

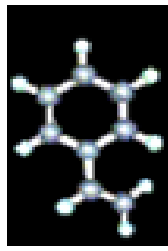
# IMPROVED AIR QUALITY USING ADVANCED AIR MONITORING & POLLUTION PREVENTION (P2) IN LEGAL INSTRUMENTS: A CASE STUDY

Canadian Pollution Prevention Round Table Conference

Ottawa, Ontario April 28-29, 2004

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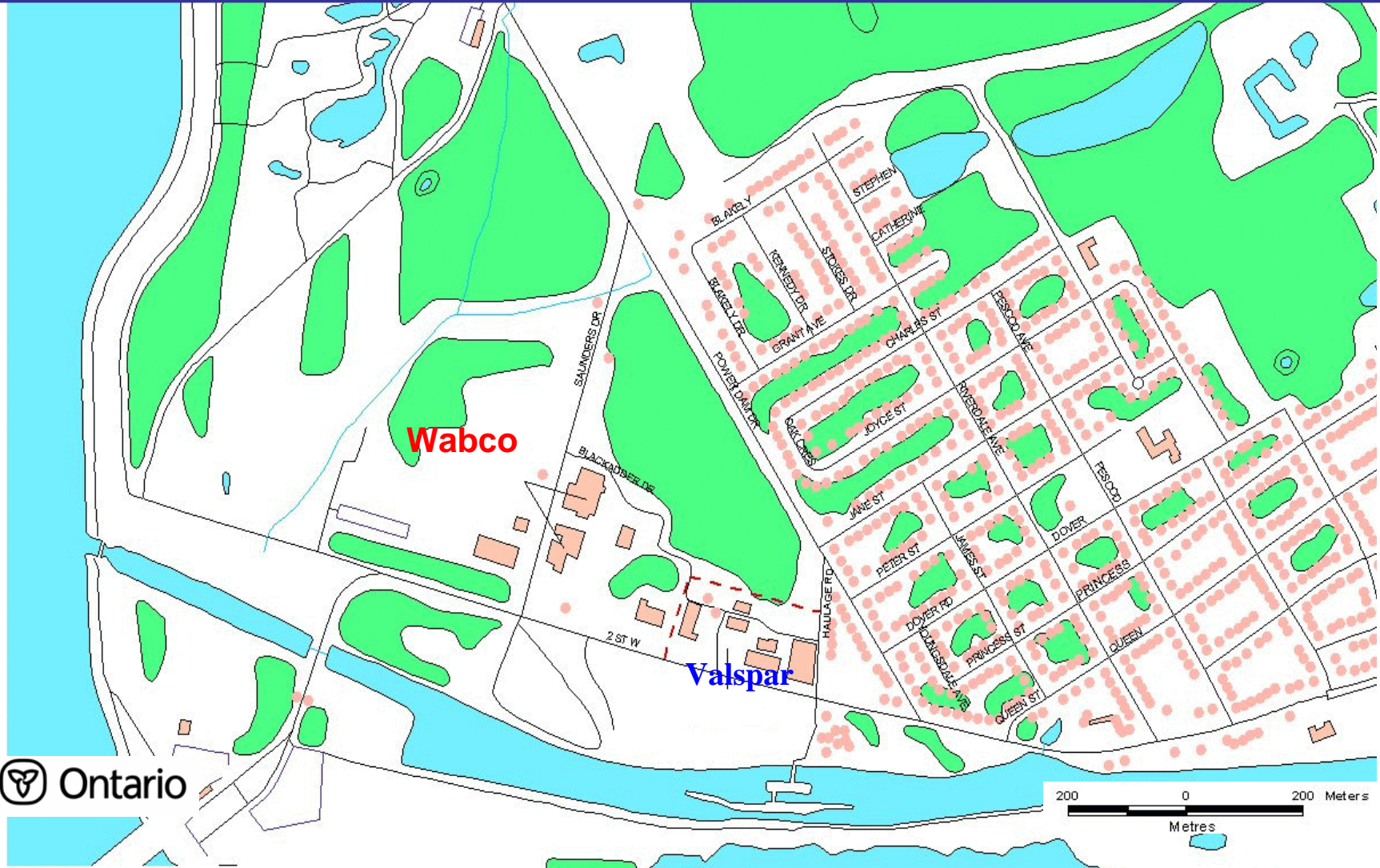
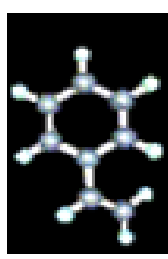
# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.



