10^{-04}	3.14×10^{-04}	1.05×10^{-03}	8.04×10^{-03}
ISOMERS OF PENTENE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
ISOMERS OF PROPYLBENZENE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
ISOMERS OF TETRADECANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
ISOMERS OF UNDECANE	2.81×10^{-04}	1.95×10^{-05}	1.41×10^{-05}	4.75×10^{-05}	3.62×10^{-04}
ISOMERS OF XYLENE	4.28×10^{-01}	2.98×10^{-02}	2.15×10^{-02}	7.23×10^{-02}	5.52×10^{-01}
ISOPENTANE	4.49×10^{-04}	3.12×10^{-05}	2.26×10^{-05}	7.59×10^{-05}	5.79×10^{-04}
ISOPRENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
ISOPROPYL ACETATE	2.64×10^{-03}	1.84×10^{-04}	1.33×10^{-04}	4.46×10^{-04}	3.40×10^{-03}
ISOPROPYL ALCOHOL	4.10×10^{-03}	2.85×10^{-04}	2.06×10^{-04}	6.93×10^{-04}	5.29×10^{-03}
ISOPROPYLBENZENE	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
LACTOL SPIRITS	2.02×10^{-03}	1.41×10^{-04}	1.02×10^{-04}	3.42×10^{-04}	2.61×10^{-03}
LEAD AND COMPOUNDS	8.89×10^{-05}	6.18×10^{-06}	4.47×10^{-06}	1.50×10^{-05}	1.15×10^{-04}
MALEIC ANHYDRIDE	3.93×10^{-04}	2.73×10^{-05}	1.98×10^{-05}	6.64×10^{-05}	5.07×10^{-04}
MANGANESE AND COMPOUNDS	1.61×10^{-04}	1.12×10^{-05}	8.10×10^{-06}	2.72×10^{-05}	2.07×10^{-04}
METHANE	$2.16 \times 10^{+01}$	1.50	1.09	3.66	$2.79 \times 10^{+01}$
METHYL ACETATE	3.99×10^{-03}	2.77×10^{-04}	2.01×10^{-04}	6.74×10^{-04}	5.14×10^{-03}
METHYL ACRYLATE	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
METHYL ALCOHOL	7.87×10^{-03}	5.47×10^{-04}	3.96×10^{-04}	1.33×10^{-03}	1.01×10^{-02}
METHYL AMYL KETONE	2.87×10^{-03}	1.99×10^{-04}	1.44×10^{-04}	4.84×10^{-04}	3.69×10^{-03}
METHYL CARBITOL	2.19×10^{-03}	1.52×10^{-04}	1.10×10^{-04}	3.70×10^{-04}	2.82×10^{-03}
METHYL CELLOSOLVE	2.19×10^{-03}	1.52×10^{-04}	1.10×10^{-04}	3.70×10^{-04}	2.82×10^{-03}
METHYL ETHYL KETONE	6.85×10^{-03}	4.76×10^{-04}	3.45×10^{-04}	1.16×10^{-03}	8.83×10^{-03}
METHYL FORMATE	1.18×10^{-03}	8.20×10^{-05}	5.94×10^{-05}	1.99×10^{-04}	1.52×10^{-03}
METHYL GLYOXAL	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
METHYL ISOBUTYL KETONE	3.15×10^{-03}	2.19×10^{-04}	1.58×10^{-04}	5.31×10^{-04}	4.05×10^{-03}
METHYL METHACRYLATE	2.58×10^{-03}	1.80×10^{-04}	1.30×10^{-04}	4.37×10^{-04}	3.33×10^{-03}
METHYL MYRISTATE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
METHYL NAPHTHALENES	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
METHYL PALMITATE	4.49×10^{-04}	3.12×10^{-05}	2.26×10^{-05}	7.59×10^{-05}	5.79×10^{-04}
METHYL STEARATE	6.18×10^{-04}	4.30×10^{-05}	3.11×10^{-05}	1.04×10^{-04}	7.97×10^{-04}
METHYL STYRENE	2.30×10^{-03}	1.60×10^{-04}	1.16×10^{-04}	3.89×10^{-04}	2.97×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYL T-BUTYL ETHER	1.85×10^{-03}	1.29×10^{-04}	9.33×10^{-05}	3.13×10^{-04}	2.39×10^{-03}
METHYLAL	9.55×10^{-04}	6.64×10^{-05}	4.81×10^{-05}	1.61×10^{-04}	1.23×10^{-03}
METHYLALLENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
METHYLCYCLOHEXANE	7.30×10^{-04}	5.08×10^{-05}	3.67×10^{-05}	1.23×10^{-04}	9.41×10^{-04}
METHYLCYCLOPENTANE	1.52×10^{-03}	1.05×10^{-04}	7.63×10^{-05}	2.56×10^{-04}	1.96×10^{-03}
METHYLDECANES	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
METHYLENE BROMIDE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
METHYLHEXANE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
METHYLNONANE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
METHYLOCTANES	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
METHYLPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
METHYLPROPYLCYCLOHEXANES	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
M-ETHYLTOLUENE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
METHYLUNDECANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
MINERAL SPIRITS	3.60×10^{-03}	2.50×10^{-04}	1.81×10^{-04}	6.07×10^{-04}	4.63×10^{-03}
MYRCENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
NAPHTHA	2.64×10^{-03}	1.84×10^{-04}	1.33×10^{-04}	4.46×10^{-04}	3.40×10^{-03}
NAPHTHALENE	3.73×10^{-02}	2.59×10^{-03}	1.88×10^{-03}	6.30×10^{-03}	4.81×10^{-02}
N-BUTANE	1.02×10^{-02}	7.07×10^{-04}	5.12×10^{-04}	1.72×10^{-03}	1.31×10^{-02}
N-BUTYL ACETATE	3.26×10^{-03}	2.27×10^{-04}	1.64×10^{-04}	5.50×10^{-04}	4.20×10^{-03}
N-BUTYL ALCOHOL	3.88×10^{-03}	2.69×10^{-04}	1.95×10^{-04}	6.55×10^{-04}	5.00×10^{-03}
N-DECANE	3.03×10^{-03}	2.11×10^{-04}	1.53×10^{-04}	5.12×10^{-04}	3.91×10^{-03}
N-DODECANE	1.07×10^{-03}	7.42×10^{-05}	5.37×10^{-05}	1.80×10^{-04}	1.38×10^{-03}
N-HEPTANE	7.87×10^{-03}	5.47×10^{-04}	3.96×10^{-04}	1.33×10^{-03}	1.01×10^{-02}
N-HEXANE	7.70×10^{-03}	5.35×10^{-04}	3.87×10^{-04}	1.30×10^{-03}	9.92×10^{-03}
NITRIC OXIDE	2.38×10^{-01}	1.65×10^{-02}	1.20×10^{-02}	4.02×10^{-02}	3.07×10^{-01}
NITROBENZENE	1.85×10^{-03}	1.29×10^{-04}	9.33×10^{-05}	3.13×10^{-04}	2.39×10^{-03}
NITROGEN DIOXIDE	1.92×10^{-02}	1.33×10^{-03}	9.66×10^{-04}	3.24×10^{-03}	2.47×10^{-02}
N-NONANE	5.06×10^{-04}	3.51×10^{-05}	2.54×10^{-05}	8.54×10^{-05}	6.52×10^{-04}
N-OCTANE	1.18×10^{-03}	8.20×10^{-05}	5.94×10^{-05}	1.99×10^{-04}	1.52×10^{-03}
NONENONE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
N-PENTADECANE	9.55×10^{-04}	6.64×10^{-05}	4.81×10^{-05}	1.61×10^{-04}	1.23×10^{-03}
N-PENTANE	3.99×10^{-03}	2.77×10^{-04}	2.01×10^{-04}	6.74×10^{-04}	5.14×10^{-03}
N-PENTYLCYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
N-PROPYL ACETATE	2.75×10^{-03}	1.91×10^{-04}	1.39×10^{-04}	4.65×10^{-04}	3.55×10^{-03}
N-PROPYL ALCOHOL	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
N-TETRADECANE	3.93×10^{-04}	2.73×10^{-05}	1.98×10^{-05}	6.64×10^{-05}	5.07×10^{-04}
N-TRIDECANE	5.62×10^{-04}	3.91×10^{-05}	2.83×10^{-05}	9.49×10^{-05}	7.24×10^{-04}
N-UNDECANE	7.87×10^{-04}	5.47×10^{-05}	3.96×10^{-05}	1.33×10^{-04}	1.01×10^{-03}
OCTAMETHYLCYCLOTETRASILOXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
O-DICHLOROBENZENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
OXIDES OF NITROGEN	3.84×10^{-01}	2.67×10^{-02}	1.93×10^{-02}	6.49×10^{-02}	4.95×10^{-01}
PALMITIC ACID	1.12×10^{-03}	7.81×10^{-05}	5.65×10^{-05}	1.90×10^{-04}	1.45×10^{-03}
PARAFFINS (C16-C34)	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 10 µm	5.11	3.55×10^{-01}	2.57×10^{-01}	8.63×10^{-01}	6.58
PARTICULATE MATTER < 2.5 µm	2.91	2.02×10^{-01}	1.46×10^{-01}	4.91×10^{-01}	3.75
P-DICHLOROBENZENE	4.05×10^{-03}	2.81×10^{-04}	2.04×10^{-04}	6.83×10^{-04}	5.21×10^{-03}
PHENANTHRENE	1.01×10^{-02}	7.02×10^{-04}	5.08×10^{-04}	1.71×10^{-03}	1.30×10^{-02}
PHENOL	2.47×10^{-03}	1.72×10^{-04}	1.24×10^{-04}	4.18×10^{-04}	3.19×10^{-03}
PHENYL ISOCYANATE	6.74×10^{-04}	4.69×10^{-05}	3.39×10^{-05}	1.14×10^{-04}	8.69×10^{-04}
PHTHALIC ANHYDRIDE	1.12×10^{-03}	7.81×10^{-05}	5.65×10^{-05}	1.90×10^{-04}	1.45×10^{-03}
PIPERYLENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
POLYCHLORINATED DIOXINS AND FURANS	1.21×10^{-09}	8.42×10^{-11}	6.09×10^{-11}	2.05×10^{-10}	1.56×10^{-09}
POLYCYCLIC AROMATIC HYDROCARBONS	9.45×10^{-02}	6.57×10^{-03}	4.75×10^{-03}	1.60×10^{-02}	1.22×10^{-01}
PROPANE	7.72×10^{-01}	5.37×10^{-02}	3.89×10^{-02}	1.30×10^{-01}	9.95×10^{-01}
PROPIONALDEHYDE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
PROPIONIC ACID	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
PROPYLCYCLOHEXANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
PROPYLENE	1.13	7.84×10^{-02}	5.67×10^{-02}	1.90×10^{-01}	1.45
PROPYLENE DICHLORIDE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
PROPYLENE GLYCOL	2.14×10^{-03}	1.48×10^{-04}	1.07×10^{-04}	3.61×10^{-04}	2.75×10^{-03}
PROPYLENE OXIDE	2.81×10^{-03}	1.95×10^{-04}	1.41×10^{-04}	4.75×10^{-04}	3.62×10^{-03}
P-XYLENE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
PYRENE	3.11×10^{-03}	2.16×10^{-04}	1.56×10^{-04}	5.25×10^{-04}	4.00×10^{-03}
S-BUTYL ALCOHOL	1.91×10^{-03}	1.33×10^{-04}	9.61×10^{-05}	3.23×10^{-04}	2.46×10^{-03}
SELENIUM AND COMPOUNDS	5.55×10^{-06}	3.86×10^{-07}	2.79×10^{-07}	9.38×10^{-07}	7.16×10^{-06}
STYRENE	5.17×10^{-02}	3.59×10^{-03}	2.60×10^{-03}	8.73×10^{-03}	6.66×10^{-02}
SUBSTITUTED C9 ESTER (C12)	5.06×10^{-04}	3.51×10^{-05}	2.54×10^{-05}	8.54×10^{-05}	6.52×10^{-04}
SULFUR DIOXIDE	5.91×10^{-02}	4.11×10^{-03}	2.97×10^{-03}	9.98×10^{-03}	7.61×10^{-02}
TERT-BUTYL ALCOHOL	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
TETRACHLOROETHYLENE	3.93×10^{-03}	2.73×10^{-04}	1.98×10^{-04}	6.64×10^{-04}	5.07×10^{-03}
TETRAFLUOROMETHANE	1.69×10^{-04}	1.17×10^{-05}	8.48×10^{-06}	2.85×10^{-05}	2.17×10^{-04}
TOLUENE	7.06×10^{-01}	4.91×10^{-02}	3.55×10^{-02}	1.19×10^{-01}	9.10×10^{-01}
TOLUENE DIISOCYANATE	3.71×10^{-03}	2.58×10^{-04}	1.87×10^{-04}	6.26×10^{-04}	4.78×10^{-03}
TOTAL AROMATIC AMINES	2.25×10^{-04}	1.56×10^{-05}	1.13×10^{-05}	3.80×10^{-05}	2.90×10^{-04}
TOTAL C2-C5 ALDEHYDES	6.74×10^{-04}	4.69×10^{-05}	3.39×10^{-05}	1.14×10^{-04}	8.69×10^{-04}
TOTAL SUSPENDED PARTICULATES	5.38	3.74×10^{-01}	2.71×10^{-01}	9.08×10^{-01}	6.93
TOTAL VOCS	$3.38 \times 10^{+01}$	2.35	1.70	5.71	$4.36 \times 10^{+01}$
TRANS-2-BUTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
TRANS-2-PENTENE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
TRICHLOROBENZENES	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}
TRICHLOROETHYLENE	2.42×10^{-03}	1.68×10^{-04}	1.22×10^{-04}	4.08×10^{-04}	3.11×10^{-03}
TRICHLOROFLUOROMETHANE	3.43×10^{-03}	2.38×10^{-04}	1.72×10^{-04}	5.79×10^{-04}	4.42×10^{-03}
TRICHLOROTRIFLUOROETHANE	2.25×10^{-03}	1.56×10^{-04}	1.13×10^{-04}	3.80×10^{-04}	2.90×10^{-03}
TRIFLUOROMETHANE	1.69×10^{-03}	1.17×10^{-04}	8.48×10^{-05}	2.85×10^{-04}	2.17×10^{-03}
TRIMETHYLBENZENE	6.18×10^{-04}	4.30×10^{-05}	3.11×10^{-05}	1.04×10^{-04}	7.97×10^{-04}
TRIMETHYLCYCLOHEXANES	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
TRIMETHYLCYCLOPENTANE	5.62×10^{-05}	3.91×10^{-06}	2.83×10^{-06}	9.49×10^{-06}	7.24×10^{-05}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRIMETHYLDECENE	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
TRIMETHYLFLUOROSILANE	3.88×10^{-03}	2.69×10^{-04}	1.95×10^{-04}	6.55×10^{-04}	5.00×10^{-03}
TRIMETHYLHEPTANES	1.12×10^{-04}	7.81×10^{-06}	5.65×10^{-06}	1.90×10^{-05}	1.45×10^{-04}
VINYL ACETATE	3.09×10^{-03}	2.15×10^{-04}	1.55×10^{-04}	5.22×10^{-04}	3.98×10^{-03}
VINYL CHLORIDE	2.36×10^{-03}	1.64×10^{-04}	1.19×10^{-04}	3.99×10^{-04}	3.04×10^{-03}
ZINC AND COMPOUNDS	4.11×10^{-03}	2.85×10^{-04}	2.07×10^{-04}	6.93×10^{-04}	5.29×10^{-03}

Table B1.3: Annual Emissions from Barbecues – Briquette Combustion

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACENAPHTHENE	1.50×10^{-05}	1.04×10^{-06}	7.56×10^{-07}	2.54×10^{-06}	1.94×10^{-05}
ACENAPHTHYLENE	3.19×10^{-04}	2.21×10^{-05}	1.60×10^{-05}	5.38×10^{-05}	4.10×10^{-04}
ACETALDEHYDE	2.79×10^{-04}	1.94×10^{-05}	1.40×10^{-05}	4.71×10^{-05}	3.60×10^{-04}
ANTHRACENE	2.10×10^{-05}	1.46×10^{-06}	1.06×10^{-06}	3.55×10^{-06}	2.71×10^{-05}
ARSENIC AND COMPOUNDS	9.30×10^{-05}	6.47×10^{-06}	4.68×10^{-06}	1.57×10^{-05}	1.20×10^{-04}
BENZENE	6.37×10^{-04}	4.42×10^{-05}	3.20×10^{-05}	1.08×10^{-04}	8.20×10^{-04}
BENZO(A)ANTHRACENE	3.01×10^{-05}	2.09×10^{-06}	1.51×10^{-06}	5.08×10^{-06}	3.87×10^{-05}
BENZO(A)PYRENE	6.01×10^{-06}	4.18×10^{-07}	3.02×10^{-07}	1.02×10^{-06}	7.75×10^{-06}
BENZO(B)FLUORANTHENE	9.02×10^{-06}	6.27×10^{-07}	4.54×10^{-07}	1.52×10^{-06}	1.16×10^{-05}
BENZO(E)PYRENE	1.80×10^{-05}	1.25×10^{-06}	9.07×10^{-07}	3.05×10^{-06}	2.32×10^{-05}
BENZO(G,H,I)PERYLENE	6.01×10^{-06}	4.18×10^{-07}	3.02×10^{-07}	1.02×10^{-06}	7.75×10^{-06}
BENZO(K)FLUORANTHENE	3.01×10^{-06}	2.09×10^{-07}	1.51×10^{-07}	5.08×10^{-07}	3.87×10^{-06}
BERYLLIUM AND COMPOUNDS	1.52×10^{-04}	1.06×10^{-05}	7.64×10^{-06}	2.56×10^{-05}	1.96×10^{-04}
C7-C16 PARAFFINS	2.41	1.67×10^{-01}	1.21×10^{-01}	4.07×10^{-01}	3.10
CADMIUM AND COMPOUNDS	3.48×10^{-05}	2.42×10^{-06}	1.75×10^{-06}	5.87×10^{-06}	4.48×10^{-05}
CARBON DISULFIDE	6.37×10^{-05}	4.42×10^{-06}	3.20×10^{-06}	1.08×10^{-05}	8.20×10^{-05}
CARBON MONOXIDE	$1.35 \times 10^{+02}$	9.39	6.80	$2.28 \times 10^{+01}$	$1.74 \times 10^{+02}$
CHROMIUM (III) COMPOUNDS	8.86×10^{-05}	6.16×10^{-06}	4.46×10^{-06}	1.50×10^{-05}	1.14×10^{-04}
CHROMIUM (VI) COMPOUNDS	1.37×10^{-02}	9.53×10^{-04}	6.90×10^{-04}	2.32×10^{-03}	1.77×10^{-02}
CHRYSENE	1.80×10^{-05}	1.25×10^{-06}	9.07×10^{-07}	3.05×10^{-06}	2.32×10^{-05}
CYANIDE COMPOUNDS	1.22×10^{-03}	8.51×10^{-05}	6.16×10^{-05}	2.07×10^{-04}	1.58×10^{-03}
DI-(2-ETHYLEXYL) PHTHALATE (DEHP)	3.57×10^{-05}	2.48×10^{-06}	1.80×10^{-06}	6.04×10^{-06}	4.61×10^{-05}
DICHLOROMETHANE	2.60×10^{-04}	1.80×10^{-05}	1.31×10^{-05}	4.38×10^{-05}	3.34×10^{-04}
ETHANE	2.37	1.64×10^{-01}	1.19×10^{-01}	4.00×10^{-01}	3.05
ETHYLBENZENE	4.60×10^{-05}	3.20×10^{-06}	2.32×10^{-06}	7.77×10^{-06}	5.93×10^{-05}
FLUORANTHENE	3.01×10^{-05}	2.09×10^{-06}	1.51×10^{-06}	5.08×10^{-06}	3.87×10^{-05}
FLUORENE	3.61×10^{-05}	2.51×10^{-06}	1.81×10^{-06}	6.09×10^{-06}	4.65×10^{-05}
FLUORIDE COMPOUNDS	7.34×10^{-02}	5.10×10^{-03}	3.70×10^{-03}	1.24×10^{-02}	9.47×10^{-02}
FORMALDEHYDE	1.18×10^{-04}	8.17×10^{-06}	5.91×10^{-06}	1.98×10^{-05}	1.51×10^{-04}
HYDROCHLORIC ACID	5.88×10^{-01}	4.08×10^{-02}	2.96×10^{-02}	9.92×10^{-02}	7.57×10^{-01}
ISOMERS OF XYLENE	1.81×10^{-05}	1.26×10^{-06}	9.11×10^{-07}	3.06×10^{-06}	2.33×10^{-05}
LEAD AND COMPOUNDS	4.36×10^{-03}	3.03×10^{-04}	2.19×10^{-04}	7.36×10^{-04}	5.62×10^{-03}
MANGANESE AND COMPOUNDS	1.76×10^{-03}	1.23×10^{-04}	8.87×10^{-05}	2.98×10^{-04}	2.27×10^{-03}
MERCURY AND COMPOUNDS	6.37×10^{-05}	4.42×10^{-06}	3.20×10^{-06}	1.08×10^{-05}	8.20×10^{-05}
METHANE	1.22	8.51×10^{-02}	6.16×10^{-02}	2.07×10^{-01}	1.58
METHYL ETHYL KETONE	1.91×10^{-04}	1.33×10^{-05}	9.61×10^{-06}	3.23×10^{-05}	2.46×10^{-04}
NAPHTHALENE	4.33×10^{-04}	3.01×10^{-05}	2.18×10^{-05}	7.31×10^{-05}	5.58×10^{-04}
N-HEXANE	3.28×10^{-05}	2.28×10^{-06}	1.65×10^{-06}	5.54×10^{-06}	4.23×10^{-05}
NICKEL AND COMPOUNDS	1.27×10^{-04}	8.85×10^{-06}	6.40×10^{-06}	2.15×10^{-05}	1.64×10^{-04}
NITRIC OXIDE	2.76	1.92×10^{-01}	1.39×10^{-01}	4.66×10^{-01}	3.56
NITROGEN DIOXIDE	2.23×10^{-01}	1.55×10^{-02}	1.12×10^{-02}	3.76×10^{-02}	2.87×10^{-01}
N-PENTANE	1.22×10^{-01}	8.51×10^{-03}	6.16×10^{-03}	2.07×10^{-02}	1.58×10^{-01}
OXIDES OF NITROGEN	4.46	3.10×10^{-01}	2.24×10^{-01}	7.53×10^{-01}	5.74

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 10 µm	3.04	2.11×10^{-01}	1.53×10^{-01}	5.13×10^{-01}	3.91
PARTICULATE MATTER < 2.5 µm	1.62	1.12×10^{-01}	8.13×10^{-02}	2.73×10^{-01}	2.08
PHENANTHRENE	1.17×10^{-04}	8.15×10^{-06}	5.90×10^{-06}	1.98×10^{-05}	1.51×10^{-04}
PHENOL	7.83×10^{-06}	5.45×10^{-07}	3.94×10^{-07}	1.32×10^{-06}	1.01×10^{-05}
POLYCYCLIC AROMATIC HYDROCARBONS	1.10×10^{-03}	7.62×10^{-05}	5.52×10^{-05}	1.85×10^{-04}	1.41×10^{-03}
PYRENE	3.61×10^{-05}	2.51×10^{-06}	1.81×10^{-06}	6.09×10^{-06}	4.65×10^{-05}
SELENIUM AND COMPOUNDS	6.37×10^{-04}	4.42×10^{-05}	3.20×10^{-05}	1.08×10^{-04}	8.20×10^{-04}
STYRENE	1.22×10^{-05}	8.51×10^{-07}	6.16×10^{-07}	2.07×10^{-06}	1.58×10^{-05}
SULFUR DIOXIDE	3.04	2.11×10^{-01}	1.53×10^{-01}	5.13×10^{-01}	3.91
TETRACHLOROETHYLENE	2.11×10^{-05}	1.46×10^{-06}	1.06×10^{-06}	3.56×10^{-06}	2.71×10^{-05}
TOLUENE	1.18×10^{-04}	8.17×10^{-06}	5.91×10^{-06}	1.98×10^{-05}	1.51×10^{-04}
TOTAL SUSPENDED PARTICULATES	3.20	2.22×10^{-01}	1.61×10^{-01}	5.40×10^{-01}	4.12
TOTAL VOCS	4.90	3.40×10^{-01}	2.46×10^{-01}	8.27×10^{-01}	6.31

Table B1.4: Annual Emissions from Barbecues – LPG and Butane Combustion

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACENAPHTHENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
ACENAPHTHYLENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
ANTHRACENE	1.14×10^{-09}	7.93×10^{-11}	5.74×10^{-11}	1.93×10^{-10}	1.47×10^{-09}
BENZENE	7.89×10^{-02}	5.48×10^{-03}	3.97×10^{-03}	1.33×10^{-02}	1.02×10^{-01}
BENZO(A)ANTHRACENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
BENZO(A)PYRENE	5.69×10^{-10}	3.96×10^{-11}	2.86×10^{-11}	9.61×10^{-11}	7.34×10^{-10}
BENZO(B)FLUORANTHENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
BENZO(G,H,I)PERYLENE	5.69×10^{-10}	3.96×10^{-11}	2.86×10^{-11}	9.61×10^{-11}	7.34×10^{-10}
BENZO(K)FLUORANTHENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
CARBON MONOXIDE	6.76	4.70×10^{-01}	3.40×10^{-01}	1.14	8.71
CHROMIUM (III) COMPOUNDS	5.54×10^{-03}	3.85×10^{-04}	2.79×10^{-04}	9.36×10^{-04}	7.14×10^{-03}
CHROMIUM (VI) COMPOUNDS	2.30×10^{-03}	1.60×10^{-04}	1.16×10^{-04}	3.88×10^{-04}	2.96×10^{-03}
CHRYSENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
COBALT AND COMPOUNDS	2.85×10^{-02}	1.98×10^{-03}	1.43×10^{-03}	4.81×10^{-03}	3.67×10^{-02}
COPPER AND COMPOUNDS	7.12×10^{-04}	4.95×10^{-05}	3.58×10^{-05}	1.20×10^{-04}	9.17×10^{-04}
CYCLOHEXANE	2.11×10^{-02}	1.47×10^{-03}	1.06×10^{-03}	3.57×10^{-03}	2.72×10^{-02}
DIBENZO(A,H)ANTHRACENE	5.69×10^{-10}	3.96×10^{-11}	2.86×10^{-11}	9.61×10^{-11}	7.34×10^{-10}
FLUORANTHENE	1.43×10^{-09}	9.91×10^{-11}	7.17×10^{-11}	2.41×10^{-10}	1.84×10^{-09}
FLUORENE	1.33×10^{-09}	9.25×10^{-11}	6.70×10^{-11}	2.25×10^{-10}	1.72×10^{-09}
FORMALDEHYDE	1.86×10^{-01}	1.29×10^{-02}	9.37×10^{-03}	3.14×10^{-02}	2.40×10^{-01}
INDENO(1,2,3-C,D)PYRENE	8.54×10^{-10}	5.93×10^{-11}	4.30×10^{-11}	1.44×10^{-10}	1.10×10^{-09}
ISOMERS OF HEXANE	2.48×10^{-02}	1.72×10^{-03}	1.25×10^{-03}	4.19×10^{-03}	3.20×10^{-02}
ISOMERS OF PENTANE	2.23×10^{-01}	1.55×10^{-02}	1.12×10^{-02}	3.77×10^{-02}	2.88×10^{-01}
LEAD AND COMPOUNDS	7.12×10^{-04}	4.95×10^{-05}	3.58×10^{-05}	1.20×10^{-04}	9.17×10^{-04}
MANGANESE AND COMPOUNDS	7.12×10^{-04}	4.95×10^{-05}	3.58×10^{-05}	1.20×10^{-04}	9.17×10^{-04}
METHANE	1.39	9.66×10^{-02}	6.99×10^{-02}	2.35×10^{-01}	1.79
NAPHTHALENE	2.90×10^{-07}	2.02×10^{-08}	1.46×10^{-08}	4.90×10^{-08}	3.74×10^{-07}
N-BUTANE	2.23×10^{-01}	1.55×10^{-02}	1.12×10^{-02}	3.77×10^{-02}	2.88×10^{-01}
N-HEXANE	2.19×10^{-02}	1.52×10^{-03}	1.10×10^{-03}	3.70×10^{-03}	2.82×10^{-02}
NICKEL AND COMPOUNDS	7.83×10^{-03}	5.44×10^{-04}	3.94×10^{-04}	1.32×10^{-03}	1.01×10^{-02}
NITRIC OXIDE	$3.09 \times 10^{+01}$	2.14	1.55	5.21	$3.98 \times 10^{+01}$
NITROGEN DIOXIDE	2.49	1.73×10^{-01}	1.25×10^{-01}	4.21×10^{-01}	3.21
N-PENTANE	1.49×10^{-01}	1.03×10^{-02}	7.49×10^{-03}	2.51×10^{-02}	1.92×10^{-01}
OXIDES OF NITROGEN	$4.98 \times 10^{+01}$	3.46	2.51	8.41	$6.42 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	1.42	9.89×10^{-02}	7.16×10^{-02}	2.40×10^{-01}	1.83
PARTICULATE MATTER < 2.5 µm	8.09×10^{-01}	5.63×10^{-02}	4.07×10^{-02}	1.37×10^{-01}	1.04
PHENANTHRENE	8.06×10^{-09}	5.60×10^{-10}	4.06×10^{-10}	1.36×10^{-09}	1.04×10^{-08}
POLYCYCLIC AROMATIC HYDROCARBONS	3.12×10^{-07}	2.17×10^{-08}	1.57×10^{-08}	5.27×10^{-08}	4.02×10^{-07}
PROPANE	9.92×10^{-02}	6.90×10^{-03}	4.99×10^{-03}	1.68×10^{-02}	1.28×10^{-01}
PYRENE	2.37×10^{-09}	1.65×10^{-10}	1.19×10^{-10}	4.01×10^{-10}	3.06×10^{-09}
SELENIUM AND COMPOUNDS	7.83×10^{-03}	5.44×10^{-04}	3.94×10^{-04}	1.32×10^{-03}	1.01×10^{-02}
SULFUR DIOXIDE	2.80×10^{-07}	1.95×10^{-08}	1.41×10^{-08}	4.73×10^{-08}	3.61×10^{-07}
TOLUENE	3.97×10^{-02}	2.76×10^{-03}	2.00×10^{-03}	6.71×10^{-03}	5.12×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TOTAL SUSPENDED PARTICULATES	1.50	1.04×10^{-01}	7.54×10^{-02}	2.53×10^{-01}	1.93
TOTAL VOCS	1.07	7.42×10^{-02}	5.37×10^{-02}	1.80×10^{-01}	1.38
ZINC AND COMPOUNDS	7.83×10^{-03}	5.44×10^{-04}	3.94×10^{-04}	1.32×10^{-03}	1.01×10^{-02}

Table B1.5: Annual Emissions from Cutback Bitumen

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,2,4,5-TETRAMETHYLBENZENE	$7.82 \times 10^{+01}$	6.11	3.63	$1.37 \times 10^{+01}$	$1.02 \times 10^{+02}$
1-METHYLNAPHTHALENE	$6.37 \times 10^{+01}$	4.98	2.96	$1.12 \times 10^{+01}$	$8.29 \times 10^{+01}$
BUTYLBENZENE	$8.62 \times 10^{+01}$	6.74	4.01	$1.51 \times 10^{+01}$	$1.12 \times 10^{+02}$
CYCLOOCTANE	$8.29 \times 10^{+01}$	6.48	3.85	$1.46 \times 10^{+01}$	$1.08 \times 10^{+02}$
DECANE	$2.94 \times 10^{+02}$	$2.30 \times 10^{+01}$	$1.37 \times 10^{+01}$	$5.16 \times 10^{+01}$	$3.82 \times 10^{+02}$
DODECANE	$4.12 \times 10^{+02}$	$3.22 \times 10^{+01}$	$1.91 \times 10^{+01}$	$7.23 \times 10^{+01}$	$5.35 \times 10^{+02}$
HEXADECANE	$2.23 \times 10^{+02}$	$1.74 \times 10^{+01}$	$1.04 \times 10^{+01}$	$3.92 \times 10^{+01}$	$2.90 \times 10^{+02}$
ISOMERS OF XYLENE	$7.21 \times 10^{+01}$	5.64	3.35	$1.27 \times 10^{+01}$	$9.38 \times 10^{+01}$
ISOOCTANE	$6.68 \times 10^{+01}$	5.22	3.11	$1.17 \times 10^{+01}$	$8.69 \times 10^{+01}$
METHYLCYCLOHEXANE	$6.41 \times 10^{+01}$	5.01	2.98	$1.13 \times 10^{+01}$	$8.33 \times 10^{+01}$
M-XYLENE	$7.21 \times 10^{+01}$	5.64	3.35	$1.27 \times 10^{+01}$	$9.38 \times 10^{+01}$
TETRADECANE	$3.08 \times 10^{+02}$	$2.41 \times 10^{+01}$	$1.43 \times 10^{+01}$	$5.41 \times 10^{+01}$	$4.01 \times 10^{+02}$
TETRALIN	$7.56 \times 10^{+01}$	5.91	3.52	$1.33 \times 10^{+01}$	$9.83 \times 10^{+01}$
TOTAL VOCS	$1.83 \times 10^{+03}$	$1.43 \times 10^{+02}$	$8.49 \times 10^{+01}$	$3.21 \times 10^{+02}$	$2.37 \times 10^{+03}$

Table B1.6: Annual Emissions from Gaseous Fuel Combustion – Natural Gas

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2-METHYLNAPHTHALENE	1.53×10^{-04}	1.01×10^{-05}	7.34×10^{-06}	2.40×10^{-05}	1.95×10^{-04}
3-METHYLCHLORANTHRENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
7,12-DIMETHYLBENZ(A)ANTHRACENE	1.02×10^{-04}	6.71×10^{-06}	4.88×10^{-06}	1.60×10^{-05}	1.29×10^{-04}
ACENAPHTHENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
ACENAPHTHYLENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
ANTHRACENE	1.53×10^{-05}	1.01×10^{-06}	7.34×10^{-07}	2.40×10^{-06}	1.95×10^{-05}
ARSENIC AND COMPOUNDS	1.28×10^{-03}	8.42×10^{-05}	6.12×10^{-05}	2.00×10^{-04}	1.62×10^{-03}
BARIUM AND COMPOUNDS	2.81×10^{-02}	1.85×10^{-03}	1.34×10^{-03}	4.40×10^{-03}	3.56×10^{-02}
BENZENE	3.19	2.10×10^{-01}	1.53×10^{-01}	5.00×10^{-01}	4.05
BENZO(A)ANTHRACENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
BENZO(A)PYRENE	7.64×10^{-06}	5.03×10^{-07}	3.66×10^{-07}	1.20×10^{-06}	9.71×10^{-06}
BENZO(B)FLUORANTHENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
BENZO(G,H,I)PERYLENE	7.64×10^{-06}	5.03×10^{-07}	3.66×10^{-07}	1.20×10^{-06}	9.71×10^{-06}
BENZO(K)FLUORANTHENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
BERYLLIUM AND COMPOUNDS	7.64×10^{-05}	5.03×10^{-06}	3.66×10^{-06}	1.20×10^{-05}	9.71×10^{-05}
CADMIUM AND COMPOUNDS	7.00×10^{-03}	4.61×10^{-04}	3.36×10^{-04}	1.10×10^{-03}	8.90×10^{-03}
CARBON MONOXIDE	$2.55 \times 10^{+02}$	$1.68 \times 10^{+01}$	$1.22 \times 10^{+01}$	$3.99 \times 10^{+01}$	$3.24 \times 10^{+02}$
CHROMIUM (III) COMPOUNDS	5.35×10^{-03}	3.52×10^{-04}	2.56×10^{-04}	8.39×10^{-04}	6.80×10^{-03}
CHROMIUM (VI) COMPOUNDS	3.57×10^{-03}	2.35×10^{-04}	1.71×10^{-04}	5.59×10^{-04}	4.53×10^{-03}
CHRYSENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
COBALT AND COMPOUNDS	5.37×10^{-04}	3.54×10^{-05}	2.57×10^{-05}	8.42×10^{-05}	6.83×10^{-04}
COPPER AND COMPOUNDS	5.41×10^{-03}	3.57×10^{-04}	2.59×10^{-04}	8.49×10^{-04}	6.88×10^{-03}
CYCLOHEXANE	7.97×10^{-01}	5.25×10^{-02}	3.82×10^{-02}	1.25×10^{-01}	1.01
DIBENZO(A,H)ANTHRACENE	7.64×10^{-06}	5.03×10^{-07}	3.66×10^{-07}	1.20×10^{-06}	9.71×10^{-06}
FLUORANTHENE	1.91×10^{-05}	1.26×10^{-06}	9.17×10^{-07}	3.00×10^{-06}	2.43×10^{-05}
FLUORENE	1.79×10^{-05}	1.18×10^{-06}	8.56×10^{-07}	2.80×10^{-06}	2.27×10^{-05}
FORMALDEHYDE	6.37	4.20×10^{-01}	3.05×10^{-01}	9.99×10^{-01}	8.10
INDENO(1,2,3-C,D)PYRENE	1.15×10^{-05}	7.55×10^{-07}	5.49×10^{-07}	1.80×10^{-06}	1.46×10^{-05}
ISOMERS OF HEXANE	7.97×10^{-01}	5.25×10^{-02}	3.82×10^{-02}	1.25×10^{-01}	1.01
ISOMERS OF PENTANE	7.17	4.72×10^{-01}	3.44×10^{-01}	1.12	9.11
LEAD AND COMPOUNDS	3.19×10^{-03}	2.10×10^{-04}	1.53×10^{-04}	5.00×10^{-04}	4.05×10^{-03}
MANGANESE AND COMPOUNDS	2.42×10^{-03}	1.60×10^{-04}	1.16×10^{-04}	3.80×10^{-04}	3.08×10^{-03}
MERCURY AND COMPOUNDS	1.66×10^{-03}	1.09×10^{-04}	7.95×10^{-05}	2.60×10^{-04}	2.11×10^{-03}
METHANE	$4.46 \times 10^{+01}$	2.94	2.14	7.00	$5.67 \times 10^{+01}$
MOLYBDENUM AND COMPOUNDS	7.00×10^{-03}	4.61×10^{-04}	3.36×10^{-04}	1.10×10^{-03}	8.90×10^{-03}
NAPHTHALENE	3.89×10^{-03}	2.56×10^{-04}	1.86×10^{-04}	6.10×10^{-04}	4.95×10^{-03}
N-BUTANE	7.17	4.72×10^{-01}	3.44×10^{-01}	1.12	9.11
NICKEL AND COMPOUNDS	1.34×10^{-02}	8.84×10^{-04}	6.42×10^{-04}	2.10×10^{-03}	1.70×10^{-02}
NITRIC OXIDE	$3.70 \times 10^{+02}$	$2.44 \times 10^{+01}$	$1.77 \times 10^{+01}$	$5.80 \times 10^{+01}$	$4.70 \times 10^{+02}$
NITROGEN DIOXIDE	$2.98 \times 10^{+01}$	1.97	1.43	4.68	$3.79 \times 10^{+01}$
N-PENTANE	4.78	3.15×10^{-01}	2.29×10^{-01}	7.50×10^{-01}	6.07
OXIDES OF NITROGEN	$5.97 \times 10^{+02}$	$3.93 \times 10^{+01}$	$2.86 \times 10^{+01}$	$9.36 \times 10^{+01}$	$7.58 \times 10^{+02}$
PARTICULATE MATTER < 10 µm	$4.78 \times 10^{+01}$	3.15	2.29	7.49	$6.07 \times 10^{+01}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 2.5 µm	$4.78 \times 10^{+01}$	3.15	2.29	7.49	$6.07 \times 10^{+01}$
PHENANTHRENE	1.08×10^{-04}	7.13×10^{-06}	5.19×10^{-06}	1.70×10^{-05}	1.38×10^{-04}
POLCYCLIC AROMATIC HYDROCARBONS	4.19×10^{-03}	2.76×10^{-04}	2.01×10^{-04}	6.57×10^{-04}	5.32×10^{-03}
PROPANE	3.19	2.10×10^{-01}	1.53×10^{-01}	5.00×10^{-01}	4.05
PYRENE	3.19×10^{-05}	2.10×10^{-06}	1.53×10^{-06}	5.00×10^{-06}	4.05×10^{-05}
SELENIUM AND COMPOUNDS	1.53×10^{-04}	1.01×10^{-05}	7.34×10^{-06}	2.40×10^{-05}	1.95×10^{-04}
SULFUR DIOXIDE	3.83	2.52×10^{-01}	1.83×10^{-01}	6.00×10^{-01}	4.86
TOLUENE	1.59	1.05×10^{-01}	7.63×10^{-02}	2.50×10^{-01}	2.02
TOTAL SUSPENDED PARTICULATES	$4.78 \times 10^{+01}$	3.15	2.29	7.49	$6.07 \times 10^{+01}$
TOTAL VOCS	$3.51 \times 10^{+01}$	2.31	1.68	5.50	$4.45 \times 10^{+01}$
VANADIUM AND COMPOUNDS	1.47×10^{-02}	9.67×10^{-04}	7.03×10^{-04}	2.30×10^{-03}	1.87×10^{-02}
ZINC AND COMPOUNDS	1.85×10^{-01}	1.22×10^{-02}	8.86×10^{-03}	2.90×10^{-02}	2.35×10^{-01}

