Community Air Monitoring Project
Summary Report - East Phillips Neighborhood
Little Earth Residential Complex

Project overview
In 2013, the Minnesota Legislature funded a two-year air monitoring study to measure air quality in Minnesota communities where low income or communities of color might be disproportionately impacted by pollution from highway traffic, air traffic, and industrial sources. This legislation funds one monitor to be moved to seven locations in a two-year period.

The project began on October 1, 2013, with monitoring in the East Phillips Neighborhood of Minneapolis. This area is mostly residential and is located near heavily used roadways and industries. Monitoring was completed on December 31, 2013.

What we monitored
Air was monitored for specific chemicals that are associated with adverse public health effects (Attachment A). These chemicals are classified as fine particles (PM$_{2.5}$) or air toxic pollutants (carbonyls, metals or volatile organic compounds). The data collected were examined to see if any results were above air quality standards or health benchmarks.

The data were compared with other data collected in the same time period at other monitors in Minnesota. Within each comparison group, the Minnesota Pollution Control Agency (MPCA) looked for results that were significantly different and had average daily values above air quality standards and health benchmarks.

Findings at a glance:

- Of the 74 air toxic pollutants measured, the levels of 38 pollutants were so low that they were not detected by the monitor.
- Of the detected pollutants, average measured values were at or below the established health benchmark or air quality standard values.
- In general, average air toxics values and trends over time were similar between the Little Earth monitor and other MPCA air monitors.
- For all days, average daily PM$_{2.5}$ values were below the daily standard of 35 μg/m$^3$.
- Average daily PM$_{2.5}$ values measured at the Little Earth monitor were generally higher than the values seen at most other sites for a majority of the monitoring days.
Summary of results

Fine Particles (PM$_{2.5}$)

Fine particulate matter is a mixture of very small particles found in the air including dust, dirt, smoke and even small liquid droplets. Some are so small they can only be detected with a microscope. Because of their small size, fine particles can become lodged in the lungs and cause health problems.

Regulatory standards exist for fine particle measurements, but these standards require a monitoring period of three years or greater. The monitoring period for this project is too short to consider regulatory compliance for safe PM$_{2.5}$ levels. However, as an informal comparison, for all days, the average daily PM$_{2.5}$ values were below the daily regulatory PM$_{2.5}$ standard of 35 μg/m$^3$.

The daily trends (Figure 1) over the three month period were similar between the Little Earth monitor and nearby Minneapolis monitors (Figure 2). While all average daily PM$_{2.5}$ values were below the daily PM$_{2.5}$ standard of 35 μg/m$^3$, average daily values measured at the Little Earth monitor were generally higher than those seen at most other sites (Figure 3) for a majority of the monitoring days (Table 1).

Figure 1. Average daily PM$_{2.5}$ values at all Minneapolis sites from October 1 to December 31, 2013.
**Figure 2.** Location of the community air monitor in relation to other PM\(_{2.5}\) air monitors in the Minneapolis metro area.

![Map of the community air monitor in relation to other PM\(_{2.5}\) air monitors in the Minneapolis metro area.](image)

**Figure 3.** Location of the community air monitor in relation to other PM\(_{2.5}\) air monitors in the Twin Cities metro area.

![Map of the community air monitor in relation to other PM\(_{2.5}\) air monitors in the Twin Cities metro area.](image)
Table 1. Summary information describing average daily PM$_{2.5}$ values found at MPCA monitors during the monitoring period of October 1, 2013 to December 31, 2013.

<table>
<thead>
<tr>
<th>Site</th>
<th>Min $\mu g/m^3$</th>
<th>Max $\mu g/m^3$</th>
<th>Mean$^1$ $\mu g/m^3$</th>
<th>Median$^2$ $\mu g/m^3$</th>
<th>Standard Deviation* $\mu g/m^3$</th>
<th>Number of days that average daily values at Little Earth were higher</th>
<th>Number of days that average daily values at Little Earth were lower</th>
<th>Total Number of Monitoring Days$^{*}$</th>
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<tbody>
<tr>
<td>Little Earth</td>
<td>0.3</td>
<td>28.0</td>
<td>8.5</td>
<td>7.5</td>
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<td>23.4</td>
<td>7.5</td>
<td>6.3</td>
<td>4.5</td>
<td>48</td>
<td>36</td>
<td>84</td>
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</table>

$^1$The mean value is the arithmetic average value of all of the average daily PM$_{2.5}$ measurements

$^2$The median value is the middle value of the set of average daily PM$_{2.5}$ measurements

*This is the standard deviation of the mean values reported in this table

*Not all monitoring days had complete data available for analysis
Summary of results (cont’d)

Air toxics

Air toxic pollutants are those chemicals known or suspected to cause serious human health effects or adverse environmental effects. Example pollutants include methylene chloride, used as a solvent and paint stripper, perchloroethylene, emitted by some dry cleaning facilities and benzene, which is found in gasoline. Some air toxic pollutants are metals such as cadmium, chromium, or lead compounds.