- 1999 - Cornwall MOE office received dozens of calls: foul odours impacting daily activities and causing headaches - Valspar Inc. suspected
- Valspar located across from residential neighbourhood & recreational area
- Valspar: built post-war; styrene resins and paint coatings manufacturer
- No air permits / Certificates of Approvals (CofAs\*) for major processes

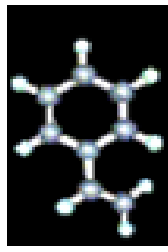
\* CofAs are legal instruments under Ontario environmental statutes

# Mobile Trace Atmospheric Gas Analyzer (TAGA) Survey of Two Possible Styrene Sources in Cornwall, Ontario



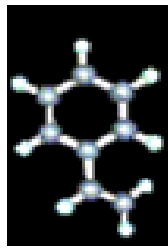
# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.

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- 1999 Ministry orders Valspar to assess emissions & carry-out O.Reg.346 air dispersion modeling
- Valspar ignores order; complaints persist
- Matter referred to Investigations & Enforcement Branch (IEB) and existing order re-issued
- Valspar complies - reports styrene exceedance at local children's soccer park

# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.



- IEB investigation reveals neighboring industrial bathware manufacturer Wabco Standard Trane Inc. also emitting styrene

## Valspar

Acetone	(1.4 tonnes)
Propanol	(1.5 tonnes)
Methyl Ethyl Ketone	(2.0 tonnes)
Methyl IsoButyl Ketone	(0.3 tonnes)
Toluene	(7.0 tonnes)
Xylenes	(0.2 tonnes)
Styrene	(18 tonnes)

## Wabco

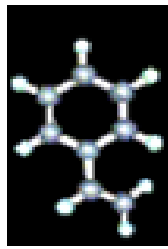
(15 tonnes)

(source: 1999 NPRI data)

- Investigations and Enforcement Branch (IEB) commences investigation into Wabco

# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.

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- MOE issues another order to Valspar to obtain air permits for each major process - resin and coatings
- Foul odors & adverse effects persist - community angry
- Year 2000 – 35 letters of complaint (including Mayor) to the MOE via Environmental Bill of Rights process
- IEB conducts pollution prevention (P2) and control technology research and *shares* dual styrene emitter and P2 research
- Need for ministry's Trace Atmospheric Gas Analyzer (TAGA)
- TAGA, a state of the art, real-time gas analyzer of ambient airborne chemicals