Table B1.7: Annual Emissions from Gaseous Fuel Combustion – LPG

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACENAPHTHENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
ACENAPHTHYLENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
ANTHRACENE	5.81×10^{-11}	3.83×10^{-12}	2.78×10^{-12}	9.11×10^{-12}	7.39×10^{-11}
BENZENE	4.02×10^{-03}	2.65×10^{-04}	1.92×10^{-04}	6.30×10^{-04}	5.10×10^{-03}
BENZO(A)ANTHRACENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
BENZO(A)PYRENE	2.90×10^{-11}	1.91×10^{-12}	1.39×10^{-12}	4.54×10^{-12}	3.68×10^{-11}
BENZO(B)FLUORANTHENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
BENZO(G,H,I)PERYLENE	2.90×10^{-11}	1.91×10^{-12}	1.39×10^{-12}	4.54×10^{-12}	3.68×10^{-11}
BENZO(K)FLUORANTHENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
CARBON MONOXIDE	3.44×10^{-01}	2.27×10^{-02}	1.65×10^{-02}	5.40×10^{-02}	4.37×10^{-01}
CHROMIUM (III) COMPOUNDS	2.82×10^{-04}	1.86×10^{-05}	1.35×10^{-05}	4.43×10^{-05}	3.59×10^{-04}
CHROMIUM (VI) COMPOUNDS	1.17×10^{-04}	7.71×10^{-06}	5.60×10^{-06}	1.83×10^{-05}	1.49×10^{-04}
CHRYSENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
COBALT AND COMPOUNDS	1.45×10^{-03}	9.55×10^{-05}	6.94×10^{-05}	2.27×10^{-04}	1.84×10^{-03}
COPPER AND COMPOUNDS	3.62×10^{-05}	2.39×10^{-06}	1.74×10^{-06}	5.68×10^{-06}	4.60×10^{-05}
CYCLOHEXANE	1.08×10^{-03}	7.09×10^{-05}	5.16×10^{-05}	1.69×10^{-04}	1.37×10^{-03}
DIBENZO(A,H)ANTHRACENE	2.90×10^{-11}	1.91×10^{-12}	1.39×10^{-12}	4.54×10^{-12}	3.68×10^{-11}
FLUORANTHENE	7.26×10^{-11}	4.78×10^{-12}	3.48×10^{-12}	1.14×10^{-11}	9.23×10^{-11}
FLUORENE	6.78×10^{-11}	4.47×10^{-12}	3.25×10^{-12}	1.06×10^{-11}	8.61×10^{-11}
FORMALDEHYDE	9.48×10^{-03}	6.25×10^{-04}	4.54×10^{-04}	1.49×10^{-03}	1.20×10^{-02}
INDENO(1,2,3-C,D)PYRENE	4.35×10^{-11}	2.86×10^{-12}	2.08×10^{-12}	6.82×10^{-12}	5.52×10^{-11}
ISOMERS OF HEXANE	1.26×10^{-03}	8.32×10^{-05}	6.05×10^{-05}	1.98×10^{-04}	1.61×10^{-03}
ISOMERS OF PENTANE	1.14×10^{-02}	7.49×10^{-04}	5.45×10^{-04}	1.78×10^{-03}	1.44×10^{-02}
LEAD AND COMPOUNDS	3.62×10^{-05}	2.39×10^{-06}	1.74×10^{-06}	5.68×10^{-06}	4.60×10^{-05}
MANGANESE AND COMPOUNDS	3.62×10^{-05}	2.39×10^{-06}	1.74×10^{-06}	5.68×10^{-06}	4.60×10^{-05}
METHANE	7.08×10^{-02}	4.66×10^{-03}	3.39×10^{-03}	1.11×10^{-02}	8.99×10^{-02}
NAPHTHALENE	1.48×10^{-08}	9.73×10^{-10}	7.07×10^{-10}	2.32×10^{-09}	1.88×10^{-08}
N-BUTANE	1.14×10^{-02}	7.49×10^{-04}	5.45×10^{-04}	1.78×10^{-03}	1.44×10^{-02}
N-HEXANE	1.11×10^{-03}	7.34×10^{-05}	5.34×10^{-05}	1.75×10^{-04}	1.42×10^{-03}
NICKEL AND COMPOUNDS	3.99×10^{-04}	2.63×10^{-05}	1.91×10^{-05}	6.25×10^{-05}	5.06×10^{-04}
NITRIC OXIDE	1.57	1.04×10^{-01}	7.53×10^{-02}	2.46×10^{-01}	2.00
NITROGEN DIOXIDE	1.27×10^{-01}	8.35×10^{-03}	6.07×10^{-03}	1.99×10^{-02}	1.61×10^{-01}
N-PENTANE	7.58×10^{-03}	4.99×10^{-04}	3.63×10^{-04}	1.19×10^{-03}	9.63×10^{-03}
OXIDES OF NITROGEN	2.54	1.67×10^{-01}	1.21×10^{-01}	3.98×10^{-01}	3.22
PARTICULATE MATTER < 10 µm	7.25×10^{-02}	4.77×10^{-03}	3.47×10^{-03}	1.14×10^{-02}	9.21×10^{-02}
PARTICULATE MATTER < 2.5 µm	7.25×10^{-02}	4.77×10^{-03}	3.47×10^{-03}	1.14×10^{-02}	9.21×10^{-02}
PHENANTHRENE	4.11×10^{-10}	2.71×10^{-11}	1.97×10^{-11}	6.44×10^{-11}	5.22×10^{-10}
POLCYCLIC AROMATIC HYDROCARBONS	1.59×10^{-08}	1.05×10^{-09}	7.61×10^{-10}	2.49×10^{-09}	2.02×10^{-08}
PROPANE	5.05×10^{-03}	3.33×10^{-04}	2.42×10^{-04}	7.92×10^{-04}	6.42×10^{-03}
PYRENE	1.21×10^{-10}	7.97×10^{-12}	5.79×10^{-12}	1.90×10^{-11}	1.54×10^{-10}
SELENIUM AND COMPOUNDS	3.99×10^{-04}	2.63×10^{-05}	1.91×10^{-05}	6.25×10^{-05}	5.06×10^{-04}
SULFUR DIOXIDE	1.43×10^{-08}	9.40×10^{-10}	6.83×10^{-10}	2.24×10^{-09}	1.81×10^{-08}
TOLUENE	2.02×10^{-03}	1.33×10^{-04}	9.69×10^{-05}	3.17×10^{-04}	2.57×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TOTAL SUSPENDED PARTICULATES	7.25×10^{-02}	4.77×10^{-03}	3.47×10^{-03}	1.14×10^{-02}	9.21×10^{-02}
TOTAL VOCS	5.44×10^{-02}	3.58×10^{-03}	2.60×10^{-03}	8.52×10^{-03}	6.91×10^{-02}
ZINC AND COMPOUNDS	3.99×10^{-04}	2.63×10^{-05}	1.91×10^{-05}	6.25×10^{-05}	5.06×10^{-04}

Table B1.8: Annual Emissions from Domestic Lawn Mowing and Garden Equipment – 2-Stroke Petrol

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	1.57	1.32×10^{-01}	8.63×10^{-02}	2.97×10^{-01}	2.08
1,1,2-TRICHLOROETHANE	1.27	1.08×10^{-01}	7.03×10^{-02}	2.42×10^{-01}	1.69
1,2,3-TRIMETHYLBENZENE	$2.03 \times 10^{+01}$	1.71	1.12	3.85	$2.70 \times 10^{+01}$
1,2,4-TRIMETHYLBENZENE	$7.26 \times 10^{+01}$	6.14	4.00	$1.38 \times 10^{+01}$	$9.65 \times 10^{+01}$
1,2-DIETHYLBENZENE	$1.68 \times 10^{+01}$	1.42	9.25×10^{-01}	3.18	$2.23 \times 10^{+01}$
1,3,5-TRIMETHYLBENZENE	$5.53 \times 10^{+01}$	4.68	3.05	$1.05 \times 10^{+01}$	$7.36 \times 10^{+01}$
1,3-BUTADIENE	5.74	4.85×10^{-01}	3.16×10^{-01}	1.09	7.63
1,4-BUTANEDIOL	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
1-BUTENE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
1-BUTYNE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
1-CHLOROBUTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
1-DECENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
1-HEXENE	5.51	4.66×10^{-01}	3.04×10^{-01}	1.05	7.32
1-METHYL-3-ISOPROPYLBENZENE	$1.28 \times 10^{+01}$	1.08	7.04×10^{-01}	2.42	$1.70 \times 10^{+01}$
1-METHYL-3-PROPYLBENZENE	9.76	8.26×10^{-01}	5.38×10^{-01}	1.85	$1.30 \times 10^{+01}$
1-PENTENE	4.76	4.02×10^{-01}	2.62×10^{-01}	9.03×10^{-01}	6.32
2,2,4-TRIMETHYLPENTANE	$1.16 \times 10^{+02}$	9.84	6.42	$2.21 \times 10^{+01}$	$1.55 \times 10^{+02}$
2,2,5-TRIMETHYLHEXANE	$1.20 \times 10^{+01}$	1.02	6.63×10^{-01}	2.28	$1.60 \times 10^{+01}$
2,2-DICHLORONITROANILINE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
2,2-DIMETHYLBUTANE	$1.78 \times 10^{+01}$	1.50	9.80×10^{-01}	3.37	$2.36 \times 10^{+01}$
2,2-DIMETHYLHEXANE	1.75	1.48×10^{-01}	9.66×10^{-02}	3.33×10^{-01}	2.33
2,3,3-TRIMETHYLPENTANE	$2.75 \times 10^{+01}$	2.33	1.52	5.23	$3.66 \times 10^{+01}$
2,3,4-TRIMETHYLPENTANE	2.75	2.33×10^{-01}	1.52×10^{-01}	5.23×10^{-01}	3.66
2,3,5-TRIMETHYLHEXANE	2.75	2.33×10^{-01}	1.52×10^{-01}	5.23×10^{-01}	3.66
2,3-DIMETHYLBUTANE	$1.33 \times 10^{+01}$	1.12	7.32×10^{-01}	2.52	$1.76 \times 10^{+01}$
2,3-DIMETHYLPENTANE	$3.13 \times 10^{+01}$	2.65	1.73	5.94	$4.16 \times 10^{+01}$
2,4,4-TRIMETHYL-1-PENTENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
2,4,5-TRIMETHYLHEPTANE	$1.13 \times 10^{+01}$	9.53×10^{-01}	6.21×10^{-01}	2.14	$1.50 \times 10^{+01}$
2,4-DIMETHYLHEPTANE	3.25	2.75×10^{-01}	1.79×10^{-01}	6.18×10^{-01}	4.33
2,4-DIMETHYLHEXANE	2.18×10^{-01}	1.85×10^{-02}	1.20×10^{-02}	4.15×10^{-02}	2.90×10^{-01}
2,4-DIMETHYLOCTANE	2.50	2.12×10^{-01}	1.38×10^{-01}	4.75×10^{-01}	3.33
2,4-DIMETHYLPENTANE	$1.33 \times 10^{+01}$	1.12	7.32×10^{-01}	2.52	$1.76 \times 10^{+01}$
2,5-DIMETHYLHEXANE	$1.58 \times 10^{+01}$	1.33	8.70×10^{-01}	2.99	$2.10 \times 10^{+01}$
2-BUTYNE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
2-FURFURAL	1.35	1.14×10^{-01}	7.43×10^{-02}	2.56×10^{-01}	1.79
2-HEXENE	2.00	1.69×10^{-01}	1.10×10^{-01}	3.80×10^{-01}	2.66
2-METHYL-1-BUTENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
2-METHYL-2-BUTENE	$1.28 \times 10^{+01}$	1.08	7.04×10^{-01}	2.42	$1.70 \times 10^{+01}$
2-METHYL-2-PENTENE	5.76	4.87×10^{-01}	3.17×10^{-01}	1.09	7.65
2-METHYL-3-HEXANONE	2.55×10^{-01}	2.15×10^{-02}	1.41×10^{-02}	4.84×10^{-02}	3.39×10^{-01}
2-METHYLDECANE	$3.30 \times 10^{+01}$	2.79	1.82	6.27	$4.39 \times 10^{+01}$
2-METHYLHEPTANE	5.51	4.66×10^{-01}	3.04×10^{-01}	1.05	7.32

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2-METHYLOCTANE	5.01×10^{-01}	4.23×10^{-02}	2.76×10^{-02}	9.50×10^{-02}	6.66×10^{-01}
2-METHYLPENTANE	$3.18 \times 10^{+01}$	2.69	1.75	6.03	$4.23 \times 10^{+01}$
3,4-DIMETHYLOCTANE	$2.40 \times 10^{+01}$	2.03	1.33	4.56	$3.19 \times 10^{+01}$
3-METHYL-1-BUTENE	4.51	3.81×10^{-01}	2.48×10^{-01}	8.55×10^{-01}	5.99
3-METHYLHEPTANE	9.01	7.62×10^{-01}	4.97×10^{-01}	1.71	$1.20 \times 10^{+01}$
3-METHYLHEXANE	$2.30 \times 10^{+01}$	1.95	1.27	4.37	$3.06 \times 10^{+01}$
3-METHYLPENTANE	$2.15 \times 10^{+01}$	1.82	1.19	4.09	$2.86 \times 10^{+01}$
4-METHYL-1-PENTENE	6.26	5.29×10^{-01}	3.45×10^{-01}	1.19	8.32
4-METHYLANILINE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
4-METHYLHEPTANE	$1.30 \times 10^{+01}$	1.10	7.18×10^{-01}	2.47	$1.73 \times 10^{+01}$
ACENAPHTHENE	8.98×10^{-02}	7.59×10^{-03}	4.95×10^{-03}	1.70×10^{-02}	1.19×10^{-01}
ACENAPHTHYLENE	1.63×10^{-01}	1.38×10^{-02}	8.97×10^{-03}	3.09×10^{-02}	2.16×10^{-01}
ACETALDEHYDE	9.31	7.87×10^{-01}	5.13×10^{-01}	1.77	$1.24 \times 10^{+01}$
ACETIC ACID	2.66	2.25×10^{-01}	1.47×10^{-01}	5.04×10^{-01}	3.53
ACETIC ANHYDRIDE	1.27	1.08×10^{-01}	7.03×10^{-02}	2.42×10^{-01}	1.69
ACETONE	5.35	4.53×10^{-01}	2.95×10^{-01}	1.02	7.11
ACETYLENE	$5.63 \times 10^{+01}$	4.76	3.11	$1.07 \times 10^{+01}$	$7.49 \times 10^{+01}$
ACROLEIN	9.52×10^{-01}	8.05×10^{-02}	5.25×10^{-02}	1.81×10^{-01}	1.27
ACRYLIC ACID	1.64	1.39×10^{-01}	9.03×10^{-02}	3.11×10^{-01}	2.18
ACRYLONITRILE	2.11	1.79×10^{-01}	1.16×10^{-01}	4.01×10^{-01}	2.81
ADIPIC ACID	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
ALIPHATICS	3.64×10^{-01}	3.08×10^{-02}	2.01×10^{-02}	6.91×10^{-02}	4.84×10^{-01}
ALKENE KETONE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ALPHA-PINENE	1.27	1.08×10^{-01}	7.03×10^{-02}	2.42×10^{-01}	1.69
ANILINE	2.88	2.43×10^{-01}	1.59×10^{-01}	5.46×10^{-01}	3.82
ANTHRACENE	9.94×10^{-02}	8.41×10^{-03}	5.48×10^{-03}	1.89×10^{-02}	1.32×10^{-01}
ANTHRAQUINONE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BENZALDEHYDE	6.01	5.08×10^{-01}	3.31×10^{-01}	1.14	7.99
BENZENE	$1.97 \times 10^{+01}$	1.67	1.09	3.75	$2.63 \times 10^{+01}$
BENZO(A)ANTHRACENE	4.98×10^{-02}	4.21×10^{-03}	2.75×10^{-03}	9.45×10^{-03}	6.62×10^{-02}
BENZO(A)PYRENE	1.03×10^{-01}	8.74×10^{-03}	5.70×10^{-03}	1.96×10^{-02}	1.37×10^{-01}
BENZO(B)FLUORANTHENE	5.18×10^{-02}	4.38×10^{-03}	2.86×10^{-03}	9.83×10^{-03}	6.88×10^{-02}
BENZO(E)PYRENE	4.07×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.72×10^{-02}	5.40×10^{-01}
BENZO(G,H,I,)PERYLENE	2.63×10^{-02}	2.22×10^{-03}	1.45×10^{-03}	4.99×10^{-03}	3.50×10^{-02}
BENZO(K)FLUORANTHENE	4.02×10^{-02}	3.40×10^{-03}	2.22×10^{-03}	7.63×10^{-03}	5.34×10^{-02}
BENZOIC ACID	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
BENZYL CHLORIDE	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
BETA-PINENE	8.37×10^{-01}	7.08×10^{-02}	4.62×10^{-02}	1.59×10^{-01}	1.11
BIPHENYL	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
B-PHELLANDRENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BROMODINITROBENZENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BUTOXYBUTENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BUTOXYETHOXYETHANOL ACETATE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BUTYL ACRYLATE	1.57	1.32×10^{-01}	8.63×10^{-02}	2.97×10^{-01}	2.08

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
BUTYL BENZOATE	7.64×10^{-01}	6.46×10^{-02}	4.22×10^{-02}	1.45×10^{-01}	1.02
BUTYL CARBITOL	1.42	1.20×10^{-01}	7.83×10^{-02}	2.70×10^{-01}	1.89
BUTYL CELLOSOLVE	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
BUTYLCYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
BUTYLISOPROPYLPHTHALATE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
BUTYRALDEHYDE	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
C10 AROMATIC	$6.63 \times 10^{+01}$	5.61	3.66	$1.26 \times 10^{+01}$	$8.82 \times 10^{+01}$
C10 OLEFINS	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
C10 PARAFFINS	4.76	4.02×10^{-01}	2.62×10^{-01}	9.03×10^{-01}	6.32
C2 ALKYL INDAN	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
C2 CYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C3 CYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C3/C4/C5 ALKYLBENZENES	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
C-3-HEXENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C4 SUBSTITUTED CYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C4 SUBSTITUTED CYCLOHEXANONE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C5 ESTER	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
C5 OLEFIN	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C5 PARAFFIN	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C5 SUBSTITUTED CYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C6 SUBSTITUTED CYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
C6H18O3SI3	3.28×10^{-01}	2.77×10^{-02}	1.81×10^{-02}	6.22×10^{-02}	4.36×10^{-01}
C-7 CYCLOPARAFFINS	2.58	2.19×10^{-01}	1.43×10^{-01}	4.91×10^{-01}	3.44
C7-C16 PARAFFINS	5.46×10^{-01}	4.62×10^{-02}	3.01×10^{-02}	1.04×10^{-01}	7.26×10^{-01}
C-8 CYCLOPARAFFINS	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
C8 PARAFFIN	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
C8H24O4SI4	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
CAMPHENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
CARBITOL	1.67	1.42×10^{-01}	9.23×10^{-02}	3.18×10^{-01}	2.23
CARBON MONOXIDE	$9.51 \times 10^{+03}$	$8.04 \times 10^{+02}$	$5.25 \times 10^{+02}$	$1.81 \times 10^{+03}$	$1.26 \times 10^{+04}$
CARBON SULFIDE	3.28×10^{-01}	2.77×10^{-02}	1.81×10^{-02}	6.22×10^{-02}	4.36×10^{-01}
CARBON TETRACHLORIDE	2.37	2.00×10^{-01}	1.30×10^{-01}	4.49×10^{-01}	3.15
CARBONYL SULFIDE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
CELLOSOLVE	1.31	1.11×10^{-01}	7.23×10^{-02}	2.49×10^{-01}	1.74
CELLOSOLVE ACETATE	1.31	1.11×10^{-01}	7.23×10^{-02}	2.49×10^{-01}	1.74
CHLOROBENZENE	2.58	2.19×10^{-01}	1.43×10^{-01}	4.91×10^{-01}	3.44
CHLORODIFLUOROMETHANE	5.82×10^{-01}	4.93×10^{-02}	3.21×10^{-02}	1.11×10^{-01}	7.74×10^{-01}
CHLOROFORM	1.86	1.57×10^{-01}	1.02×10^{-01}	3.52×10^{-01}	2.47
CHLOROPENTAFLUOROETHANE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
CHLOROPRENE	1.24	1.05×10^{-01}	6.83×10^{-02}	2.35×10^{-01}	1.65
CHLOROTRIFLUOROMETHANE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
CHROMIUM (III) COMPOUNDS	4.68×10^{-02}	3.96×10^{-03}	2.58×10^{-03}	8.89×10^{-03}	6.22×10^{-02}
CHROMIUM (VI) COMPOUNDS	1.95×10^{-02}	1.65×10^{-03}	1.07×10^{-03}	3.69×10^{-03}	2.59×10^{-02}
CHRYSENE	4.54×10^{-02}	3.84×10^{-03}	2.50×10^{-03}	8.62×10^{-03}	6.04×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CIS-2-BUTENE	$1.15 \times 10^{+01}$	9.74×10^{-01}	6.35×10^{-01}	2.19	$1.53 \times 10^{+01}$
CIS-2-PENTENE	5.01	4.23×10^{-01}	2.76×10^{-01}	9.50×10^{-01}	6.66
COBALT AND COMPOUNDS	6.63×10^{-02}	5.60×10^{-03}	3.65×10^{-03}	1.26×10^{-02}	8.81×10^{-02}
COPPER AND COMPOUNDS	6.63×10^{-02}	5.60×10^{-03}	3.65×10^{-03}	1.26×10^{-02}	8.81×10^{-02}
CORONENE	1.06×10^{-02}	8.99×10^{-04}	5.86×10^{-04}	2.02×10^{-03}	1.41×10^{-02}
CREOSOTE	1.35	1.14×10^{-01}	7.43×10^{-02}	2.56×10^{-01}	1.79
CRESOL	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
CROTONALDEHYDE	1.75	1.48×10^{-01}	9.66×10^{-02}	3.33×10^{-01}	2.33
CYCLOHEXANE	$4.06 \times 10^{+01}$	3.43	2.24	7.70	$5.39 \times 10^{+01}$
CYCLOHEXANOL	1.64	1.39×10^{-01}	9.03×10^{-02}	3.11×10^{-01}	2.18
CYCLOHEXANONE	1.93	1.63×10^{-01}	1.06×10^{-01}	3.66×10^{-01}	2.57
CYCLOHEXENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
CYCLOPENTA(C,D)PYRENE	1.20×10^{-01}	1.01×10^{-02}	6.60×10^{-03}	2.27×10^{-02}	1.59×10^{-01}
CYCLOPENTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
CYCLOPENTENE	6.76	5.72×10^{-01}	3.73×10^{-01}	1.28	8.99
DENATURANT	3.64×10^{-01}	3.08×10^{-02}	2.01×10^{-02}	6.91×10^{-02}	4.84×10^{-01}
DIBENZO(A,H)ANTHRACENE	5.86×10^{-02}	4.96×10^{-03}	3.23×10^{-03}	1.11×10^{-02}	7.80×10^{-02}
DIBUTYL PHTHALATE	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
DICHLOROBENZENES	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
DICHLORODIFLUOROMETHANE	1.27	1.08×10^{-01}	7.03×10^{-02}	2.42×10^{-01}	1.69
DICHLOROMETHANE	2.73	2.31×10^{-01}	1.51×10^{-01}	5.18×10^{-01}	3.63
DICHLOROTETRAFLUORETHANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
DIETHYLCYCLOHEXANE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
DIETHYLENE GLYCOL	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
DIISOPROPYL BENZENE	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
DIMETHYL FORMAMIDE	1.31	1.11×10^{-01}	7.23×10^{-02}	2.49×10^{-01}	1.74
DIMETHYL PHTHALATE	2.18×10^{-01}	1.85×10^{-02}	1.20×10^{-02}	4.15×10^{-02}	2.90×10^{-01}
DIMETHYLCYCLOHEXANE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
DIMETHYLCYCLOPENTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
DIMETHYLETHER	4.08	3.45×10^{-01}	2.25×10^{-01}	7.74×10^{-01}	5.42
DIMETHYLHEXENE	3.25	2.75×10^{-01}	1.79×10^{-01}	6.18×10^{-01}	4.33
DIMETHYLOCTANES	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
DIPROPYLENE GLYCOL	2.40	2.03×10^{-01}	1.32×10^{-01}	4.56×10^{-01}	3.19
D-LIMONENE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
DODECENE	1.82	1.54×10^{-01}	1.00×10^{-01}	3.46×10^{-01}	2.42
EPICHLOROHYDRIN	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ETHANE	$4.48 \times 10^{+01}$	3.79	2.47	8.51	$5.96 \times 10^{+01}$
ETHANOLAMINE	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
ETHYL ACETATE	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
ETHYL ACRYLATE	1.82	1.54×10^{-01}	1.00×10^{-01}	3.46×10^{-01}	2.42
ETHYL ALCOHOL	4.95	4.19×10^{-01}	2.73×10^{-01}	9.40×10^{-01}	6.58
ETHYL CHLORIDE	1.06	8.93×10^{-02}	5.82×10^{-02}	2.00×10^{-01}	1.40
ETHYL ETHER	2.26	1.91×10^{-01}	1.24×10^{-01}	4.28×10^{-01}	3.00
ETHYL MERCAPTAN	1.20	1.02×10^{-01}	6.62×10^{-02}	2.28×10^{-01}	1.60

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ETHYL STYRENE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
ETHYLBENZENE	$7.49 \times 10^{+01}$	6.34	4.13	$1.42 \times 10^{+01}$	$9.96 \times 10^{+01}$
ETHYLCYCLOHEXANE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
ETHYLCYCLOPENTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ETHYLENE	$2.11 \times 10^{+02}$	$1.78 \times 10^{+01}$	$1.16 \times 10^{+01}$	$4.00 \times 10^{+01}$	$2.80 \times 10^{+02}$
ETHYLENE DIBROMIDE	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ETHYLENE DICHLORIDE	2.11	1.79×10^{-01}	1.16×10^{-01}	4.01×10^{-01}	2.81
ETHYLENE GLYCOL	1.35	1.14×10^{-01}	7.43×10^{-02}	2.56×10^{-01}	1.79
ETHYLENE OXIDE	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
ETHYLENEAMINES	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
ETHYLHEPTENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ETHYLHEXANE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
ETHYLISOPROPYL ETHER	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
ETHYLMETHYLCYCLOHEXANES	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
ETHYL-PHENYL-PHENYL-ETHANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ETHYLTOLUENE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
FLUORANTHENE	2.04×10^{-01}	1.72×10^{-02}	1.12×10^{-02}	3.87×10^{-02}	2.71×10^{-01}
FLUORENE	3.24×10^{-01}	2.74×10^{-02}	1.78×10^{-02}	6.14×10^{-02}	4.30×10^{-01}
FORMALDEHYDE	7.63	6.45×10^{-01}	4.21×10^{-01}	1.45	$1.01 \times 10^{+01}$
FORMIC ACID	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
GLYOXAL	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
HEPTENE	1.86	1.57×10^{-01}	1.02×10^{-01}	3.52×10^{-01}	2.47
HEXADECANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
HEXAFLUOROETHANE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
HEXAMETHYLENEDIAMINE	2.44	2.06×10^{-01}	1.35×10^{-01}	4.63×10^{-01}	3.24
HEXYLENE GLYCOL	1.31	1.11×10^{-01}	7.23×10^{-02}	2.49×10^{-01}	1.74
INDANE	$1.35 \times 10^{+01}$	1.14	7.45×10^{-01}	2.57	$1.80 \times 10^{+01}$
INDENO(1,2,3-C,D)PYRENE	5.86×10^{-03}	4.95×10^{-04}	3.23×10^{-04}	1.11×10^{-03}	7.79×10^{-03}
ISOBUTANE	$1.55 \times 10^{+01}$	1.31	8.56×10^{-01}	2.95	$2.06 \times 10^{+01}$
ISOBUTYL ACRYLATE	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
ISOBUTYL ALCOHOL	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ISOBUTYL ISOBUTYRATE	1.42	1.20×10^{-01}	7.83×10^{-02}	2.70×10^{-01}	1.89
ISOBUTYLBENZENE	$1.23 \times 10^{+01}$	1.04	6.76×10^{-01}	2.33	$1.63 \times 10^{+01}$
ISOBUTYLENE	$3.53 \times 10^{+01}$	2.98	1.95	6.70	$4.69 \times 10^{+01}$
ISOBUTYRALDEHYDE	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ISOMERS OF BUTENE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
ISOMERS OF BUTYLBENZENE	2.18×10^{-01}	1.85×10^{-02}	1.20×10^{-02}	4.15×10^{-02}	2.90×10^{-01}
ISOMERS OF C10H18	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ISOMERS OF DECANE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
ISOMERS OF DIETHYLBENZENE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
ISOMERS OF DODECANE	1.67	1.42×10^{-01}	9.23×10^{-02}	3.18×10^{-01}	2.23
ISOMERS OF ETHYLTOLUENE	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
ISOMERS OF HEPTADECANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ISOMERS OF HEPTANE	9.10×10^{-01}	7.70×10^{-02}	5.02×10^{-02}	1.73×10^{-01}	1.21

