

Analyses of '03 OP-FTIR monitoring results

Project overview for the CEWG

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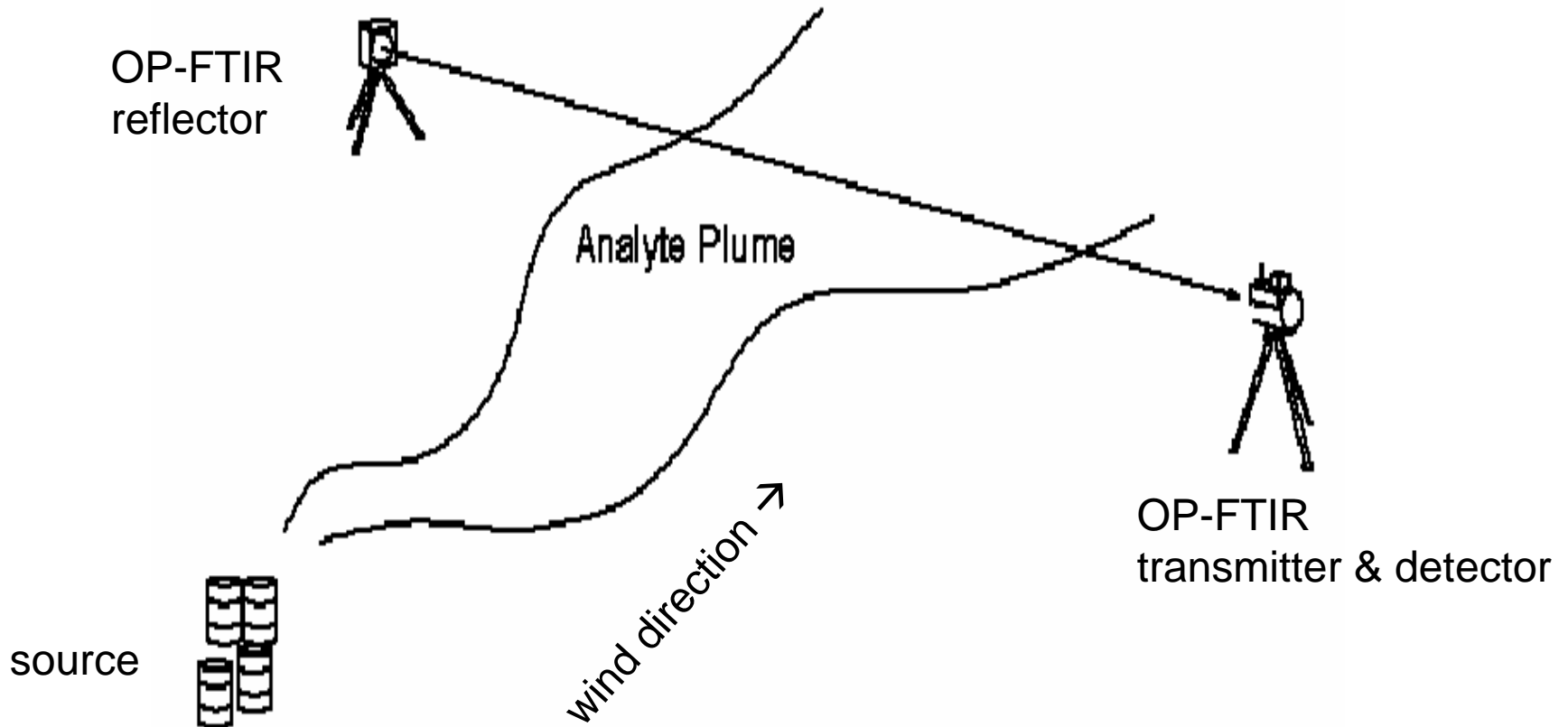
Intel

19-Dec-2007

Analysis by wind direction

- Examining possible sources ('source attribution') of substances measured by OP-FTIR was not within the scope of the '03 air-quality study
 - Various point, area, and mobile sources were potential contributors to what was measured
- Rationale of evaluating results by wind direction: improved understanding of possible source(s) of substances

Analysis by wind direction, cont.