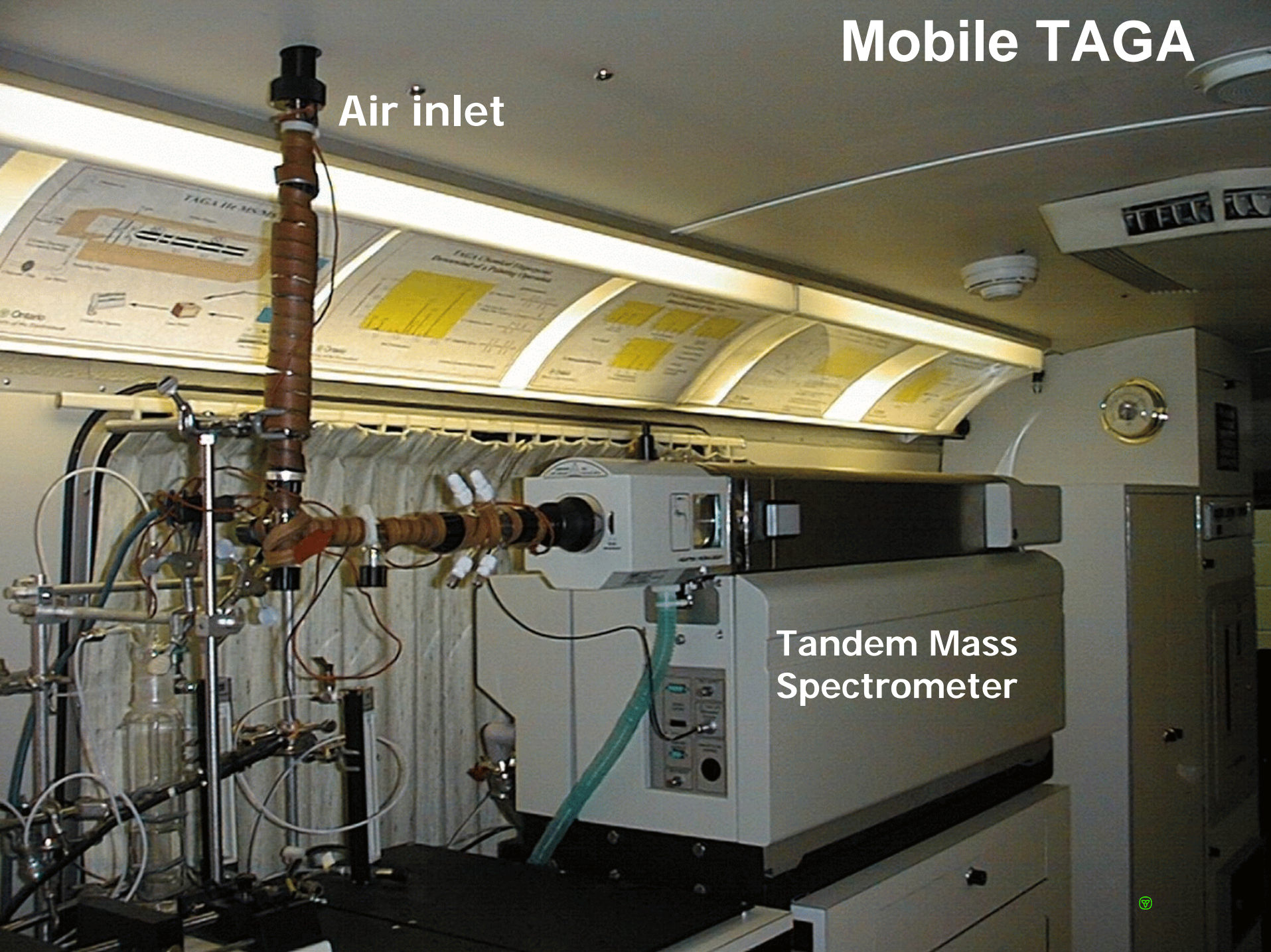
# Mobile Unit TAGA: Trace Atmospheric Gas Analyzer



# Mobile TAGA

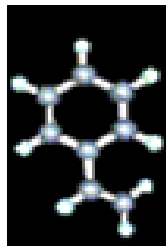
Air inlet

Tandem Mass Spectrometer



# Conclusive Field Surveys

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- Simultaneous odour survey conducted to determine reach of plumes
- Findings of odour surveys:
  - each company had distinct, odourous plume extending into the neighborhood
  - different types of wind patterns may results in plume overlapping