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOMERS OF HEXANE	1.97	1.66×10^{-01}	1.08×10^{-01}	3.73×10^{-01}	2.61
ISOMERS OF NONANE	6.92×10^{-01}	5.85×10^{-02}	3.81×10^{-02}	1.31×10^{-01}	9.20×10^{-01}
ISOMERS OF OCTADECANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ISOMERS OF OCTANE	5.46×10^{-01}	4.62×10^{-02}	3.01×10^{-02}	1.04×10^{-01}	7.26×10^{-01}
ISOMERS OF PENTADECANE	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ISOMERS OF PENTANE	4.04	3.42×10^{-01}	2.23×10^{-01}	7.67×10^{-01}	5.37
ISOMERS OF PENTENE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
ISOMERS OF PROPYLBENZENE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
ISOMERS OF TETRADECANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
ISOMERS OF UNDECANE	1.82×10^{-01}	1.54×10^{-02}	1.00×10^{-02}	3.46×10^{-02}	2.42×10^{-01}
ISOMERS OF XYLENE	$3.34 \times 10^{+02}$	$2.83 \times 10^{+01}$	$1.84 \times 10^{+01}$	$6.34 \times 10^{+01}$	$4.44 \times 10^{+02}$
ISOPENTANE	$8.79 \times 10^{+01}$	7.43	4.85	$1.67 \times 10^{+01}$	$1.17 \times 10^{+02}$
ISOPRENE	4.26	3.60×10^{-01}	2.35×10^{-01}	8.08×10^{-01}	5.66
ISOPROPYL ACETATE	1.71	1.45×10^{-01}	9.44×10^{-02}	3.25×10^{-01}	2.27
ISOPROPYL ALCOHOL	2.66	2.25×10^{-01}	1.47×10^{-01}	5.04×10^{-01}	3.53
ISOPROPYLBENZENE	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
LACTOL SPIRITS	1.31	1.11×10^{-01}	7.23×10^{-02}	2.49×10^{-01}	1.74
LEAD AND COMPOUNDS	2.82×10^{-02}	2.38×10^{-03}	1.56×10^{-03}	5.35×10^{-03}	3.75×10^{-02}
MALEIC ANHYDRIDE	2.55×10^{-01}	2.15×10^{-02}	1.41×10^{-02}	4.84×10^{-02}	3.39×10^{-01}
MANGANESE AND COMPOUNDS	6.63×10^{-02}	5.60×10^{-03}	3.65×10^{-03}	1.26×10^{-02}	8.81×10^{-02}
M-DIETHYLBENZENE	$1.43 \times 10^{+01}$	1.21	7.87×10^{-01}	2.71	$1.90 \times 10^{+01}$
METHANE	$2.75 \times 10^{+02}$	$2.32 \times 10^{+01}$	$1.51 \times 10^{+01}$	$5.21 \times 10^{+01}$	$3.65 \times 10^{+02}$
METHYL ACETATE	2.58	2.19×10^{-01}	1.43×10^{-01}	4.91×10^{-01}	3.44
METHYL ACRYLATE	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
METHYL ALCOHOL	5.10	4.31×10^{-01}	2.81×10^{-01}	9.68×10^{-01}	6.78
METHYL AMYL KETONE	1.86	1.57×10^{-01}	1.02×10^{-01}	3.52×10^{-01}	2.47
METHYL CARBITOL	1.42	1.20×10^{-01}	7.83×10^{-02}	2.70×10^{-01}	1.89
METHYL CELLOSOLVE	1.42	1.20×10^{-01}	7.83×10^{-02}	2.70×10^{-01}	1.89
METHYL ETHYL KETONE	4.44	3.76×10^{-01}	2.45×10^{-01}	8.43×10^{-01}	5.90
METHYL FORMATE	7.64×10^{-01}	6.46×10^{-02}	4.22×10^{-02}	1.45×10^{-01}	1.02
METHYL GLYOXAL	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
METHYL ISOBUTYL KETONE	2.04	1.72×10^{-01}	1.12×10^{-01}	3.87×10^{-01}	2.71
METHYL METHACRYLATE	1.67	1.42×10^{-01}	9.23×10^{-02}	3.18×10^{-01}	2.23
METHYL MYRISTATE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
METHYL NAPHTHALENES	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
METHYL PALMITATE	2.91×10^{-01}	2.46×10^{-02}	1.61×10^{-02}	5.53×10^{-02}	3.87×10^{-01}
METHYL STEARATE	4.00×10^{-01}	3.39×10^{-02}	2.21×10^{-02}	7.60×10^{-02}	5.32×10^{-01}
METHYL STYRENE	1.49	1.26×10^{-01}	8.23×10^{-02}	2.83×10^{-01}	1.98
METHYL TERT-BUTYL ETHER	$4.37 \times 10^{+02}$	$3.69 \times 10^{+01}$	$2.41 \times 10^{+01}$	$8.29 \times 10^{+01}$	$5.81 \times 10^{+02}$
METHYLACETYLENE	4.26	3.60×10^{-01}	2.35×10^{-01}	8.08×10^{-01}	5.66
METHYLAL	6.19×10^{-01}	5.23×10^{-02}	3.41×10^{-02}	1.17×10^{-01}	8.23×10^{-01}
METHYLALLENE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
METHYLCYCLOHEXANE	$1.18 \times 10^{+01}$	9.95×10^{-01}	6.49×10^{-01}	2.23	$1.56 \times 10^{+01}$
METHYLCYCLOPENTANE	$1.53 \times 10^{+01}$	1.29	8.42×10^{-01}	2.90	$2.03 \times 10^{+01}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYLCYCLOPENTENE	5.01×10^{-01}	4.23×10^{-02}	2.76×10^{-02}	9.50×10^{-02}	6.66×10^{-01}
METHYLDECANES	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
METHYLENE BROMIDE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
METHYLHEXANE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
METHYLNONANE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
METHYLOCTANES	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
METHYLPENTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
METHYLPROPYLCYCLOHEXANES	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
M-ETHYLTOLUENE	$3.13 \times 10^{+01}$	2.65	1.73	5.94	$4.16 \times 10^{+01}$
METHYLUNDECANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
MINERAL SPIRITS	2.33	1.97×10^{-01}	1.28×10^{-01}	4.42×10^{-01}	3.10
MYRCENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
NAPHTHA	1.71	1.45×10^{-01}	9.44×10^{-02}	3.25×10^{-01}	2.27
NAPHTHALENE	4.35	3.68×10^{-01}	2.40×10^{-01}	8.25×10^{-01}	5.78
N-BUTANE	$9.54 \times 10^{+01}$	8.06	5.26	$1.81 \times 10^{+01}$	$1.27 \times 10^{+02}$
N-BUTYL ACETATE	2.11	1.79×10^{-01}	1.16×10^{-01}	4.01×10^{-01}	2.81
N-BUTYL ALCOHOL	2.51	2.12×10^{-01}	1.39×10^{-01}	4.77×10^{-01}	3.34
N-DECANE	5.01	4.23×10^{-01}	2.76×10^{-01}	9.50×10^{-01}	6.66
N-DODECANE	6.92×10^{-01}	5.85×10^{-02}	3.81×10^{-02}	1.31×10^{-01}	9.20×10^{-01}
N-HEPTANE	$1.33 \times 10^{+01}$	1.12	7.32×10^{-01}	2.52	$1.76 \times 10^{+01}$
N-HEXANE	$4.43 \times 10^{+01}$	3.74	2.44	8.40	$5.88 \times 10^{+01}$
NICKEL AND COMPOUNDS	6.63×10^{-02}	5.60×10^{-03}	3.65×10^{-03}	1.26×10^{-02}	8.81×10^{-02}
NITRIC OXIDE	$1.54 \times 10^{+01}$	1.30	8.47×10^{-01}	2.92	$2.04 \times 10^{+01}$
NITROBENZENE	1.20	1.02×10^{-01}	6.62×10^{-02}	2.28×10^{-01}	1.60
NITROGEN DIOXIDE	1.24	1.05×10^{-01}	6.83×10^{-02}	2.35×10^{-01}	1.65
N-NONANE	6.26	5.29×10^{-01}	3.45×10^{-01}	1.19	8.32
N-OCTANE	7.51	6.35×10^{-01}	4.14×10^{-01}	1.43	9.98
NONENONE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
N-PENTADECANE	6.19×10^{-01}	5.23×10^{-02}	3.41×10^{-02}	1.17×10^{-01}	8.23×10^{-01}
N-PENTANE	$4.01 \times 10^{+01}$	3.39	2.21	7.60	$5.32 \times 10^{+01}$
N-PENTYLCYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
N-PROPYL ACETATE	1.78	1.51×10^{-01}	9.84×10^{-02}	3.39×10^{-01}	2.37
N-PROPYL ALCOHOL	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
N-PROPYLBENZENE	$1.40 \times 10^{+01}$	1.19	7.73×10^{-01}	2.66	$1.86 \times 10^{+01}$
N-TETRADECANE	2.55×10^{-01}	2.15×10^{-02}	1.41×10^{-02}	4.84×10^{-02}	3.39×10^{-01}
N-TRIDECANE	3.64×10^{-01}	3.08×10^{-02}	2.01×10^{-02}	6.91×10^{-02}	4.84×10^{-01}
N-UNDECANE	$1.50 \times 10^{+01}$	1.27	8.28×10^{-01}	2.85	$2.00 \times 10^{+01}$
OCTAMETHYLCYCLOTETRASILOXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
O-DICHLOROBENZENE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
O-ETHYLTOLUENE	6.51	5.50×10^{-01}	3.59×10^{-01}	1.24	8.65
OXIDES OF NITROGEN	$2.48 \times 10^{+01}$	2.10	1.37	4.71	$3.30 \times 10^{+01}$
PALMITIC ACID	7.28×10^{-01}	6.16×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.68×10^{-01}
PARAFFINS (C16-C34)	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
PARTICULATE MATTER < 10 µm	$1.67 \times 10^{+02}$	$1.42 \times 10^{+01}$	9.23	$3.18 \times 10^{+01}$	$2.23 \times 10^{+02}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 2.5 µm	$1.54 \times 10^{+02}$	$1.30 \times 10^{+01}$	8.49	$2.92 \times 10^{+01}$	$2.05 \times 10^{+02}$
P-DICHLOROBENZENE	2.62	2.22×10^{-01}	1.45×10^{-01}	4.98×10^{-01}	3.48
PHENANTHRENE	2.98×10^{-01}	2.52×10^{-02}	1.65×10^{-02}	5.67×10^{-02}	3.97×10^{-01}
PHENOL	1.60	1.35×10^{-01}	8.83×10^{-02}	3.04×10^{-01}	2.13
PHENYL ISOCYANATE	4.37×10^{-01}	3.69×10^{-02}	2.41×10^{-02}	8.29×10^{-02}	5.81×10^{-01}
PHTHALIC ANHYDRIDE	7.28×10^{-01}	6.16×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.68×10^{-01}
PIPERYLENE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
POLYCHLORINATED DIOXIONS AND FURANS	4.07×10^{-11}	3.44×10^{-12}	2.24×10^{-12}	7.72×10^{-12}	5.40×10^{-11}
POLYCYCLIC AROMATIC HYDROCARBONS	7.03	5.94×10^{-01}	3.88×10^{-01}	1.33	9.35
PROPADIENE	3.25	2.75×10^{-01}	1.79×10^{-01}	6.18×10^{-01}	4.33
PROPANE	8.74	7.39×10^{-01}	4.82×10^{-01}	1.66	$1.16 \times 10^{+01}$
PROPIONALDEHYDE	7.72×10^{-01}	6.53×10^{-02}	4.26×10^{-02}	1.47×10^{-01}	1.03
PROPIONIC ACID	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
PROPYLCYCLOHEXANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
PROPYLENE	$7.21 \times 10^{+01}$	6.10	3.98	$1.37 \times 10^{+01}$	$9.58 \times 10^{+01}$
PROPYLENE DICHLORIDE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
PROPYLENE GLYCOL	1.38	1.17×10^{-01}	7.63×10^{-02}	2.63×10^{-01}	1.84
PROPYLENE OXIDE	1.82	1.54×10^{-01}	1.00×10^{-01}	3.46×10^{-01}	2.42
PYRENE	4.41×10^{-01}	3.73×10^{-02}	2.43×10^{-02}	8.37×10^{-02}	5.86×10^{-01}
RETENE	1.45×10^{-01}	1.23×10^{-02}	8.02×10^{-03}	2.76×10^{-02}	1.93×10^{-01}
S-BUTYL ALCOHOL	1.24	1.05×10^{-01}	6.83×10^{-02}	2.35×10^{-01}	1.65
S-BUTYLBENZENE	4.26	3.60×10^{-01}	2.35×10^{-01}	8.08×10^{-01}	5.66
STYRENE	4.05	3.42×10^{-01}	2.23×10^{-01}	7.69×10^{-01}	5.38
SUBSTITUTED C9 ESTER (C12)	3.28×10^{-01}	2.77×10^{-02}	1.81×10^{-02}	6.22×10^{-02}	4.36×10^{-01}
SULFUR DIOXIDE	3.51	2.97×10^{-01}	1.94×10^{-01}	6.67×10^{-01}	4.67
T-3-HEXENE	5.01	4.23×10^{-01}	2.76×10^{-01}	9.50×10^{-01}	6.66
TERT-BUTYL ALCOHOL	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
TETRACHLOROETHYLENE	2.55	2.15×10^{-01}	1.41×10^{-01}	4.84×10^{-01}	3.39
TETRAFLUOROMETHANE	1.09×10^{-01}	9.24×10^{-03}	6.02×10^{-03}	2.07×10^{-02}	1.45×10^{-01}
TOLUENE	$3.01 \times 10^{+02}$	$2.54 \times 10^{+01}$	$1.66 \times 10^{+01}$	$5.71 \times 10^{+01}$	$4.00 \times 10^{+02}$
TOLUENE DIISOCYANATE	2.40	2.03×10^{-01}	1.32×10^{-01}	4.56×10^{-01}	3.19
TOTAL AROMATIC AMINES	1.46×10^{-01}	1.23×10^{-02}	8.03×10^{-03}	2.76×10^{-02}	1.94×10^{-01}
TOTAL C2-C5 ALDEHYDES	4.37×10^{-01}	3.69×10^{-02}	2.41×10^{-02}	8.29×10^{-02}	5.81×10^{-01}
TOTAL SUSPENDED PARTICULATES	$1.76 \times 10^{+02}$	$1.49 \times 10^{+01}$	9.72	$3.35 \times 10^{+01}$	$2.34 \times 10^{+02}$
TOTAL VOCS	$3.13 \times 10^{+03}$	$2.64 \times 10^{+02}$	$1.72 \times 10^{+02}$	$5.94 \times 10^{+02}$	$4.16 \times 10^{+03}$
TRANS-2-BUTENE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
TRANS-2-PENTENE	8.51	7.20×10^{-01}	4.69×10^{-01}	1.62	$1.13 \times 10^{+01}$
TRICHLOROBENZENES	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
TRICHLOROETHYLENE	1.57	1.32×10^{-01}	8.63×10^{-02}	2.97×10^{-01}	2.08
TRICHLOROFLUOROMETHANE	2.22	1.88×10^{-01}	1.22×10^{-01}	4.22×10^{-01}	2.95
TRICHLOROTRIFLUOROETHANE	1.46	1.23×10^{-01}	8.03×10^{-02}	2.76×10^{-01}	1.94
TRIFLUOROMETHANE	1.09	9.24×10^{-02}	6.02×10^{-02}	2.07×10^{-01}	1.45
TRIMETHYLBENZENE	4.00×10^{-01}	3.39×10^{-02}	2.21×10^{-02}	7.60×10^{-02}	5.32×10^{-01}
TRIMETHYLCYCLOHEXANES	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRIMETHYLCYCLOPENTANE	3.64×10^{-02}	3.08×10^{-03}	2.01×10^{-03}	6.91×10^{-03}	4.84×10^{-02}
TRIMETHYLDECENE	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
TRIMETHYLFLUOROSILANE	2.51	2.12×10^{-01}	1.39×10^{-01}	4.77×10^{-01}	3.34
TRIMETHYLHEPTANES	7.28×10^{-02}	6.16×10^{-03}	4.02×10^{-03}	1.38×10^{-02}	9.68×10^{-02}
VINYL ACETATE	2.00	1.69×10^{-01}	1.10×10^{-01}	3.80×10^{-01}	2.66
VINYL CHLORIDE	1.53	1.29×10^{-01}	8.43×10^{-02}	2.90×10^{-01}	2.03
ZINC AND COMPOUNDS	6.63×10^{-02}	5.60×10^{-03}	3.65×10^{-03}	1.26×10^{-02}	8.81×10^{-02}

Table B1.9: Annual Emissions from Domestic Lawn Mowing and Garden Equipment – 4-Stroke Petrol

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	4.85×10^{-01}	4.10×10^{-02}	2.68×10^{-02}	9.21×10^{-02}	6.45×10^{-01}
1,1,2-TRICHLOROETHANE	3.95×10^{-01}	3.34×10^{-02}	2.18×10^{-02}	7.50×10^{-02}	5.25×10^{-01}
1,2,3-TRIMETHYLBENZENE	6.29	5.32×10^{-01}	3.47×10^{-01}	1.19	8.36
1,2,4-TRIMETHYLBENZENE	$2.25 \times 10^{+01}$	1.90	1.24	4.27	$2.99 \times 10^{+01}$
1,2-DIETHYLBENZENE	5.20	4.40×10^{-01}	2.87×10^{-01}	9.87×10^{-01}	6.91
1,3,5-TRIMETHYLBENZENE	$1.72 \times 10^{+01}$	1.45	9.46×10^{-01}	3.26	$2.28 \times 10^{+01}$
1,3-BUTADIENE	9.03	7.64×10^{-01}	4.98×10^{-01}	1.71	$1.20 \times 10^{+01}$
1,4-BUTANEDIOL	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
1-BUTENE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
1-BUTYNE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
1-CHLOROBUTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
1-DECENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
1-HEXENE	1.71	1.44×10^{-01}	9.42×10^{-02}	3.24×10^{-01}	2.27
1-METHYL-3-ISOPROPYLBENZENE	3.96	3.35×10^{-01}	2.18×10^{-01}	7.51×10^{-01}	5.26
1-METHYL-3-PROPYLBENZENE	3.03	2.56×10^{-01}	1.67×10^{-01}	5.75×10^{-01}	4.02
1-PENTENE	1.47	1.25×10^{-01}	8.13×10^{-02}	2.80×10^{-01}	1.96
2,2,4-TRIMETHYLPENTANE	$1.40 \times 10^{+01}$	1.18	7.70×10^{-01}	2.65	$1.86 \times 10^{+01}$
2,2,5-TRIMETHYLHEXANE	3.73	3.15×10^{-01}	2.05×10^{-01}	7.07×10^{-01}	4.95
2,2-DICHLORONITROANILINE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
2,2-DIMETHYLBUTANE	5.51	4.66×10^{-01}	3.04×10^{-01}	1.05	7.33
2,2-DIMETHYLHEXANE	5.43×10^{-01}	4.59×10^{-02}	3.00×10^{-02}	1.03×10^{-01}	7.22×10^{-01}
2,3,3-TRIMETHYLPENTANE	8.54	7.22×10^{-01}	4.71×10^{-01}	1.62	$1.14 \times 10^{+01}$
2,3,4-TRIMETHYLPENTANE	8.54×10^{-01}	7.22×10^{-02}	4.71×10^{-02}	1.62×10^{-01}	1.14
2,3,5-TRIMETHYLHEXANE	8.54×10^{-01}	7.22×10^{-02}	4.71×10^{-02}	1.62×10^{-01}	1.14
2,3-DIMETHYLBUTANE	4.11	3.48×10^{-01}	2.27×10^{-01}	7.81×10^{-01}	5.47
2,3-DIMETHYLPENTANE	9.70	8.20×10^{-01}	5.35×10^{-01}	1.84	$1.29 \times 10^{+01}$
2,4,4-TRIMETHYL-1-PENTENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
2,4,5-TRIMETHYLHEPTANE	3.49	2.95×10^{-01}	1.93×10^{-01}	6.63×10^{-01}	4.64
2,4-DIMETHYLHEPTANE	1.01	8.53×10^{-02}	5.56×10^{-02}	1.92×10^{-01}	1.34
2,4-DIMETHYLHEXANE	6.77×10^{-02}	5.73×10^{-03}	3.73×10^{-03}	1.29×10^{-02}	9.00×10^{-02}
2,4-DIMETHYLOCTANE	7.76×10^{-01}	6.56×10^{-02}	4.28×10^{-02}	1.47×10^{-01}	1.03
2,4-DIMETHYLPENTANE	4.11	3.48×10^{-01}	2.27×10^{-01}	7.81×10^{-01}	5.47
2,5-DIMETHYLHEXANE	4.89	4.13×10^{-01}	2.70×10^{-01}	9.28×10^{-01}	6.50
2-BUTYNE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
2-FURFURAL	4.18×10^{-01}	3.53×10^{-02}	2.30×10^{-02}	7.93×10^{-02}	5.55×10^{-01}
2-HEXENE	6.21×10^{-01}	5.25×10^{-02}	3.42×10^{-02}	1.18×10^{-01}	8.26×10^{-01}
2-METHYL-1-BUTENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
2-METHYL-2-BUTENE	3.96	3.35×10^{-01}	2.18×10^{-01}	7.51×10^{-01}	5.26
2-METHYL-2-PENTENE	1.79	1.51×10^{-01}	9.84×10^{-02}	3.39×10^{-01}	2.37
2-METHYL-3-HEXANONE	7.90×10^{-02}	6.68×10^{-03}	4.36×10^{-03}	1.50×10^{-02}	1.05×10^{-01}
2-METHYLDECANE	$1.02 \times 10^{+01}$	8.66×10^{-01}	5.65×10^{-01}	1.94	$1.36 \times 10^{+01}$
2-METHYLHEPTANE	1.71	1.44×10^{-01}	9.42×10^{-02}	3.24×10^{-01}	2.27

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2-METHYLOCTANE	1.55×10^{-01}	1.31×10^{-02}	8.56×10^{-03}	2.95×10^{-02}	2.06×10^{-01}
2-METHYLPENTANE	9.86	8.34×10^{-01}	5.44×10^{-01}	1.87	$1.31 \times 10^{+01}$
3,4-DIMETHYLOCTANE	7.45	6.30×10^{-01}	4.11×10^{-01}	1.41	9.91
3-METHYL-1-BUTENE	1.40	1.18×10^{-01}	7.70×10^{-02}	2.65×10^{-01}	1.86
3-METHYLHEPTANE	2.79	2.36×10^{-01}	1.54×10^{-01}	5.30×10^{-01}	3.71
3-METHYLHEXANE	7.14	6.04×10^{-01}	3.94×10^{-01}	1.36	9.49
3-METHYLPENTANE	6.68	5.64×10^{-01}	3.68×10^{-01}	1.27	8.87
4-METHYL-1-PENTENE	1.94	1.64×10^{-01}	1.07×10^{-01}	3.68×10^{-01}	2.58
4-METHYLANILINE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
4-METHYLHEPTANE	4.04	3.41×10^{-01}	2.23×10^{-01}	7.66×10^{-01}	5.37
ACENAPHTHENE	4.26×10^{-02}	3.60×10^{-03}	2.35×10^{-03}	8.09×10^{-03}	5.66×10^{-02}
ACENAPHTHYLENE	1.33×10^{-01}	1.12×10^{-02}	7.33×10^{-03}	2.52×10^{-02}	1.77×10^{-01}
ACETALDEHYDE	3.89	3.29×10^{-01}	2.15×10^{-01}	7.39×10^{-01}	5.17
ACETIC ACID	8.24×10^{-01}	6.97×10^{-02}	4.54×10^{-02}	1.56×10^{-01}	1.10
ACETIC ANHYDRIDE	3.95×10^{-01}	3.34×10^{-02}	2.18×10^{-02}	7.50×10^{-02}	5.25×10^{-01}
ACETONE	1.66	1.40×10^{-01}	9.15×10^{-02}	3.15×10^{-01}	2.21
ACETYLENE	$1.75 \times 10^{+01}$	1.48	9.63×10^{-01}	3.32	$2.32 \times 10^{+01}$
ACROLEIN	6.64×10^{-01}	5.62×10^{-02}	3.66×10^{-02}	1.26×10^{-01}	8.83×10^{-01}
ACRYLIC ACID	5.08×10^{-01}	4.30×10^{-02}	2.80×10^{-02}	9.64×10^{-02}	6.75×10^{-01}
ACRYLONITRILE	6.55×10^{-01}	5.54×10^{-02}	3.61×10^{-02}	1.24×10^{-01}	8.70×10^{-01}
ADIPIC ACID	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
ALIPHATICS	1.13×10^{-01}	9.55×10^{-03}	6.22×10^{-03}	2.14×10^{-02}	1.50×10^{-01}
ALKENE KETONE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ALPHA-PINENE	3.95×10^{-01}	3.34×10^{-02}	2.18×10^{-02}	7.50×10^{-02}	5.25×10^{-01}
ANILINE	8.92×10^{-01}	7.54×10^{-02}	4.92×10^{-02}	1.69×10^{-01}	1.19
ANTHRACENE	4.48×10^{-02}	3.79×10^{-03}	2.47×10^{-03}	8.50×10^{-03}	5.95×10^{-02}
ANTHRAQUINONE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BENZALDEHYDE	1.86	1.58×10^{-01}	1.03×10^{-01}	3.54×10^{-01}	2.48
BENZENE	$4.78 \times 10^{+01}$	4.04	2.63	9.07	$6.35 \times 10^{+01}$
BENZO(A)ANTHRACENE	1.55×10^{-02}	1.31×10^{-03}	8.55×10^{-04}	2.94×10^{-03}	2.06×10^{-02}
BENZO(A)PYRENE	3.20×10^{-02}	2.71×10^{-03}	1.76×10^{-03}	6.08×10^{-03}	4.26×10^{-02}
BENZO(B)FLUORANTHENE	1.74×10^{-02}	1.47×10^{-03}	9.62×10^{-04}	3.31×10^{-03}	2.32×10^{-02}
BENZO(E)PYRENE	1.23×10^{-01}	1.04×10^{-02}	6.80×10^{-03}	2.34×10^{-02}	1.64×10^{-01}
BENZO(G,H,I,)PERYLENE	7.60×10^{-03}	6.42×10^{-04}	4.19×10^{-04}	1.44×10^{-03}	1.01×10^{-02}
BENZO(K)FLUORANTHENE	1.40×10^{-02}	1.19×10^{-03}	7.73×10^{-04}	2.66×10^{-03}	1.86×10^{-02}
BENZOIC ACID	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
BENZYL CHLORIDE	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
BETA-PINENE	2.60×10^{-01}	2.20×10^{-02}	1.43×10^{-02}	4.93×10^{-02}	3.45×10^{-01}
BIPHENYL	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
B-PHELLANDRENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BROMODINITROBENZENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BUTOXYBUTENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BUTOXYETHOXYETHANOL ACETATE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BUTYL ACRYLATE	4.85×10^{-01}	4.10×10^{-02}	2.68×10^{-02}	9.21×10^{-02}	6.45×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
BUTYL BENZOATE	2.37×10^{-01}	2.00×10^{-02}	1.31×10^{-02}	4.50×10^{-02}	3.15×10^{-01}
BUTYL CARBITOL	4.40×10^{-01}	3.72×10^{-02}	2.43×10^{-02}	8.36×10^{-02}	5.85×10^{-01}
BUTYL CELLOSOLVE	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
BUTYLCYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
BUTYLISOPROPYLPHTHALATE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
BUTYRALDEHYDE	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
C10 AROMATIC	$2.06 \times 10^{+01}$	1.74	1.13	3.90	$2.73 \times 10^{+01}$
C10 OLEFINS	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
C10 PARAFFINS	1.47	1.25×10^{-01}	8.13×10^{-02}	2.80×10^{-01}	1.96
C2 ALKYL INDAN	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
C2 CYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C3 CYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C3/C4/C5 ALKYLBENZENES	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
C-3-HEXENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C4 SUBSTITUTED CYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C4 SUBSTITUTED CYCLOHEXANONE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C5 ESTER	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
C5 OLEFIN	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C5 PARAFFIN	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C5 SUBSTITUTED CYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C6 SUBSTITUTED CYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
C6H18O3SI3	1.02×10^{-01}	8.59×10^{-03}	5.60×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
C-7 CYCLOPARAFFINS	8.01×10^{-01}	6.78×10^{-02}	4.42×10^{-02}	1.52×10^{-01}	1.07
C7-C16 PARAFFINS	1.69×10^{-01}	1.43×10^{-02}	9.34×10^{-03}	3.21×10^{-02}	2.25×10^{-01}
C-8 CYCLOPARAFFINS	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
C8 PARAFFIN	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
C8H24O4SI4	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
CAMPHENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
CARBITOL	5.19×10^{-01}	4.39×10^{-02}	2.86×10^{-02}	9.86×10^{-02}	6.90×10^{-01}
CARBON MONOXIDE	$2.18 \times 10^{+04}$	$1.84 \times 10^{+03}$	$1.20 \times 10^{+03}$	$4.13 \times 10^{+03}$	$2.89 \times 10^{+04}$
CARBON SULFIDE	1.02×10^{-01}	8.59×10^{-03}	5.60×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
CARBON TETRACHLORIDE	7.34×10^{-01}	6.20×10^{-02}	4.05×10^{-02}	1.39×10^{-01}	9.75×10^{-01}
CARBONYL SULFIDE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
CELLOSOLVE	4.06×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.71×10^{-02}	5.40×10^{-01}
CELLOSOLVE ACETATE	4.06×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.71×10^{-02}	5.40×10^{-01}
CHLOROBENZENE	8.01×10^{-01}	6.78×10^{-02}	4.42×10^{-02}	1.52×10^{-01}	1.07
CHLORODIFLUOROMETHANE	1.81×10^{-01}	1.53×10^{-02}	9.96×10^{-03}	3.43×10^{-02}	2.40×10^{-01}
CHLOROFORM	5.76×10^{-01}	4.87×10^{-02}	3.17×10^{-02}	1.09×10^{-01}	7.65×10^{-01}
CHLOROPENTAFLUOROETHANE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
CHLOROPRENE	3.84×10^{-01}	3.25×10^{-02}	2.12×10^{-02}	7.29×10^{-02}	5.10×10^{-01}
CHLOROTRIFLUOROMETHANE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
CHROMIUM (III) COMPOUNDS	3.08×10^{-03}	2.60×10^{-04}	1.70×10^{-04}	5.84×10^{-04}	4.09×10^{-03}
CHROMIUM (VI) COMPOUNDS	1.28×10^{-03}	1.08×10^{-04}	7.05×10^{-05}	2.43×10^{-04}	1.70×10^{-03}
CHRYSENE	1.48×10^{-02}	1.25×10^{-03}	8.18×10^{-04}	2.82×10^{-03}	1.97×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CIS-2-BUTENE	3.57	3.02×10^{-01}	1.97×10^{-01}	6.78×10^{-01}	4.75
CIS-2-PENTENE	1.55	1.31×10^{-01}	8.56×10^{-02}	2.95×10^{-01}	2.06
COBALT AND COMPOUNDS	4.36×10^{-03}	3.68×10^{-04}	2.40×10^{-04}	8.27×10^{-04}	5.79×10^{-03}
COPPER AND COMPOUNDS	4.36×10^{-03}	3.68×10^{-04}	2.40×10^{-04}	8.27×10^{-04}	5.79×10^{-03}
CORONENE	3.23×10^{-03}	2.73×10^{-04}	1.78×10^{-04}	6.12×10^{-04}	4.29×10^{-03}
CREOSOTE	4.18×10^{-01}	3.53×10^{-02}	2.30×10^{-02}	7.93×10^{-02}	5.55×10^{-01}
CRESOL	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
CROTONALDEHYDE	5.43×10^{-01}	4.59×10^{-02}	3.00×10^{-02}	1.03×10^{-01}	7.22×10^{-01}
CYCLOHEXANE	$1.26 \times 10^{+01}$	1.06	6.93×10^{-01}	2.39	$1.67 \times 10^{+01}$
CYCLOHEXANOL	5.08×10^{-01}	4.30×10^{-02}	2.80×10^{-02}	9.64×10^{-02}	6.75×10^{-01}
CYCLOHEXANONE	5.98×10^{-01}	5.06×10^{-02}	3.30×10^{-02}	1.14×10^{-01}	7.95×10^{-01}
CYCLOHEXENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
CYCLOPENTA(C,D)PYRENE	3.63×10^{-02}	3.07×10^{-03}	2.00×10^{-03}	6.90×10^{-03}	4.83×10^{-02}
CYCLOPENTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
CYCLOPENTENE	2.10	1.77×10^{-01}	1.16×10^{-01}	3.98×10^{-01}	2.79
DENATURANT	1.13×10^{-01}	9.55×10^{-03}	6.22×10^{-03}	2.14×10^{-02}	1.50×10^{-01}
DIBENZO(A,H)ANTHRACENE	1.77×10^{-02}	1.50×10^{-03}	9.78×10^{-04}	3.37×10^{-03}	2.36×10^{-02}
DIBUTYL PHTHALATE	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
DICHLOROBENZENES	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
DICHLORODIFLUOROMETHANE	3.95×10^{-01}	3.34×10^{-02}	2.18×10^{-02}	7.50×10^{-02}	5.25×10^{-01}
DICHLOROMETHANE	8.47×10^{-01}	7.16×10^{-02}	4.67×10^{-02}	1.61×10^{-01}	1.13
DICHLOROTETRAFLUORETHANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
DIETHYLCYCLOHEXANE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
DIETHYLENE GLYCOL	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
DIISOPROPYL BENZENE	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
DIMETHYL FORMAMIDE	4.06×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.71×10^{-02}	5.40×10^{-01}
DIMETHYL PHTHALATE	6.77×10^{-02}	5.73×10^{-03}	3.73×10^{-03}	1.29×10^{-02}	9.00×10^{-02}
DIMETHYLCYCLOHEXANE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
DIMETHYLCYCLOPENTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
DIMETHYLETHER	1.26	1.07×10^{-01}	6.97×10^{-02}	2.40×10^{-01}	1.68
DIMETHYLHEXENE	1.01	8.53×10^{-02}	5.56×10^{-02}	1.92×10^{-01}	1.34
DIMETHYLOCTANES	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
DIPROPYLENE GLYCOL	7.45×10^{-01}	6.30×10^{-02}	4.11×10^{-02}	1.41×10^{-01}	9.91×10^{-01}
D-LIMONENE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
DODECENE	5.64×10^{-01}	4.77×10^{-02}	3.11×10^{-02}	1.07×10^{-01}	7.50×10^{-01}
EPICHLOROHYDRIN	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ETHANE	$1.39 \times 10^{+01}$	1.17	7.66×10^{-01}	2.64	$1.85 \times 10^{+01}$
ETHANOLAMINE	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
ETHYL ACETATE	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
ETHYL ACRYLATE	5.64×10^{-01}	4.77×10^{-02}	3.11×10^{-02}	1.07×10^{-01}	7.50×10^{-01}
ETHYL ALCOHOL	1.54	1.30×10^{-01}	8.47×10^{-02}	2.91×10^{-01}	2.04
ETHYL CHLORIDE	3.27×10^{-01}	2.77×10^{-02}	1.81×10^{-02}	6.21×10^{-02}	4.35×10^{-01}
ETHYL ETHER	7.00×10^{-01}	5.92×10^{-02}	3.86×10^{-02}	1.33×10^{-01}	9.30×10^{-01}
ETHYL MERCAPTAN	3.72×10^{-01}	3.15×10^{-02}	2.05×10^{-02}	7.07×10^{-02}	4.95×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ETHYL STYRENE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
ETHYLBENZENE	$1.88 \times 10^{+01}$	1.59	1.04	3.57	$2.50 \times 10^{+01}$
ETHYLCYCLOHEXANE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
ETHYLCYCLOPENTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ETHYLENE	$6.53 \times 10^{+01}$	5.52	3.60	$1.24 \times 10^{+01}$	$8.68 \times 10^{+01}$
ETHYLENE DIBROMIDE	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ETHYLENE DICHLORIDE	6.55×10^{-01}	5.54×10^{-02}	3.61×10^{-02}	1.24×10^{-01}	8.70×10^{-01}
ETHYLENE GLYCOL	4.18×10^{-01}	3.53×10^{-02}	2.30×10^{-02}	7.93×10^{-02}	5.55×10^{-01}
ETHYLENE OXIDE	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
ETHYLENEAMINES	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
ETHYLHEPTENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ETHYLHEXANE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
ETHYLISOPROPYL ETHER	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
ETHYLMETHYLCYCLOHEXANES	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
ETHYL-PHENYL-PHENYL-ETHANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ETHYLTOLUENE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
FLUORANTHENE	6.76×10^{-02}	5.71×10^{-03}	3.73×10^{-03}	1.28×10^{-02}	8.98×10^{-02}
FLUORENE	1.18×10^{-01}	9.98×10^{-03}	6.51×10^{-03}	2.24×10^{-02}	1.57×10^{-01}
FORMALDEHYDE	$1.63 \times 10^{+01}$	1.38	8.97×10^{-01}	3.09	$2.16 \times 10^{+01}$
FORMIC ACID	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
GLYOXAL	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
HEPTENE	5.76×10^{-01}	4.87×10^{-02}	3.17×10^{-02}	1.09×10^{-01}	7.65×10^{-01}
HEXADECANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
HEXAFLUOROETHANE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
HEXAMETHYLENEDIAMINE	7.56×10^{-01}	6.40×10^{-02}	4.17×10^{-02}	1.44×10^{-01}	1.01
HEXYLENE GLYCOL	4.06×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.71×10^{-02}	5.40×10^{-01}
INDANE	4.19	3.54×10^{-01}	2.31×10^{-01}	7.96×10^{-01}	5.57
INDENO(1,2,3-C,D)PYRENE	1.70×10^{-03}	1.43×10^{-04}	9.35×10^{-05}	3.22×10^{-04}	2.25×10^{-03}
ISOBUTANE	4.81	4.07×10^{-01}	2.65×10^{-01}	9.14×10^{-01}	6.40
ISOBUTYL ACRYLATE	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
ISOBUTYL ALCOHOL	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ISOBUTYL ISOBUTYRATE	4.40×10^{-01}	3.72×10^{-02}	2.43×10^{-02}	8.36×10^{-02}	5.85×10^{-01}
ISOBUTYLBENZENE	3.80	3.22×10^{-01}	2.10×10^{-01}	7.22×10^{-01}	5.06
ISOBUTYLENE	$1.09 \times 10^{+01}$	9.25×10^{-01}	6.03×10^{-01}	2.08	$1.46 \times 10^{+01}$
ISOBUTYRALDEHYDE	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ISOMERS OF BUTENE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
ISOMERS OF BUTYLBENZENE	6.77×10^{-02}	5.73×10^{-03}	3.73×10^{-03}	1.29×10^{-02}	9.00×10^{-02}
ISOMERS OF C10H18	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ISOMERS OF DECANE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
ISOMERS OF DIETHYLBENZENE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
ISOMERS OF DODECANE	5.19×10^{-01}	4.39×10^{-02}	2.86×10^{-02}	9.86×10^{-02}	6.90×10^{-01}
ISOMERS OF ETHYLTOLUENE	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
ISOMERS OF HEPTADECANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ISOMERS OF HEPTANE	2.82×10^{-01}	2.39×10^{-02}	1.56×10^{-02}	5.36×10^{-02}	3.75×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOMERS OF HEXANE	6.10×10^{-01}	5.15×10^{-02}	3.36×10^{-02}	1.16×10^{-01}	8.10×10^{-01}
ISOMERS OF NONANE	2.14×10^{-01}	1.81×10^{-02}	1.18×10^{-02}	4.07×10^{-02}	2.85×10^{-01}
ISOMERS OF OCTADECANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ISOMERS OF OCTANE	1.69×10^{-01}	1.43×10^{-02}	9.34×10^{-03}	3.21×10^{-02}	2.25×10^{-01}
ISOMERS OF PENTADECANE	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ISOMERS OF PENTANE	1.25	1.06×10^{-01}	6.91×10^{-02}	2.38×10^{-01}	1.67
ISOMERS OF PENTENE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
ISOMERS OF PROPYLBENZENE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
ISOMERS OF TETRADECANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
ISOMERS OF UNDECANE	5.64×10^{-02}	4.77×10^{-03}	3.11×10^{-03}	1.07×10^{-02}	7.50×10^{-02}
ISOMERS OF XYLENE	$6.43 \times 10^{+01}$	5.44	3.55	$1.22 \times 10^{+01}$	$8.55 \times 10^{+01}$
ISOPENTANE	$2.72 \times 10^{+01}$	2.30	1.50	5.17	$3.62 \times 10^{+01}$
ISOPRENE	1.32	1.12×10^{-01}	7.28×10^{-02}	2.50×10^{-01}	1.75
ISOPROPYL ACETATE	5.31×10^{-01}	4.49×10^{-02}	2.93×10^{-02}	1.01×10^{-01}	7.05×10^{-01}
ISOPROPYL ALCOHOL	8.24×10^{-01}	6.97×10^{-02}	4.54×10^{-02}	1.56×10^{-01}	1.10
ISOPROPYLBENZENE	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
LACTOL SPIRITS	4.06×10^{-01}	3.44×10^{-02}	2.24×10^{-02}	7.71×10^{-02}	5.40×10^{-01}
LEAD AND COMPOUNDS	1.40×10^{-02}	1.19×10^{-03}	7.75×10^{-04}	2.67×10^{-03}	1.87×10^{-02}
MALEIC ANHYDRIDE	7.90×10^{-02}	6.68×10^{-03}	4.36×10^{-03}	1.50×10^{-02}	1.05×10^{-01}
MANGANESE AND COMPOUNDS	4.36×10^{-03}	3.68×10^{-04}	2.40×10^{-04}	8.27×10^{-04}	5.79×10^{-03}
M-DIETHYLBENZENE	4.42	3.74×10^{-01}	2.44×10^{-01}	8.40×10^{-01}	5.88
METHANE	$8.51 \times 10^{+01}$	7.20	4.70	$1.62 \times 10^{+01}$	$1.13 \times 10^{+02}$
METHYL ACETATE	8.01×10^{-01}	6.78×10^{-02}	4.42×10^{-02}	1.52×10^{-01}	1.07
METHYL ACRYLATE	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
METHYL ALCOHOL	1.58	1.34×10^{-01}	8.71×10^{-02}	3.00×10^{-01}	2.10
METHYL AMYL KETONE	5.76×10^{-01}	4.87×10^{-02}	3.17×10^{-02}	1.09×10^{-01}	7.65×10^{-01}
METHYL CARBITOL	4.40×10^{-01}	3.72×10^{-02}	2.43×10^{-02}	8.36×10^{-02}	5.85×10^{-01}
METHYL CELLOSOLVE	4.40×10^{-01}	3.72×10^{-02}	2.43×10^{-02}	8.36×10^{-02}	5.85×10^{-01}
METHYL ETHYL KETONE	1.38	1.16×10^{-01}	7.59×10^{-02}	2.61×10^{-01}	1.83
METHYL FORMATE	2.37×10^{-01}	2.00×10^{-02}	1.31×10^{-02}	4.50×10^{-02}	3.15×10^{-01}
METHYL GLYOXAL	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
METHYL ISOBUTYL KETONE	6.32×10^{-01}	5.35×10^{-02}	3.49×10^{-02}	1.20×10^{-01}	8.40×10^{-01}
METHYL METHACRYLATE	5.19×10^{-01}	4.39×10^{-02}	2.86×10^{-02}	9.86×10^{-02}	6.90×10^{-01}
METHYL MYRISTATE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
METHYL NAPHTHALENES	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
METHYL PALMITATE	9.03×10^{-02}	7.64×10^{-03}	4.98×10^{-03}	1.71×10^{-02}	1.20×10^{-01}
METHYL STEARATE	1.24×10^{-01}	1.05×10^{-02}	6.85×10^{-03}	2.36×10^{-02}	1.65×10^{-01}
METHYL STYRENE	4.63×10^{-01}	3.91×10^{-02}	2.55×10^{-02}	8.79×10^{-02}	6.15×10^{-01}
METHYL TERT-BUTYL ETHER	$1.45 \times 10^{+02}$	$1.22 \times 10^{+01}$	7.97	$2.74 \times 10^{+01}$	$1.92 \times 10^{+02}$
METHYLACETYLENE	1.32	1.12×10^{-01}	7.28×10^{-02}	2.50×10^{-01}	1.75
METHYLAL	1.92×10^{-01}	1.62×10^{-02}	1.06×10^{-02}	3.64×10^{-02}	2.55×10^{-01}
METHYLALLENE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
METHYLCYCLOHEXANE	3.65	3.08×10^{-01}	2.01×10^{-01}	6.93×10^{-01}	4.85
METHYLCYCLOPENTANE	4.73	4.00×10^{-01}	2.61×10^{-01}	8.99×10^{-01}	6.29

