COMMUNITY AIR TOXICS STUDY

Delaware Department of Natural Resources and Environmental Control

Blue Skies Delaware; Clean Air for Life
WILMINGTON, DELAWARE

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MARTIN LUTHER KING BLVD.

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NORTH BROOM STREET

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WILMINGTON FIRE DEPARTMENT

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NATIVITY PREP SCHOOL

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LUMS POND STATE PARK

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STUDY OVERVIEW

- State-of-the-art monitoring techniques
- GC/MS analytical platform
- 2 hour time resolutions

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OBJECTIVE #1

Establish an enhanced VOC monitoring program in Delaware capable of performing fast, accurate VOC measurements.
OBJECTIVE #2

- Investigate temporal and spatial variations on VOC concentrations at the community level.
  - Two hour sampling over 24 hours every six days.
  - Five sampling sites over a 5 km x 5 km grid.

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OBJECTIVE #3

- Build a time-resolved VOC data set to be used for improved model validations.
OBJECTIVE #4

- Evaluate potential concentration changes in ambient air of specific VOCs resulting from reformulated gasoline (RFG) usage.
OBJECTIVE #5

- Build a community-level data set of specific hazardous air pollutants (HAPs) to accomplish mutual health-risk assessment goals in cooperation with Delaware’s Department of Health and Social Services (DHSS).
SAMPLING EQUIPMENT

- PerkinElmer Sequential Tube Sampler Model STS 25
- Air Toxics tubes
- Gilian personal air pump
ANALYSIS EQUIPMENT

- PerkinElmer Clarus 500 GC/MS with Automated Thermal Desorber
GAS CHROMATOGRAPH

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CHROMATOGRAM

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MASS SPECTROMETER

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TARGET COMPOUND LIST

- Dichlorodifluoromethane
- Methyl Chloride
- 1,2-dichloro-1,1,2,2-tetrafluoroethane
- Vinyl Chloride
- Methyl Bromide
- Ethyl Chloride
- Trichlorofluoromethane
- 1,1-dichloroethene
- Dichloromethane
- 3-chloropropene
- 1,1,2-trichloro-1,2,2-trifluoroethane
- 1,1-dichloroethane
- Cis-1,2-dichloroethane
- Trichloromethane
- 1,2-dichloroethane
- 1,1,1-trichloroethane
- Benzene
- Carbon Tetrachloride
- 1,2-dichloropropene
- Trichloroethene
- Cis-1,3-dichloropropene
- Trans-1,3-dichloropropene
- 1,1,2-trichloroethane
- Toluene
- 1,2-dibromoethane
- Tetrachloroethene
- Chlorobenzene
- Ethylbenzene
- m,p-xylene
- Styrene
- 1,1,2,2-tetrachloroethane
- o-xylene
- 4-ethyltoluene
- 1,3,5-trimethylbenzene
- 1,2,4-trimethylbenzene
- m-dichlorobenzene
- Benzyl Chloride
- p-dichlorobenzene
- o-dichlorobenzene
- m-dichlorobenzene
- 1,2,4-trichlorobenzene
- Hexachlorobutadiene
- 1,3-butadiene

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DATA COLLECTION

- 4 Season Collection Period
- 6-Day Schedule
- 60 Sampling Dates x 7 Samplers x 12 Samples
- >5,000 characterizations

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DATA ANALYSIS

- Timing
  - 2, 8 and 24 hours

- Meteorological
  - Temperature
  - Wind Speed
  - Wind Direction

- Geographical

- Anthropogenic
  - Traffic Patterns
  - Emission Inventory

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ENVIRONMENTAL OUTCOMES

- Shed light on temporal and spatial variability.
- Need to monitor other communities.
- Better understanding of health risks.
- Public awareness of study and results.
MANY THANKS TO...

- **EPA** - Community-Scale Air Toxics Ambient Monitoring Program
- **MARAMA** - Alice Lutrey