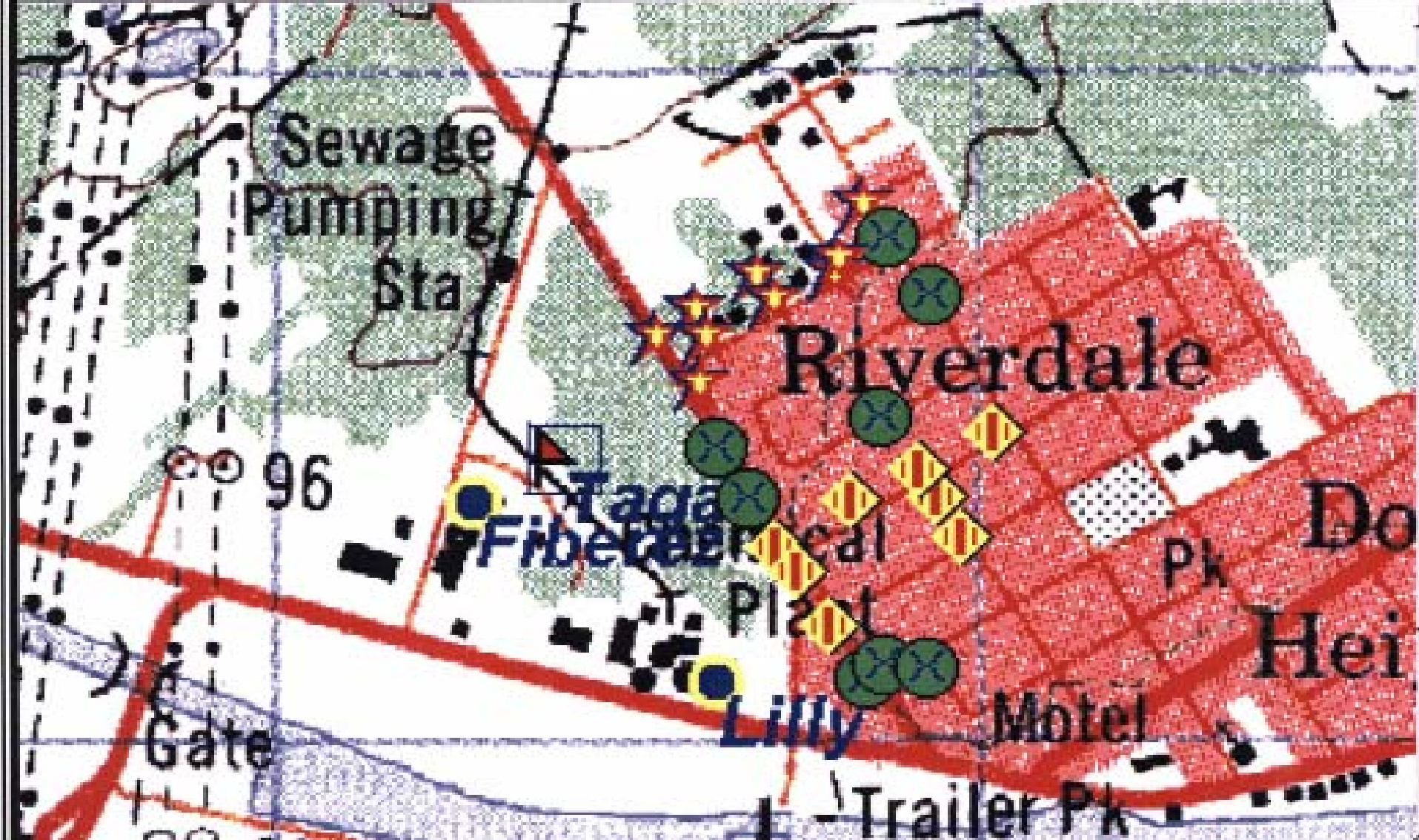


Figure 1: Odour survey results: Fiberez (now WABCO) plume designated by “star”, Lilly Industries (now VALSPAR) by “diamond” & no odor by green dots.

