

# Tullamarine Landfill

Community information



## Community air monitoring program Final Report

In February 2011, EPA commenced an air monitoring program in Tullamarine. As part of this, four residential sites were chosen in the vicinity of the closed Tullamarine landfill. A fifth site was added in August 2011 at a non-residential location between the airport and the landfill. This report summarises the entire monitoring program.

EPA sampled and analysed a wide range of pollutants, and compared the results against national and international air quality guidelines (see table 1).

Many of the pollutants EPA monitored for in the residential area didn't show up, meaning they're at really low levels. The ones that did show up were below the corresponding health-based air quality guideline value.

During this investigation more than 300 samples were taken at five sites. Three of these samples showed higher readings of a few compounds than is usually found.

Two samples (residential site 1 and airport site 5) showed higher levels for three substances - benzene, toluene and xylene - the residential sample was below annual guideline levels.

EPA suspect a common source because the sample results were very similar and measured on the same day at both sites.

While this source hasn't been pinpointed, one potential cause at the airport site in particular, could be petrol and other motor vehicle emissions.

Petrol vapour and motor vehicle emissions release the substances benzene, toluene and xylene into air.

The landfill is an unlikely source, because the samples didn't pick up any of the usual landfill gas markers, such as trichloroethylene and vinyl chloride (see EPA publication 1461 for more details).

As there was a northerly wind on the day, the wind was not blowing across the landfill towards residential or airport sites.

One other sample taken at the airport site showed unusually higher levels of methylene chloride, and can be related to the use of surface coatings solvent at a nearby construction site.

### More information

Visit [www.epa.vic.gov.au](http://www.epa.vic.gov.au) or phone EPA on 1300 EPA VIC (1300 372 842) for further information.

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## SUMMARY

The 12-month air monitoring program was undertaken to address community concerns about air quality impacts from pollutants in the residential area of the closed Tullamarine Landfill.

This piece of work finalises the additional work EPA agreed to undertake following the release of the Tullamarine Landfill - Community Health and Environment Report which consisted of a study by Cancer Council Victoria into cancer rates in areas near the Tullamarine Landfill, an independent review of the landfill's cap and a study of past and present air quality at the Tullamarine Landfill.

Air monitoring results have consistently shown that many of the substances monitored were not detected and those that did show-up fell below health-based air quality standards.

As with any former landfill site which has closed and is going through rehabilitation, ongoing monitoring is required. As part of this site's landfill gas management systems the site's owner will undertake ongoing gas monitoring over the landfill cap and in bores installed at targeted locations around the perimeter of the site.



*The low levels of pollution measured in this study suggest the measures in place to manage potential air emissions from the landfill are working.*