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYLCYCLOPENTENE	1.55×10^{-01}	1.31×10^{-02}	8.56×10^{-03}	2.95×10^{-02}	2.06×10^{-01}
METHYLDECANES	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
METHYLENE BROMIDE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
METHYLHEXANE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
METHYLNONANE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
METHYLOCTANES	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
METHYLPENTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
METHYLPROPYLCYCLOHEXANES	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
M-ETHYLTOLUENE	9.70	8.20×10^{-01}	5.35×10^{-01}	1.84	$1.29 \times 10^{+01}$
METHYLUNDECANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
MINERAL SPIRITS	7.22×10^{-01}	6.11×10^{-02}	3.98×10^{-02}	1.37×10^{-01}	9.60×10^{-01}
MYRCENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
NAPHTHA	5.31×10^{-01}	4.49×10^{-02}	2.93×10^{-02}	1.01×10^{-01}	7.05×10^{-01}
NAPHTHALENE	3.24	2.74×10^{-01}	1.79×10^{-01}	6.15×10^{-01}	4.31
N-BUTANE	$2.96 \times 10^{+01}$	2.50	1.63	5.61	$3.93 \times 10^{+01}$
N-BUTYL ACETATE	6.55×10^{-01}	5.54×10^{-02}	3.61×10^{-02}	1.24×10^{-01}	8.70×10^{-01}
N-BUTYL ALCOHOL	7.79×10^{-01}	6.59×10^{-02}	4.30×10^{-02}	1.48×10^{-01}	1.04
N-DECANE	1.55	1.31×10^{-01}	8.56×10^{-02}	2.95×10^{-01}	2.06
N-DODECANE	2.14×10^{-01}	1.81×10^{-02}	1.18×10^{-02}	4.07×10^{-02}	2.85×10^{-01}
N-HEPTANE	4.11	3.48×10^{-01}	2.27×10^{-01}	7.81×10^{-01}	5.47
N-HEXANE	9.41	7.96×10^{-01}	5.19×10^{-01}	1.79	$1.25 \times 10^{+01}$
NICKEL AND COMPOUNDS	4.36×10^{-03}	3.68×10^{-04}	2.40×10^{-04}	8.27×10^{-04}	5.79×10^{-03}
NITRIC OXIDE	$6.71 \times 10^{+01}$	5.68	3.70	$1.27 \times 10^{+01}$	$8.93 \times 10^{+01}$
NITROBENZENE	3.72×10^{-01}	3.15×10^{-02}	2.05×10^{-02}	7.07×10^{-02}	4.95×10^{-01}
NITROGEN DIOXIDE	5.42	4.58×10^{-01}	2.99×10^{-01}	1.03	7.20
N-NONANE	1.94	1.64×10^{-01}	1.07×10^{-01}	3.68×10^{-01}	2.58
N-OCTANE	2.33	1.97×10^{-01}	1.28×10^{-01}	4.42×10^{-01}	3.10
NONENONE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
N-PENTADECANE	1.92×10^{-01}	1.62×10^{-02}	1.06×10^{-02}	3.64×10^{-02}	2.55×10^{-01}
N-PENTANE	$1.24 \times 10^{+01}$	1.05	6.85×10^{-01}	2.36	$1.65 \times 10^{+01}$
N-PENTYLCYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
N-PROPYL ACETATE	5.53×10^{-01}	4.68×10^{-02}	3.05×10^{-02}	1.05×10^{-01}	7.35×10^{-01}
N-PROPYL ALCOHOL	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
N-PROPYLBENZENE	4.35	3.68×10^{-01}	2.40×10^{-01}	8.25×10^{-01}	5.78
N-TETRADECANE	7.90×10^{-02}	6.68×10^{-03}	4.36×10^{-03}	1.50×10^{-02}	1.05×10^{-01}
N-TRIDECANE	1.13×10^{-01}	9.55×10^{-03}	6.22×10^{-03}	2.14×10^{-02}	1.50×10^{-01}
N-UNDECANE	4.66	3.94×10^{-01}	2.57×10^{-01}	8.84×10^{-01}	6.19
OCTAMETHYLCYCLOTETRASILOXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
O-DICHLOROBENZENE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
O-ETHYLTOLUENE	2.02	1.71×10^{-01}	1.11×10^{-01}	3.83×10^{-01}	2.68
OXIDES OF NITROGEN	$1.08 \times 10^{+02}$	9.16	5.98	$2.06 \times 10^{+01}$	$1.44 \times 10^{+02}$
PALMITIC ACID	2.26×10^{-01}	1.91×10^{-02}	1.24×10^{-02}	4.29×10^{-02}	3.00×10^{-01}
PARAFFINS (C16-C34)	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
PARTICULATE MATTER < 10 µm	$2.12 \times 10^{+01}$	1.79	1.17	4.02	$2.82 \times 10^{+01}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 2.5 µm	$1.95 \times 10^{+01}$	1.65	1.07	3.70	$2.59 \times 10^{+01}$
P-DICHLOROBENZENE	8.13×10^{-01}	6.87×10^{-02}	4.48×10^{-02}	1.54×10^{-01}	1.08
PHENANTHRENE	1.34×10^{-01}	1.13×10^{-02}	7.38×10^{-03}	2.54×10^{-02}	1.78×10^{-01}
PHENOL	4.97×10^{-01}	4.20×10^{-02}	2.74×10^{-02}	9.43×10^{-02}	6.60×10^{-01}
PHENYL ISOCYANATE	1.35×10^{-01}	1.15×10^{-02}	7.47×10^{-03}	2.57×10^{-02}	1.80×10^{-01}
PHTHALIC ANHYDRIDE	2.26×10^{-01}	1.91×10^{-02}	1.24×10^{-02}	4.29×10^{-02}	3.00×10^{-01}
PIPERYLENE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
POLYCHLORINATED DIOXINS AND FURANS	5.44×10^{-11}	4.60×10^{-12}	3.00×10^{-12}	1.03×10^{-11}	7.24×10^{-11}
POLYCYCLIC AROMATIC HYDROCARBONS	4.25	3.60×10^{-01}	2.35×10^{-01}	8.07×10^{-01}	5.65
PROPADIENE	1.01	8.53×10^{-02}	5.56×10^{-02}	1.92×10^{-01}	1.34
PROPANE	2.71	2.29×10^{-01}	1.49×10^{-01}	5.14×10^{-01}	3.60
PROPIONALDEHYDE	1.78	1.51×10^{-01}	9.84×10^{-02}	3.39×10^{-01}	2.37
PROPIONIC ACID	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
PROPYLCYCLOHEXANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
PROPYLENE	$2.24 \times 10^{+01}$	1.89	1.23	4.24	$2.97 \times 10^{+01}$
PROPYLENE DICHLORIDE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
PROPYLENE GLYCOL	4.29×10^{-01}	3.63×10^{-02}	2.37×10^{-02}	8.14×10^{-02}	5.70×10^{-01}
PROPYLENE OXIDE	5.64×10^{-01}	4.77×10^{-02}	3.11×10^{-02}	1.07×10^{-01}	7.50×10^{-01}
PYRENE	1.44×10^{-01}	1.22×10^{-02}	7.94×10^{-03}	2.73×10^{-02}	1.91×10^{-01}
RETENE	4.41×10^{-02}	3.73×10^{-03}	2.43×10^{-03}	8.37×10^{-03}	5.87×10^{-02}
S-BUTYL ALCOHOL	3.84×10^{-01}	3.25×10^{-02}	2.12×10^{-02}	7.29×10^{-02}	5.10×10^{-01}
S-BUTYLBENZENE	1.32	1.12×10^{-01}	7.28×10^{-02}	2.50×10^{-01}	1.75
STYRENE	7.20×10^{-01}	6.09×10^{-02}	3.97×10^{-02}	1.37×10^{-01}	9.57×10^{-01}
SUBSTITUTED C9 ESTER (C12)	1.02×10^{-01}	8.59×10^{-03}	5.60×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
SULFUR DIOXIDE	7.80	6.60×10^{-01}	4.30×10^{-01}	1.48	$1.04 \times 10^{+01}$
T-3-HEXENE	1.55	1.31×10^{-01}	8.56×10^{-02}	2.95×10^{-01}	2.06
TERT-BUTYL ALCOHOL	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
TETRACHLOROETHYLENE	7.90×10^{-01}	6.68×10^{-02}	4.36×10^{-02}	1.50×10^{-01}	1.05
TETRAFLUOROMETHANE	3.39×10^{-02}	2.86×10^{-03}	1.87×10^{-03}	6.43×10^{-03}	4.50×10^{-02}
TOLUENE	$6.82 \times 10^{+01}$	5.76	3.76	$1.29 \times 10^{+01}$	$9.06 \times 10^{+01}$
TOLUENE DIISOCYANATE	7.45×10^{-01}	6.30×10^{-02}	4.11×10^{-02}	1.41×10^{-01}	9.91×10^{-01}
TOTAL AROMATIC AMINES	4.52×10^{-02}	3.82×10^{-03}	2.49×10^{-03}	8.57×10^{-03}	6.00×10^{-02}
TOTAL C2-C5 ALDEHYDES	1.35×10^{-01}	1.15×10^{-02}	7.47×10^{-03}	2.57×10^{-02}	1.80×10^{-01}
TOTAL SUSPENDED PARTICULATES	$2.23 \times 10^{+01}$	1.89	1.23	4.23	$2.97 \times 10^{+01}$
TOTAL VOCS	$9.49 \times 10^{+02}$	$8.02 \times 10^{+01}$	$5.23 \times 10^{+01}$	$1.80 \times 10^{+02}$	$1.26 \times 10^{+03}$
TRANS-2-BUTENE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
TRANS-2-PENTENE	2.64	2.23×10^{-01}	1.46×10^{-01}	5.01×10^{-01}	3.51
TRICHLOROBENZENES	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
TRICHLOROETHYLENE	4.85×10^{-01}	4.10×10^{-02}	2.68×10^{-02}	9.21×10^{-02}	6.45×10^{-01}
TRICHLOROFLUOROMETHANE	6.89×10^{-01}	5.82×10^{-02}	3.80×10^{-02}	1.31×10^{-01}	9.15×10^{-01}
TRICHLOROTRIFLUOROETHANE	4.52×10^{-01}	3.82×10^{-02}	2.49×10^{-02}	8.57×10^{-02}	6.00×10^{-01}
TRIFLUOROMETHANE	3.39×10^{-01}	2.86×10^{-02}	1.87×10^{-02}	6.43×10^{-02}	4.50×10^{-01}
TRIMETHYLBENZENE	1.24×10^{-01}	1.05×10^{-02}	6.85×10^{-03}	2.36×10^{-02}	1.65×10^{-01}
TRIMETHYLCYCLOHEXANES	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRIMETHYLCYCLOPENTANE	1.13×10^{-02}	9.55×10^{-04}	6.22×10^{-04}	2.14×10^{-03}	1.50×10^{-02}
TRIMETHYLDECENE	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
TRIMETHYLFLUOROSILANE	7.79×10^{-01}	6.59×10^{-02}	4.30×10^{-02}	1.48×10^{-01}	1.04
TRIMETHYLHEPTANES	2.26×10^{-02}	1.91×10^{-03}	1.24×10^{-03}	4.29×10^{-03}	3.00×10^{-02}
VINYL ACETATE	6.21×10^{-01}	5.25×10^{-02}	3.42×10^{-02}	1.18×10^{-01}	8.25×10^{-01}
VINYL CHLORIDE	4.74×10^{-01}	4.01×10^{-02}	2.61×10^{-02}	9.00×10^{-02}	6.30×10^{-01}
ZINC AND COMPOUNDS	4.36×10^{-03}	3.68×10^{-04}	2.40×10^{-04}	8.27×10^{-04}	5.79×10^{-03}

Table B1.10: Annual Emissions from Commercial Lawn Mowing and Garden Equipment – 2-Stroke Petrol

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	3.66×10^{-01}	3.59×10^{-02}	1.69×10^{-02}	1.24×10^{-01}	5.42×10^{-01}
1,1,2-TRICHLOROETHANE	2.98×10^{-01}	2.93×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.41×10^{-01}
1,2,3-TRIMETHYLBENZENE	4.74	4.66×10^{-01}	2.19×10^{-01}	1.60	7.02
1,2,4-TRIMETHYLBENZENE	$1.70 \times 10^{+01}$	1.67	7.84×10^{-01}	5.73	$2.51 \times 10^{+01}$
1,2-DIETHYLBENZENE	3.92	3.85×10^{-01}	1.81×10^{-01}	1.32	5.81
1,3,5-TRIMETHYLBENZENE	$1.29 \times 10^{+01}$	1.27	5.98×10^{-01}	4.37	$1.92 \times 10^{+01}$
1,3-BUTADIENE	1.58	1.55×10^{-01}	7.31×10^{-02}	5.34×10^{-01}	2.34
1,4-BUTANEDIOL	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
1-BUTENE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
1-BUTYNE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
1-CHLOROBUTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
1-DECENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
1-HEXENE	1.29	1.26×10^{-01}	5.95×10^{-02}	4.35×10^{-01}	1.91
1-METHYL-3-ISOPROPYLBENZENE	2.98	2.93×10^{-01}	1.38×10^{-01}	1.01	4.42
1-METHYL-3-PROPYLBENZENE	2.28	2.24×10^{-01}	1.05×10^{-01}	7.71×10^{-01}	3.38
1-PENTENE	1.11	1.09×10^{-01}	5.14×10^{-02}	3.76×10^{-01}	1.65
2,2,4-TRIMETHYLPENTANE	$2.74 \times 10^{+01}$	2.69	1.27	9.27	$4.06 \times 10^{+01}$
2,2,5-TRIMETHYLHEXANE	2.81	2.76×10^{-01}	1.30×10^{-01}	9.49×10^{-01}	4.16
2,2-DICHLORONITROANILINE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
2,2-DIMETHYLBUTANE	4.15	4.08×10^{-01}	1.92×10^{-01}	1.40	6.15
2,2-DIMETHYLHEXANE	4.09×10^{-01}	4.02×10^{-02}	1.89×10^{-02}	1.38×10^{-01}	6.07×10^{-01}
2,3,3 TRIMETHYLPENTANE	6.43	6.32×10^{-01}	2.97×10^{-01}	2.17	9.54
2,3,4-TRIMETHYLPENTANE	6.43×10^{-01}	6.32×10^{-02}	2.97×10^{-02}	2.17×10^{-01}	9.54×10^{-01}
2,3,5-TRIMETHYLHEXANE	6.43×10^{-01}	6.32×10^{-02}	2.97×10^{-02}	2.17×10^{-01}	9.54×10^{-01}
2,3-DIMETHYLBUTANE	3.10	3.05×10^{-01}	1.43×10^{-01}	1.05	4.59
2,3-DIMETHYLPENTANE	7.31	7.18×10^{-01}	3.38×10^{-01}	2.47	$1.08 \times 10^{+01}$
2,4,4-TRIMETHYL-1-PENTENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
2,4,5-TRIMETHYLHEPTANE	2.63	2.59×10^{-01}	1.22×10^{-01}	8.89×10^{-01}	3.90
2,4-DIMETHYLHEPTANE	7.60×10^{-01}	7.47×10^{-02}	3.52×10^{-02}	2.57×10^{-01}	1.13
2,4-DIMETHYLHEXANE	5.10×10^{-02}	5.01×10^{-03}	2.36×10^{-03}	1.72×10^{-02}	7.56×10^{-02}
2,4-DIMETHYLOCTANE	5.85×10^{-01}	5.75×10^{-02}	2.70×10^{-02}	1.98×10^{-01}	8.67×10^{-01}
2,4-DIMETHYLPENTANE	3.10	3.05×10^{-01}	1.43×10^{-01}	1.05	4.59
2,5-DIMETHYLHEXANE	3.68	3.62×10^{-01}	1.70×10^{-01}	1.25	5.46
2-BUTYNE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
2-FURFURAL	3.15×10^{-01}	3.09×10^{-02}	1.46×10^{-02}	1.06×10^{-01}	4.66×10^{-01}
2-HEXENE	4.68×10^{-01}	4.60×10^{-02}	2.16×10^{-02}	1.58×10^{-01}	6.93×10^{-01}
2-METHYL-1-BUTENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
2-METHYL-2-BUTENE	2.98	2.93×10^{-01}	1.38×10^{-01}	1.01	4.42
2-METHYL-2-PENTENE	1.34	1.32×10^{-01}	6.22×10^{-02}	4.55×10^{-01}	1.99
2-METHYL-3-HEXANONE	5.95×10^{-02}	5.85×10^{-03}	2.75×10^{-03}	2.01×10^{-02}	8.82×10^{-02}
2-METHYLDECANE	7.72	7.59×10^{-01}	3.57×10^{-01}	2.61	$1.14 \times 10^{+01}$
2-METHYLHEPTANE	1.29	1.26×10^{-01}	5.95×10^{-02}	4.35×10^{-01}	1.91

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2-METHYLOCTANE	1.17×10^{-01}	1.15×10^{-02}	5.41×10^{-03}	3.95×10^{-02}	1.73×10^{-01}
2-METHYLPENTANE	7.43	7.30×10^{-01}	3.43×10^{-01}	2.51	$1.10 \times 10^{+01}$
3,4-DIMETHYLOCTANE	5.61	5.52×10^{-01}	2.60×10^{-01}	1.90	8.32
3-METHYL-1-BUTENE	1.05	1.03×10^{-01}	4.87×10^{-02}	3.56×10^{-01}	1.56
3-METHYLHEPTANE	2.10	2.07×10^{-01}	9.74×10^{-02}	7.11×10^{-01}	3.12
3-METHYLHEXANE	5.38	5.29×10^{-01}	2.49×10^{-01}	1.82	7.97
3-METHYLPENTANE	5.03	4.94×10^{-01}	2.33×10^{-01}	1.70	7.45
4-METHYL-1-PENTENE	1.46	1.44×10^{-01}	6.76×10^{-02}	4.94×10^{-01}	2.17
4-METHYLANILINE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
4-METHYLHEPTANE	3.04	2.99×10^{-01}	1.41×10^{-01}	1.03	4.51
ACENAPHTHENE	2.12×10^{-02}	2.08×10^{-03}	9.81×10^{-04}	7.17×10^{-03}	3.14×10^{-02}
ACENAPHTHYLENE	4.05×10^{-02}	3.98×10^{-03}	1.87×10^{-03}	1.37×10^{-02}	6.00×10^{-02}
ACETALDEHYDE	1.23	1.20×10^{-01}	5.67×10^{-02}	4.14×10^{-01}	1.82
ACETIC ACID	6.21×10^{-01}	6.10×10^{-02}	2.87×10^{-02}	2.10×10^{-01}	9.20×10^{-01}
ACETIC ANHYDRIDE	2.98×10^{-01}	2.93×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.41×10^{-01}
ACETONE	1.25	1.23×10^{-01}	5.78×10^{-02}	4.23×10^{-01}	1.85
ACETYLENE	$1.32 \times 10^{+01}$	1.29	6.09×10^{-01}	4.45	$1.95 \times 10^{+01}$
ACROLEIN	2.21×10^{-01}	2.17×10^{-02}	1.02×10^{-02}	7.47×10^{-02}	3.28×10^{-01}
ACRYLIC ACID	3.83×10^{-01}	3.76×10^{-02}	1.77×10^{-02}	1.29×10^{-01}	5.67×10^{-01}
ACRYLONITRILE	4.93×10^{-01}	4.85×10^{-02}	2.28×10^{-02}	1.67×10^{-01}	7.31×10^{-01}
ADIPIC ACID	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
ALIPHATICS	8.50×10^{-02}	8.36×10^{-03}	3.93×10^{-03}	2.87×10^{-02}	1.26×10^{-01}
ALKENE KETONE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ALPHA-PINENE	2.98×10^{-01}	2.93×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.41×10^{-01}
ANILINE	6.72×10^{-01}	6.60×10^{-02}	3.11×10^{-02}	2.27×10^{-01}	9.96×10^{-01}
ANTHRACENE	2.54×10^{-02}	2.49×10^{-03}	1.17×10^{-03}	8.58×10^{-03}	3.76×10^{-02}
ANTHRAQUINONE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BENZALDEHYDE	1.40	1.38×10^{-01}	6.49×10^{-02}	4.74×10^{-01}	2.08
BENZENE	$1.85 \times 10^{+01}$	1.82	8.57×10^{-01}	6.26	$2.75 \times 10^{+01}$
BENZO(A)ANTHRACENE	1.27×10^{-02}	1.25×10^{-03}	5.88×10^{-04}	4.30×10^{-03}	1.89×10^{-02}
BENZO(A)PYRENE	2.52×10^{-02}	2.48×10^{-03}	1.17×10^{-03}	8.52×10^{-03}	3.73×10^{-02}
BENZO(B)FLUORANTHENE	1.27×10^{-02}	1.24×10^{-03}	5.86×10^{-04}	4.28×10^{-03}	1.88×10^{-02}
BENZO(E)PYRENE	9.57×10^{-02}	9.41×10^{-03}	4.43×10^{-03}	3.24×10^{-02}	1.42×10^{-01}
BENZO(G,H,I,)PERYLENE	9.59×10^{-03}	9.43×10^{-04}	4.44×10^{-04}	3.24×10^{-03}	1.42×10^{-02}
BENZO(K)FLUORANTHENE	9.87×10^{-03}	9.70×10^{-04}	4.57×10^{-04}	3.34×10^{-03}	1.46×10^{-02}
BENZOIC ACID	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
BENZYL CHLORIDE	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
BETA-PINENE	1.96×10^{-01}	1.92×10^{-02}	9.05×10^{-03}	6.61×10^{-02}	2.90×10^{-01}
BIPHENYL	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
B-PHELLANDRENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BROMODINITROBENZENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BUTOXYBUTENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BUTOXYETHOXYETHANOL ACETATE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BUTYL ACRYLATE	3.66×10^{-01}	3.59×10^{-02}	1.69×10^{-02}	1.24×10^{-01}	5.42×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
BUTYL BENZOATE	1.79×10^{-01}	1.76×10^{-02}	8.26×10^{-03}	6.04×10^{-02}	2.65×10^{-01}
BUTYL CARBITOL	3.32×10^{-01}	3.26×10^{-02}	1.53×10^{-02}	1.12×10^{-01}	4.92×10^{-01}
BUTYL CELLOSOLVE	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
BUTYLCYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
BUTYLISOPROPYLPHTHALATE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
BUTYRALDEHYDE	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
C10 AROMATIC	$1.55 \times 10^{+01}$	1.52	7.17×10^{-01}	5.24	$2.30 \times 10^{+01}$
C10 OLEFINS	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
C10 PARAFFINS	1.11	1.09×10^{-01}	5.14×10^{-02}	3.76×10^{-01}	1.65
C2 ALKYL INDAN	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
C2 CYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C3 CYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C3/C4/C5 ALKYLBENZENES	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
C-3-HEXENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C4 SUBSTITUTED CYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C4 SUBSTITUTED CYCLOHEXANONE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C5 ESTER	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
C5 OLEFIN	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C5 PARAFFIN	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C5 SUBSTITUTED CYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C6 SUBSTITUTED CYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
C6H18O3SI3	7.65×10^{-02}	7.52×10^{-03}	3.54×10^{-03}	2.59×10^{-02}	1.13×10^{-01}
C-7 CYCLOPARAFFINS	6.04×10^{-01}	5.93×10^{-02}	2.79×10^{-02}	2.04×10^{-01}	8.95×10^{-01}
C7-C16 PARAFFINS	1.28×10^{-01}	1.25×10^{-02}	5.90×10^{-03}	4.31×10^{-02}	1.89×10^{-01}
C-8 CYCLOPARAFFINS	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
C8 PARAFFIN	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
C8H24O4SI4	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
CAMPHENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
CARBITOL	3.91×10^{-01}	3.84×10^{-02}	1.81×10^{-02}	1.32×10^{-01}	5.80×10^{-01}
CARBON MONOXIDE	$4.15 \times 10^{+03}$	$4.08 \times 10^{+02}$	$1.92 \times 10^{+02}$	$1.40 \times 10^{+03}$	$6.16 \times 10^{+03}$
CARBON SULFIDE	7.65×10^{-02}	7.52×10^{-03}	3.54×10^{-03}	2.59×10^{-02}	1.13×10^{-01}
CARBON TETRACHLORIDE	5.53×10^{-01}	5.43×10^{-02}	2.56×10^{-02}	1.87×10^{-01}	8.19×10^{-01}
CARBONYL SULFIDE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
CELLOSOLVE	3.06×10^{-01}	3.01×10^{-02}	1.42×10^{-02}	1.03×10^{-01}	4.54×10^{-01}
CELLOSOLVE ACETATE	3.06×10^{-01}	3.01×10^{-02}	1.42×10^{-02}	1.03×10^{-01}	4.54×10^{-01}
CHLOROBENZENE	6.04×10^{-01}	5.93×10^{-02}	2.79×10^{-02}	2.04×10^{-01}	8.95×10^{-01}
CHLORODIFLUOROMETHANE	1.36×10^{-01}	1.34×10^{-02}	6.29×10^{-03}	4.60×10^{-02}	2.02×10^{-01}
CHLOROFORM	4.34×10^{-01}	4.26×10^{-02}	2.01×10^{-02}	1.47×10^{-01}	6.43×10^{-01}
CHLOROPENTAFLUOROETHANE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
CHLOROPRENE	2.89×10^{-01}	2.84×10^{-02}	1.34×10^{-02}	9.77×10^{-02}	4.29×10^{-01}
CHLOROTRIFLUOROMETHANE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
CHROMIUM (III) COMPOUNDS	1.46×10^{-02}	1.44×10^{-03}	6.76×10^{-04}	4.94×10^{-03}	2.17×10^{-02}
CHROMIUM (VI) COMPOUNDS	6.07×10^{-03}	5.97×10^{-04}	2.81×10^{-04}	2.05×10^{-03}	9.00×10^{-03}
CHRYSENE	1.13×10^{-02}	1.11×10^{-03}	5.23×10^{-04}	3.82×10^{-03}	1.68×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CIS-2-BUTENE	2.69	2.64×10^{-01}	1.24×10^{-01}	9.09×10^{-01}	3.99
CIS-2-PENTENE	1.17	1.15×10^{-01}	5.41×10^{-02}	3.95×10^{-01}	1.73
COBALT AND COMPOUNDS	2.07×10^{-02}	2.03×10^{-03}	9.56×10^{-04}	6.99×10^{-03}	3.07×10^{-02}
COPPER AND COMPOUNDS	2.07×10^{-02}	2.03×10^{-03}	9.56×10^{-04}	6.99×10^{-03}	3.07×10^{-02}
CORONENE	2.50×10^{-03}	2.46×10^{-04}	1.16×10^{-04}	8.46×10^{-04}	3.71×10^{-03}
CREOSOTE	3.15×10^{-01}	3.09×10^{-02}	1.46×10^{-02}	1.06×10^{-01}	4.66×10^{-01}
CRESOL	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
CROTONALDEHYDE	4.09×10^{-01}	4.02×10^{-02}	1.89×10^{-02}	1.38×10^{-01}	6.07×10^{-01}
CYCLOHEXANE	9.47	9.31×10^{-01}	4.38×10^{-01}	3.20	$1.40 \times 10^{+01}$
CYCLOHEXANOL	3.83×10^{-01}	3.76×10^{-02}	1.77×10^{-02}	1.29×10^{-01}	5.67×10^{-01}
CYCLOHEXANONE	4.51×10^{-01}	4.43×10^{-02}	2.08×10^{-02}	1.52×10^{-01}	6.68×10^{-01}
CYCLOHEXENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
CYCLOPENTA(C,D)PYRENE	2.82×10^{-02}	2.77×10^{-03}	1.30×10^{-03}	9.53×10^{-03}	4.18×10^{-02}
CYCLOPENTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
CYCLOPENTENE	1.58	1.55×10^{-01}	7.30×10^{-02}	5.34×10^{-01}	2.34
DENATURANT	8.50×10^{-02}	8.36×10^{-03}	3.93×10^{-03}	2.87×10^{-02}	1.26×10^{-01}
DIBENZO(A,H)ANTHRACENE	1.38×10^{-02}	1.36×10^{-03}	6.40×10^{-04}	4.68×10^{-03}	2.05×10^{-02}
DIBUTYL PHTHALATE	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
DICHLOROBENZENES	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
DICHLORODIFLUOROMETHANE	2.98×10^{-01}	2.93×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.41×10^{-01}
DICHLOROMETHANE	6.38×10^{-01}	6.27×10^{-02}	2.95×10^{-02}	2.16×10^{-01}	9.45×10^{-01}
DICHLOROTETRAFLUORETHANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
DIETHYLCYCLOHEXANE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
DIETHYLENE GLYCOL	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
DIISOPROPYL BENZENE	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
DIMETHYL FORMAMIDE	3.06×10^{-01}	3.01×10^{-02}	1.42×10^{-02}	1.03×10^{-01}	4.54×10^{-01}
DIMETHYL PHTHALATE	5.10×10^{-02}	5.01×10^{-03}	2.36×10^{-03}	1.72×10^{-02}	7.56×10^{-02}
DIMETHYLCYCLOHEXANE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
DIMETHYLCYCLOPENTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
DIMETHYLETHER	9.52×10^{-01}	9.36×10^{-02}	4.41×10^{-02}	3.22×10^{-01}	1.41
DIMETHYLHEXENE	7.60×10^{-01}	7.47×10^{-02}	3.52×10^{-02}	2.57×10^{-01}	1.13
DIMETHYLOCTANES	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
DIPROPYLENE GLYCOL	5.61×10^{-01}	5.52×10^{-02}	2.60×10^{-02}	1.90×10^{-01}	8.32×10^{-01}
D-LIMONENE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
DODECENE	4.25×10^{-01}	4.18×10^{-02}	1.97×10^{-02}	1.44×10^{-01}	6.30×10^{-01}
EPICHLOROHYDRIN	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ETHANE	$1.05 \times 10^{+01}$	1.03	4.84×10^{-01}	3.54	$1.55 \times 10^{+01}$
ETHANOLAMINE	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
ETHYL ACETATE	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
ETHYL ACRYLATE	4.25×10^{-01}	4.18×10^{-02}	1.97×10^{-02}	1.44×10^{-01}	6.30×10^{-01}
ETHYL ALCOHOL	1.16	1.14×10^{-01}	5.35×10^{-02}	3.91×10^{-01}	1.71
ETHYL CHLORIDE	2.47×10^{-01}	2.42×10^{-02}	1.14×10^{-02}	8.34×10^{-02}	3.66×10^{-01}
ETHYL ETHER	5.27×10^{-01}	5.18×10^{-02}	2.44×10^{-02}	1.78×10^{-01}	7.82×10^{-01}
ETHYL MERCAPTAN	2.81×10^{-01}	2.76×10^{-02}	1.30×10^{-02}	9.49×10^{-02}	4.16×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ETHYL STYRENE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
ETHYLBENZENE	$1.76 \times 10^{+01}$	1.73	8.16×10^{-01}	5.96	$2.62 \times 10^{+01}$
ETHYLCYCLOHEXANE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
ETHYLCYCLOPENTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ETHYLENE	$4.92 \times 10^{+01}$	4.83	2.27	$1.66 \times 10^{+01}$	$7.29 \times 10^{+01}$
ETHYLENE DIBROMIDE	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ETHYLENE DICHLORIDE	4.93×10^{-01}	4.85×10^{-02}	2.28×10^{-02}	1.67×10^{-01}	7.31×10^{-01}
ETHYLENE GLYCOL	3.15×10^{-01}	3.09×10^{-02}	1.46×10^{-02}	1.06×10^{-01}	4.66×10^{-01}
ETHYLENE OXIDE	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
ETHYLENEAMINES	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
ETHYLHEPTENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ETHYLHEXANE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
ETHYLISOPROPYL ETHER	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
ETHYLMETHYLCYCLOHEXANES	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
ETHYL-PHENYL-PHENYL-ETHANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ETHYLTOLUENE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
FLUORANTHENE	5.58×10^{-02}	5.49×10^{-03}	2.58×10^{-03}	1.89×10^{-02}	8.28×10^{-02}
FLUORENE	8.32×10^{-02}	8.18×10^{-03}	3.85×10^{-03}	2.81×10^{-02}	1.23×10^{-01}
FORMALDEHYDE	1.87	1.84×10^{-01}	8.65×10^{-02}	6.32×10^{-01}	2.77
FORMIC ACID	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
GLYOXAL	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
HEPTENE	4.34×10^{-01}	4.26×10^{-02}	2.01×10^{-02}	1.47×10^{-01}	6.43×10^{-01}
HEXADECANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
HEXAFLUOROETHANE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
HEXAMETHYLENEDIAMINE	5.70×10^{-01}	5.60×10^{-02}	2.64×10^{-02}	1.93×10^{-01}	8.45×10^{-01}
HEXYLENE GLYCOL	3.06×10^{-01}	3.01×10^{-02}	1.42×10^{-02}	1.03×10^{-01}	4.54×10^{-01}
INDANE	3.16	3.10×10^{-01}	1.46×10^{-01}	1.07	4.68
INDENO(1,2,3-C,D)PYRENE	2.40×10^{-03}	2.36×10^{-04}	1.11×10^{-04}	8.13×10^{-04}	3.56×10^{-03}
ISOBUTANE	3.63	3.56×10^{-01}	1.68×10^{-01}	1.23	5.37
ISOBUTYL ACRYLATE	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
ISOBUTYL ALCOHOL	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ISOBUTYL ISOBUTYRATE	3.32×10^{-01}	3.26×10^{-02}	1.53×10^{-02}	1.12×10^{-01}	4.92×10^{-01}
ISOBUTYLBENZENE	2.86	2.82×10^{-01}	1.33×10^{-01}	9.68×10^{-01}	4.25
ISOBUTYLENE	8.24	8.10×10^{-01}	3.81×10^{-01}	2.79	$1.22 \times 10^{+01}$
ISOBUTYRALDEHYDE	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ISOMERS OF BUTENE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
ISOMERS OF BUTYLBENZENE	5.10×10^{-02}	5.01×10^{-03}	2.36×10^{-03}	1.72×10^{-02}	7.56×10^{-02}
ISOMERS OF C10H18	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ISOMERS OF DECANE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
ISOMERS OF DIETHYLBENZENE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
ISOMERS OF DODECANE	3.91×10^{-01}	3.84×10^{-02}	1.81×10^{-02}	1.32×10^{-01}	5.80×10^{-01}
ISOMERS OF ETHYLTOLUENE	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
ISOMERS OF HEPTADECANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ISOMERS OF HEPTANE	2.13×10^{-01}	2.09×10^{-02}	9.83×10^{-03}	7.19×10^{-02}	3.15×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOMERS OF HEXANE	4.59×10^{-01}	4.51×10^{-02}	2.12×10^{-02}	1.55×10^{-01}	6.81×10^{-01}
ISOMERS OF NONANE	1.62×10^{-01}	1.59×10^{-02}	7.47×10^{-03}	5.46×10^{-02}	2.40×10^{-01}
ISOMERS OF OCTADECANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ISOMERS OF OCTANE	1.28×10^{-01}	1.25×10^{-02}	5.90×10^{-03}	4.31×10^{-02}	1.89×10^{-01}
ISOMERS OF PENTADECANE	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ISOMERS OF PENTANE	9.44×10^{-01}	9.28×10^{-02}	4.37×10^{-02}	3.19×10^{-01}	1.40
ISOMERS OF PENTENE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
ISOMERS OF PROPYLBENZENE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
ISOMERS OF TETRADECANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
ISOMERS OF UNDECANE	4.25×10^{-02}	4.18×10^{-03}	1.97×10^{-03}	1.44×10^{-02}	6.30×10^{-02}
ISOMERS OF XYLENE	$7.92 \times 10^{+01}$	7.78	3.66	$2.68 \times 10^{+01}$	$1.17 \times 10^{+02}$
ISOPENTANE	$2.05 \times 10^{+01}$	2.02	9.49×10^{-01}	6.94	$3.04 \times 10^{+01}$
ISOPRENE	9.94×10^{-01}	9.77×10^{-02}	4.60×10^{-02}	3.36×10^{-01}	1.47
ISOPROPYL ACETATE	4.00×10^{-01}	3.93×10^{-02}	1.85×10^{-02}	1.35×10^{-01}	5.93×10^{-01}
ISOPROPYL ALCOHOL	6.21×10^{-01}	6.10×10^{-02}	2.87×10^{-02}	2.10×10^{-01}	9.20×10^{-01}
ISOPROPYLBENZENE	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
LACTOL SPIRITS	3.06×10^{-01}	3.01×10^{-02}	1.42×10^{-02}	1.03×10^{-01}	4.54×10^{-01}
LEAD AND COMPOUNDS	8.80×10^{-03}	8.65×10^{-04}	4.07×10^{-04}	2.97×10^{-03}	1.30×10^{-02}
MALEIC ANHYDRIDE	5.95×10^{-02}	5.85×10^{-03}	2.75×10^{-03}	2.01×10^{-02}	8.82×10^{-02}
MANGANESE AND COMPOUNDS	2.07×10^{-02}	2.03×10^{-03}	9.56×10^{-04}	6.99×10^{-03}	3.07×10^{-02}
M-DIETHYLBENZENE	3.33	3.28×10^{-01}	1.54×10^{-01}	1.13	4.94
METHANE	$3.35 \times 10^{+01}$	3.29	1.55	$1.13 \times 10^{+01}$	$4.97 \times 10^{+01}$
METHYL ACETATE	6.04×10^{-01}	5.93×10^{-02}	2.79×10^{-02}	2.04×10^{-01}	8.95×10^{-01}
METHYL ACRYLATE	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
METHYL ALCOHOL	1.19	1.17×10^{-01}	5.51×10^{-02}	4.02×10^{-01}	1.76
METHYL AMYL KETONE	4.34×10^{-01}	4.26×10^{-02}	2.01×10^{-02}	1.47×10^{-01}	6.43×10^{-01}
METHYL CARBITOL	3.32×10^{-01}	3.26×10^{-02}	1.53×10^{-02}	1.12×10^{-01}	4.92×10^{-01}
METHYL CELLOSOLVE	3.32×10^{-01}	3.26×10^{-02}	1.53×10^{-02}	1.12×10^{-01}	4.92×10^{-01}
METHYL ETHYL KETONE	1.04	1.02×10^{-01}	4.80×10^{-02}	3.51×10^{-01}	1.54
METHYL FORMATE	1.79×10^{-01}	1.76×10^{-02}	8.26×10^{-03}	6.04×10^{-02}	2.65×10^{-01}
METHYL GLYOXAL	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
METHYL ISOBUTYL KETONE	4.76×10^{-01}	4.68×10^{-02}	2.20×10^{-02}	1.61×10^{-01}	7.06×10^{-01}
METHYL METHACRYLATE	3.91×10^{-01}	3.84×10^{-02}	1.81×10^{-02}	1.32×10^{-01}	5.80×10^{-01}
METHYL MYRISTATE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
METHYL NAPHTHALENES	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
METHYL PALMITATE	6.80×10^{-02}	6.69×10^{-03}	3.15×10^{-03}	2.30×10^{-02}	1.01×10^{-01}
METHYL STEARATE	9.35×10^{-02}	9.19×10^{-03}	4.33×10^{-03}	3.16×10^{-02}	1.39×10^{-01}
METHYL STYRENE	3.49×10^{-01}	3.43×10^{-02}	1.61×10^{-02}	1.18×10^{-01}	5.17×10^{-01}
METHYL TERT-BUTYL ETHER	$9.14 \times 10^{+01}$	8.98	4.23	$3.09 \times 10^{+01}$	$1.35 \times 10^{+02}$
METHYLACETYLENE	9.94×10^{-01}	9.77×10^{-02}	4.60×10^{-02}	3.36×10^{-01}	1.47
METHYLAL	1.45×10^{-01}	1.42×10^{-02}	6.69×10^{-03}	4.89×10^{-02}	2.14×10^{-01}
METHYLALLENE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
METHYLCYCLOHEXANE	2.75	2.70×10^{-01}	1.27×10^{-01}	9.29×10^{-01}	4.07
METHYLCYCLOPENTANE	3.57	3.51×10^{-01}	1.65×10^{-01}	1.21	5.29