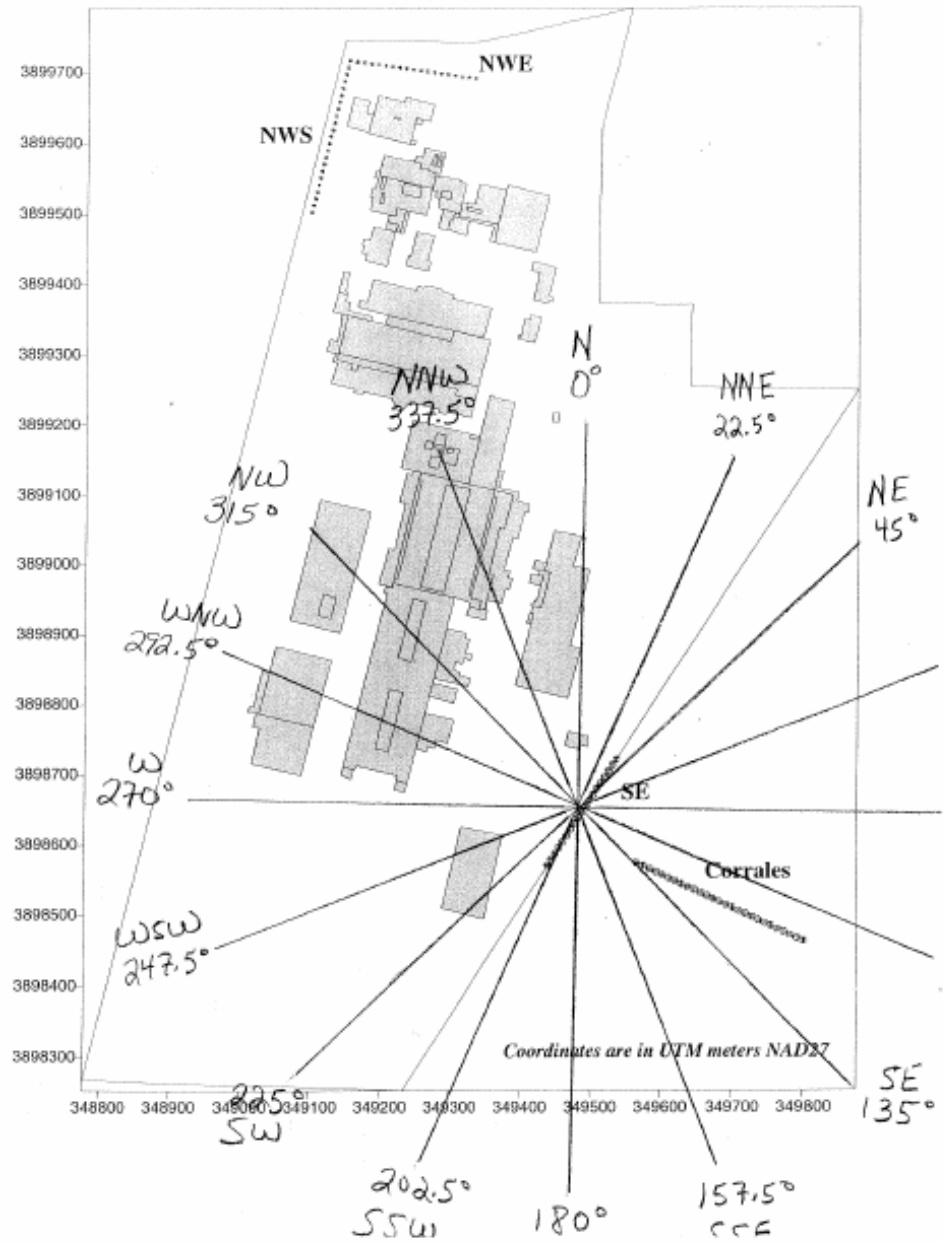
Analysis by wind direction, cont.

- Each OP-FTIR measurement interval associated with a local wind direction
 - 10-m meteorological tower at south end of Intel campus
- Results grouped into ‘downwind’ and ‘upwind’ of manufacturing facility
 - Statistical comparison of groups
 - Are there differences?

Analysis by wind direction, cont.

SE OP-FTIR monitoring
path with compass grid
to illustrate upwind and
downwind directions of
wind flow.