Table 1: Tullamarine Landfill air monitoring results February 2011 - August 2012

| COMPOUND                                | SITE 1      |            | SITE 2      |            | SITE 3      |            | SITE 4      |            | SITE 5 - AIRPORT |            | GUIDELINE<br>ppb    | SAMPLES DETECTED   |               | DETECTION LIMITS |            |            |
|---|-------------|------------|-------------|------------|-------------|------------|-------------|------------|------------------|------------|---------------------|--------------------|---------------|------------------|------------|------------|
|   | Average ppb | Max ppb    | Average ppb | Max ppb    | Average ppb | Max ppb    | Average ppb | Max ppb    | Average ppb      | Max ppb    |                     | % Samples Detected | Total Samples | Min ppb          | Avg ppb    | Max ppb    |
| Trichloroethylene                       | bdl         | bdl        | bdl         | 0.8        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 10 (TCEQ)           | 0.3%               | 300           | 0.2              | 0.2        | 0.9        |
| Vinyl chloride                          | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 0.45 (TCEQ)         | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Benzene                                 | <b>2.9</b>  | <b>160</b> | <b>0.3</b>  | <b>1.2</b> | <b>0.4</b>  | <b>2.3</b> | <b>0.3</b>  | <b>1.3</b> | <b>11.6</b>      | <b>690</b> | <b>3 (NEPM)</b>     | <b>44%</b>         | <b>300</b>    | <b>0.2</b>       | <b>0.3</b> | <b>1.1</b> |
| Benzene, 1,2-dichloro-                  | bdl         | bdl        | 0.5         | 1.8        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 47 (ATSDR)          | 0.3%               | 300           | 0.2              | 1.0        | 5.3        |
| Benzene, 1,2,4-trichloro-               | 1.2         | 4.1        | 1.3         | 6.0        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 13 (ATSDR)          | 1%                 | 300           | 0.2              | 2.6        | 12.6       |
| Benzene, 1,2,4-trimethyl                | 0.6         | 2.7        | 0.5         | 1.8        | 0.5         | 1.5        | 0.5         | 2.4        | 1.2              | 2.3        | 25 (TCEQ)           | 7%                 | 300           | 0.2              | 1.1        | 5.4        |
| Benzene, 1,3-dichloro-                  | bdl         | bdl        | bdl         | bdl        | 0.5         | 1.5        | bdl         | bdl        | bdl              | bdl        | 63# (ATSDR)         | 0.3%               | 300           | 0.2              | 1.0        | 5.4        |
| Benzene, 1,3,5-trimethyl-               | 0.6         | 2.8        | bdl         | bdl        | 0.5         | 1.6        | 0.5         | 2.0        | bdl              | bdl        | 25 (TCEQ)           | 2%                 | 300           | 0.2              | 1.0        | 5.5        |
| Benzene, 1,4-dichloro-                  | bdl         | bdl        | bdl         | bdl        | 0.5         | 2.7        | bdl         | bdl        | bdl              | bdl        | 10 (ATSDR)          | 0.7%               | 300           | 0.2              | 1.0        | 5.4        |
| Benzene, ethyl-                         | 0.2         | 1.2        | 0.2         | 2.0        | 0.2         | 0.6        | bdl         | 0.5        | 0.3              | 0.6        | 450 (TCEQ)          | 13%                | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,1-dichloro-                   | bdl         | bdl        | bdl         | 0.4        | bdl         | 0.8        | bdl         | 0.5        | bdl              | 0.6        | 100 (TCEQ)          | 2%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethene, 1,1-dichloro-, (E)-             | bdl         | 1.0        | bdl         | 0.9        | bdl         | 1.1        | bdl         | bdl        | bdl              | bdl        | 86 (TCEQ)           | 1%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethene, 1,2-dichloro-, (E)-             | 0.2         | 0.8        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 200# (ASTDR)        | 0.3%               | 298           | 0.2              | 0.5        | 4.4        |
| Formaldehyde                            | 2.5         | 7.6        | *           | *          | 2.1         | 4.7        | *           | *          | 3.7              | 8.0        | 40# (NEPM)          | 94%                | 144           | 0.4              | 0.7        | 0.8        |
| Methane, bromo-                         | bdl         | 1.5        | 0.2         | 0.9        | bdl         | bdl        | 0.2         | 1.5        | bdl              | bdl        | 3 (TCEQ)            | 2%                 | 300           | 0.2              | 0.3        | 3.0        |
| Methane, chloro-                        | 0.8         | 2.5        | 0.8         | 5.5        | 0.9         | 3.5        | 0.8         | 2.5        | 0.8              | 3.4        | 50 (TCEQ)           | 19%                | 299           | 0.2              | 1.7        | 11.0       |
| Methane, dichlorodifluoro               | <b>0.5</b>  | <b>0.8</b> | <b>0.5</b>  | <b>0.7</b> | <b>0.5</b>  | <b>0.7</b> | <b>0.5</b>  | <b>0.6</b> | <b>0.4</b>       | <b>0.7</b> | <b>1,000 (TCEQ)</b> | <b>93%</b>         | <b>300</b>    | <b>0.2</b>       | <b>0.5</b> | <b>0.9</b> |
