## Compounds Monitored

The majority of the compounds were selected from the U.S. Environmental Protection Agency (EPA) Photochemical Assessment Monitoring Station target list (EPA/454/B-93-051) and the Method TO-14 (Determination of VOCs in Ambient Air Using SUMMA® Passivated Canister Sampling and Gas Chromatographic Analysis) target list. During 1995, the TNRCC laboratory measured 69 compounds.

Monitored compounds were selected based on a number of factors including their known applicability to the canister collection technique. Some compounds were selected based on emission quantities, the expected frequency

# Sampling and Analysis

**Compounds monitored primarily to provide data required by EPA for evaluation of the formation of ozone or for other purposes are:**

| | |
|---|---|
| n-Butane | 2-Methylheptane |
| 1-Butene | 3-Methylheptane |
| c-2-Butene | 2-Methylhexane |
| t-2-Butene | 3-Methylhexane |
| 2-Chloropentane | 2-Methylpentane |
| Cumene | 3-Methylpentane |
| Cyclohexane | 2-Methyl-1-pentene |
| Cyclopentane | 4-Methyl-1-pentene |
| n-Decane | n-Nonane |
| 2,2-Dimethylbutane | n-Octane |
| 2,3-Dimethylbutane | n-Pentane |
| 2,3-Dimethylpentane | 1-Pentene |
| 2,4-Dimethylpentane | c-2-Pentene |
| n-Heptane | t-2-Pentene |
| n-Hexane | a-Pinene |
| c-2-Hexene | b-Pinene |
| t-2-Hexene | n-Propane |
| Isobutane | n-Propylbenzene |
| Isopentane | Propylene |
| Isoprene | Trichlorofluoromethane |
| 3-Methyl-1-butene | 2,2,4-Trimethylpentane |
| 2-Methyl-2-butene | 2,3,4-Trimethylpentane |
| Methylcyclohexane | n-Undecane |
| Methylcyclopentane | |

**Compounds monitored primarily due to their potential to cause health effects resulting from long-term exposure are:**

| | |
|---|---|
| Benzene | Methylene Chloride |
| Bromomethane | Perchloroethylene |
| 1,3-Butadiene | Styrene |
| Carbon Tetrachloride | Toluene |
| Chlorobenzene | 1,1,2-Trichloroethane |
| Chloroform | Trichloroethylene |
| 1,1-Dichloroethane | 1,2,4-Trimethylbenzene |
| 1,2-Dichloroethane | 1,3,5-Trimethylbenzene |
| 1,1-Dichloroethylene | Vinyl Chloride |
| 1,2-Dichloropropane | o-Xylene |
| Ethyl Benzene | m- and p-Xylenes |

of occurrence, and their potential to cause health effects resulting from long-term exposure. Others were selected to provide the EPA information on compounds that can react in the atmosphere to form ozone and for other purposes. In this report, data for all of the compounds monitored were evaluated with respect to their potential to cause adverse health effects in the general public.

## Sampling Duration and Frequency

Air samples were collected into clean, evacuated stainless steel canisters that had been passivated to provide an inert surface. The filled canisters were returned to the agency's Austin laboratory for analysis. Air samples were collected for 24 hours every sixth day.

## Analytical Methods and Validation

Samples were analyzed by gas chromatography using mass spectroscopy detection in accordance with EPA Method TO-14 as published in the *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air* (EPA/600/4-89-017).

Data validation is a routine part of the TNRCC's quality assurance/quality control process. Agency staff closely examine all air pollutant data and the conditions under which they were recorded to determine whether the data were valid and whether individual measurements were representative of ambient conditions. Only valid measurements were included in the analysis and calculation of annual means.

In order for the data collected to be evaluated as representative of the annual concentration of VOCs present in the ambient air, TNRCC's goal for data completeness for this monitoring network is 75 percent data return, or 45 valid samples per year from each site. In addition, every season must have 75 percent data return in order for the annual VOC concentrations to be representative of a site. Due to technical problems, data are not complete for every site for 1995. Sites for which data were limited were Aldine, Austin, DFW Irving, Grapevine, Port Arthur, San Antonio, West Orange, and Winona. The Aldine site began collecting samples in November 1995.

All data were entered into the TNRCC's air toxics database, but the measurements that were invalidated were flagged and were not used in this report's data summaries and evaluation.

## Summary Statistics

TNRCC staff calculated summary statistics for each compound measured at each site from 1992 through 1995. The summary statistics for 1992 were calculated from less than

one full calendar year of sampling because the first network monitors were installed during the latter part of that year. The statistics include:

- the number of valid samples,
- the number of samples greater than or equal to the compound's method detection limit (MDL),
- the mean or average of a year's worth of 24-hour measurements,
- the median, and
- the maximum and second highest measurements.

These statistics are listed in Appendix A. Each page contains the summary data for one compound. The mean is calculated for each compound for each year. The MDL for each compound was determined experimentally using EPA methods (40 Code of Federal Regulations Part 53, Appendix B). If a compound is found at or above its MDL, one can be 99 percent certain of its presence in an air sample.

The data return goal for the Community Air Toxics Monitoring Network is at least 75 percent. Data return rates less than this indicate that a portion of data is missing, which may bias (increase or decrease) the annual average concentrations. (The main reason for missing data was design deficiencies in the air samplers.) ◆