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYLCYCLOPENTENE	1.17×10^{-01}	1.15×10^{-02}	5.41×10^{-03}	3.95×10^{-02}	1.73×10^{-01}
METHYLDECANES	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
METHYLENE BROMIDE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
METHYLHEXANE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
METHYLNONANE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
METHYLOCTANES	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
METHYLPENTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
METHYLPROPYLCYCLOHEXANES	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
M-ETHYLTOLUENE	7.31	7.18×10^{-01}	3.38×10^{-01}	2.47	$1.08 \times 10^{+01}$
METHYLUNDECANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
MINERAL SPIRITS	5.44×10^{-01}	5.35×10^{-02}	2.52×10^{-02}	1.84×10^{-01}	8.07×10^{-01}
MYRCENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
NAPHTHA	4.00×10^{-01}	3.93×10^{-02}	1.85×10^{-02}	1.35×10^{-01}	5.93×10^{-01}
NAPHTHALENE	1.02	1.01×10^{-01}	4.74×10^{-02}	3.46×10^{-01}	1.52
N-BUTANE	$2.23 \times 10^{+01}$	2.19	1.03	7.53	$3.30 \times 10^{+01}$
N-BUTYL ACETATE	4.93×10^{-01}	4.85×10^{-02}	2.28×10^{-02}	1.67×10^{-01}	7.31×10^{-01}
N-BUTYL ALCOHOL	5.87×10^{-01}	5.77×10^{-02}	2.71×10^{-02}	1.98×10^{-01}	8.70×10^{-01}
N-DECANE	1.17	1.15×10^{-01}	5.41×10^{-02}	3.95×10^{-01}	1.73
N-DODECANE	1.62×10^{-01}	1.59×10^{-02}	7.47×10^{-03}	5.46×10^{-02}	2.40×10^{-01}
N-HEPTANE	3.10	3.05×10^{-01}	1.43×10^{-01}	1.05	4.59
N-HEXANE	$1.04 \times 10^{+01}$	1.02	4.82×10^{-01}	3.52	$1.55 \times 10^{+01}$
NICKEL AND COMPOUNDS	2.07×10^{-02}	2.03×10^{-03}	9.56×10^{-04}	6.99×10^{-03}	3.07×10^{-02}
NITRIC OXIDE	$6.03 \times 10^{+01}$	5.93	2.79	$2.04 \times 10^{+01}$	$8.94 \times 10^{+01}$
NITROBENZENE	2.81×10^{-01}	2.76×10^{-02}	1.30×10^{-02}	9.49×10^{-02}	4.16×10^{-01}
NITROGEN DIOXIDE	4.87	4.78×10^{-01}	2.25×10^{-01}	1.65	7.22
N-NONANE	1.46	1.44×10^{-01}	6.76×10^{-02}	4.94×10^{-01}	2.17
N-OCTANE	1.75	1.72×10^{-01}	8.11×10^{-02}	5.93×10^{-01}	2.60
NONENONE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
N-PENTADECANE	1.45×10^{-01}	1.42×10^{-02}	6.69×10^{-03}	4.89×10^{-02}	2.14×10^{-01}
N-PENTANE	9.35	9.20×10^{-01}	4.33×10^{-01}	3.16	$1.39 \times 10^{+01}$
N-PENTYLCYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
N-PROPYL ACETATE	4.17×10^{-01}	4.10×10^{-02}	1.93×10^{-02}	1.41×10^{-01}	6.18×10^{-01}
N-PROPYL ALCOHOL	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
N-PROPYLBENZENE	3.27	3.22×10^{-01}	1.51×10^{-01}	1.11	4.85
N-TETRADECANE	5.95×10^{-02}	5.85×10^{-03}	2.75×10^{-03}	2.01×10^{-02}	8.82×10^{-02}
N-TRIDECANE	8.50×10^{-02}	8.36×10^{-03}	3.93×10^{-03}	2.87×10^{-02}	1.26×10^{-01}
N-UNDECANE	3.51	3.45×10^{-01}	1.62×10^{-01}	1.19	5.20
OCTAMETHYLCYCLOTETRASILOXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
O-DICHLOROBENZENE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
O-ETHYLTOLUENE	1.52	1.49×10^{-01}	7.03×10^{-02}	5.14×10^{-01}	2.25
OXIDES OF NITROGEN	$9.74 \times 10^{+01}$	9.57	4.50	$3.29 \times 10^{+01}$	$1.44 \times 10^{+02}$
PALMITIC ACID	1.70×10^{-01}	1.67×10^{-02}	7.87×10^{-03}	5.75×10^{-02}	2.52×10^{-01}
PARAFFINS (C16-C34)	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
PARTICULATE MATTER < 10 µm	$6.87 \times 10^{+01}$	6.75	3.18	$2.32 \times 10^{+01}$	$1.02 \times 10^{+02}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 2.5 µm	$6.38 \times 10^{+01}$	6.27	2.95	$2.16 \times 10^{+01}$	$9.45 \times 10^{+01}$
P-DICHLOROBENZENE	6.12×10^{-01}	6.02×10^{-02}	2.83×10^{-02}	2.07×10^{-01}	9.08×10^{-01}
PHENANTHRENE	7.64×10^{-02}	7.51×10^{-03}	3.53×10^{-03}	2.58×10^{-02}	1.13×10^{-01}
PHENOL	3.74×10^{-01}	3.68×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.55×10^{-01}
PHENYL ISOCYANATE	1.02×10^{-01}	1.00×10^{-02}	4.72×10^{-03}	3.45×10^{-02}	1.51×10^{-01}
PHTHALIC ANHYDRIDE	1.70×10^{-01}	1.67×10^{-02}	7.87×10^{-03}	5.75×10^{-02}	2.52×10^{-01}
PIPERYLENE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
POLYCHLORINATED DIOXINS AND FURANS	1.19×10^{-11}	1.17×10^{-12}	5.49×10^{-13}	4.01×10^{-12}	1.76×10^{-11}
POLYCYCLIC AROMATIC HYDROCARBONS	1.70	1.67×10^{-01}	7.85×10^{-02}	5.74×10^{-01}	2.52
PROPADIENE	7.60×10^{-01}	7.47×10^{-02}	3.52×10^{-02}	2.57×10^{-01}	1.13
PROPANE	2.04	2.01×10^{-01}	9.44×10^{-02}	6.90×10^{-01}	3.03
PROPIONALDEHYDE	1.82×10^{-01}	1.79×10^{-02}	8.41×10^{-03}	6.14×10^{-02}	2.69×10^{-01}
PROPIONIC ACID	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
PROPYLCYCLOHEXANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
PROPYLENE	$1.68 \times 10^{+01}$	1.66	7.79×10^{-01}	5.69	$2.50 \times 10^{+01}$
PROPYLENE DICHLORIDE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
PROPYLENE GLYCOL	3.23×10^{-01}	3.18×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.79×10^{-01}
PROPYLENE OXIDE	4.25×10^{-01}	4.18×10^{-02}	1.97×10^{-02}	1.44×10^{-01}	6.30×10^{-01}
PYRENE	1.13×10^{-01}	1.11×10^{-02}	5.23×10^{-03}	3.83×10^{-02}	1.68×10^{-01}
RETENE	3.42×10^{-02}	3.37×10^{-03}	1.58×10^{-03}	1.16×10^{-02}	5.08×10^{-02}
S-BUTYL ALCOHOL	2.89×10^{-01}	2.84×10^{-02}	1.34×10^{-02}	9.77×10^{-02}	4.29×10^{-01}
S-BUTYLBENZENE	9.94×10^{-01}	9.77×10^{-02}	4.60×10^{-02}	3.36×10^{-01}	1.47
STYRENE	9.54×10^{-01}	9.38×10^{-02}	4.41×10^{-02}	3.22×10^{-01}	1.41
SUBSTITUTED C9 ESTER (C12)	7.65×10^{-02}	7.52×10^{-03}	3.54×10^{-03}	2.59×10^{-02}	1.13×10^{-01}
SULFUR DIOXIDE	3.46	3.40×10^{-01}	1.60×10^{-01}	1.17	5.13
T-3-HEXENE	1.17	1.15×10^{-01}	5.41×10^{-02}	3.95×10^{-01}	1.73
TERT-BUTYL ALCOHOL	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
TETRACHLOROETHYLENE	5.95×10^{-01}	5.85×10^{-02}	2.75×10^{-02}	2.01×10^{-01}	8.82×10^{-01}
TETRAFLUOROMETHANE	2.55×10^{-02}	2.51×10^{-03}	1.18×10^{-03}	8.62×10^{-03}	3.78×10^{-02}
TOLUENE	$7.20 \times 10^{+01}$	7.08	3.33	$2.43 \times 10^{+01}$	$1.07 \times 10^{+02}$
TOLUENE DIISOCYANATE	5.61×10^{-01}	5.52×10^{-02}	2.60×10^{-02}	1.90×10^{-01}	8.32×10^{-01}
TOTAL AROMATIC AMINES	3.40×10^{-02}	3.34×10^{-03}	1.57×10^{-03}	1.15×10^{-02}	5.04×10^{-02}
TOTAL C2-C5 ALDEHYDES	1.02×10^{-01}	1.00×10^{-02}	4.72×10^{-03}	3.45×10^{-02}	1.51×10^{-01}
TOTAL SUSPENDED PARTICULATES	$7.23 \times 10^{+01}$	7.11	3.35	$2.44 \times 10^{+01}$	$1.07 \times 10^{+02}$
TOTAL VOCS	$7.36 \times 10^{+02}$	$7.24 \times 10^{+01}$	$3.41 \times 10^{+01}$	$2.49 \times 10^{+02}$	$1.09 \times 10^{+03}$
TRANS-2-BUTENE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
TRANS-2-PENTENE	1.99	1.95×10^{-01}	9.20×10^{-02}	6.72×10^{-01}	2.95
TRICHLOROBENZENES	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
TRICHLOROETHYLENE	3.66×10^{-01}	3.59×10^{-02}	1.69×10^{-02}	1.24×10^{-01}	5.42×10^{-01}
TRICHLOROFLUOROMETHANE	5.19×10^{-01}	5.10×10^{-02}	2.40×10^{-02}	1.75×10^{-01}	7.69×10^{-01}
TRICHLOROTRIFLUOROETHANE	3.40×10^{-01}	3.34×10^{-02}	1.57×10^{-02}	1.15×10^{-01}	5.04×10^{-01}
TRIFLUOROMETHANE	2.55×10^{-01}	2.51×10^{-02}	1.18×10^{-02}	8.62×10^{-02}	3.78×10^{-01}
TRIMETHYLBENZENE	9.35×10^{-02}	9.19×10^{-03}	4.33×10^{-03}	3.16×10^{-02}	1.39×10^{-01}
TRIMETHYLCYCLOHEXANES	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRIMETHYLCYCLOPENTANE	8.50×10^{-03}	8.36×10^{-04}	3.93×10^{-04}	2.87×10^{-03}	1.26×10^{-02}
TRIMETHYLDECENE	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
TRIMETHYLFLUOROSILANE	5.87×10^{-01}	5.77×10^{-02}	2.71×10^{-02}	1.98×10^{-01}	8.70×10^{-01}
TRIMETHYLHEPTANES	1.70×10^{-02}	1.67×10^{-03}	7.87×10^{-04}	5.75×10^{-03}	2.52×10^{-02}
VINYL ACETATE	4.68×10^{-01}	4.60×10^{-02}	2.16×10^{-02}	1.58×10^{-01}	6.93×10^{-01}
VINYL CHLORIDE	3.57×10^{-01}	3.51×10^{-02}	1.65×10^{-02}	1.21×10^{-01}	5.29×10^{-01}
ZINC AND COMPOUNDS	2.07×10^{-02}	2.03×10^{-03}	9.56×10^{-04}	6.99×10^{-03}	3.07×10^{-02}

Table B1.11: Annual Emissions from Commercial Lawn Mowing and Garden Equipment – 4-Stroke Petrol

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	9.34×10^{-02}	9.18×10^{-03}	4.32×10^{-03}	3.16×10^{-02}	1.38×10^{-01}
1,1,2-TRICHLOROETHANE	7.60×10^{-02}	7.47×10^{-03}	3.52×10^{-03}	2.57×10^{-02}	1.13×10^{-01}
1,2,3-TRIMETHYLBENZENE	1.21	1.19×10^{-01}	5.59×10^{-02}	4.09×10^{-01}	1.79
1,2,4-TRIMETHYLBENZENE	4.33	4.26×10^{-01}	2.00×10^{-01}	1.46	6.42
1,2-DIETHYLBENZENE	1.00	9.83×10^{-02}	4.63×10^{-02}	3.38×10^{-01}	1.48
1,3,5-TRIMETHYLBENZENE	3.30	3.24×10^{-01}	1.53×10^{-01}	1.12	4.89
1,3-BUTADIENE	1.71	1.68×10^{-01}	7.90×10^{-02}	5.77×10^{-01}	2.53
1,4-BUTANEDIOL	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
1-BUTENE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
1-BUTYNE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
1-CHLOROBUTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
1-DECENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
1-HEXENE	3.28×10^{-01}	3.23×10^{-02}	1.52×10^{-02}	1.11×10^{-01}	4.87×10^{-01}
1-METHYL-3-ISOPROPYLBENZENE	7.61×10^{-01}	7.48×10^{-02}	3.52×10^{-02}	2.57×10^{-01}	1.13
1-METHYL-3-PROPYLBENZENE	5.82×10^{-01}	5.72×10^{-02}	2.69×10^{-02}	1.97×10^{-01}	8.63×10^{-01}
1-PENTENE	2.84×10^{-01}	2.79×10^{-02}	1.31×10^{-02}	9.59×10^{-02}	4.21×10^{-01}
2,2,4-TRIMETHYLPENTANE	3.45	3.39×10^{-01}	1.60×10^{-01}	1.17	5.12
2,2,5-TRIMETHYLHEXANE	7.17×10^{-01}	7.04×10^{-02}	3.31×10^{-02}	2.42×10^{-01}	1.06
2,2-DICHLORONITROANILINE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
2,2-DIMETHYLBUTANE	1.06	1.04×10^{-01}	4.90×10^{-02}	3.58×10^{-01}	1.57
2,2-DIMETHYLHEXANE	1.05×10^{-01}	1.03×10^{-02}	4.83×10^{-03}	3.53×10^{-02}	1.55×10^{-01}
2,3,3-TRIMETHYLPENTANE	1.64	1.61×10^{-01}	7.60×10^{-02}	5.55×10^{-01}	2.43
2,3,4-TRIMETHYLPENTANE	1.64×10^{-01}	1.61×10^{-02}	7.60×10^{-03}	5.55×10^{-02}	2.43×10^{-01}
2,3,5-TRIMETHYLHEXANE	1.64×10^{-01}	1.61×10^{-02}	7.60×10^{-03}	5.55×10^{-02}	2.43×10^{-01}
2,3-DIMETHYLBUTANE	7.91×10^{-01}	7.78×10^{-02}	3.66×10^{-02}	2.67×10^{-01}	1.17
2,3-DIMETHYLPENTANE	1.87	1.83×10^{-01}	8.63×10^{-02}	6.31×10^{-01}	2.77
2,4,4-TRIMETHYL-1-PENTENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
2,4,5-TRIMETHYLHEPTANE	6.72×10^{-01}	6.60×10^{-02}	3.11×10^{-02}	2.27×10^{-01}	9.96×10^{-01}
2,4-DIMETHYLHEPTANE	1.94×10^{-01}	1.91×10^{-02}	8.98×10^{-03}	6.56×10^{-02}	2.88×10^{-01}
2,4-DIMETHYLHEXANE	1.30×10^{-02}	1.28×10^{-03}	6.03×10^{-04}	4.40×10^{-03}	1.93×10^{-02}
2,4-DIMETHYLOCTANE	1.49×10^{-01}	1.47×10^{-02}	6.91×10^{-03}	5.05×10^{-02}	2.21×10^{-01}
2,4-DIMETHYLPENTANE	7.91×10^{-01}	7.78×10^{-02}	3.66×10^{-02}	2.67×10^{-01}	1.17
2,5-DIMETHYLHEXANE	9.41×10^{-01}	9.25×10^{-02}	4.35×10^{-02}	3.18×10^{-01}	1.39
2-BUTYNE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
2-FURFURAL	8.03×10^{-02}	7.90×10^{-03}	3.72×10^{-03}	2.72×10^{-02}	1.19×10^{-01}
2-HEXENE	1.19×10^{-01}	1.17×10^{-02}	5.52×10^{-03}	4.04×10^{-02}	1.77×10^{-01}
2-METHYL-1-BUTENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
2-METHYL-2-BUTENE	7.61×10^{-01}	7.48×10^{-02}	3.52×10^{-02}	2.57×10^{-01}	1.13
2-METHYL-2-PENTENE	3.43×10^{-01}	3.38×10^{-02}	1.59×10^{-02}	1.16×10^{-01}	5.09×10^{-01}
2-METHYL-3-HEXANONE	1.52×10^{-02}	1.49×10^{-03}	7.03×10^{-04}	5.14×10^{-03}	2.25×10^{-02}
2-METHYLDECANE	1.97	1.94×10^{-01}	9.12×10^{-02}	6.66×10^{-01}	2.92
2-METHYLHEPTANE	3.28×10^{-01}	3.23×10^{-02}	1.52×10^{-02}	1.11×10^{-01}	4.87×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2-METHYLOCTANE	2.99×10^{-02}	2.94×10^{-03}	1.38×10^{-03}	1.01×10^{-02}	4.43×10^{-02}
2-METHYLPENTANE	1.90	1.86×10^{-01}	8.77×10^{-02}	6.41×10^{-01}	2.81
3,4-DIMETHYLOCTANE	1.43	1.41×10^{-01}	6.63×10^{-02}	4.84×10^{-01}	2.12
3-METHYL-1-BUTENE	2.69×10^{-01}	2.64×10^{-02}	1.24×10^{-02}	9.08×10^{-02}	3.98×10^{-01}
3-METHYLHEPTANE	5.37×10^{-01}	5.28×10^{-02}	2.49×10^{-02}	1.82×10^{-01}	7.97×10^{-01}
3-METHYLHEXANE	1.37	1.35×10^{-01}	6.35×10^{-02}	4.64×10^{-01}	2.04
3-METHYLPENTANE	1.28	1.26×10^{-01}	5.94×10^{-02}	4.34×10^{-01}	1.90
4-METHYL-1-PENTENE	3.73×10^{-01}	3.67×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.53×10^{-01}
4-METHYLANILINE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
4-METHYLHEPTANE	7.76×10^{-01}	7.63×10^{-02}	3.59×10^{-02}	2.62×10^{-01}	1.15
ACENAPHTHENE	1.75×10^{-02}	1.72×10^{-03}	8.07×10^{-04}	5.90×10^{-03}	2.59×10^{-02}
ACENAPHTHYLENE	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
ACETALDEHYDE	7.35×10^{-01}	7.23×10^{-02}	3.40×10^{-02}	2.49×10^{-01}	1.09
ACETIC ACID	1.59×10^{-01}	1.56×10^{-02}	7.33×10^{-03}	5.36×10^{-02}	2.35×10^{-01}
ACETIC ANHYDRIDE	7.60×10^{-02}	7.47×10^{-03}	3.52×10^{-03}	2.57×10^{-02}	1.13×10^{-01}
ACETONE	3.19×10^{-01}	3.14×10^{-02}	1.48×10^{-02}	1.08×10^{-01}	4.73×10^{-01}
ACETYLENE	3.36	3.30×10^{-01}	1.55×10^{-01}	1.14	4.98
ACROLEIN	1.26×10^{-01}	1.23×10^{-02}	5.81×10^{-03}	4.24×10^{-02}	1.86×10^{-01}
ACRYLIC ACID	9.77×10^{-02}	9.60×10^{-03}	4.52×10^{-03}	3.30×10^{-02}	1.45×10^{-01}
ACRYLONITRILE	1.26×10^{-01}	1.24×10^{-02}	5.83×10^{-03}	4.26×10^{-02}	1.87×10^{-01}
ADIPIC ACID	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
ALIPHATICS	2.17×10^{-02}	2.13×10^{-03}	1.00×10^{-03}	7.34×10^{-03}	3.22×10^{-02}
ALKENE KETONE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ALPHA-PINENE	7.60×10^{-02}	7.47×10^{-03}	3.52×10^{-03}	2.57×10^{-02}	1.13×10^{-01}
ANILINE	1.72×10^{-01}	1.69×10^{-02}	7.93×10^{-03}	5.80×10^{-02}	2.54×10^{-01}
ANTHRACENE	1.94×10^{-02}	1.91×10^{-03}	8.98×10^{-04}	6.56×10^{-03}	2.88×10^{-02}
ANTHRAQUINONE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BENZALDEHYDE	3.58×10^{-01}	3.52×10^{-02}	1.66×10^{-02}	1.21×10^{-01}	5.31×10^{-01}
BENZENE	9.41	9.25×10^{-01}	4.35×10^{-01}	3.18	$1.39 \times 10^{+01}$
BENZO(A)ANTHRACENE	4.22×10^{-03}	4.14×10^{-04}	1.95×10^{-04}	1.43×10^{-03}	6.25×10^{-03}
BENZO(A)PYRENE	7.34×10^{-03}	7.21×10^{-04}	3.39×10^{-04}	2.48×10^{-03}	1.09×10^{-02}
BENZO(B)FLUORANTHENE	4.84×10^{-03}	4.76×10^{-04}	2.24×10^{-04}	1.64×10^{-03}	7.18×10^{-03}
BENZO(E)PYRENE	2.33×10^{-02}	2.29×10^{-03}	1.08×10^{-03}	7.88×10^{-03}	3.46×10^{-02}
BENZO(G,H,I,)PERYLENE	4.78×10^{-03}	4.70×10^{-04}	2.21×10^{-04}	1.62×10^{-03}	7.09×10^{-03}
BENZO(K)FLUORANTHENE	4.20×10^{-03}	4.12×10^{-04}	1.94×10^{-04}	1.42×10^{-03}	6.22×10^{-03}
BENZOIC ACID	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
BENZYL CHLORIDE	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
BETA-PINENE	4.99×10^{-02}	4.91×10^{-03}	2.31×10^{-03}	1.69×10^{-02}	7.40×10^{-02}
BIPHENYL	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
B-PHELLANDRENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BROMODINITROBENZENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BUTOXYBUTENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BUTOXYETHOXYETHANOL ACETATE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BUTYL ACRYLATE	9.34×10^{-02}	9.18×10^{-03}	4.32×10^{-03}	3.16×10^{-02}	1.38×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
BUTYL BENZOATE	4.56×10^{-02}	4.48×10^{-03}	2.11×10^{-03}	1.54×10^{-02}	6.76×10^{-02}
BUTYL CARBITOL	8.47×10^{-02}	8.32×10^{-03}	3.92×10^{-03}	2.86×10^{-02}	1.26×10^{-01}
BUTYL CELLOSOLVE	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
BUTYLCYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
BUTYLISOPROPYLPHTHALATE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
BUTYRALDEHYDE	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
C10 AROMATIC	3.96	3.89×10^{-01}	1.83×10^{-01}	1.34	5.87
C10 OLEFINS	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
C10 PARAFFINS	2.84×10^{-01}	2.79×10^{-02}	1.31×10^{-02}	9.59×10^{-02}	4.21×10^{-01}
C2 ALKYL INDAN	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
C2 CYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C3 CYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C3/C4/C5 ALKYLBENZENES	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
C-3-HEXENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C4 SUBSTITUTED CYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C4 SUBSTITUTED CYCLOHEXANONE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C5 ESTER	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
C5 OLEFIN	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C5 PARAFFIN	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C5 SUBSTITUTED CYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C6 SUBSTITUTED CYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
C6H18O3SI3	1.95×10^{-02}	1.92×10^{-03}	9.04×10^{-04}	6.61×10^{-03}	2.90×10^{-02}
C-7 CYCLOPARAFFINS	1.54×10^{-01}	1.52×10^{-02}	7.13×10^{-03}	5.21×10^{-02}	2.29×10^{-01}
C7-C16 PARAFFINS	3.26×10^{-02}	3.20×10^{-03}	1.51×10^{-03}	1.10×10^{-02}	4.83×10^{-02}
C-8 CYCLOPARAFFINS	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
C8 PARAFFIN	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
C8H24O4SI4	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
CAMPHENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
CARBITOL	9.99×10^{-02}	9.82×10^{-03}	4.62×10^{-03}	3.38×10^{-02}	1.48×10^{-01}
CARBON MONOXIDE	$1.81 \times 10^{+03}$	$1.78 \times 10^{+02}$	$8.36 \times 10^{+01}$	$6.11 \times 10^{+02}$	$2.68 \times 10^{+03}$
CARBON SULFIDE	1.95×10^{-02}	1.92×10^{-03}	9.04×10^{-04}	6.61×10^{-03}	2.90×10^{-02}
CARBON TETRACHLORIDE	1.41×10^{-01}	1.39×10^{-02}	6.53×10^{-03}	4.77×10^{-02}	2.09×10^{-01}
CARBONYL SULFIDE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
CELLOSOLVE	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
CELLOSOLVE ACETATE	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
CHLOROBENZENE	1.54×10^{-01}	1.52×10^{-02}	7.13×10^{-03}	5.21×10^{-02}	2.29×10^{-01}
CHLORODIFLUOROMETHANE	3.47×10^{-02}	3.41×10^{-03}	1.61×10^{-03}	1.17×10^{-02}	5.15×10^{-02}
CHLOROFORM	1.11×10^{-01}	1.09×10^{-02}	5.12×10^{-03}	3.74×10^{-02}	1.64×10^{-01}
CHLOROPENTAFLUOROETHANE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
CHLOROPRENE	7.38×10^{-02}	7.26×10^{-03}	3.41×10^{-03}	2.50×10^{-02}	1.09×10^{-01}
CHLOROTRIFLUOROMETHANE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
CHROMIUM (III) COMPOUNDS	4.35×10^{-05}	4.28×10^{-06}	2.01×10^{-06}	1.47×10^{-05}	6.45×10^{-05}
CHROMIUM (VI) COMPOUNDS	1.81×10^{-05}	1.78×10^{-06}	8.36×10^{-07}	6.11×10^{-06}	2.68×10^{-05}
CHRYSENE	4.09×10^{-03}	4.02×10^{-04}	1.89×10^{-04}	1.38×10^{-03}	6.06×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CIS-2-BUTENE	6.87×10^{-01}	6.75×10^{-02}	3.18×10^{-02}	2.32×10^{-01}	1.02
CIS-2-PENTENE	2.99×10^{-01}	2.94×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.43×10^{-01}
COBALT AND COMPOUNDS	6.16×10^{-05}	6.05×10^{-06}	2.85×10^{-06}	2.08×10^{-05}	9.13×10^{-05}
COPPER AND COMPOUNDS	6.16×10^{-05}	6.05×10^{-06}	2.85×10^{-06}	2.08×10^{-05}	9.13×10^{-05}
CORONENE	6.10×10^{-04}	5.99×10^{-05}	2.82×10^{-05}	2.06×10^{-04}	9.04×10^{-04}
CREOSOTE	8.03×10^{-02}	7.90×10^{-03}	3.72×10^{-03}	2.72×10^{-02}	1.19×10^{-01}
CRESOL	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
CROTONALDEHYDE	1.05×10^{-01}	1.03×10^{-02}	4.83×10^{-03}	3.53×10^{-02}	1.55×10^{-01}
CYCLOHEXANE	2.42	2.38×10^{-01}	1.12×10^{-01}	8.18×10^{-01}	3.59
CYCLOHEXANOL	9.77×10^{-02}	9.60×10^{-03}	4.52×10^{-03}	3.30×10^{-02}	1.45×10^{-01}
CYCLOHEXANONE	1.15×10^{-01}	1.13×10^{-02}	5.32×10^{-03}	3.89×10^{-02}	1.71×10^{-01}
CYCLOHEXENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
CYCLOPENTA(C,D)PYRENE	6.87×10^{-03}	6.75×10^{-04}	3.18×10^{-04}	2.32×10^{-03}	1.02×10^{-02}
CYCLOPENTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
CYCLOPENTENE	4.03×10^{-01}	3.96×10^{-02}	1.86×10^{-02}	1.36×10^{-01}	5.98×10^{-01}
DENATURANT	2.17×10^{-02}	2.13×10^{-03}	1.00×10^{-03}	7.34×10^{-03}	3.22×10^{-02}
DIBENZO(A,H)ANTHRACENE	3.35×10^{-03}	3.30×10^{-04}	1.55×10^{-04}	1.13×10^{-03}	4.97×10^{-03}
DIBUTYL PHTHALATE	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
DICHLOROBENZENES	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
DICHLORODIFLUOROMETHANE	7.60×10^{-02}	7.47×10^{-03}	3.52×10^{-03}	2.57×10^{-02}	1.13×10^{-01}
DICHLOROMETHANE	1.63×10^{-01}	1.60×10^{-02}	7.53×10^{-03}	5.50×10^{-02}	2.41×10^{-01}
DICHLOROTETRAFLUORETHANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
DIETHYLCYCLOHEXANE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
DIETHYLENE GLYCOL	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
DIISOPROPYL BENZENE	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
DIMETHYL FORMAMIDE	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
DIMETHYL PHTHALATE	1.30×10^{-02}	1.28×10^{-03}	6.03×10^{-04}	4.40×10^{-03}	1.93×10^{-02}
DIMETHYLCYCLOHEXANE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
DIMETHYLCYCLOPENTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
DIMETHYLETHER	2.43×10^{-01}	2.39×10^{-02}	1.12×10^{-02}	8.22×10^{-02}	3.61×10^{-01}
DIMETHYLHEXENE	1.94×10^{-01}	1.91×10^{-02}	8.98×10^{-03}	6.56×10^{-02}	2.88×10^{-01}
DIMETHYLOCTANES	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
DIPROPYLENE GLYCOL	1.43×10^{-01}	1.41×10^{-02}	6.63×10^{-03}	4.84×10^{-02}	2.12×10^{-01}
D-LIMONENE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
DODECENE	1.09×10^{-01}	1.07×10^{-02}	5.02×10^{-03}	3.67×10^{-02}	1.61×10^{-01}
EPICHLOROHYDRIN	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ETHANE	2.67	2.63×10^{-01}	1.24×10^{-01}	9.03×10^{-01}	3.96
ETHANOLAMINE	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
ETHYL ACETATE	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
ETHYL ACRYLATE	1.09×10^{-01}	1.07×10^{-02}	5.02×10^{-03}	3.67×10^{-02}	1.61×10^{-01}
ETHYL ALCOHOL	2.95×10^{-01}	2.90×10^{-02}	1.37×10^{-02}	9.98×10^{-02}	4.38×10^{-01}
ETHYL CHLORIDE	6.30×10^{-02}	6.19×10^{-03}	2.91×10^{-03}	2.13×10^{-02}	9.34×10^{-02}
ETHYL ETHER	1.35×10^{-01}	1.32×10^{-02}	6.23×10^{-03}	4.55×10^{-02}	2.00×10^{-01}
ETHYL MERCAPTAN	7.17×10^{-02}	7.04×10^{-03}	3.31×10^{-03}	2.42×10^{-02}	1.06×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ETHYL STYRENE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
ETHYLBENZENE	3.55	3.49×10^{-01}	1.64×10^{-01}	1.20	5.27
ETHYLCYCLOHEXANE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
ETHYLCYCLOPENTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ETHYLENE	$1.26 \times 10^{+01}$	1.23	5.81×10^{-01}	4.24	$1.86 \times 10^{+01}$
ETHYLENE DIBROMIDE	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ETHYLENE DICHLORIDE	1.26×10^{-01}	1.24×10^{-02}	5.83×10^{-03}	4.26×10^{-02}	1.87×10^{-01}
ETHYLENE GLYCOL	8.03×10^{-02}	7.90×10^{-03}	3.72×10^{-03}	2.72×10^{-02}	1.19×10^{-01}
ETHYLENE OXIDE	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
ETHYLENEAMINES	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
ETHYLHEPTENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ETHYLHEXANE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
ETHYLISOPROPYL ETHER	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
ETHYLMETHYLCYCLOHEXANES	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
ETHYL-PHENYL-PHENYL-ETHANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ETHYLTOLUENE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
FLUORANTHENE	2.45×10^{-02}	2.41×10^{-03}	1.13×10^{-03}	8.28×10^{-03}	3.63×10^{-02}
FLUORENE	4.18×10^{-02}	4.10×10^{-03}	1.93×10^{-03}	1.41×10^{-02}	6.19×10^{-02}
FORMALDEHYDE	3.07	3.02×10^{-01}	1.42×10^{-01}	1.04	4.56
FORMIC ACID	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
GLYOXAL	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
HEPTENE	1.11×10^{-01}	1.09×10^{-02}	5.12×10^{-03}	3.74×10^{-02}	1.64×10^{-01}
HEXADECANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
HEXAFLUOROETHANE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
HEXAMETHYLENEDIAMINE	1.45×10^{-01}	1.43×10^{-02}	6.73×10^{-03}	4.92×10^{-02}	2.16×10^{-01}
HEXYLENE GLYCOL	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
INDANE	8.06×10^{-01}	7.92×10^{-02}	3.73×10^{-02}	2.73×10^{-01}	1.20
INDENO(1,2,3-C,D)PYRENE	1.35×10^{-03}	1.33×10^{-04}	6.25×10^{-05}	4.56×10^{-04}	2.00×10^{-03}
ISOBUTANE	9.26×10^{-01}	9.10×10^{-02}	4.28×10^{-02}	3.13×10^{-01}	1.37
ISOBUTYL ACRYLATE	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
ISOBUTYL ALCOHOL	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ISOBUTYL ISOBUTYRATE	8.47×10^{-02}	8.32×10^{-03}	3.92×10^{-03}	2.86×10^{-02}	1.26×10^{-01}
ISOBUTYLBENZENE	7.32×10^{-01}	7.19×10^{-02}	3.38×10^{-02}	2.47×10^{-01}	1.08
ISOBUTYLENE	2.11	2.07×10^{-01}	9.74×10^{-02}	7.12×10^{-01}	3.12
ISOBUTYRALDEHYDE	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ISOMERS OF BUTENE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
ISOMERS OF BUTYLBENZENE	1.30×10^{-02}	1.28×10^{-03}	6.03×10^{-04}	4.40×10^{-03}	1.93×10^{-02}
ISOMERS OF C10H18	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ISOMERS OF DECANE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
ISOMERS OF DIETHYLBENZENE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
ISOMERS OF DODECANE	9.99×10^{-02}	9.82×10^{-03}	4.62×10^{-03}	3.38×10^{-02}	1.48×10^{-01}
ISOMERS OF ETHYLTOLUENE	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
ISOMERS OF HEPTADECANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ISOMERS OF HEPTANE	5.43×10^{-02}	5.34×10^{-03}	2.51×10^{-03}	1.83×10^{-02}	8.05×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ISOMERS OF HEXANE	1.17×10^{-01}	1.15×10^{-02}	5.42×10^{-03}	3.96×10^{-02}	1.74×10^{-01}
ISOMERS OF NONANE	4.13×10^{-02}	4.06×10^{-03}	1.91×10^{-03}	1.39×10^{-02}	6.12×10^{-02}
ISOMERS OF OCTADECANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ISOMERS OF OCTANE	3.26×10^{-02}	3.20×10^{-03}	1.51×10^{-03}	1.10×10^{-02}	4.83×10^{-02}
ISOMERS OF PENTADECANE	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ISOMERS OF PENTANE	2.41×10^{-01}	2.37×10^{-02}	1.11×10^{-02}	8.15×10^{-02}	3.57×10^{-01}
ISOMERS OF PENTENE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
ISOMERS OF PROPYLBENZENE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
ISOMERS OF TETRADECANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
ISOMERS OF UNDECANE	1.09×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.67×10^{-03}	1.61×10^{-02}
ISOMERS OF XYLENE	$1.22 \times 10^{+01}$	1.19	5.62×10^{-01}	4.11	$1.80 \times 10^{+01}$
ISOPENTANE	5.24	5.15×10^{-01}	2.42×10^{-01}	1.77	7.77
ISOPRENE	2.54×10^{-01}	2.49×10^{-02}	1.17×10^{-02}	8.58×10^{-02}	3.76×10^{-01}
ISOPROPYL ACETATE	1.02×10^{-01}	1.00×10^{-02}	4.72×10^{-03}	3.45×10^{-02}	1.51×10^{-01}
ISOPROPYL ALCOHOL	1.59×10^{-01}	1.56×10^{-02}	7.33×10^{-03}	5.36×10^{-02}	2.35×10^{-01}
ISOPROPYLBENZENE	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
LACTOL SPIRITS	7.82×10^{-02}	7.68×10^{-03}	3.62×10^{-03}	2.64×10^{-02}	1.16×10^{-01}
LEAD AND COMPOUNDS	1.99×10^{-04}	1.95×10^{-05}	9.19×10^{-06}	6.71×10^{-05}	2.94×10^{-04}
MALEIC ANHYDRIDE	1.52×10^{-02}	1.49×10^{-03}	7.03×10^{-04}	5.14×10^{-03}	2.25×10^{-02}
MANGANESE AND COMPOUNDS	6.16×10^{-05}	6.05×10^{-06}	2.85×10^{-06}	2.08×10^{-05}	9.13×10^{-05}
M-DIETHYLBENZENE	8.51×10^{-01}	8.36×10^{-02}	3.94×10^{-02}	2.88×10^{-01}	1.26
METHANE	$2.57 \times 10^{+01}$	2.52	1.19	8.68	$3.81 \times 10^{+01}$
METHYL ACETATE	1.54×10^{-01}	1.52×10^{-02}	7.13×10^{-03}	5.21×10^{-02}	2.29×10^{-01}
METHYL ACRYLATE	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
METHYL ALCOHOL	3.04×10^{-01}	2.99×10^{-02}	1.41×10^{-02}	1.03×10^{-01}	4.51×10^{-01}
METHYL AMYL KETONE	1.11×10^{-01}	1.09×10^{-02}	5.12×10^{-03}	3.74×10^{-02}	1.64×10^{-01}
METHYL CARBITOL	8.47×10^{-02}	8.32×10^{-03}	3.92×10^{-03}	2.86×10^{-02}	1.26×10^{-01}
METHYL CELLOSOLVE	8.47×10^{-02}	8.32×10^{-03}	3.92×10^{-03}	2.86×10^{-02}	1.26×10^{-01}
METHYL ETHYL KETONE	2.65×10^{-01}	2.60×10^{-02}	1.23×10^{-02}	8.95×10^{-02}	3.93×10^{-01}
METHYL FORMATE	4.56×10^{-02}	4.48×10^{-03}	2.11×10^{-03}	1.54×10^{-02}	6.76×10^{-02}
METHYL GLYOXAL	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
METHYL ISOBUTYL KETONE	1.22×10^{-01}	1.20×10^{-02}	5.62×10^{-03}	4.11×10^{-02}	1.80×10^{-01}
METHYL METHACRYLATE	9.99×10^{-02}	9.82×10^{-03}	4.62×10^{-03}	3.38×10^{-02}	1.48×10^{-01}
METHYL MYRISTATE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
METHYL NAPHTHALENES	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
METHYL PALMITATE	1.74×10^{-02}	1.71×10^{-03}	8.03×10^{-04}	5.87×10^{-03}	2.58×10^{-02}
METHYL STEARATE	2.39×10^{-02}	2.35×10^{-03}	1.10×10^{-03}	8.07×10^{-03}	3.54×10^{-02}
METHYL STYRENE	8.90×10^{-02}	8.75×10^{-03}	4.12×10^{-03}	3.01×10^{-02}	1.32×10^{-01}
METHYL TERT-BUTYL ETHER	$2.43 \times 10^{+01}$	2.39	1.12	8.21	$3.60 \times 10^{+01}$
METHYLACETYLENE	2.54×10^{-01}	2.49×10^{-02}	1.17×10^{-02}	8.58×10^{-02}	3.76×10^{-01}
METHYLAL	3.69×10^{-02}	3.63×10^{-03}	1.71×10^{-03}	1.25×10^{-02}	5.47×10^{-02}
METHYLALLENE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
METHYLCYCLOHEXANE	7.02×10^{-01}	6.90×10^{-02}	3.25×10^{-02}	2.37×10^{-01}	1.04
METHYLCYCLOPENTANE	9.11×10^{-01}	8.95×10^{-02}	4.21×10^{-02}	3.08×10^{-01}	1.35