| Methane, trichloromonofluoro-           | 0.2         | 0.3        | bdl         | 0.4        | bdl         | 0.5        | bdl         | 0.5        | bdl              | 0.3        | 1000 (TCEQ)         | 12%                | 300           | 0.2              | 0.2        | 0.9        |
| Methylene chloride                      | 0.3         | 4.8        | 0.2         | 2.6        | 0.5         | 15         | 0.2         | 1.9        | 1.7              | 68.0       | 100 (TCEQ)          | 12%                | 300           | 0.2              | 0.2        | 0.9        |
| Styrene                                 | 2.1         | 5.0        | bdl         | bdl        | 2.4         | 12         | bdl         | bdl        | 2.1              | 8.8        | 110 (TCEQ)          | 1%                 | 299           | 1.0              | 4.4        | 11.6       |
| Toluene                                 | <b>7.0</b>  | <b>150</b> | <b>2.3</b>  | <b>70</b>  | <b>2.4</b>  | <b>18</b>  | <b>2.1</b>  | <b>30</b>  | <b>10.2</b>      | <b>560</b> | <b>100 (NEPM)</b>   | <b>94%</b>         | <b>299</b>    | <b>0.2</b>       | <b>0.4</b> | <b>0.5</b> |
| Xylene, m- & p-                         | 3.7         | 163        | 0.8         | 9.1        | <b>0.8</b>  | <b>4.1</b> | 0.5         | 1.5        | 13.6             | 770        | 200 (NEPM)          | 39%                | 300           | 0.4              | 0.5        | 1.8        |
| Xylene, o-                              | 2.0         | 82         | 0.3         | 2.7        | 0.4         | 2.7        | 0.3         | 2.2        | 6.6              | 370        | 200 (NEPM)          | 31%                | 300           | 0.2              | 0.2        | 0.9        |
| Benzene, chloro-                        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 10 (TCEQ)           | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| hexachlorobutadiene-                    | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | N/A                 | 0%                 | 298           | 0.2              | 0.2        | 0.9        |
| Butadiene                               | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | N/A                 | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Carbon tetrachloride                    | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 2 (TCEQ)            | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Chloroform                              | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | 0.4        | 2 (TCEQ)            | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,1,1-trichloro-                | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 2,000# (ASTDR)      | 0%                 | 298           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,1,2-trichloro-                | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 52# (ASTDR)         | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,1,2-trichloro-1,2,2-trifluoro | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | N/A                 | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,1,2,2-tetrachloro-            | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 69# (ASTDR)         | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,2-dibromo-                    | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | N/A                 | 0%                 | 300           | 0.2              | 0.2        | 0.9        |
| Ethane, 1,2-dichloro-                   | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 1 (TCEQ)            | 0%                 | 298           | 0.2              | 0.2        | 0.9        |
| Ethane, dichlorotetrafluoro-            | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | N/A                 | 0%                 | 299           | 0.2              | 0.2        | 0.9        |
| Ethylene, tetrachloro-                  | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | 0.4        | 3.8 (TCEQ)          | 0.3%               | 300           | 0.2              | 0.2        | 0.9        |
| Prop-1-ene, 1,3-dichloro-, (E)-         | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 7 (ASTDR)           | 0%                 | 300           | 0.2              | 0.2        | 0.8        |
| Prop-1-ene, 1,3-dichloro-, (Z)-         | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl              | bdl        | 7 (ASTDR)           | 0%                 | 300           | 0.2              | 0.4        | 3.2        |
| Propane, 1,2-dichloro-                  | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | bdl         | bdl        | 0.2              | 0.9        | 10 (TCEQ)           | 0.3%               | 300           | 0.2              | 0.2        | 0.9        |

**Key** - All guidelines are annual averages, in cases where there is no annual average, 24-hour average is used instead, denoted by # - 24-hour average;  
**bdl** - below detection limit; \* - not monitored at this site; **N/A** - not available; **NEPM** - Air Toxics National Environmental Protection Measure, **TCEQ** - Texas Centre for Environmental Quality  
**ATSDR** - US Agency for Toxic Substances and Disease Registry; **ppb** - parts per billion, **% samples detected** - shows how many samples the compound was detected in.