Air toxics health benchmarks

Existing air quality standards and health benchmarks come from a variety of sources. However, these are not available for all chemicals. For the air toxics, the MPCA uses available published health benchmarks. Specific information about standards and health benchmarks can be found at: http://www.pca.state.mn.us/bkzq4b0.

Of the 74 air toxic pollutants measured (Attachment A), there were 36 pollutants detected at the Little Earth monitor.

The majority of pollutants measured at Little Earth were not different from levels measured at other monitoring sites (Figure 4). Several air toxic pollutants measured at Little Earth were higher than levels measured in suburban locations, but were very similar to levels measured at other monitoring sites in the urban core cities of Minneapolis and St. Paul.

All measured values were at or below the established health benchmark values.

Figure 4. The number of air toxic pollutants that had a statistically different daily average value between the Little Earth monitor and the group of monitors in St. Paul, Minneapolis and around the suburban area of the Twin Cities.
Links to other information

Information about other environmental hazards, health outcomes, and socioeconomic indicators is available from the EPA at http://epamap14.epa.gov/ejmap/entry.html. This information is available by searching an address.

For more information and to view updates about the Community Air Monitoring Project, please visit www.pca.state.mn.us/9xc4ahc.

For more information on the air monitoring results from the Little Earth Residential Complex site or other air quality monitoring studies, please call 651-296-6300 or 1-800-657-3864 and ask for air data analysis staff. More information about the MPCA’s air monitoring program is available on the web at http://www.pca.state.mn.us/ruu6fhw.
## Attachment A. Community Air Monitoring Project - Monitored Air Quality Pollutants

### Carbonyls
- Acetaldehyde
- Benzaldehyde
- Butyraldehyde
- Formaldehyde
- Propionaldehyde
- Trans-Crotonaldehyde

### Metals
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Iron
- Lead
- Manganese
- Nickel
- Selenium
- Zinc

### PM$_{2.5}$ Continuous PM$_{2.5}$ Concentration

### Volatile Organic Compounds
- 1,1,2,2-Tetrachloroethane
- 1,1,2-Trichloroethane
- 1,1-Dichloroethane
- 1,1-Dichloroethylene
- 1,2,4-Trichlorobenzene
- 1,2,4-Trimethylbenzene
- 1,2-Dichlorobenzene
- 1,2-Dihloropropane
- 1,3,5-Trimethylbenzene
- Benzene
- Benzene, 1-Ethenyl-4-Methyl
- Benzy Chloride
- Bromodichloromethane
- Bromoform
- Bromomethane
- Carbon Disulfide
- Carbon Tetrachloride
- Chlorobenzene
- Chloroethylene
- Chloroform
- Chloromethane
- Cis-1,2-Dichloroethene
- Cis-1,3-Dichloropropene
- Cyclohexane
- Dibromochloromethane
- Dichlorodifluoromethane
- Dichloromethane
- Ethylbenzene
- Ethylene Dibromide
- Ethylene Dichloride
- Freon 113
- Freon 114
- Furan, Tetrahydro-
- Hexachlorobutadiene
- M/P Xylene
- Methyl Butyl Ketone
- Methyl Chloroform
- Methyl Ethyl Ketone
- Methyl Tert-Butyl Ether
- N-Heptane
- N-Hexane
- O-Xylene
- Propylene
- Styrene
- Tetrachloroethylene
- Toluene
- Trans-1,2-Dichloroethylene
- Trans-1,3-Dichloropropene
- Trichloroethylene
- Trichlorofluoromethane
- Vinyl Acetate
- Vinyl Chloride

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1Indicates chemicals that were below detection limits at all monitors in Minnesota, including the Little Earth residential complex monitor, for this three month monitoring time.

*Indicates chemicals that were below the detection limit at the Little Earth residential complex, but were detected at one or more monitoring sites in Minnesota.