# 2000 TAGA Fingerprinting of Valspar & Wabco

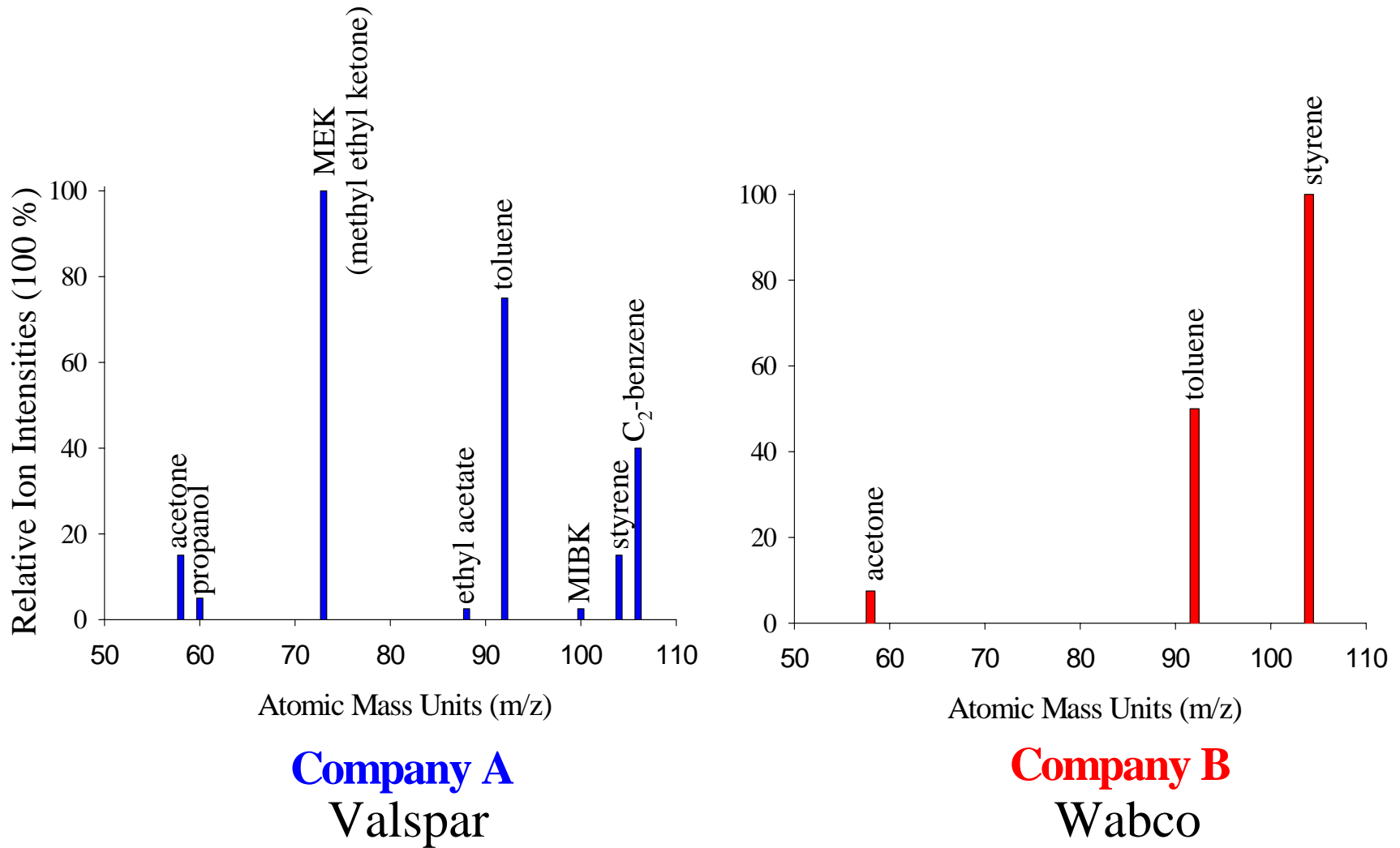
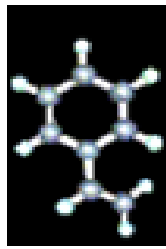


Figure 2: Single Mass Spectrometer Spectrum obtained Downwind of **Company A (Valspar)** and **Company B (Wabco)**.

# Conclusive Field Surveys



## TAGA's findings:

### Valspar Inc.

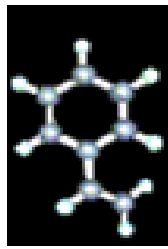
- 7% exceedance of 400  $\mu\text{g}/\text{m}^3$  styrene air limit
- maximum half hour: 610  $\mu\text{g}/\text{m}^3$
- high ambient concentrations of toluene, xylenes and methyl ethyl ketone (MEK)
- total Volatile Organic Compound (VOC) concentration measured in  $\text{mg}/\text{m}^3$  range
- highest VOCs measured by TAGA up to that period

### Wabco

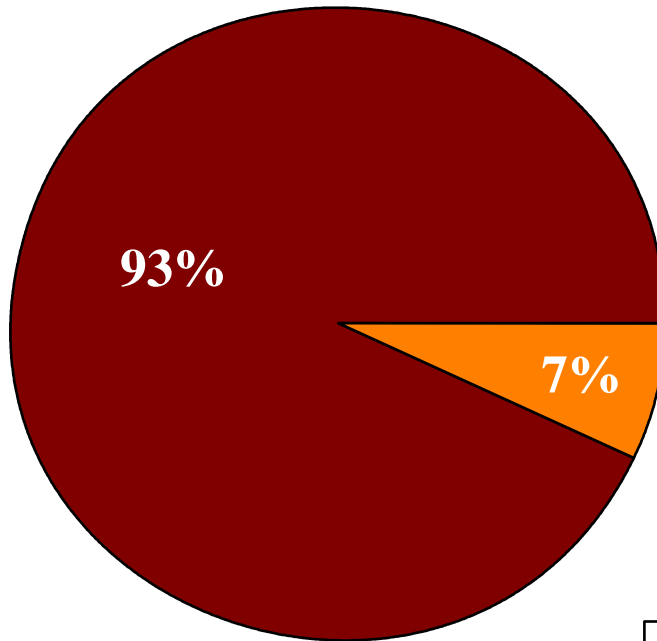
- 68% exceedances of styrene air limit
- maximum half hour: 2300  $\mu\text{g}/\text{m}^3$  - highest recorded by TAGA
- toluene & acetone detected downwind of Wabco at lower levels than Valspar