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYLCYCLOPENTENE	2.99×10^{-02}	2.94×10^{-03}	1.38×10^{-03}	1.01×10^{-02}	4.43×10^{-02}
METHYLDECANES	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
METHYLENE BROMIDE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
METHYLHEXANE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
METHYLNONANE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
METHYLOCTANES	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
METHYLPENTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
METHYLPROPYLCYCLOHEXANES	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
M-ETHYLTOLUENE	1.87	1.83×10^{-01}	8.63×10^{-02}	6.31×10^{-01}	2.77
METHYLUNDECANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
MINERAL SPIRITS	1.39×10^{-01}	1.37×10^{-02}	6.43×10^{-03}	4.70×10^{-02}	2.06×10^{-01}
MYRCENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
NAPHTHA	1.02×10^{-01}	1.00×10^{-02}	4.72×10^{-03}	3.45×10^{-02}	1.51×10^{-01}
NAPHTHALENE	1.78	1.75×10^{-01}	8.24×10^{-02}	6.02×10^{-01}	2.64
N-BUTANE	5.69	5.59×10^{-01}	2.63×10^{-01}	1.92	8.43
N-BUTYL ACETATE	1.26×10^{-01}	1.24×10^{-02}	5.83×10^{-03}	4.26×10^{-02}	1.87×10^{-01}
N-BUTYL ALCOHOL	1.50×10^{-01}	1.47×10^{-02}	6.93×10^{-03}	5.06×10^{-02}	2.22×10^{-01}
N-DECANE	2.99×10^{-01}	2.94×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.43×10^{-01}
N-DODECANE	4.13×10^{-02}	4.06×10^{-03}	1.91×10^{-03}	1.39×10^{-02}	6.12×10^{-02}
N-HEPTANE	7.91×10^{-01}	7.78×10^{-02}	3.66×10^{-02}	2.67×10^{-01}	1.17
N-HEXANE	1.78	1.75×10^{-01}	8.23×10^{-02}	6.01×10^{-01}	2.64
NICKEL AND COMPOUNDS	6.16×10^{-05}	6.05×10^{-06}	2.85×10^{-06}	2.08×10^{-05}	9.13×10^{-05}
NITRIC OXIDE	$2.72 \times 10^{+01}$	2.67	1.26	9.19	$4.03 \times 10^{+01}$
NITROBENZENE	7.17×10^{-02}	7.04×10^{-03}	3.31×10^{-03}	2.42×10^{-02}	1.06×10^{-01}
NITROGEN DIOXIDE	2.19	2.16×10^{-01}	1.01×10^{-01}	7.41×10^{-01}	3.25
N-NONANE	3.73×10^{-01}	3.67×10^{-02}	1.73×10^{-02}	1.26×10^{-01}	5.53×10^{-01}
N-OCTANE	4.48×10^{-01}	4.40×10^{-02}	2.07×10^{-02}	1.51×10^{-01}	6.64×10^{-01}
NONENONE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
N-PENTADECANE	3.69×10^{-02}	3.63×10^{-03}	1.71×10^{-03}	1.25×10^{-02}	5.47×10^{-02}
N-PENTANE	2.39	2.35×10^{-01}	1.10×10^{-01}	8.07×10^{-01}	3.54
N-PENTYLCYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
N-PROPYL ACETATE	1.06×10^{-01}	1.05×10^{-02}	4.92×10^{-03}	3.60×10^{-02}	1.58×10^{-01}
N-PROPYL ALCOHOL	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
N-PROPYLBENZENE	8.36×10^{-01}	8.22×10^{-02}	3.87×10^{-02}	2.83×10^{-01}	1.24
N-TETRADECANE	1.52×10^{-02}	1.49×10^{-03}	7.03×10^{-04}	5.14×10^{-03}	2.25×10^{-02}
N-TRIDECANE	2.17×10^{-02}	2.13×10^{-03}	1.00×10^{-03}	7.34×10^{-03}	3.22×10^{-02}
N-UNDECANE	8.96×10^{-01}	8.81×10^{-02}	4.14×10^{-02}	3.03×10^{-01}	1.33
OCTAMETHYLCYCLOTETRASILOXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
O-DICHLOROBENZENE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
O-ETHYLTOLUENE	3.88×10^{-01}	3.82×10^{-02}	1.80×10^{-02}	1.31×10^{-01}	5.75×10^{-01}
OXIDES OF NITROGEN	$4.39 \times 10^{+01}$	4.31	2.03	$1.48 \times 10^{+01}$	$6.50 \times 10^{+01}$
PALMITIC ACID	4.34×10^{-02}	4.27×10^{-03}	2.01×10^{-03}	1.47×10^{-02}	6.44×10^{-02}
PARAFFINS (C16-C34)	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
PARTICULATE MATTER < 10 µm	$1.69 \times 10^{+01}$	1.66	7.81×10^{-01}	5.71	$2.50 \times 10^{+01}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 2.5 µm	$1.57 \times 10^{+01}$	1.54	7.26×10^{-01}	5.31	$2.33 \times 10^{+01}$
P-DICHLOROBENZENE	1.56×10^{-01}	1.54×10^{-02}	7.23×10^{-03}	5.28×10^{-02}	2.32×10^{-01}
PHENANTHRENE	5.80×10^{-02}	5.70×10^{-03}	2.68×10^{-03}	1.96×10^{-02}	8.60×10^{-02}
PHENOL	9.55×10^{-02}	9.39×10^{-03}	4.42×10^{-03}	3.23×10^{-02}	1.42×10^{-01}
PHENYL ISOCYANATE	2.61×10^{-02}	2.56×10^{-03}	1.21×10^{-03}	8.81×10^{-03}	3.86×10^{-02}
PHTHALIC ANHYDRIDE	4.34×10^{-02}	4.27×10^{-03}	2.01×10^{-03}	1.47×10^{-02}	6.44×10^{-02}
PIPERYLENE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
POLYCHLORINATED DIOXINS AND FURANS	9.46×10^{-12}	9.30×10^{-13}	4.38×10^{-13}	3.20×10^{-12}	1.40×10^{-11}
POLYCYCLIC AROMATIC HYDROCARBONS	2.14	2.10×10^{-01}	9.88×10^{-02}	7.22×10^{-01}	3.17
PROPADIENE	1.94×10^{-01}	1.91×10^{-02}	8.98×10^{-03}	6.56×10^{-02}	2.88×10^{-01}
PROPANE	5.21×10^{-01}	5.12×10^{-02}	2.41×10^{-02}	1.76×10^{-01}	7.73×10^{-01}
PROPIONALDEHYDE	3.37×10^{-01}	3.31×10^{-02}	1.56×10^{-02}	1.14×10^{-01}	5.00×10^{-01}
PROPIONIC ACID	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
PROPYLCYCLOHEXANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
PROPYLENE	4.30	4.23×10^{-01}	1.99×10^{-01}	1.45	6.37
PROPYLENE DICHLORIDE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
PROPYLENE GLYCOL	8.25×10^{-02}	8.11×10^{-03}	3.82×10^{-03}	2.79×10^{-02}	1.22×10^{-01}
PROPYLENE OXIDE	1.09×10^{-01}	1.07×10^{-02}	5.02×10^{-03}	3.67×10^{-02}	1.61×10^{-01}
PYRENE	4.32×10^{-02}	4.24×10^{-03}	2.00×10^{-03}	1.46×10^{-02}	6.40×10^{-02}
RETENE	8.34×10^{-03}	8.19×10^{-04}	3.86×10^{-04}	2.82×10^{-03}	1.24×10^{-02}
S-BUTYL ALCOHOL	7.38×10^{-02}	7.26×10^{-03}	3.41×10^{-03}	2.50×10^{-02}	1.09×10^{-01}
S-BUTYLBENZENE	2.54×10^{-01}	2.49×10^{-02}	1.17×10^{-02}	8.58×10^{-02}	3.76×10^{-01}
STYRENE	1.36×10^{-01}	1.34×10^{-02}	6.29×10^{-03}	4.60×10^{-02}	2.02×10^{-01}
SUBSTITUTED C9 ESTER (C12)	1.95×10^{-02}	1.92×10^{-03}	9.04×10^{-04}	6.61×10^{-03}	2.90×10^{-02}
SULFUR DIOXIDE	1.50	1.47×10^{-01}	6.93×10^{-02}	5.07×10^{-01}	2.22
T-3-HEXENE	2.99×10^{-01}	2.94×10^{-02}	1.38×10^{-02}	1.01×10^{-01}	4.43×10^{-01}
TERT-BUTYL ALCOHOL	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
TETRACHLOROETHYLENE	1.52×10^{-01}	1.49×10^{-02}	7.03×10^{-03}	5.14×10^{-02}	2.25×10^{-01}
TETRAFLUOROMETHANE	6.51×10^{-03}	6.40×10^{-04}	3.01×10^{-04}	2.20×10^{-03}	9.66×10^{-03}
TOLUENE	$1.29 \times 10^{+01}$	1.27	5.96×10^{-01}	4.35	$1.91 \times 10^{+01}$
TOLUENE DIISOCYANATE	1.43×10^{-01}	1.41×10^{-02}	6.63×10^{-03}	4.84×10^{-02}	2.12×10^{-01}
TOTAL AROMATIC AMINES	8.68×10^{-03}	8.54×10^{-04}	4.02×10^{-04}	2.94×10^{-03}	1.29×10^{-02}
TOTAL C2-C5 ALDEHYDES	2.61×10^{-02}	2.56×10^{-03}	1.21×10^{-03}	8.81×10^{-03}	3.86×10^{-02}
TOTAL SUSPENDED PARTICULATES	$1.78 \times 10^{+01}$	1.75	8.22×10^{-01}	6.01	$2.63 \times 10^{+01}$
TOTAL VOCS	$1.79 \times 10^{+02}$	$1.76 \times 10^{+01}$	8.29	$6.06 \times 10^{+01}$	$2.66 \times 10^{+02}$
TRANS-2-BUTENE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
TRANS-2-PENTENE	5.08×10^{-01}	4.99×10^{-02}	2.35×10^{-02}	1.72×10^{-01}	7.53×10^{-01}
TRICHLOROBENZENES	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
TRICHLOROETHYLENE	9.34×10^{-02}	9.18×10^{-03}	4.32×10^{-03}	3.16×10^{-02}	1.38×10^{-01}
TRICHLOROFLUOROMETHANE	1.32×10^{-01}	1.30×10^{-02}	6.13×10^{-03}	4.48×10^{-02}	1.96×10^{-01}
TRICHLOROTRIFLUOROETHANE	8.68×10^{-02}	8.54×10^{-03}	4.02×10^{-03}	2.94×10^{-02}	1.29×10^{-01}
TRIFLUOROMETHANE	6.51×10^{-02}	6.40×10^{-03}	3.01×10^{-03}	2.20×10^{-02}	9.66×10^{-02}
TRIMETHYLBENZENE	2.39×10^{-02}	2.35×10^{-03}	1.10×10^{-03}	8.07×10^{-03}	3.54×10^{-02}
TRIMETHYLCYCLOHEXANES	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRIMETHYLCYCLOPENTANE	2.17×10^{-03}	2.13×10^{-04}	1.00×10^{-04}	7.34×10^{-04}	3.22×10^{-03}
TRIMETHYLDECENE	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
TRIMETHYLFLUOROSILANE	1.50×10^{-01}	1.47×10^{-02}	6.93×10^{-03}	5.06×10^{-02}	2.22×10^{-01}
TRIMETHYLHEPTANES	4.34×10^{-03}	4.27×10^{-04}	2.01×10^{-04}	1.47×10^{-03}	6.44×10^{-03}
VINYL ACETATE	1.19×10^{-01}	1.17×10^{-02}	5.52×10^{-03}	4.04×10^{-02}	1.77×10^{-01}
VINYL CHLORIDE	9.12×10^{-02}	8.96×10^{-03}	4.22×10^{-03}	3.08×10^{-02}	1.35×10^{-01}
ZINC AND COMPOUNDS	6.16×10^{-05}	6.05×10^{-06}	2.85×10^{-06}	2.08×10^{-05}	9.13×10^{-05}

Table B1.12: Annual Emissions from Commercial Lawn Mowing and Garden Equipment – Diesel

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,2,4-TRIMETHYLBENZENE	9.15×10^{-01}	9.00×10^{-02}	4.23×10^{-02}	3.09×10^{-01}	1.36
1,3,5-TRIMETHYLBENZENE	2.70×10^{-01}	2.66×10^{-02}	1.25×10^{-02}	9.14×10^{-02}	4.01×10^{-01}
1,3-BUTADIENE	3.22×10^{-01}	3.17×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.78×10^{-01}
1-METHYL-3-ETHYLBENZENE	2.18×10^{-01}	2.15×10^{-02}	1.01×10^{-02}	7.38×10^{-02}	3.24×10^{-01}
1-METHYL-4-ETHYLBENZENE	5.41×10^{-01}	5.32×10^{-02}	2.50×10^{-02}	1.83×10^{-01}	8.02×10^{-01}
1-METHYLNAPHTHALENE	3.93×10^{-01}	3.86×10^{-02}	1.82×10^{-02}	1.33×10^{-01}	5.83×10^{-01}
1-METHYLPHENANTHRENE	1.77×10^{-02}	1.74×10^{-03}	8.18×10^{-04}	5.98×10^{-03}	2.62×10^{-02}
2,2,4-TRIMETHYLPENTANE	1.29	1.27×10^{-01}	5.97×10^{-02}	4.36×10^{-01}	1.91
2,2-DIMETHYLBUTANE	3.22×10^{-01}	3.17×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.78×10^{-01}
2,3,4-TRIMETHYLPENTANE	3.22×10^{-01}	3.17×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.78×10^{-01}
2,3-DIMETHYLBUTANE	5.93×10^{-01}	5.83×10^{-02}	2.74×10^{-02}	2.00×10^{-01}	8.79×10^{-01}
2,3-DIMETHYLHEXANE	1.66×10^{-01}	1.64×10^{-02}	7.70×10^{-03}	5.63×10^{-02}	2.47×10^{-01}
2,3-DIMETHYLPENTANE	7.49×10^{-01}	7.36×10^{-02}	3.46×10^{-02}	2.53×10^{-01}	1.11
2,4-DIMETHYLHEXANE	5.21×10^{-02}	5.12×10^{-03}	2.41×10^{-03}	1.76×10^{-02}	7.72×10^{-02}
2,4-DIMETHYLPENTANE	4.26×10^{-01}	4.19×10^{-02}	1.97×10^{-02}	1.44×10^{-01}	6.32×10^{-01}
2,5-DIMETHYLHEXANE	5.21×10^{-02}	5.12×10^{-03}	2.41×10^{-03}	1.76×10^{-02}	7.72×10^{-02}
2-METHYL-1-BUTENE	2.70×10^{-01}	2.66×10^{-02}	1.25×10^{-02}	9.14×10^{-02}	4.01×10^{-01}
2-METHYL-2-PENTENE	2.18×10^{-01}	2.15×10^{-02}	1.01×10^{-02}	7.38×10^{-02}	3.24×10^{-01}
2-METHYL-2-PROPENAL	4.16	4.09×10^{-01}	1.92×10^{-01}	1.41	6.17
2-METHYLANTHRACENE	1.08×10^{-02}	1.06×10^{-03}	4.98×10^{-04}	3.64×10^{-03}	1.60×10^{-02}
2-METHYLCHOLANTHRENE	7.48×10^{-02}	7.35×10^{-03}	3.46×10^{-03}	2.53×10^{-02}	1.11×10^{-01}
2-METHYLHEPTANE	1.04×10^{-01}	1.02×10^{-02}	4.81×10^{-03}	3.52×10^{-02}	1.54×10^{-01}
2-METHYLHEXANE	5.93×10^{-01}	5.83×10^{-02}	2.74×10^{-02}	2.00×10^{-01}	8.79×10^{-01}
2-METHYLNAPHTHALENE	6.36×10^{-01}	6.25×10^{-02}	2.94×10^{-02}	2.15×10^{-01}	9.42×10^{-01}
2-METHYLPENTANE	9.67×10^{-01}	9.51×10^{-02}	4.47×10^{-02}	3.27×10^{-01}	1.43
3-ETHYLHEXANE	2.18×10^{-01}	2.15×10^{-02}	1.01×10^{-02}	7.38×10^{-02}	3.24×10^{-01}
3-METHYL-1-BUTENE	1.66×10^{-01}	1.64×10^{-02}	7.70×10^{-03}	5.63×10^{-02}	2.47×10^{-01}
3-METHYLHEXANE	3.22×10^{-01}	3.17×10^{-02}	1.49×10^{-02}	1.09×10^{-01}	4.78×10^{-01}
3-METHYLPENTANE	6.97×10^{-01}	6.85×10^{-02}	3.22×10^{-02}	2.36×10^{-01}	1.03
3-METHYL-PHENANTHRENE	3.15×10^{-02}	3.10×10^{-03}	1.46×10^{-03}	1.07×10^{-02}	4.67×10^{-02}
9-METHYLPHENANTHRENE	2.38×10^{-02}	2.34×10^{-03}	1.10×10^{-03}	8.06×10^{-03}	3.53×10^{-02}
ACENAPHTHENE	1.60×10^{-01}	1.57×10^{-02}	7.39×10^{-03}	5.40×10^{-02}	2.37×10^{-01}
ACENAPHTHYLENE	1.34×10^{-01}	1.32×10^{-02}	6.20×10^{-03}	4.53×10^{-02}	1.99×10^{-01}
ACETALDEHYDE	$4.35 \times 10^{+01}$	4.27	2.01	$1.47 \times 10^{+01}$	$6.45 \times 10^{+01}$
ACETOPHENONE	5.30	5.21×10^{-01}	2.45×10^{-01}	1.79	7.86
ACETYLENE	4.78	4.70×10^{-01}	2.21×10^{-01}	1.62	7.09
ACROLEIN	3.54	3.48×10^{-01}	1.64×10^{-01}	1.20	5.24
ANTHRACENE	2.75×10^{-02}	2.71×10^{-03}	1.27×10^{-03}	9.31×10^{-03}	4.08×10^{-02}
BENZALDEHYDE	3.95	3.88×10^{-01}	1.83×10^{-01}	1.34	5.86
BENZENE	2.85	2.80×10^{-01}	1.32×10^{-01}	9.63×10^{-01}	4.23
BENZO(A)ANTHRACENE	3.30×10^{-02}	3.25×10^{-03}	1.53×10^{-03}	1.12×10^{-02}	4.90×10^{-02}
BENZO(A)PYRENE	2.77×10^{-02}	2.73×10^{-03}	1.28×10^{-03}	9.37×10^{-03}	4.11×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
BENZO(B)FLUORANTHENE	1.54×10^{-02}	1.51×10^{-03}	7.10×10^{-04}	5.19×10^{-03}	2.28×10^{-02}
BENZO(E)PYRENE	1.64×10^{-02}	1.61×10^{-03}	7.59×10^{-04}	5.54×10^{-03}	2.43×10^{-02}
BENZO(G,H,I)FLUORANTHENE	5.96×10^{-03}	5.86×10^{-04}	2.76×10^{-04}	2.01×10^{-03}	8.84×10^{-03}
BENZO(G,H,I,)PERYLENE	1.15×10^{-02}	1.13×10^{-03}	5.33×10^{-04}	3.89×10^{-03}	1.71×10^{-02}
BENZO(K)FLUORANTHENE	1.48×10^{-02}	1.46×10^{-03}	6.85×10^{-04}	5.01×10^{-03}	2.20×10^{-02}
BUTYRALDEHYDE	1.35	1.33×10^{-01}	6.25×10^{-02}	4.57×10^{-01}	2.00
CADMIUM AND COMPOUNDS	1.08×10^{-02}	1.07×10^{-03}	5.02×10^{-04}	3.66×10^{-03}	1.61×10^{-02}
CARBON MONOXIDE	$1.66 \times 10^{+03}$	$1.63 \times 10^{+02}$	$7.66 \times 10^{+01}$	$5.60 \times 10^{+02}$	$2.46 \times 10^{+03}$
CHROMIUM (III) COMPOUNDS	1.26×10^{-03}	1.24×10^{-04}	5.85×10^{-05}	4.28×10^{-04}	1.88×10^{-03}
CHROMIUM (VI) COMPOUNDS	5.42×10^{-04}	5.33×10^{-05}	2.51×10^{-05}	1.83×10^{-04}	8.04×10^{-04}
CHRYSENE	1.83×10^{-02}	1.80×10^{-03}	8.46×10^{-04}	6.18×10^{-03}	2.71×10^{-02}
CIS-2-BUTENE	2.70×10^{-01}	2.66×10^{-02}	1.25×10^{-02}	9.14×10^{-02}	4.01×10^{-01}
CIS-2-HEXENE	1.04×10^{-01}	1.02×10^{-02}	4.81×10^{-03}	3.52×10^{-02}	1.54×10^{-01}
COBALT AND COMPOUNDS	1.81×10^{-03}	1.78×10^{-04}	8.36×10^{-05}	6.11×10^{-04}	2.68×10^{-03}
COPPER AND COMPOUNDS	1.81×10^{-03}	1.78×10^{-04}	8.36×10^{-05}	6.11×10^{-04}	2.68×10^{-03}
CORONENE	7.70×10^{-04}	7.57×10^{-05}	3.56×10^{-05}	2.60×10^{-04}	1.14×10^{-03}
CROTONALDEHYDE	$1.39 \times 10^{+01}$	1.37	6.45×10^{-01}	4.71	$2.07 \times 10^{+01}$
CYCLOHEXANE	2.18×10^{-01}	2.15×10^{-02}	1.01×10^{-02}	7.38×10^{-02}	3.24×10^{-01}
CYCLOPENTA(C,D)PYRENE	2.54×10^{-02}	2.50×10^{-03}	1.18×10^{-03}	8.59×10^{-03}	3.77×10^{-02}
CYCLOPENTANE	4.26×10^{-01}	4.19×10^{-02}	1.97×10^{-02}	1.44×10^{-01}	6.32×10^{-01}
CYCLOPENTENE	2.18×10^{-01}	2.15×10^{-02}	1.01×10^{-02}	7.38×10^{-02}	3.24×10^{-01}
DECANOIC ACID	7.57×10^{-02}	7.44×10^{-03}	3.50×10^{-03}	2.56×10^{-02}	1.12×10^{-01}
DECYLCYCLOHEXANE	3.98×10^{-02}	3.91×10^{-03}	1.84×10^{-03}	1.35×10^{-02}	5.90×10^{-02}
DIACETYL	9.36×10^{-01}	9.20×10^{-02}	4.33×10^{-02}	3.16×10^{-01}	1.39
DIBENZO(A,H)ANTHRACENE	1.50×10^{-02}	1.47×10^{-03}	6.92×10^{-04}	5.06×10^{-03}	2.22×10^{-02}
DIBENZOFURAN	2.98×10^{-02}	2.93×10^{-03}	1.38×10^{-03}	1.01×10^{-02}	4.42×10^{-02}
EICOSANE	2.14×10^{-01}	2.11×10^{-02}	9.91×10^{-03}	7.25×10^{-02}	3.18×10^{-01}
ETHYLBENZENE	4.89×10^{-01}	4.81×10^{-02}	2.26×10^{-02}	1.65×10^{-01}	7.25×10^{-01}
ETHYLENE	8.90	8.75×10^{-01}	4.12×10^{-01}	3.01	$1.32 \times 10^{+01}$
FLUORANTHENE	1.06×10^{-02}	1.04×10^{-03}	4.89×10^{-04}	3.57×10^{-03}	1.57×10^{-02}
FLUORENE	9.50×10^{-02}	9.34×10^{-03}	4.39×10^{-03}	3.21×10^{-02}	1.41×10^{-01}
FORMALDEHYDE	$2.32 \times 10^{+01}$	2.28	1.07	7.84	$3.44 \times 10^{+01}$
GLYOXAL	2.18	2.15×10^{-01}	1.01×10^{-01}	7.38×10^{-01}	3.24
HEPTADECANE	6.39×10^{-01}	6.28×10^{-02}	2.95×10^{-02}	2.16×10^{-01}	9.47×10^{-01}
HEPTANAL	3.33	3.27×10^{-01}	1.54×10^{-01}	1.13	4.93
HEPTYLCYCLOHEXANE	2.08×10^{-02}	2.04×10^{-03}	9.60×10^{-04}	7.02×10^{-03}	3.08×10^{-02}
HEXADECANE	7.40×10^{-01}	7.27×10^{-02}	3.42×10^{-02}	2.50×10^{-01}	1.10
HEXALDEHYDE	2.29	2.25×10^{-01}	1.06×10^{-01}	7.73×10^{-01}	3.39
HEXYLCYCLOHEXANE	1.56×10^{-02}	1.53×10^{-03}	7.20×10^{-04}	5.26×10^{-03}	2.31×10^{-02}
INDENO(1,2,3-C,D)PYRENE	2.16×10^{-02}	2.12×10^{-03}	9.97×10^{-04}	7.29×10^{-03}	3.20×10^{-02}
ISOBUTYLENE	1.19	1.17×10^{-01}	5.48×10^{-02}	4.01×10^{-01}	1.76
ISOMERS OF XYLENE	3.29	3.23×10^{-01}	1.52×10^{-01}	1.11	4.87
ISOPENTANE	2.85	2.80×10^{-01}	1.32×10^{-01}	9.63×10^{-01}	4.23
LAURIC ACID	6.09×10^{-02}	5.99×10^{-03}	2.82×10^{-03}	2.06×10^{-02}	9.03×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
LEAD AND COMPOUNDS	1.81×10^{-03}	1.78×10^{-04}	8.36×10^{-05}	6.11×10^{-04}	2.68×10^{-03}
M & P-XYLENE	2.42	2.38×10^{-01}	1.12×10^{-01}	8.19×10^{-01}	3.59
MANGANESE AND COMPOUNDS	1.81×10^{-03}	1.78×10^{-04}	8.36×10^{-05}	6.11×10^{-04}	2.68×10^{-03}
METHANE	$2.13 \times 10^{+01}$	2.10	9.86×10^{-01}	7.21	$3.16 \times 10^{+01}$
METHYL ETHYL KETONE	7.80	7.67×10^{-01}	3.61×10^{-01}	2.64	$1.16 \times 10^{+01}$
METHYLCYCLOHEXANE	5.41×10^{-01}	5.32×10^{-02}	2.50×10^{-02}	1.83×10^{-01}	8.02×10^{-01}
METHYLCYCLOPENTANE	6.45×10^{-01}	6.34×10^{-02}	2.98×10^{-02}	2.18×10^{-01}	9.56×10^{-01}
METHYLGLYOXAL	1.77	1.74×10^{-01}	8.18×10^{-02}	5.98×10^{-01}	2.62
MYRISTIC ACID	5.57×10^{-03}	5.48×10^{-04}	2.58×10^{-04}	1.88×10^{-03}	8.27×10^{-03}
NAPHTHALENE	7.51×10^{-01}	7.39×10^{-02}	3.48×10^{-02}	2.54×10^{-01}	1.11
N-BUTANE	3.98	3.92×10^{-01}	1.84×10^{-01}	1.35	5.91
N-DODECANE	5.23×10^{-01}	5.14×10^{-02}	2.42×10^{-02}	1.77×10^{-01}	7.76×10^{-01}
N-HENEICOSANE	6.84×10^{-02}	6.73×10^{-03}	3.17×10^{-03}	2.31×10^{-02}	1.01×10^{-01}
N-HEPTANE	4.89×10^{-01}	4.81×10^{-02}	2.26×10^{-02}	1.65×10^{-01}	7.25×10^{-01}
NITRIC OXIDE	$2.47 \times 10^{+01}$	2.43	1.14	8.36	$3.67 \times 10^{+01}$
NITROGEN DIOXIDE	2.00	1.96×10^{-01}	9.23×10^{-02}	6.74×10^{-01}	2.96
N-NONANE	1.66×10^{-01}	1.64×10^{-02}	7.70×10^{-03}	5.63×10^{-02}	2.47×10^{-01}
N-NONYLCYCLOHEXANE	2.58×10^{-02}	2.53×10^{-03}	1.19×10^{-03}	8.71×10^{-03}	3.82×10^{-02}
N-OCTANE	2.70×10^{-01}	2.66×10^{-02}	1.25×10^{-02}	9.14×10^{-02}	4.01×10^{-01}
NONADECANE	4.28×10^{-01}	4.20×10^{-02}	1.98×10^{-02}	1.45×10^{-01}	6.34×10^{-01}
NONANOIC ACID	2.50×10^{-01}	2.45×10^{-02}	1.16×10^{-02}	8.44×10^{-02}	3.70×10^{-01}
N-PENTANE	1.93	1.90×10^{-01}	8.95×10^{-02}	6.54×10^{-01}	2.87
N-PROPYLBENZENE	1.04×10^{-01}	1.02×10^{-02}	4.81×10^{-03}	3.52×10^{-02}	1.54×10^{-01}
N-TRIDECANE	4.96×10^{-01}	4.88×10^{-02}	2.30×10^{-02}	1.68×10^{-01}	7.36×10^{-01}
OCTADECANE	6.25×10^{-01}	6.14×10^{-02}	2.89×10^{-02}	2.11×10^{-01}	9.27×10^{-01}
OCTANAL	3.22	3.17×10^{-01}	1.49×10^{-01}	1.09	4.78
OCTANOIC ACID	1.30×10^{-01}	1.28×10^{-02}	6.01×10^{-03}	4.39×10^{-02}	1.93×10^{-01}
OCTYLCYCLOHEXANE	2.73×10^{-02}	2.68×10^{-03}	1.26×10^{-03}	9.23×10^{-03}	4.05×10^{-02}
OXIDES OF NITROGEN	$3.99 \times 10^{+01}$	3.92	1.85	$1.35 \times 10^{+01}$	$5.92 \times 10^{+01}$
O-XYLENE	8.63×10^{-01}	8.49×10^{-02}	3.99×10^{-02}	2.92×10^{-01}	1.28
PARTICULATE MATTER < 10 µm	$1.81 \times 10^{+01}$	1.78	8.36×10^{-01}	6.11	$2.68 \times 10^{+01}$
PARTICULATE MATTER < 2.5 µm	$1.68 \times 10^{+01}$	1.65	7.77×10^{-01}	5.68	$2.49 \times 10^{+01}$
PENTADECANE	4.14×10^{-01}	4.07×10^{-02}	1.91×10^{-02}	1.40×10^{-01}	6.14×10^{-01}
PENTYLCYCLOHEXANE	8.73×10^{-02}	8.58×10^{-03}	4.04×10^{-03}	2.95×10^{-02}	1.29×10^{-01}
PHENANTHRENE	5.38×10^{-02}	5.29×10^{-03}	2.49×10^{-03}	1.82×10^{-02}	7.97×10^{-02}
POLYCHLORINATED DIOXINS AND FURANS	2.48×10^{-08}	2.44×10^{-09}	1.15×10^{-09}	8.39×10^{-09}	3.68×10^{-08}
POLYCYCLIC AROMATIC HYDROCARBONS	1.45	1.42×10^{-01}	6.69×10^{-02}	4.89×10^{-01}	2.14
PROPIONALDEHYDE	$1.46 \times 10^{+01}$	1.43	6.74×10^{-01}	4.92	$2.16 \times 10^{+01}$
PROPYLENE	8.11×10^{-01}	7.97×10^{-02}	3.75×10^{-02}	2.74×10^{-01}	1.20
PYRENE	6.79×10^{-03}	6.67×10^{-04}	3.14×10^{-04}	2.30×10^{-03}	1.01×10^{-02}
RETENE	8.03×10^{-03}	7.89×10^{-04}	3.71×10^{-04}	2.71×10^{-03}	1.19×10^{-02}
SULFUR DIOXIDE	1.38	1.35×10^{-01}	6.36×10^{-02}	4.65×10^{-01}	2.04
TETRADECANE	6.54×10^{-01}	6.43×10^{-02}	3.03×10^{-02}	2.21×10^{-01}	9.70×10^{-01}
TOLUENE	4.14	4.07×10^{-01}	1.91×10^{-01}	1.40	6.14

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TOTAL SUSPENDED PARTICULATES	$1.90 \times 10^{+01}$	1.87	8.80×10^{-01}	6.43	$2.82 \times 10^{+01}$
TOTAL VOCS	$1.93 \times 10^{+02}$	$1.89 \times 10^{+01}$	8.90	$6.51 \times 10^{+01}$	$2.85 \times 10^{+02}$
TRANS-2-BUTENE	5.41×10^{-01}	5.32×10^{-02}	2.50×10^{-02}	1.83×10^{-01}	8.02×10^{-01}
TRANS-2-HEXENE	1.66×10^{-01}	1.64×10^{-02}	7.70×10^{-03}	5.63×10^{-02}	2.47×10^{-01}
TRANS-2-PENTENE	5.21×10^{-02}	5.12×10^{-03}	2.41×10^{-03}	1.76×10^{-02}	7.72×10^{-02}
TRIDECANOIC ACID	1.36×10^{-02}	1.34×10^{-03}	6.31×10^{-04}	4.61×10^{-03}	2.02×10^{-02}
UNDECANOIC ACID	2.14×10^{-01}	2.11×10^{-02}	9.91×10^{-03}	7.25×10^{-02}	3.18×10^{-01}
ZINC AND COMPOUNDS	1.26×10^{-02}	1.24×10^{-03}	5.85×10^{-04}	4.28×10^{-03}	1.88×10^{-02}

Table B1.13: Annual Emissions from Liquid Fuel Combustion

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	3.42×10^{-04}	2.25×10^{-05}	1.64×10^{-05}	5.37×10^{-05}	4.35×10^{-04}
ACENAPHTHENE	3.06×10^{-05}	2.02×10^{-06}	1.47×10^{-06}	4.80×10^{-06}	3.89×10^{-05}
ACENAPHTHYLENE	3.67×10^{-07}	2.42×10^{-08}	1.76×10^{-08}	5.75×10^{-08}	4.66×10^{-07}
ANTHRACENE	1.77×10^{-06}	1.17×10^{-07}	8.48×10^{-08}	2.77×10^{-07}	2.25×10^{-06}
ANTIMONY AND COMPOUNDS	7.61×10^{-03}	5.02×10^{-04}	3.65×10^{-04}	1.19×10^{-03}	9.67×10^{-03}
ARSENIC AND COMPOUNDS	1.91×10^{-03}	1.26×10^{-04}	9.17×10^{-05}	3.00×10^{-04}	2.43×10^{-03}
BARIUM AND COMPOUNDS	3.73×10^{-03}	2.46×10^{-04}	1.79×10^{-04}	5.84×10^{-04}	4.74×10^{-03}
BENZENE	3.10×10^{-04}	2.04×10^{-05}	1.49×10^{-05}	4.87×10^{-05}	3.94×10^{-04}
BENZO(A)ANTHRACENE	1.77×10^{-06}	1.17×10^{-07}	8.48×10^{-08}	2.77×10^{-07}	2.25×10^{-06}
BENZO(B,K)FLUORANTHENE	2.15×10^{-06}	1.41×10^{-07}	1.03×10^{-07}	3.37×10^{-07}	2.73×10^{-06}
BENZO(G,H,I)PERYLENE	3.28×10^{-06}	2.16×10^{-07}	1.57×10^{-07}	5.14×10^{-07}	4.16×10^{-06}
BERYLLIUM AND COMPOUNDS	4.03×10^{-05}	2.66×10^{-06}	1.93×10^{-06}	6.32×10^{-06}	5.12×10^{-05}
CADMIUM AND COMPOUNDS	5.77×10^{-04}	3.80×10^{-05}	2.77×10^{-05}	9.05×10^{-05}	7.33×10^{-04}
CARBON MONOXIDE	7.26	4.78×10^{-01}	3.48×10^{-01}	1.14	9.23
CHROMIUM (III) COMPOUNDS	7.35×10^{-04}	4.84×10^{-05}	3.52×10^{-05}	1.15×10^{-04}	9.34×10^{-04}
CHROMIUM (VI) COMPOUNDS	4.90×10^{-04}	3.23×10^{-05}	2.35×10^{-05}	7.69×10^{-05}	6.23×10^{-04}
CHRYSENE	3.45×10^{-06}	2.27×10^{-07}	1.65×10^{-07}	5.41×10^{-07}	4.39×10^{-06}
COBALT AND COMPOUNDS	8.73×10^{-03}	5.75×10^{-04}	4.18×10^{-04}	1.37×10^{-03}	1.11×10^{-02}
COPPER AND COMPOUNDS	2.55×10^{-03}	1.68×10^{-04}	1.22×10^{-04}	4.00×10^{-04}	3.24×10^{-03}
DIBENZO(A,H) ANTHRACENE	2.42×10^{-06}	1.60×10^{-07}	1.16×10^{-07}	3.80×10^{-07}	3.08×10^{-06}
ETHYLBENZENE	9.22×10^{-05}	6.08×10^{-06}	4.42×10^{-06}	1.45×10^{-05}	1.17×10^{-04}
FLUORANTHENE	7.02×10^{-06}	4.62×10^{-07}	3.36×10^{-07}	1.10×10^{-06}	8.92×10^{-06}
FLUORENE	6.48×10^{-06}	4.27×10^{-07}	3.11×10^{-07}	1.02×10^{-06}	8.24×10^{-06}
FLUORIDE COMPOUNDS	5.41×10^{-02}	3.56×10^{-03}	2.59×10^{-03}	8.48×10^{-03}	6.87×10^{-02}
FORMALDEHYDE	4.79×10^{-02}	3.15×10^{-03}	2.29×10^{-03}	7.50×10^{-03}	6.08×10^{-02}
HYDROCHLORIC ACID	5.03×10^{-01}	3.32×10^{-02}	2.41×10^{-02}	7.89×10^{-02}	6.39×10^{-01}
INDENO(1,2,3-C,D)PYRENE	3.10×10^{-06}	2.04×10^{-07}	1.49×10^{-07}	4.87×10^{-07}	3.94×10^{-06}
ISOBUTANE	7.80×10^{-02}	5.14×10^{-03}	3.74×10^{-03}	1.22×10^{-02}	9.91×10^{-02}
ISOMERS OF HEPTANE	4.95×10^{-02}	3.26×10^{-03}	2.37×10^{-03}	7.76×10^{-03}	6.29×10^{-02}
ISOMERS OF HEXANE	9.89×10^{-02}	6.52×10^{-03}	4.74×10^{-03}	1.55×10^{-02}	1.26×10^{-01}
ISOMERS OF OCTANE	8.94×10^{-02}	5.89×10^{-03}	4.28×10^{-03}	1.40×10^{-02}	1.14×10^{-01}
ISOMERS OF PENTANE	1.05×10^{-01}	6.89×10^{-03}	5.01×10^{-03}	1.64×10^{-02}	1.33×10^{-01}
ISOMERS OF XYLENE	1.58×10^{-04}	1.04×10^{-05}	7.57×10^{-06}	2.48×10^{-05}	2.01×10^{-04}
LEAD AND COMPOUNDS	2.19×10^{-03}	1.44×10^{-04}	1.05×10^{-04}	3.43×10^{-04}	2.78×10^{-03}
MANGANESE AND COMPOUNDS	4.35×10^{-03}	2.87×10^{-04}	2.08×10^{-04}	6.82×10^{-04}	5.53×10^{-03}
MERCURY AND COMPOUNDS	1.64×10^{-04}	1.08×10^{-05}	7.85×10^{-06}	2.57×10^{-05}	2.08×10^{-04}
MOLYBDENUM AND COMPOUNDS	1.14×10^{-03}	7.52×10^{-05}	5.47×10^{-05}	1.79×10^{-04}	1.45×10^{-03}
NAPHTHALENE	1.64×10^{-03}	1.08×10^{-04}	7.85×10^{-05}	2.57×10^{-04}	2.08×10^{-03}
N-BUTANE	2.32×10^{-01}	1.53×10^{-02}	1.11×10^{-02}	3.64×10^{-02}	2.95×10^{-01}
N-HEPTANE	5.71×10^{-03}	3.76×10^{-04}	2.73×10^{-04}	8.95×10^{-04}	7.25×10^{-03}
N-HEXANE	2.06×10^{-01}	1.35×10^{-02}	9.84×10^{-03}	3.22×10^{-02}	2.61×10^{-01}
NICKEL AND COMPOUNDS	1.23×10^{-01}	8.07×10^{-03}	5.87×10^{-03}	1.92×10^{-02}	1.56×10^{-01}
NITRIC OXIDE	$1.62 \times 10^{+01}$	1.07	7.76×10^{-01}	2.54	$2.06 \times 10^{+01}$