**\*\* plume overlapping observed at times and not reported in above\*\***

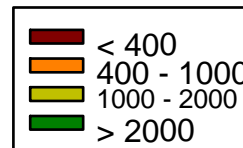
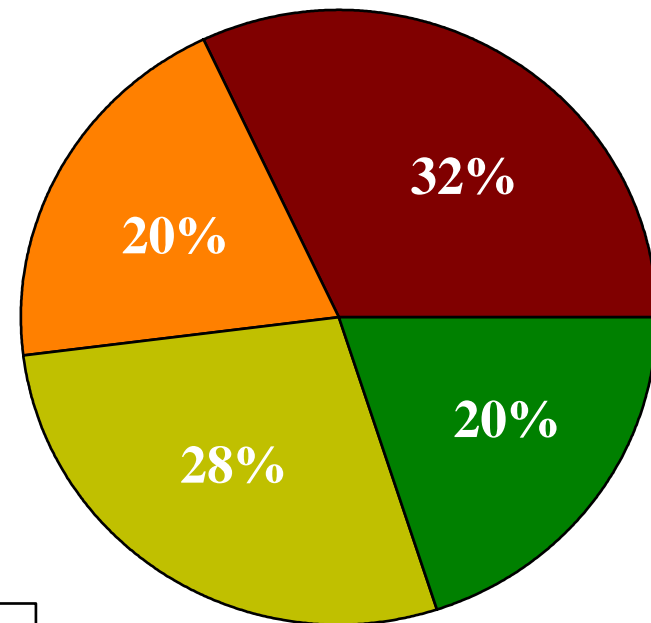
# Half-hour Styrene Levels Measured by TAGA IIe During the 2000 Cornwall Survey (EMRB, OMOE)



**Valspar Inc.**



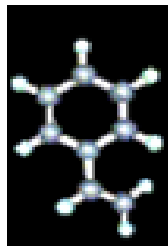
**Wabco**



MOE standard is 400 µg/m<sup>3</sup> for styrene

# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.

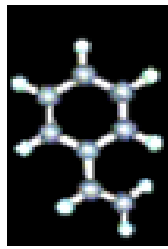
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- MOE treated both facilities as one emitter - air shed approach
- August 2001 TAGA monitoring: Valspar and Wabco exceeded styrene air standard again!
- Valspar's ambient chemical concentrations increase
- Wabco's ambient chemical concentrations decrease slightly

# Regina vs Valspar Inc. and Regina vs Wabco Standard Trane Inc.

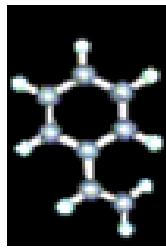
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- Late 2001 MOE issues toughest air permits:
  - styrene emission rate limit (not an air standard);
  - implement Pollution Prevention (P2) actions;
  - implement a Fugitive Solvent Reduction Management Plan; and
  - report P2 actions yearly to MOE
- Wabco: eliminates gel coat line, implements P2 & Solvent Reduction Plan
- Valspar: installs glycol scrubber for styrene emissions; large tall stack for coatings; prepares P2 / Solvent Reduction Plan

# Expert Opinion, Charges & Convictions

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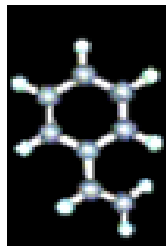


## Toxicologist Expert Opinion on Styrene:

- Affects central nervous system: headaches, depression, fatigue, dizziness;
- Affects eyes, nose, throat;
- Converts to styrene oxide in the body and acts as mutagen;
- Styrene and solvents impact young children and fetuses.

# Expert Opinion, Charges & Convictions

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- September 2002 - Valspar and Wabco each charged with air limit exceedances and causing an adverse effect
- Early 2003 - companies plead guilty under weight of irrefutable evidence and fined
- \$45,000 fine for Wabco\*
- \$30,000 fine for Valspar\*

\* excludes 25% victim surcharge fine

# Valspar Air Quality Data 2000-2003

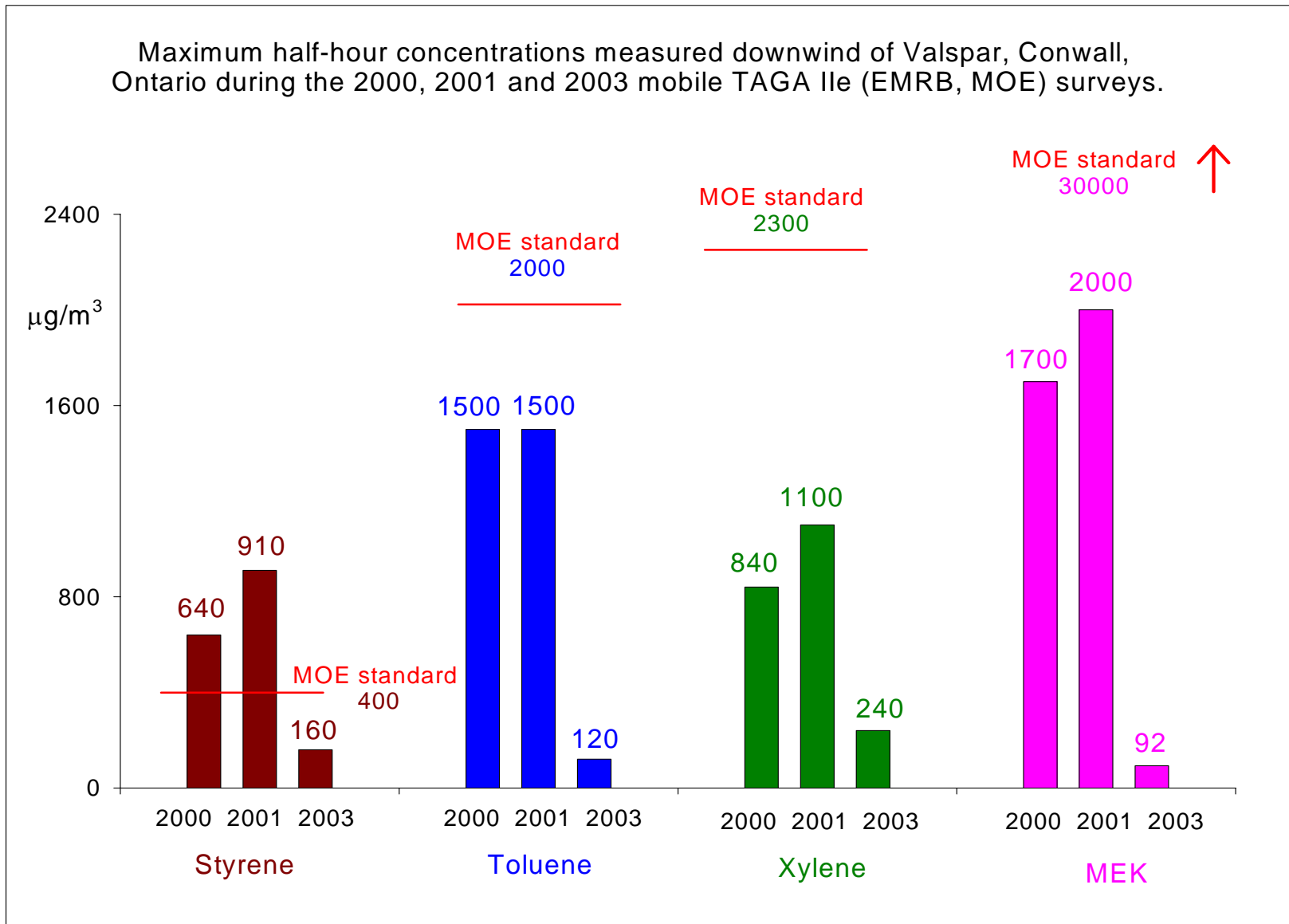
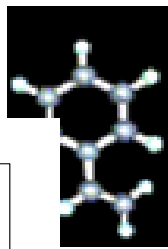


Figure 3: Valspar, Cornwall, Ontario. Mobile TAGA Ile (EMRB, MOE) Surveys.