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
NITROGEN DIOXIDE	1.31	8.61×10^{-02}	6.26×10^{-02}	2.05×10^{-01}	1.66
N-PENTANE	8.94×10^{-02}	5.89×10^{-03}	4.28×10^{-03}	1.40×10^{-02}	1.14×10^{-01}
OCDD	4.50×10^{-09}	2.96×10^{-10}	2.15×10^{-10}	7.05×10^{-10}	5.71×10^{-09}
O-XYLENE	1.58×10^{-04}	1.04×10^{-05}	7.57×10^{-06}	2.48×10^{-05}	2.01×10^{-04}
OXIDES OF NITROGEN	$2.61 \times 10^{+01}$	1.72	1.25	4.10	$3.32 \times 10^{+01}$
PARTICULATE MATTER < 10 µm	5.81×10^{-01}	3.83×10^{-02}	2.78×10^{-02}	9.11×10^{-02}	7.38×10^{-01}
PARTICULATE MATTER < 2.5 µm	1.45×10^{-01}	9.57×10^{-03}	6.96×10^{-03}	2.28×10^{-02}	1.85×10^{-01}
PHENANTHRENE	1.52×10^{-05}	1.00×10^{-06}	7.29×10^{-07}	2.39×10^{-06}	1.93×10^{-05}
PHOSPHOROUS AND COMPOUNDS	1.37×10^{-02}	9.04×10^{-04}	6.57×10^{-04}	2.15×10^{-03}	1.74×10^{-02}
POLCYCLIC AROMATIC HYDROCARBONS	1.69×10^{-03}	1.12×10^{-04}	8.12×10^{-05}	2.66×10^{-04}	2.15×10^{-03}
PROPANE	2.28×10^{-02}	1.50×10^{-03}	1.09×10^{-03}	3.58×10^{-03}	2.90×10^{-02}
PYRENE	6.16×10^{-06}	4.06×10^{-07}	2.95×10^{-07}	9.66×10^{-07}	7.83×10^{-06}
SELENIUM AND COMPOUNDS	9.91×10^{-04}	6.53×10^{-05}	4.75×10^{-05}	1.55×10^{-04}	1.26×10^{-03}
SULFUR DIOXIDE	$1.03 \times 10^{+01}$	6.79×10^{-01}	4.94×10^{-01}	1.62	$1.31 \times 10^{+01}$
TOLUENE	8.99×10^{-03}	5.92×10^{-04}	4.31×10^{-04}	1.41×10^{-03}	1.14×10^{-02}
TOTAL SUSPENDED PARTICULATES	6.12×10^{-01}	4.03×10^{-02}	2.93×10^{-02}	9.59×10^{-02}	7.77×10^{-01}
TOTAL VOCS	1.04	6.82×10^{-02}	4.96×10^{-02}	1.62×10^{-01}	1.32
VANADIUM AND COMPOUNDS	4.61×10^{-02}	3.04×10^{-03}	2.21×10^{-03}	7.23×10^{-03}	5.86×10^{-02}
ZINC AND COMPOUNDS	4.22×10^{-02}	2.78×10^{-03}	2.02×10^{-03}	6.62×10^{-03}	5.36×10^{-02}

Table B1.14: Annual Emissions from Natural Gas Leakage

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
CARBON DIOXIDE	$3.83 \times 10^{+02}$	$2.65 \times 10^{+01}$	$1.94 \times 10^{+01}$	$5.63 \times 10^{+01}$	$4.85 \times 10^{+02}$
ETHANE	$1.53 \times 10^{+03}$	$1.06 \times 10^{+02}$	$7.77 \times 10^{+01}$	$2.25 \times 10^{+02}$	$1.94 \times 10^{+03}$
HYDROGEN SULFIDE	1.44×10^{-01}	9.95×10^{-03}	7.29×10^{-03}	2.11×10^{-02}	1.82×10^{-01}
METHANE	$1.69 \times 10^{+04}$	$1.17 \times 10^{+03}$	$8.60 \times 10^{+02}$	$2.49 \times 10^{+03}$	$2.15 \times 10^{+04}$
PROPANE	$3.83 \times 10^{+01}$	2.65	1.94	5.63	$4.85 \times 10^{+01}$
TOTAL VOCS	$1.57 \times 10^{+03}$	$1.09 \times 10^{+02}$	$7.97 \times 10^{+01}$	$2.31 \times 10^{+02}$	$1.99 \times 10^{+03}$

Table B1.15: Annual Emissions from Solid Fuel Combustion - Wood

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1,1,1-TRICHLOROETHANE	7.29×10^{-01}	6.17×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.69×10^{-01}
1,1,2-TRICHLOROETHANE	5.93×10^{-01}	5.02×10^{-02}	3.27×10^{-02}	1.13×10^{-01}	7.89×10^{-01}
1,2,4-TRIMETHYLBENZENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
1,3,5-TRIMETHYLBENZENE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
1,3-BUTADIENE	$2.37 \times 10^{+01}$	2.00	1.31	4.49	$3.15 \times 10^{+01}$
1,4-BUTANEDIOL	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
12-METHYLBENZ(A)ANTHRACENE	2.62×10^{-01}	2.21×10^{-02}	1.44×10^{-02}	4.96×10^{-02}	3.48×10^{-01}
1-BUTENE	$7.75 \times 10^{+01}$	6.56	4.28	$1.47 \times 10^{+01}$	$1.03 \times 10^{+02}$
1-BUTYNE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
1-CHLOROBUTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
1-DECENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
1-HEXENE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
1-METHYLPHENANTHRENE	3.92	3.32×10^{-01}	2.16×10^{-01}	7.45×10^{-01}	5.22
1-PENTENE	9.16×10^{-01}	7.74×10^{-02}	5.05×10^{-02}	1.74×10^{-01}	1.22
2,2,4-TRIMETHYLPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2,2-DICHLORONITROANILINE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2,3-DIMETHYLBUTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2,4,4-TRIMETHYL-1-PENTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2,4-DIMETHYLHEXANE	1.02×10^{-01}	8.60×10^{-03}	5.61×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
2,4-DIMETHYLPENTANE	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
2-BUTYNE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2-FURFURAL	6.27×10^{-01}	5.31×10^{-02}	3.46×10^{-02}	1.19×10^{-01}	8.34×10^{-01}
2-HEXENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2-METHYL-1-BUTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2-METHYL-2-PENTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
2-METHYL-3-HEXANONE	1.19×10^{-01}	1.00×10^{-02}	6.55×10^{-03}	2.25×10^{-02}	1.58×10^{-01}
2-METHYLPENTANE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
3-METHYLCHLOLANTHRENE	1.31×10^{-01}	1.11×10^{-02}	7.21×10^{-03}	2.48×10^{-02}	1.74×10^{-01}
3-METHYLHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
3-METHYLPENTANE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
4-METHYLANILINE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
7,12-DIMETHYLBENZ(A)ANTHRACENE	5.23×10^{-01}	4.42×10^{-02}	2.88×10^{-02}	9.93×10^{-02}	6.95×10^{-01}
9-METHYLANTHRACENE	5.23×10^{-01}	4.42×10^{-02}	2.88×10^{-02}	9.93×10^{-02}	6.95×10^{-01}
ACENAPHTHENE	1.35	1.14×10^{-01}	7.45×10^{-02}	2.56×10^{-01}	1.80
ACENAPHTHYLENE	5.10	4.31×10^{-01}	2.81×10^{-01}	9.68×10^{-01}	6.78
ACETALDEHYDE	$7.22 \times 10^{+02}$	$6.11 \times 10^{+01}$	$3.98 \times 10^{+01}$	$1.37 \times 10^{+02}$	$9.60 \times 10^{+02}$
ACETIC ACID	1.24	1.05×10^{-01}	6.83×10^{-02}	2.35×10^{-01}	1.65
ACETIC ANHYDRIDE	5.93×10^{-01}	5.02×10^{-02}	3.27×10^{-02}	1.13×10^{-01}	7.89×10^{-01}
ACETONE	$5.34 \times 10^{+02}$	$4.52 \times 10^{+01}$	$2.95 \times 10^{+01}$	$1.01 \times 10^{+02}$	$7.10 \times 10^{+02}$
ACETYLENE	1.46	1.23×10^{-01}	8.04×10^{-02}	2.77×10^{-01}	1.94
ACROLEIN	1.31	1.10×10^{-01}	7.20×10^{-02}	2.48×10^{-01}	1.74
ACRYLIC ACID	7.63×10^{-01}	6.45×10^{-02}	4.21×10^{-02}	1.45×10^{-01}	1.01
ACRYLONITRILE	9.83×10^{-01}	8.32×10^{-02}	5.42×10^{-02}	1.87×10^{-01}	1.31

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ADIPIC ACID	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
ALIPHATICS	1.70×10^{-01}	1.43×10^{-02}	9.35×10^{-03}	3.22×10^{-02}	2.25×10^{-01}
ALKENE KETONE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ALPHA-PINENE	5.93×10^{-01}	5.02×10^{-02}	3.27×10^{-02}	1.13×10^{-01}	7.89×10^{-01}
ANILINE	1.34	1.13×10^{-01}	7.39×10^{-02}	2.54×10^{-01}	1.78
ANTHRACENE	1.24	1.05×10^{-01}	6.82×10^{-02}	2.35×10^{-01}	1.65
ANTHRAQUINONE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ANTIMONY AND COMPOUNDS	1.67×10^{-02}	1.41×10^{-03}	9.21×10^{-04}	3.17×10^{-03}	2.22×10^{-02}
ARSENIC AND COMPOUNDS	1.11×10^{-02}	9.41×10^{-04}	6.14×10^{-04}	2.11×10^{-03}	1.48×10^{-02}
BENZALDEHYDE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
BENZENE	$4.63 \times 10^{+02}$	$3.91 \times 10^{+01}$	$2.55 \times 10^{+01}$	$8.78 \times 10^{+01}$	$6.15 \times 10^{+02}$
BENZO(A)ANTHRACENE	2.17×10^{-01}	1.84×10^{-02}	1.20×10^{-02}	4.12×10^{-02}	2.89×10^{-01}
BENZO(A)PYRENE	8.02×10^{-01}	6.78×10^{-02}	4.42×10^{-02}	1.52×10^{-01}	1.07
BENZO(B)FLUORANTHENE	5.49×10^{-01}	4.64×10^{-02}	3.03×10^{-02}	1.04×10^{-01}	7.30×10^{-01}
BENZO(E)PYRENE	3.13×10^{-01}	2.65×10^{-02}	1.73×10^{-02}	5.95×10^{-02}	4.17×10^{-01}
BENZO(G,H,I)FLUORANTHENE	3.66	3.10×10^{-01}	2.02×10^{-01}	6.95×10^{-01}	4.87
BENZO(G,H,I)PERYLENE	2.63	2.23×10^{-01}	1.45×10^{-01}	5.00×10^{-01}	3.50
BENZO(K)FLUORANTHENE	1.39×10^{-01}	1.18×10^{-02}	7.69×10^{-03}	2.65×10^{-02}	1.85×10^{-01}
BENZOIC ACID	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
BENZYL CHLORIDE	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
BETA-PINENE	3.90×10^{-01}	3.30×10^{-02}	2.15×10^{-02}	7.40×10^{-02}	5.19×10^{-01}
BIPHENYL	2.88	2.43×10^{-01}	1.59×10^{-01}	5.46×10^{-01}	3.82
B-PHELLANDRENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
BROMODINITROBENZENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
BUTOXYBUTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
BUTOXYETHOXYETHANOL ACETATE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
BUTYL ACRYLATE	7.29×10^{-01}	6.17×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.69×10^{-01}
BUTYL BENZOATE	3.56×10^{-01}	3.01×10^{-02}	1.96×10^{-02}	6.76×10^{-02}	4.73×10^{-01}
BUTYL CARBITOL	6.61×10^{-01}	5.59×10^{-02}	3.65×10^{-02}	1.26×10^{-01}	8.79×10^{-01}
BUTYL CELLOSOLVE	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}
BUTYLCYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
BUTYLISOPROPYLPHTHALATE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
BUTYRALDEHYDE	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}
C10 AROMATIC	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C10 OLEFINS	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
C2 ALKYL INDAN	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
C2 CYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C3 CYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C3/C4/C5 ALKYLBENZENES	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
C-3-HEXENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C4 SUBSTITUTED CYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C4 SUBSTITUTED CYCLOHEXANONE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C5 ESTER	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
C5 OLEFIN	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
C5 PARAFFIN	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C5 SUBSTITUTED CYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C6 SUBSTITUTED CYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
C6H18O3SI3	1.53×10^{-01}	1.29×10^{-02}	8.42×10^{-03}	2.90×10^{-02}	2.03×10^{-01}
C-7 CYCLOPARAFFINS	1.20	1.02×10^{-01}	6.64×10^{-02}	2.29×10^{-01}	1.60
C7-C16 PARAFFINS	2.54×10^{-01}	2.15×10^{-02}	1.40×10^{-02}	4.83×10^{-02}	3.38×10^{-01}
C-8 CYCLOPARAFFINS	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
C8 PARAFFIN	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
C8H24O4SI4	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
CADMIUM AND COMPOUNDS	8.89×10^{-03}	7.52×10^{-04}	4.90×10^{-04}	1.69×10^{-03}	1.18×10^{-02}
CAMPHENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
CARBITOL	7.80×10^{-01}	6.60×10^{-02}	4.30×10^{-02}	1.48×10^{-01}	1.04
CARBON MONOXIDE	$2.77 \times 10^{+04}$	$2.34 \times 10^{+03}$	$1.53 \times 10^{+03}$	$5.26 \times 10^{+03}$	$3.68 \times 10^{+04}$
CARBON SULFIDE	1.53×10^{-01}	1.29×10^{-02}	8.42×10^{-03}	2.90×10^{-02}	2.03×10^{-01}
CARBON TETRACHLORIDE	1.10	9.32×10^{-02}	6.08×10^{-02}	2.09×10^{-01}	1.47
CARBONYL SULFIDE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
CELLOSOLVE	6.10×10^{-01}	5.16×10^{-02}	3.37×10^{-02}	1.16×10^{-01}	8.12×10^{-01}
CELLOSOLVE ACETATE	6.10×10^{-01}	5.16×10^{-02}	3.37×10^{-02}	1.16×10^{-01}	8.12×10^{-01}
CHLOROBENZENE	1.20	1.02×10^{-01}	6.64×10^{-02}	2.29×10^{-01}	1.60
CHLORODIFLUOROMETHANE	2.71×10^{-01}	2.29×10^{-02}	1.50×10^{-02}	5.15×10^{-02}	3.61×10^{-01}
CHLOROFORM	8.65×10^{-01}	7.31×10^{-02}	4.77×10^{-02}	1.64×10^{-01}	1.15
CHLOROPENTAFLUOROETHANE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
CHLOROPRENE	5.77×10^{-01}	4.88×10^{-02}	3.18×10^{-02}	1.09×10^{-01}	7.66×10^{-01}
CHLOROTRIFLUOROMETHANE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
CHROMIUM (III) COMPOUNDS	9.53×10^{-05}	8.06×10^{-06}	5.26×10^{-06}	1.81×10^{-05}	1.27×10^{-04}
CHROMIUM (VI) COMPOUNDS	3.97×10^{-05}	3.36×10^{-06}	2.19×10^{-06}	7.53×10^{-06}	5.28×10^{-05}
CHRYSENE	1.36	1.15×10^{-01}	7.50×10^{-02}	2.58×10^{-01}	1.81
COBALT AND COMPOUNDS	2.78×10^{-03}	2.35×10^{-04}	1.53×10^{-04}	5.28×10^{-04}	3.70×10^{-03}
CREOSOTE	6.27×10^{-01}	5.31×10^{-02}	3.46×10^{-02}	1.19×10^{-01}	8.34×10^{-01}
CRESOL	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
CYCLOHEXANE	1.53	1.29×10^{-01}	8.42×10^{-02}	2.90×10^{-01}	2.03
CYCLOHEXANOL	7.63×10^{-01}	6.45×10^{-02}	4.21×10^{-02}	1.45×10^{-01}	1.01
CYCLOHEXANONE	8.99×10^{-01}	7.60×10^{-02}	4.96×10^{-02}	1.71×10^{-01}	1.19
CYCLOHEXENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
CYCLOPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
CYCLOPENTENE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
DENATURANT	1.70×10^{-01}	1.43×10^{-02}	9.35×10^{-03}	3.22×10^{-02}	2.25×10^{-01}
DIBENZO(A,H)ANTHRACENE	5.23×10^{-01}	4.42×10^{-02}	2.88×10^{-02}	9.93×10^{-02}	6.95×10^{-01}
DIBUTYL PHTHALATE	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
DICHLOROBENZENES	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
DICHLORODIFLUOROMETHANE	5.93×10^{-01}	5.02×10^{-02}	3.27×10^{-02}	1.13×10^{-01}	7.89×10^{-01}
DICHLOROTETRAFLUORETHANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
DIETHYLCYCLOHEXANE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
DIETHYLENE GLYCOL	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
DIISOPROPYL BENZENE	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
DIMETHYL FORMAMIDE	6.10×10^{-01}	5.16×10^{-02}	3.37×10^{-02}	1.16×10^{-01}	8.12×10^{-01}
DIMETHYL PHTHALATE	1.02×10^{-01}	8.60×10^{-03}	5.61×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
DIMETHYLCYCLOHEXANE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
DIMETHYLCYCLOPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
DIMETHYLETHER	1.90	1.61×10^{-01}	1.05×10^{-01}	3.61×10^{-01}	2.52
DIMETHYLOCTANES	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
DIPROPYLENE GLYCOL	1.12	9.46×10^{-02}	6.17×10^{-02}	2.12×10^{-01}	1.49
D-LIMONENE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
DODECENE	8.48×10^{-01}	7.17×10^{-02}	4.68×10^{-02}	1.61×10^{-01}	1.13
EPICHLOROHYDRIN	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
ETHANE	$8.24 \times 10^{+02}$	$6.97 \times 10^{+01}$	$4.55 \times 10^{+01}$	$1.56 \times 10^{+02}$	$1.10 \times 10^{+03}$
ETHANOLAMINE	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}
ETHYL ACETATE	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}
ETHYL ACRYLATE	8.48×10^{-01}	7.17×10^{-02}	4.68×10^{-02}	1.61×10^{-01}	1.13
ETHYL ALCOHOL	$2.61 \times 10^{+03}$	$2.20 \times 10^{+02}$	$1.44 \times 10^{+02}$	$4.95 \times 10^{+02}$	$3.46 \times 10^{+03}$
ETHYL CHLORIDE	4.92×10^{-01}	4.16×10^{-02}	2.71×10^{-02}	9.33×10^{-02}	6.54×10^{-01}
ETHYL ETHER	1.05	8.89×10^{-02}	5.80×10^{-02}	2.00×10^{-01}	1.40
ETHYL MERCAPTAN	5.60×10^{-01}	4.73×10^{-02}	3.09×10^{-02}	1.06×10^{-01}	7.44×10^{-01}
ETHYL STYRENE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
ETHYLCYCLOHEXANE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
ETHYLCYCLOPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ETHYLENE	$2.59 \times 10^{+03}$	$2.19 \times 10^{+02}$	$1.43 \times 10^{+02}$	$4.92 \times 10^{+02}$	$3.45 \times 10^{+03}$
ETHYLENE DIBROMIDE	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
ETHYLENE DICHLORIDE	9.83×10^{-01}	8.32×10^{-02}	5.42×10^{-02}	1.87×10^{-01}	1.31
ETHYLENE GLYCOL	6.27×10^{-01}	5.31×10^{-02}	3.46×10^{-02}	1.19×10^{-01}	8.34×10^{-01}
ETHYLENE OXIDE	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
ETHYLENEAMINES	7.46×10^{-01}	6.31×10^{-02}	4.11×10^{-02}	1.42×10^{-01}	9.92×10^{-01}
ETHYLHEPTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ETHYLHEXANE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
ETHYLISOPROPYL ETHER	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
ETHYLMETHYLCYCLOHEXANES	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
ETHYL-PHENYL-PHENYL-ETHANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ETHYLTOLUENE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
FLUORANTHENE	1.13	9.58×10^{-02}	6.24×10^{-02}	2.15×10^{-01}	1.51
FLUORENE	1.93	1.64×10^{-01}	1.07×10^{-01}	3.67×10^{-01}	2.57
FORMALDEHYDE	$7.77 \times 10^{+02}$	$6.57 \times 10^{+01}$	$4.29 \times 10^{+01}$	$1.48 \times 10^{+02}$	$1.03 \times 10^{+03}$
FORMIC ACID	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
GLYOXAL	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
HEPTENE	8.65×10^{-01}	7.31×10^{-02}	4.77×10^{-02}	1.64×10^{-01}	1.15
HEXADECANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
HEXAFLUOROETHANE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
HEXAMETHYLENEDIAMINE	1.14	9.61×10^{-02}	6.26×10^{-02}	2.16×10^{-01}	1.51
HEXYLENE GLYCOL	6.10×10^{-01}	5.16×10^{-02}	3.37×10^{-02}	1.16×10^{-01}	8.12×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
INDENO(1,2,3,C,D)PYRENE	2.62	2.21×10^{-01}	1.44×10^{-01}	4.96×10^{-01}	3.48
ISOBUTANE	$1.42 \times 10^{+01}$	1.20	7.85×10^{-01}	2.70	$1.89 \times 10^{+01}$
ISOBUTYL ACRYLATE	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
ISOBUTYL ALCOHOL	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
ISOBUTYL ISOBUTYRATE	6.61×10^{-01}	5.59×10^{-02}	3.65×10^{-02}	1.26×10^{-01}	8.79×10^{-01}
ISOBUTYRALDEHYDE	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
ISOMERS OF BUTENE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
ISOMERS OF BUTYLBENZENE	1.02×10^{-01}	8.60×10^{-03}	5.61×10^{-03}	1.93×10^{-02}	1.35×10^{-01}
ISOMERS OF C10H18	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ISOMERS OF DECANE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
ISOMERS OF DIETHYLBENZENE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
ISOMERS OF DODECANE	7.80×10^{-01}	6.60×10^{-02}	4.30×10^{-02}	1.48×10^{-01}	1.04
ISOMERS OF ETHYLTOLUENE	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
ISOMERS OF HEPTADECANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ISOMERS OF HEPTANE	4.24×10^{-01}	3.58×10^{-02}	2.34×10^{-02}	8.05×10^{-02}	5.64×10^{-01}
ISOMERS OF HEXANE	9.16×10^{-01}	7.74×10^{-02}	5.05×10^{-02}	1.74×10^{-01}	1.22
ISOMERS OF NONANE	3.22×10^{-01}	2.72×10^{-02}	1.78×10^{-02}	6.12×10^{-02}	4.28×10^{-01}
ISOMERS OF OCTADECANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ISOMERS OF OCTANE	2.54×10^{-01}	2.15×10^{-02}	1.40×10^{-02}	4.83×10^{-02}	3.38×10^{-01}
ISOMERS OF PENTADECANE	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
ISOMERS OF PENTANE	1.88	1.59×10^{-01}	1.04×10^{-01}	3.57×10^{-01}	2.50
ISOMERS OF PENTENE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
ISOMERS OF PROPYLBENZENE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
ISOMERS OF TETRADECANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
ISOMERS OF UNDECANE	8.48×10^{-02}	7.17×10^{-03}	4.68×10^{-03}	1.61×10^{-02}	1.13×10^{-01}
ISOMERS OF XYLENE	$7.19 \times 10^{+01}$	6.08	3.96	$1.36 \times 10^{+01}$	$9.55 \times 10^{+01}$
ISOPENTANE	1.36×10^{-01}	1.15×10^{-02}	7.48×10^{-03}	2.58×10^{-02}	1.80×10^{-01}
ISOPRENE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
ISOPROPYL ACETATE	7.97×10^{-01}	6.74×10^{-02}	4.39×10^{-02}	1.51×10^{-01}	1.06
ISOPROPYL ALCOHOL	1.24	1.05×10^{-01}	6.83×10^{-02}	2.35×10^{-01}	1.65
ISOPROPYLBENZENE	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
LACTOL SPIRITS	6.10×10^{-01}	5.16×10^{-02}	3.37×10^{-02}	1.16×10^{-01}	8.12×10^{-01}
LEAD AND COMPOUNDS	4.45×10^{-02}	3.76×10^{-03}	2.45×10^{-03}	8.45×10^{-03}	5.92×10^{-02}
MALEIC ANHYDRIDE	1.19×10^{-01}	1.00×10^{-02}	6.55×10^{-03}	2.25×10^{-02}	1.58×10^{-01}
MANGANESE AND COMPOUNDS	5.49×10^{-02}	4.64×10^{-03}	3.02×10^{-03}	1.04×10^{-02}	7.29×10^{-02}
METHANE	$6.07 \times 10^{+03}$	$5.14 \times 10^{+02}$	$3.35 \times 10^{+02}$	$1.15 \times 10^{+03}$	$8.08 \times 10^{+03}$
METHYL ACETATE	1.20	1.02×10^{-01}	6.64×10^{-02}	2.29×10^{-01}	1.60
METHYL ACRYLATE	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
METHYL ALCOHOL	2.37	2.01×10^{-01}	1.31×10^{-01}	4.51×10^{-01}	3.16
METHYL AMYL KETONE	8.65×10^{-01}	7.31×10^{-02}	4.77×10^{-02}	1.64×10^{-01}	1.15
METHYL CARBITOL	6.61×10^{-01}	5.59×10^{-02}	3.65×10^{-02}	1.26×10^{-01}	8.79×10^{-01}
METHYL CELLOSOLVE	6.61×10^{-01}	5.59×10^{-02}	3.65×10^{-02}	1.26×10^{-01}	8.79×10^{-01}
METHYL ETHYL KETONE	9.34	7.90×10^{-01}	5.15×10^{-01}	1.77	$1.24 \times 10^{+01}$
METHYL FORMATE	3.56×10^{-01}	3.01×10^{-02}	1.96×10^{-02}	6.76×10^{-02}	4.73×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
METHYL GLYOXAL	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
METHYL ISOBUTYL KETONE	9.50×10^{-01}	8.03×10^{-02}	5.24×10^{-02}	1.80×10^{-01}	1.26
METHYL METHACRYLATE	7.80×10^{-01}	6.60×10^{-02}	4.30×10^{-02}	1.48×10^{-01}	1.04
METHYL MYRISTATE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
METHYL NAPHTHALENES	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
METHYL PALMITATE	1.36×10^{-01}	1.15×10^{-02}	7.48×10^{-03}	2.58×10^{-02}	1.80×10^{-01}
METHYL STEARATE	1.87×10^{-01}	1.58×10^{-02}	1.03×10^{-02}	3.54×10^{-02}	2.48×10^{-01}
METHYL STYRENE	6.95×10^{-01}	5.88×10^{-02}	3.83×10^{-02}	1.32×10^{-01}	9.24×10^{-01}
METHYL T-BUTYL ETHER	5.60×10^{-01}	4.73×10^{-02}	3.09×10^{-02}	1.06×10^{-01}	7.44×10^{-01}
METHYLAL	2.88×10^{-01}	2.44×10^{-02}	1.59×10^{-02}	5.47×10^{-02}	3.83×10^{-01}
METHYLALLENE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
METHYLCYCLOHEXANE	2.20×10^{-01}	1.86×10^{-02}	1.22×10^{-02}	4.18×10^{-02}	2.93×10^{-01}
METHYLCYCLOPENTANE	4.58×10^{-01}	3.87×10^{-02}	2.52×10^{-02}	8.69×10^{-02}	6.09×10^{-01}
METHYLDECANES	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
METHYLENE BROMIDE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
METHYLHEXANE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
METHYLNONANE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
METHYLOCTANES	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
METHYLPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
METHYLPROPYLCYCLOHEXANES	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
M-ETHYLTOLUENE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
METHYLUNDECANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
MINERAL SPIRITS	1.09	9.18×10^{-02}	5.98×10^{-02}	2.06×10^{-01}	1.44
MYRCENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
NAPHTHA	7.97×10^{-01}	6.74×10^{-02}	4.39×10^{-02}	1.51×10^{-01}	1.06
NAPHTHALENE	$2.01 \times 10^{+01}$	1.70	1.11	3.81	$2.67 \times 10^{+01}$
N-BUTANE	3.07	2.60×10^{-01}	1.69×10^{-01}	5.83×10^{-01}	4.08
N-BUTYL ACETATE	9.83×10^{-01}	8.32×10^{-02}	5.42×10^{-02}	1.87×10^{-01}	1.31
N-BUTYL ALCOHOL	1.17	9.89×10^{-02}	6.45×10^{-02}	2.22×10^{-01}	1.56
N-DECANE	9.16×10^{-01}	7.74×10^{-02}	5.05×10^{-02}	1.74×10^{-01}	1.22
N-DODECANE	3.22×10^{-01}	2.72×10^{-02}	1.78×10^{-02}	6.12×10^{-02}	4.28×10^{-01}
N-HEPTANE	2.37	2.01×10^{-01}	1.31×10^{-01}	4.51×10^{-01}	3.16
NICKEL AND COMPOUNDS	2.67×10^{-03}	2.26×10^{-04}	1.47×10^{-04}	5.08×10^{-04}	3.56×10^{-03}
NITRIC OXIDE	$2.22 \times 10^{+02}$	$1.88 \times 10^{+01}$	$1.23 \times 10^{+01}$	$4.22 \times 10^{+01}$	$2.96 \times 10^{+02}$
NITROBENZENE	5.60×10^{-01}	4.73×10^{-02}	3.09×10^{-02}	1.06×10^{-01}	7.44×10^{-01}
NITROGEN DIOXIDE	$1.79 \times 10^{+01}$	1.52	9.89×10^{-01}	3.41	$2.39 \times 10^{+01}$
N-NONANE	1.53×10^{-01}	1.29×10^{-02}	8.42×10^{-03}	2.90×10^{-02}	2.03×10^{-01}
N-OCTANE	3.56×10^{-01}	3.01×10^{-02}	1.96×10^{-02}	6.76×10^{-02}	4.73×10^{-01}
NONENONE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
N-PENTADECANE	2.88×10^{-01}	2.44×10^{-02}	1.59×10^{-02}	5.47×10^{-02}	3.83×10^{-01}
N-PENTANE	1.20	1.02×10^{-01}	6.64×10^{-02}	2.29×10^{-01}	1.60
N-PENTYLCYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
N-PROPYL ACETATE	8.31×10^{-01}	7.03×10^{-02}	4.58×10^{-02}	1.58×10^{-01}	1.10
N-PROPYL ALCOHOL	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
N-TETRADECANE	1.19×10^{-01}	1.00×10^{-02}	6.55×10^{-03}	2.25×10^{-02}	1.58×10^{-01}
N-TRIDECANE	1.70×10^{-01}	1.43×10^{-02}	9.35×10^{-03}	3.22×10^{-02}	2.25×10^{-01}
N-UNDECANE	2.37×10^{-01}	2.01×10^{-02}	1.31×10^{-02}	4.51×10^{-02}	3.16×10^{-01}
OCTAMETHYLCYCLOTETRASILOXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
O-DICHLOROBENZENE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
OXIDES OF NITROGEN	$3.59 \times 10^{+02}$	$3.03 \times 10^{+01}$	$1.98 \times 10^{+01}$	$6.81 \times 10^{+01}$	$4.77 \times 10^{+02}$
PALMITIC ACID	3.39×10^{-01}	2.87×10^{-02}	1.87×10^{-02}	6.44×10^{-02}	4.51×10^{-01}
PARAFFINS (C16-C34)	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
PARTICULATE MATTER < 10 µm	$4.64 \times 10^{+03}$	$3.92 \times 10^{+02}$	$2.56 \times 10^{+02}$	$8.81 \times 10^{+02}$	$6.17 \times 10^{+03}$
PARTICULATE MATTER < 2.5 µm	$4.50 \times 10^{+03}$	$3.81 \times 10^{+02}$	$2.48 \times 10^{+02}$	$8.55 \times 10^{+02}$	$5.99 \times 10^{+03}$
P-DICHLOROBENZENE	1.22	1.03×10^{-01}	6.73×10^{-02}	2.32×10^{-01}	1.62
PERYLENE	2.62×10^{-01}	2.21×10^{-02}	1.44×10^{-02}	4.96×10^{-02}	3.48×10^{-01}
PHENANTHRENE	$1.58 \times 10^{+01}$	1.33	8.69×10^{-01}	2.99	$2.10 \times 10^{+01}$
PHENOL	1.31×10^{-01}	1.11×10^{-02}	7.21×10^{-03}	2.48×10^{-02}	1.74×10^{-01}
PHENYL ISOCYANATE	2.03×10^{-01}	1.72×10^{-02}	1.12×10^{-02}	3.86×10^{-02}	2.71×10^{-01}
PHTHALIC ANHYDRIDE	3.39×10^{-01}	2.87×10^{-02}	1.87×10^{-02}	6.44×10^{-02}	4.51×10^{-01}
PIPERYLENE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
POLYCHLORINATED DIOXINS AND FURANS	1.38×10^{-06}	1.16×10^{-07}	7.59×10^{-08}	2.61×10^{-07}	1.83×10^{-06}
POLYCYCLIC AROMATIC HYDROCARBONS	$6.92 \times 10^{+01}$	5.85	3.82	$1.31 \times 10^{+01}$	$9.20 \times 10^{+01}$
PROPANE	$2.17 \times 10^{+02}$	$1.83 \times 10^{+01}$	$1.20 \times 10^{+01}$	$4.12 \times 10^{+01}$	$2.88 \times 10^{+02}$
PROPIONALDEHYDE	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
PROPIONIC ACID	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
PROPYLCYCLOHEXANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
PROPYLENE	$3.16 \times 10^{+02}$	$2.68 \times 10^{+01}$	$1.75 \times 10^{+01}$	$6.01 \times 10^{+01}$	$4.21 \times 10^{+02}$
PROPYLENE DICHLORIDE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
PROPYLENE GLYCOL	6.44×10^{-01}	5.45×10^{-02}	3.55×10^{-02}	1.22×10^{-01}	8.57×10^{-01}
PROPYLENE OXIDE	8.48×10^{-01}	7.17×10^{-02}	4.68×10^{-02}	1.61×10^{-01}	1.13
PYRENE	1.15	9.72×10^{-02}	6.34×10^{-02}	2.18×10^{-01}	1.53
S-BUTYL ALCOHOL	5.77×10^{-01}	4.88×10^{-02}	3.18×10^{-02}	1.09×10^{-01}	7.66×10^{-01}
SELENIUM AND COMPOUNDS	2.78×10^{-03}	2.35×10^{-04}	1.53×10^{-04}	5.28×10^{-04}	3.70×10^{-03}
STYRENE	$1.15 \times 10^{+01}$	9.73×10^{-01}	6.34×10^{-01}	2.18	$1.53 \times 10^{+01}$
SUBSTITUTED C9 ESTER (C12)	1.53×10^{-01}	1.29×10^{-02}	8.42×10^{-03}	2.90×10^{-02}	2.03×10^{-01}
SULFUR DIOXIDE	$6.72 \times 10^{+01}$	5.68	3.70	$1.27 \times 10^{+01}$	$8.93 \times 10^{+01}$
TERT-BUTYL ALCOHOL	7.12×10^{-01}	6.02×10^{-02}	3.93×10^{-02}	1.35×10^{-01}	9.47×10^{-01}
TETRACHLOROETHYLENE	1.19	1.00×10^{-01}	6.55×10^{-02}	2.25×10^{-01}	1.58
TETRAFLUOROMETHANE	5.09×10^{-02}	4.30×10^{-03}	2.81×10^{-03}	9.66×10^{-03}	6.76×10^{-02}
TOLUENE	$1.48 \times 10^{+02}$	$1.25 \times 10^{+01}$	8.16	$2.81 \times 10^{+01}$	$1.97 \times 10^{+02}$
TOLUENE DIISOCYANATE	1.12	9.46×10^{-02}	6.17×10^{-02}	2.12×10^{-01}	1.49
TOTAL AROMATIC AMINES	6.78×10^{-02}	5.74×10^{-03}	3.74×10^{-03}	1.29×10^{-02}	9.02×10^{-02}
TOTAL C2-C5 ALDEHYDES	2.03×10^{-01}	1.72×10^{-02}	1.12×10^{-02}	3.86×10^{-02}	2.71×10^{-01}
TOTAL SUSPENDED PARTICULATES	$4.89 \times 10^{+03}$	$4.13 \times 10^{+02}$	$2.69 \times 10^{+02}$	$9.27 \times 10^{+02}$	$6.49 \times 10^{+03}$
TOTAL VOCS	$9.52 \times 10^{+03}$	$8.05 \times 10^{+02}$	$5.25 \times 10^{+02}$	$1.81 \times 10^{+03}$	$1.27 \times 10^{+04}$
TRANS-2-BUTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
TRANS-2-PENTENE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
TRICHLOROBENZENES	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
TRICHLOROETHYLENE	7.29×10^{-01}	6.17×10^{-02}	4.02×10^{-02}	1.38×10^{-01}	9.69×10^{-01}
TRICHLOROFLUOROMETHANE	1.03	8.75×10^{-02}	5.70×10^{-02}	1.96×10^{-01}	1.38
TRICHLOROTRIFLUOROETHANE	6.78×10^{-01}	5.74×10^{-02}	3.74×10^{-02}	1.29×10^{-01}	9.02×10^{-01}
TRIFLUOROMETHANE	5.09×10^{-01}	4.30×10^{-02}	2.81×10^{-02}	9.66×10^{-02}	6.76×10^{-01}
TRIMETHYLBENZENE	1.87×10^{-01}	1.58×10^{-02}	1.03×10^{-02}	3.54×10^{-02}	2.48×10^{-01}
TRIMETHYLCYCLOHEXANES	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
TRIMETHYLCYCLOPENTANE	1.70×10^{-02}	1.43×10^{-03}	9.35×10^{-04}	3.22×10^{-03}	2.25×10^{-02}
TRIMETHYLDECENE	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
TRIMETHYLFLUOROSILANE	1.17	9.89×10^{-02}	6.45×10^{-02}	2.22×10^{-01}	1.56
TRIMETHYLHEPTANES	3.39×10^{-02}	2.87×10^{-03}	1.87×10^{-03}	6.44×10^{-03}	4.51×10^{-02}
VINYL ACETATE	9.33×10^{-01}	7.89×10^{-02}	5.14×10^{-02}	1.77×10^{-01}	1.24
ZINC AND COMPOUNDS	2.06	1.74×10^{-01}	1.14×10^{-01}	3.91×10^{-01}	2.74