# WABCO (American Standard) Air Quality Data 2000-2003

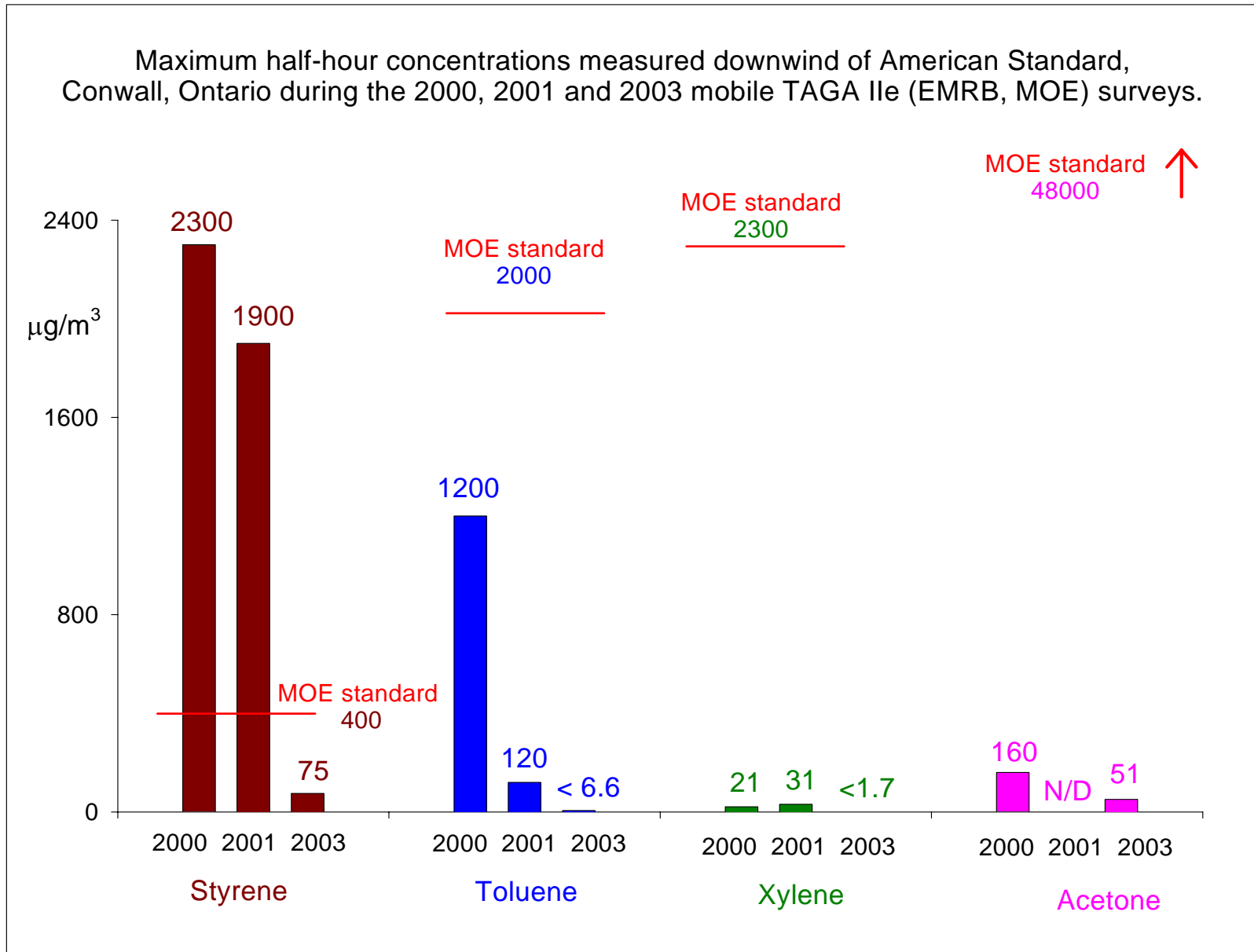
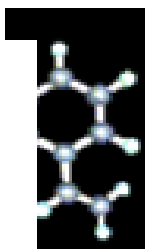
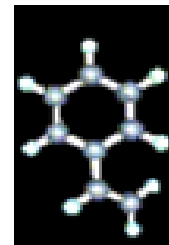


Figure 4: American Standard, Cornwall, Ontario. Mobile TAGA IIe (EMRB, MOE) Surveys.

# Thank You!

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