Table B1.16: Annual Emissions from Solid Fuel Combustion – Coal

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACENAPHTHENE	2.17×10^{-05}	1.83×10^{-06}	1.20×10^{-06}	4.12×10^{-06}	2.88×10^{-05}
ACENAPHTHYLENE	4.60×10^{-04}	3.89×10^{-05}	2.54×10^{-05}	8.73×10^{-05}	6.11×10^{-04}
ACETALDEHYDE	4.03×10^{-04}	3.41×10^{-05}	2.22×10^{-05}	7.65×10^{-05}	5.36×10^{-04}
ANTHRACENE	3.04×10^{-05}	2.57×10^{-06}	1.67×10^{-06}	5.76×10^{-06}	4.04×10^{-05}
ARSENIC AND COMPOUNDS	1.34×10^{-04}	1.14×10^{-05}	7.41×10^{-06}	2.55×10^{-05}	1.79×10^{-04}
BENZENE	9.19×10^{-04}	7.77×10^{-05}	5.07×10^{-05}	1.74×10^{-04}	1.22×10^{-03}
BENZO(A)ANTHRACENE	4.34×10^{-05}	3.67×10^{-06}	2.39×10^{-06}	8.23×10^{-06}	5.77×10^{-05}
BENZO(A)PYRENE	8.68×10^{-06}	7.34×10^{-07}	4.78×10^{-07}	1.65×10^{-06}	1.15×10^{-05}
BENZO(B)FLUORANTHENE	1.30×10^{-05}	1.10×10^{-06}	7.18×10^{-07}	2.47×10^{-06}	1.73×10^{-05}
BENZO(E)PYRENE	2.60×10^{-05}	2.20×10^{-06}	1.44×10^{-06}	4.94×10^{-06}	3.46×10^{-05}
BENZO(G,H,I)PERYLENE	8.68×10^{-06}	7.34×10^{-07}	4.78×10^{-07}	1.65×10^{-06}	1.15×10^{-05}
BENZO(K)FLUORANTHENE	4.34×10^{-06}	3.67×10^{-07}	2.39×10^{-07}	8.23×10^{-07}	5.77×10^{-06}
BERYLLIUM AND COMPOUNDS	2.19×10^{-04}	1.85×10^{-05}	1.21×10^{-05}	4.16×10^{-05}	2.91×10^{-04}
C7-C16 PARAFFINS	3.48	2.94×10^{-01}	1.92×10^{-01}	6.60×10^{-01}	4.62
CADMIUM AND COMPOUNDS	5.02×10^{-05}	4.24×10^{-06}	2.77×10^{-06}	9.53×10^{-06}	6.67×10^{-05}
CARBON DISULFIDE	9.19×10^{-05}	7.77×10^{-06}	5.07×10^{-06}	1.74×10^{-05}	1.22×10^{-04}
CARBON MONOXIDE	$1.95 \times 10^{+02}$	$1.65 \times 10^{+01}$	$1.08 \times 10^{+01}$	$3.70 \times 10^{+01}$	$2.59 \times 10^{+02}$
CHROMIUM (III) COMPOUNDS	1.28×10^{-04}	1.08×10^{-05}	7.06×10^{-06}	2.43×10^{-05}	1.70×10^{-04}
CHROMIUM (VI) COMPOUNDS	5.58×10^{-05}	4.72×10^{-06}	3.08×10^{-06}	1.06×10^{-05}	7.42×10^{-05}
CHRYSENE	2.60×10^{-05}	2.20×10^{-06}	1.44×10^{-06}	4.94×10^{-06}	3.46×10^{-05}
CYANIDE COMPOUNDS	1.77×10^{-03}	1.49×10^{-04}	9.74×10^{-05}	3.35×10^{-04}	2.35×10^{-03}
DI-(2-ETHYLEXYL) PHTHALATE (DEHP)	5.16×10^{-05}	4.36×10^{-06}	2.85×10^{-06}	9.80×10^{-06}	6.86×10^{-05}
DICHLOROMETHANE	3.75×10^{-04}	3.17×10^{-05}	2.07×10^{-05}	7.11×10^{-05}	4.98×10^{-04}
ETHANE	3.42	2.89×10^{-01}	1.88×10^{-01}	6.48×10^{-01}	4.54
ETHYLBENZENE	6.64×10^{-05}	5.62×10^{-06}	3.66×10^{-06}	1.26×10^{-05}	8.83×10^{-05}
FLUORANTHENE	4.34×10^{-05}	3.67×10^{-06}	2.39×10^{-06}	8.23×10^{-06}	5.77×10^{-05}
FLUORENE	5.21×10^{-05}	4.40×10^{-06}	2.87×10^{-06}	9.88×10^{-06}	6.92×10^{-05}
FLUORIDE COMPOUNDS	1.06×10^{-01}	8.97×10^{-03}	5.85×10^{-03}	2.01×10^{-02}	1.41×10^{-01}
FORMALDEHYDE	1.70×10^{-04}	1.43×10^{-05}	9.35×10^{-06}	3.22×10^{-05}	2.26×10^{-04}
HYDROCHLORIC ACID	8.48×10^{-01}	7.17×10^{-02}	4.68×10^{-02}	1.61×10^{-01}	1.13
ISOMERS OF XYLENE	2.62×10^{-05}	2.21×10^{-06}	1.44×10^{-06}	4.96×10^{-06}	3.48×10^{-05}
LEAD AND COMPOUNDS	6.29×10^{-03}	5.32×10^{-04}	3.47×10^{-04}	1.19×10^{-03}	8.36×10^{-03}
MANGANESE AND COMPOUNDS	2.54×10^{-03}	2.15×10^{-04}	1.40×10^{-04}	4.83×10^{-04}	3.38×10^{-03}
MERCURY AND COMPOUNDS	9.19×10^{-05}	7.77×10^{-06}	5.07×10^{-06}	1.74×10^{-05}	1.22×10^{-04}
METHANE	1.77	1.49×10^{-01}	9.74×10^{-02}	3.35×10^{-01}	2.35
METHYL ETHYL KETONE	2.76×10^{-04}	2.33×10^{-05}	1.52×10^{-05}	5.23×10^{-05}	3.67×10^{-04}
NAPHTHALENE	6.25×10^{-04}	5.28×10^{-05}	3.44×10^{-05}	1.19×10^{-04}	8.31×10^{-04}
N-HEXANE	4.74×10^{-05}	4.00×10^{-06}	2.61×10^{-06}	8.99×10^{-06}	6.30×10^{-05}
NICKEL AND COMPOUNDS	1.84×10^{-04}	1.55×10^{-05}	1.01×10^{-05}	3.49×10^{-05}	2.44×10^{-04}
NITRIC OXIDE	1.31	1.11×10^{-01}	7.25×10^{-02}	2.49×10^{-01}	1.75
NITROGEN DIOXIDE	1.06×10^{-01}	8.97×10^{-03}	5.85×10^{-03}	2.01×10^{-02}	1.41×10^{-01}
N-PENTANE	1.77×10^{-01}	1.49×10^{-02}	9.74×10^{-03}	3.35×10^{-02}	2.35×10^{-01}
OXIDES OF NITROGEN	2.12	1.79×10^{-01}	1.17×10^{-01}	4.03×10^{-01}	2.82

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
PARTICULATE MATTER < 10 µm	1.63	1.37×10^{-01}	8.97×10^{-02}	3.09×10^{-01}	2.16
PARTICULATE MATTER < 2.5 µm	9.33×10^{-01}	7.89×10^{-02}	5.15×10^{-02}	1.77×10^{-01}	1.24
PHENANTHRENE	1.69×10^{-04}	1.43×10^{-05}	9.33×10^{-06}	3.21×10^{-05}	2.25×10^{-04}
PHENOL	1.13×10^{-05}	9.56×10^{-07}	6.24×10^{-07}	2.15×10^{-06}	1.50×10^{-05}
POLYCYCLIC AROMATIC HYDROCARBONS	1.58×10^{-03}	1.34×10^{-04}	8.73×10^{-05}	3.01×10^{-04}	2.11×10^{-03}
PYRENE	5.21×10^{-05}	4.40×10^{-06}	2.87×10^{-06}	9.88×10^{-06}	6.92×10^{-05}
SELENIUM AND COMPOUNDS	9.19×10^{-04}	7.77×10^{-05}	5.07×10^{-05}	1.74×10^{-04}	1.22×10^{-03}
STYRENE	1.77×10^{-05}	1.49×10^{-06}	9.74×10^{-07}	3.35×10^{-06}	2.35×10^{-05}
SULFUR DIOXIDE	5.51	4.66×10^{-01}	3.04×10^{-01}	1.05	7.33
TETRACHLOROETHYLENE	3.04×10^{-05}	2.57×10^{-06}	1.68×10^{-06}	5.77×10^{-06}	4.04×10^{-05}
TOLUENE	1.70×10^{-04}	1.43×10^{-05}	9.35×10^{-06}	3.22×10^{-05}	2.26×10^{-04}
TOTAL SUSPENDED PARTICULATES	1.71	1.45×10^{-01}	9.44×10^{-02}	3.25×10^{-01}	2.28
TOTAL VOCS	7.07	5.98×10^{-01}	3.90×10^{-01}	1.34	9.40

Table B1.17: Annual Emissions from Surface Coating – Architectural and Decorative Water Thinned

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
1-CHLOROBUTANE	$5.17 \times 10^{+01}$	3.60	2.60	8.74	$6.67 \times 10^{+01}$
1-ETHOXY-2-PROPANOL	$3.42 \times 10^{+01}$	2.38	1.72	5.77	$4.41 \times 10^{+01}$
2-BUTYLTETRAHYDROFURAN	3.51	2.44×10^{-01}	1.77×10^{-01}	5.93×10^{-01}	4.53
2-ETHYL HEXANOL	$2.36 \times 10^{+01}$	1.64	1.19	3.99	$3.05 \times 10^{+01}$
3-(CHLOROMETHYL)-HEPTANE	$1.45 \times 10^{+01}$	1.01	7.30×10^{-01}	2.45	$1.87 \times 10^{+01}$
BENZENE	8.43	5.86×10^{-01}	4.24×10^{-01}	1.42	$1.09 \times 10^{+01}$
BUTYL CARBITOL	$1.83 \times 10^{+01}$	1.27	9.19×10^{-01}	3.08	$2.35 \times 10^{+01}$
DIACETONE ALCOHOL	$1.83 \times 10^{+01}$	1.27	9.19×10^{-01}	3.08	$2.35 \times 10^{+01}$
DIBUTYL ETHER	5.62	3.91×10^{-01}	2.83×10^{-01}	9.49×10^{-01}	7.24
DICHLOROMETHANE	$1.29 \times 10^{+02}$	8.98	6.50	$2.18 \times 10^{+01}$	$1.67 \times 10^{+02}$
ETHYL CHLORIDE	$1.45 \times 10^{+01}$	1.01	7.30×10^{-01}	2.45	$1.87 \times 10^{+01}$
ETHYLENE GLYCOL	$1.36 \times 10^{+01}$	9.44×10^{-01}	6.83×10^{-01}	2.29	$1.75 \times 10^{+01}$
ETHYLISOPROPYL ETHER	$1.22 \times 10^{+02}$	8.46	6.12	$2.06 \times 10^{+01}$	$1.57 \times 10^{+02}$
HEXYLENE GLYCOL	$3.35 \times 10^{+01}$	2.33	1.68	5.66	$4.31 \times 10^{+01}$
ISOMERS OF UNDECANE	$2.34 \times 10^{+01}$	1.63	1.18	3.95	$3.02 \times 10^{+01}$
METHYL AMYL KETONE	$2.43 \times 10^{+01}$	1.69	1.22	4.11	$3.14 \times 10^{+01}$
METHYL CHLORIDE	$1.29 \times 10^{+01}$	8.95×10^{-01}	6.48×10^{-01}	2.18	$1.66 \times 10^{+01}$
METHYL PALMITATE	8.43	5.86×10^{-01}	4.24×10^{-01}	1.42	$1.09 \times 10^{+01}$
METHYLAL	$6.31 \times 10^{+02}$	$4.39 \times 10^{+01}$	$3.18 \times 10^{+01}$	$1.07 \times 10^{+02}$	$8.14 \times 10^{+02}$
N-BUTYL ALCOHOL	$4.70 \times 10^{+02}$	$3.27 \times 10^{+01}$	$2.37 \times 10^{+01}$	$7.95 \times 10^{+01}$	$6.06 \times 10^{+02}$
N-DECANE	4.92	3.42×10^{-01}	2.47×10^{-01}	8.30×10^{-01}	6.34
N-UNDECANE	2.81	1.95×10^{-01}	1.41×10^{-01}	4.75×10^{-01}	3.62
SUBSTITUTED C9 ESTER (C12)	$6.69 \times 10^{+02}$	$4.65 \times 10^{+01}$	$3.37 \times 10^{+01}$	$1.13 \times 10^{+02}$	$8.62 \times 10^{+02}$
TOTAL VOCS	$2.34 \times 10^{+03}$	$1.63 \times 10^{+02}$	$1.18 \times 10^{+02}$	$3.95 \times 10^{+02}$	$3.02 \times 10^{+03}$
VINYL ACETATE	2.81	1.95×10^{-01}	1.41×10^{-01}	4.75×10^{-01}	3.62

Table B1.18: Annual Emissions from Surface Coating – Architectural and Decorative Solvent Thinned

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
2,4-DIMETHYLHEXANE	$1.11 \times 10^{+02}$	7.71	5.58	$1.87 \times 10^{+01}$	$1.43 \times 10^{+02}$
2,4-DIMETHYLPENTANE	$2.62 \times 10^{+01}$	1.82	1.32	4.43	$3.38 \times 10^{+01}$
2-METHYL-3-HEXANONE	$5.78 \times 10^{+01}$	4.02	2.91	9.76	$7.45 \times 10^{+01}$
ACETONE	$1.96 \times 10^{+01}$	1.36	9.85×10^{-01}	3.31	$2.52 \times 10^{+01}$
BUTYL CELLOSOLVE	$9.99 \times 10^{+01}$	6.94	5.03	$1.69 \times 10^{+01}$	$1.29 \times 10^{+02}$
C5 ESTER	$1.94 \times 10^{+01}$	1.35	9.77×10^{-01}	3.28	$2.50 \times 10^{+01}$
CYCLOHEXANE	8.02	5.57×10^{-01}	4.03×10^{-01}	1.35	$1.03 \times 10^{+01}$
DIMETHYLCYCLOHEXANE	$6.18 \times 10^{+01}$	4.30	3.11	$1.04 \times 10^{+01}$	$7.97 \times 10^{+01}$
DIMETHYLHEPTANES	$1.03 \times 10^{+01}$	7.18×10^{-01}	5.20×10^{-01}	1.74	$1.33 \times 10^{+01}$
ETHYL ACETATE	$3.14 \times 10^{+01}$	2.19	1.58	5.31	$4.05 \times 10^{+01}$
ETHYLBENZENE	8.32	5.79×10^{-01}	4.19×10^{-01}	1.41	$1.07 \times 10^{+01}$
ETHYLCYCLOHEXANE	$2.20 \times 10^{+01}$	1.53	1.11	3.72	$2.84 \times 10^{+01}$
ETHYLCYCLOPENTANE	3.39	2.36×10^{-01}	1.71×10^{-01}	5.73×10^{-01}	4.37
ISOMERS OF ETHYLTOLUENE	3.08	2.14×10^{-01}	1.55×10^{-01}	5.21×10^{-01}	3.97
ISOMERS OF NONANE	$4.30 \times 10^{+01}$	2.99	2.16	7.26	$5.54 \times 10^{+01}$
ISOMERS OF XYLENE	$1.26 \times 10^{+02}$	8.75	6.34	$2.13 \times 10^{+01}$	$1.62 \times 10^{+02}$
METHYL AMYL KETONE	$1.28 \times 10^{+01}$	8.89×10^{-01}	6.44×10^{-01}	2.16	$1.65 \times 10^{+01}$
METHYL ETHYL KETONE	8.32	5.79×10^{-01}	4.19×10^{-01}	1.41	$1.07 \times 10^{+01}$
METHYL ISOBUTYL KETONE	5.55	3.86×10^{-01}	2.79×10^{-01}	9.37×10^{-01}	7.15
METHYLCYCLOHEXANE	$5.56 \times 10^{+01}$	3.87	2.80	9.40	$7.17 \times 10^{+01}$
METHYLHEPTENE	2.31	1.61×10^{-01}	1.16×10^{-01}	3.91×10^{-01}	2.98
N-BUTYL ACETATE	$1.46 \times 10^{+02}$	$1.02 \times 10^{+01}$	7.37	$2.47 \times 10^{+01}$	$1.89 \times 10^{+02}$
N-HEPTANE	$4.53 \times 10^{+01}$	3.15	2.28	7.65	$5.84 \times 10^{+01}$
O-XYLENE	$6.89 \times 10^{+01}$	4.79	3.47	$1.16 \times 10^{+01}$	$8.88 \times 10^{+01}$
TOLUENE	$5.84 \times 10^{+02}$	$4.06 \times 10^{+01}$	$2.94 \times 10^{+01}$	$9.86 \times 10^{+01}$	$7.53 \times 10^{+02}$
TOTAL VOCS	$1.54 \times 10^{+03}$	$1.07 \times 10^{+02}$	$7.75 \times 10^{+01}$	$2.60 \times 10^{+02}$	$1.99 \times 10^{+03}$
TRIMETHYLBENZENE	1.70	1.18×10^{-01}	8.53×10^{-02}	2.86×10^{-01}	2.19
TRIMETHYLCYCLOHEXANES	$2.56 \times 10^{+01}$	1.78	1.29	4.32	$3.30 \times 10^{+01}$
TRIMETHYLCYCLOPENTANE	2.62	1.82×10^{-01}	1.32×10^{-01}	4.43×10^{-01}	3.38

Table B1.19: Annual Emissions from Surface Coating – Architectural and Decorative Timber Finishes

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACETONE	$1.53 \times 10^{+02}$	$1.06 \times 10^{+01}$	7.69	$2.58 \times 10^{+01}$	$1.97 \times 10^{+02}$
DIETHYLENE GLYCOL	$1.18 \times 10^{+01}$	8.23×10^{-01}	5.96×10^{-01}	2.00	$1.53 \times 10^{+01}$
METHYL ETHYL KETONE	$1.64 \times 10^{+02}$	$1.14 \times 10^{+01}$	8.27	$2.78 \times 10^{+01}$	$2.12 \times 10^{+02}$
METHYL ISOBUTYL KETONE	$6.60 \times 10^{+01}$	4.58	3.32	$1.11 \times 10^{+01}$	$8.50 \times 10^{+01}$
TOTAL VOCS	$3.95 \times 10^{+02}$	$2.74 \times 10^{+01}$	$1.99 \times 10^{+01}$	$6.67 \times 10^{+01}$	$5.09 \times 10^{+02}$

Table B1.20: Annual Emissions from Surface Coating – Architectural and Decorative Thinners

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ALKENE KETONE	4.32	3.01×10^{-01}	2.18×10^{-01}	7.30×10^{-01}	5.57
BENZALDEHYDE	1.65	1.15×10^{-01}	8.31×10^{-02}	2.79×10^{-01}	2.13
C10 OLEFINS	$1.56 \times 10^{+01}$	1.08	7.85×10^{-01}	2.64	$2.01 \times 10^{+01}$
C2 CYCLOHEXANE	6.28	4.36×10^{-01}	3.16×10^{-01}	1.06	8.09
C3 CYCLOHEXANE	4.32	3.01×10^{-01}	2.18×10^{-01}	7.30×10^{-01}	5.57
C4 SUBSTITUTED CYCLOHEXANE	6.28	4.36×10^{-01}	3.16×10^{-01}	1.06	8.09
C5 CYCLOHEXANE	1.98	1.37×10^{-01}	9.95×10^{-02}	3.34×10^{-01}	2.55
DICHLOROMETHANE	2.65	1.84×10^{-01}	1.33×10^{-01}	4.48×10^{-01}	3.42
DIETHYLCYCLOHEXANE	$1.73 \times 10^{+01}$	1.20	8.70×10^{-01}	2.92	$2.23 \times 10^{+01}$
ETHYLBENZENE	2.02	1.40×10^{-01}	1.02×10^{-01}	3.41×10^{-01}	2.60
ETHYLENE DIBROMIDE	1.98	1.37×10^{-01}	9.95×10^{-02}	3.34×10^{-01}	2.55
ETHYLHEPTENE	4.91	3.41×10^{-01}	2.47×10^{-01}	8.29×10^{-01}	6.33
ISOMERS OF C10H18	9.67	6.72×10^{-01}	4.86×10^{-01}	1.63	$1.25 \times 10^{+01}$
ISOMERS OF DECANE	$1.41 \times 10^{+01}$	9.77×10^{-01}	7.07×10^{-01}	2.37	$1.81 \times 10^{+01}$
ISOMERS OF NONANE	$1.14 \times 10^{+01}$	7.91×10^{-01}	5.73×10^{-01}	1.92	$1.47 \times 10^{+01}$
ISOMERS OF UNDECANE	3.54	2.46×10^{-01}	1.78×10^{-01}	5.98×10^{-01}	4.56
ISOMERS OF XYLENE	5.91	4.11×10^{-01}	2.97×10^{-01}	9.98×10^{-01}	7.62
ISOPROPYL ALCOHOL	$1.07 \times 10^{+01}$	7.41×10^{-01}	5.37×10^{-01}	1.80	$1.37 \times 10^{+01}$
METHYL ETHYL KETONE	8.82	6.13×10^{-01}	4.44×10^{-01}	1.49	$1.14 \times 10^{+01}$
METHYLCYCLOHEXANE	$1.46 \times 10^{+01}$	1.01	7.35×10^{-01}	2.47	$1.88 \times 10^{+01}$
M-XYLENE	3.59	2.49×10^{-01}	1.80×10^{-01}	6.06×10^{-01}	4.62
N-BUTYL ACETATE	$2.01 \times 10^{+01}$	1.40	1.01	3.40	$2.60 \times 10^{+01}$
N-HEPTANE	6.67	4.64×10^{-01}	3.36×10^{-01}	1.13	8.60
N-UNDECANE	5.45	3.79×10^{-01}	2.74×10^{-01}	9.21×10^{-01}	7.03
PHTHALIC ANHYDRIDE	1.65	1.15×10^{-01}	8.31×10^{-02}	2.79×10^{-01}	2.13
P-TOLUALDEHYDE	2.28	1.59×10^{-01}	1.15×10^{-01}	3.85×10^{-01}	2.94
P-XYLENE	2.32	1.62×10^{-01}	1.17×10^{-01}	3.93×10^{-01}	3.00
TOLUENE	$3.31 \times 10^{+01}$	2.30	1.67	5.60	$4.27 \times 10^{+01}$
TOTAL VOCS	$2.17 \times 10^{+02}$	$1.51 \times 10^{+01}$	$1.09 \times 10^{+01}$	$3.67 \times 10^{+01}$	$2.80 \times 10^{+02}$

Table B1.21: Annual Emissions from Surface Coating – Industrial Coating

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACETONE	$1.67 \times 10^{+02}$	$1.16 \times 10^{+01}$	8.39	$2.82 \times 10^{+01}$	$2.15 \times 10^{+02}$
C10 PARAFFINS	$3.07 \times 10^{+02}$	$2.13 \times 10^{+01}$	$1.54 \times 10^{+01}$	$5.18 \times 10^{+01}$	$3.95 \times 10^{+02}$
C4 SUBSTITUTED CYCLOHEXANE	$3.12 \times 10^{+02}$	$2.17 \times 10^{+01}$	$1.57 \times 10^{+01}$	$5.27 \times 10^{+01}$	$4.02 \times 10^{+02}$
C7-C16 PARAFFINS	$4.84 \times 10^{+01}$	3.37	2.44	8.18	$6.24 \times 10^{+01}$
C-9 CYCLOPARAFFINS	$1.29 \times 10^{+02}$	8.98	6.50	$2.18 \times 10^{+01}$	$1.66 \times 10^{+02}$
C9 PARAFFIN	$9.69 \times 10^{+01}$	6.73	4.87	$1.64 \times 10^{+01}$	$1.25 \times 10^{+02}$
DIETHYLENE GLYCOL	$3.55 \times 10^{+02}$	$2.47 \times 10^{+01}$	$1.79 \times 10^{+01}$	$6.00 \times 10^{+01}$	$4.58 \times 10^{+02}$
ETHYL ACETATE	$1.08 \times 10^{+02}$	7.48	5.41	$1.82 \times 10^{+01}$	$1.39 \times 10^{+02}$
ETHYL ALCOHOL	$1.45 \times 10^{+02}$	$1.01 \times 10^{+01}$	7.31	$2.45 \times 10^{+01}$	$1.87 \times 10^{+02}$
ISOMERS OF UNDECANE	$1.67 \times 10^{+02}$	$1.16 \times 10^{+01}$	8.39	$2.82 \times 10^{+01}$	$2.15 \times 10^{+02}$
ISOMERS OF XYLENE	$8.50 \times 10^{+02}$	$5.91 \times 10^{+01}$	$4.28 \times 10^{+01}$	$1.44 \times 10^{+02}$	$1.10 \times 10^{+03}$
ISOPROPYL ALCOHOL	$1.88 \times 10^{+02}$	$1.31 \times 10^{+01}$	9.47	$3.18 \times 10^{+01}$	$2.43 \times 10^{+02}$
METHYL ETHYL KETONE	$4.36 \times 10^{+02}$	$3.03 \times 10^{+01}$	$2.19 \times 10^{+01}$	$7.36 \times 10^{+01}$	$5.62 \times 10^{+02}$
METHYL ISOBUTYL KETONE	$3.17 \times 10^{+02}$	$2.21 \times 10^{+01}$	$1.60 \times 10^{+01}$	$5.36 \times 10^{+01}$	$4.09 \times 10^{+02}$
N-BUTYL ACETATE	$1.67 \times 10^{+02}$	$1.16 \times 10^{+01}$	8.39	$2.82 \times 10^{+01}$	$2.15 \times 10^{+02}$
N-BUTYL ALCOHOL	$3.44 \times 10^{+02}$	$2.39 \times 10^{+01}$	$1.73 \times 10^{+01}$	$5.82 \times 10^{+01}$	$4.44 \times 10^{+02}$
N-PROPYL ACETATE	$8.61 \times 10^{+01}$	5.98	4.33	$1.45 \times 10^{+01}$	$1.11 \times 10^{+02}$
PARAFFINS/OLEFINS (C12-C16)	$1.08 \times 10^{+02}$	7.48	5.41	$1.82 \times 10^{+01}$	$1.39 \times 10^{+02}$
TOLUENE	$7.91 \times 10^{+02}$	$5.50 \times 10^{+01}$	$3.98 \times 10^{+01}$	$1.34 \times 10^{+02}$	$1.02 \times 10^{+03}$
TOTAL VOCS	$5.12 \times 10^{+03}$	$3.56 \times 10^{+02}$	$2.58 \times 10^{+02}$	$8.65 \times 10^{+02}$	$6.60 \times 10^{+03}$

Table B1.22: Annual Emissions from Surface Coating – Industrial Thinners

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ALKENE KETONE	$5.35 \times 10^{+01}$	3.72	2.69	9.03	$6.89 \times 10^{+01}$
BENZALDEHYDE	$2.04 \times 10^{+01}$	1.42	1.03	3.45	$2.63 \times 10^{+01}$
C10 OLEFINS	$1.93 \times 10^{+02}$	$1.34 \times 10^{+01}$	9.70	$3.26 \times 10^{+01}$	$2.49 \times 10^{+02}$
C2 CYCLOHEXANE	$7.76 \times 10^{+01}$	5.40	3.91	$1.31 \times 10^{+01}$	$1.00 \times 10^{+02}$
C3 CYCLOHEXANE	$5.35 \times 10^{+01}$	3.72	2.69	9.03	$6.89 \times 10^{+01}$
C4 SUBSTITUTED CYCLOHEXANE	$7.76 \times 10^{+01}$	5.40	3.91	$1.31 \times 10^{+01}$	$1.00 \times 10^{+02}$
C5 CYCLOHEXANE	$2.44 \times 10^{+01}$	1.70	1.23	4.13	$3.15 \times 10^{+01}$
DICHLOROMETHANE	$3.28 \times 10^{+01}$	2.28	1.65	5.54	$4.22 \times 10^{+01}$
DIETHYLCYCLOHEXANE	$2.14 \times 10^{+02}$	$1.49 \times 10^{+01}$	$1.08 \times 10^{+01}$	$3.61 \times 10^{+01}$	$2.76 \times 10^{+02}$
ETHYLBENZENE	$2.50 \times 10^{+01}$	1.74	1.26	4.22	$3.22 \times 10^{+01}$
ETHYLENE DIBROMIDE	$2.44 \times 10^{+01}$	1.70	1.23	4.13	$3.15 \times 10^{+01}$
ETHYLHEPTENE	$6.07 \times 10^{+01}$	4.22	3.05	$1.03 \times 10^{+01}$	$7.83 \times 10^{+01}$
ISOMERS OF C10H18	$1.20 \times 10^{+02}$	8.31	6.01	$2.02 \times 10^{+01}$	$1.54 \times 10^{+02}$
ISOMERS OF DECANE	$1.74 \times 10^{+02}$	$1.21 \times 10^{+01}$	8.75	$2.94 \times 10^{+01}$	$2.24 \times 10^{+02}$
ISOMERS OF NONANE	$1.41 \times 10^{+02}$	9.79	7.08	$2.38 \times 10^{+01}$	$1.81 \times 10^{+02}$
ISOMERS OF UNDECANE	$4.38 \times 10^{+01}$	3.04	2.20	7.40	$5.64 \times 10^{+01}$
ISOMERS OF XYLENE	$7.31 \times 10^{+01}$	5.08	3.68	$1.23 \times 10^{+01}$	$9.42 \times 10^{+01}$
ISOPROPYL ALCOHOL	$1.32 \times 10^{+02}$	9.17	6.64	$2.23 \times 10^{+01}$	$1.70 \times 10^{+02}$
METHYL ETHYL KETONE	$1.09 \times 10^{+02}$	7.58	5.49	$1.84 \times 10^{+01}$	$1.41 \times 10^{+02}$
METHYLCYCLOHEXANE	$1.81 \times 10^{+02}$	$1.25 \times 10^{+01}$	9.08	$3.05 \times 10^{+01}$	$2.33 \times 10^{+02}$
M-XYLENE	$4.43 \times 10^{+01}$	3.08	2.23	7.49	$5.71 \times 10^{+01}$
N-BUTYL ACETATE	$2.49 \times 10^{+02}$	$1.73 \times 10^{+01}$	$1.25 \times 10^{+01}$	$4.21 \times 10^{+01}$	$3.21 \times 10^{+02}$
N-HEPTANE	$8.25 \times 10^{+01}$	5.73	4.15	$1.39 \times 10^{+01}$	$1.06 \times 10^{+02}$
N-UNDECANE	$6.74 \times 10^{+01}$	4.69	3.39	$1.14 \times 10^{+01}$	$8.69 \times 10^{+01}$
PHTHALIC ANHYDRIDE	$2.04 \times 10^{+01}$	1.42	1.03	3.45	$2.63 \times 10^{+01}$
P-TOLUALDEHYDE	$2.82 \times 10^{+01}$	1.96	1.42	4.76	$3.64 \times 10^{+01}$
P-XYLENE	$2.87 \times 10^{+01}$	2.00	1.45	4.86	$3.70 \times 10^{+01}$
TOLUENE	$4.10 \times 10^{+02}$	$2.85 \times 10^{+01}$	$2.06 \times 10^{+01}$	$6.92 \times 10^{+01}$	$5.28 \times 10^{+02}$
TOTAL VOCS	$2.69 \times 10^{+03}$	$1.87 \times 10^{+02}$	$1.35 \times 10^{+02}$	$4.54 \times 10^{+02}$	$3.46 \times 10^{+03}$

Table B1.23: Annual Emissions from Surface Coating – Industrial Timber Finishes

SUBSTANCE	EMISSIONS (TONNES/YEAR)				
	SYDNEY	NEWCASTLE	WOLLONGONG	NON-URBAN	GMR
ACETONE	$3.13 \times 10^{+02}$	$2.17 \times 10^{+01}$	$1.57 \times 10^{+01}$	$5.28 \times 10^{+01}$	$4.03 \times 10^{+02}$
DIETHYLENE GLYCOL	$2.43 \times 10^{+01}$	1.69	1.22	4.10	$3.13 \times 10^{+01}$
METHYL ETHYL KETONE	$3.36 \times 10^{+02}$	$2.34 \times 10^{+01}$	$1.69 \times 10^{+01}$	$5.68 \times 10^{+01}$	$4.33 \times 10^{+02}$
METHYL ISOBUTYL KETONE	$1.35 \times 10^{+02}$	9.38	6.79	$2.28 \times 10^{+01}$	$1.74 \times 10^{+02}$
TOTAL VOCS	$8.08 \times 10^{+02}$	$5.62 \times 10^{+01}$	$4.07 \times 10^{+01}$	$1.37 \times 10^{+02}$	$1.04 \times 10^{+03}$

Appendix C: Number and Sales of Domestic and Commercial Lawn Mowing and Garden Equipment

Table C1.1 includes a comparison between number and sales of 2-stroke and 4-stroke petrol domestic and commercial lawn mowing and garden equipment in the GMR and NSW respectively.

Table C1.1: Number and sales of 2-stroke and 4-stroke petrol domestic and commercial lawn mowing and garden equipment during 2003 in the GMR and NSW

Data Source	2-Stroke Petrol			4-stroke Petrol			Total
NSW Sales of Lawn Mowing and Garden Equipment [1]	187,650			70,940			258,590
Data Source	**Council**	**Domestic**	**Golf Course**	**Council**	**Domestic**	**Golf Course**	**Total**
GMR Number of Lawn Mowing and Garden Equipment [2]	6,547	1,123,986	2,227	1,262	515,003	2,158	1,651,182
Total Number of Lawn Mowing and Garden Equipment	1,132,760			518,422			

[1] Data Source: (AIA, 2005).
[2] Data Source: (Council Survey, Domestic Survey and Golf Course Survey). The total number of lawn mowing and garden equipment obtained from the Council and Golf Course Surveys have been multiplied by ~8.8 and ~23.2 respectively. The rationale is discussed in Section 3.6.3.

Figure C1.1 shows the proportion of 2-stroke petrol and 4-stroke petrol number and sales of domestic and commercial lawn mowing and garden equipment in the GMR and NSW respectively.

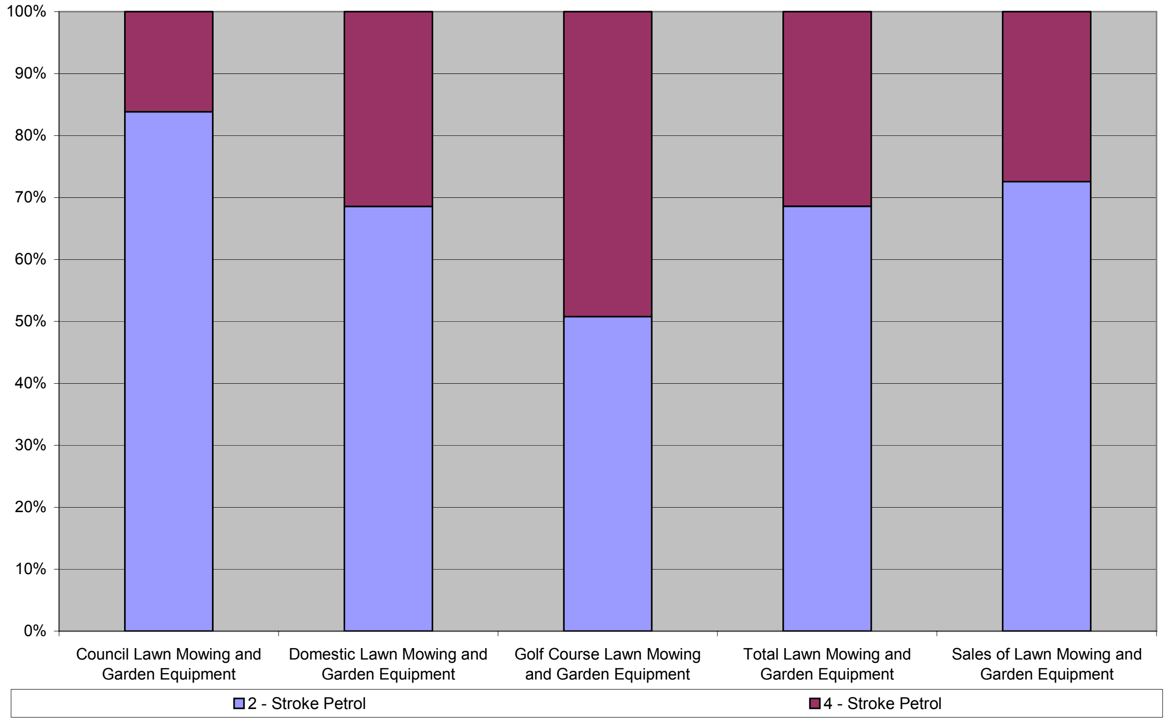

Figure C1.1: Proportion of 2-stroke and 4-stroke petrol number and sales of domestic and commercial lawn mowing and garden equipment during 2003 in the GMR and NSW