(downwind-of-facility wind
directions are from W to NNE)

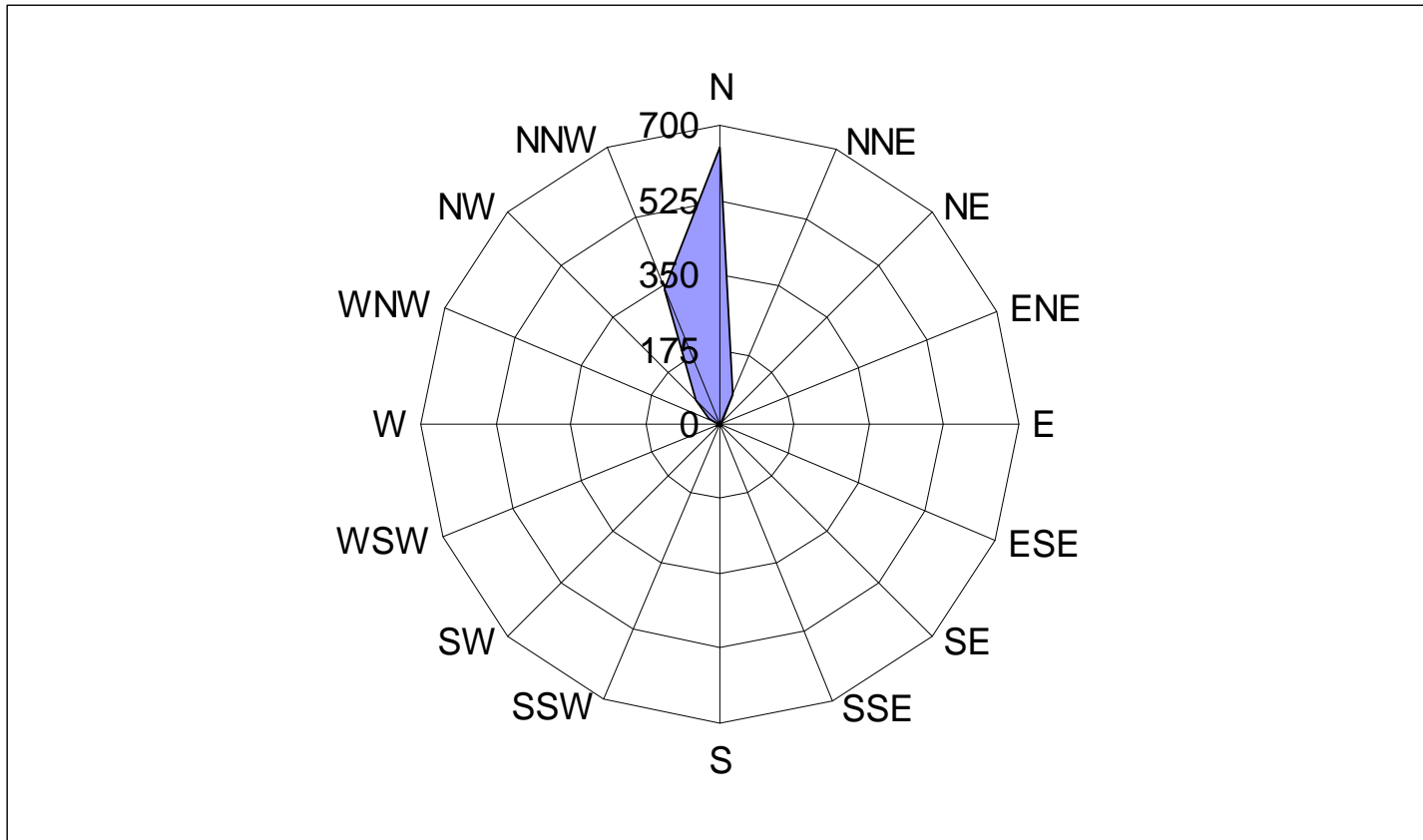


Analysis by wind direction, cont.

- Three low-toxicity substances measured by OP-FTIR probably were unique to Intel operations
 - Previously detected in Intel emission stacks
 - No other known source, locally
 - Almost all OP-FTIR measurements of the three substances under downwind conditions
 - Validated the method of comparing OP-FTIR results – of the other substances – by wind direction relative to the manufacturing facility

Analysis by wind direction, cont.

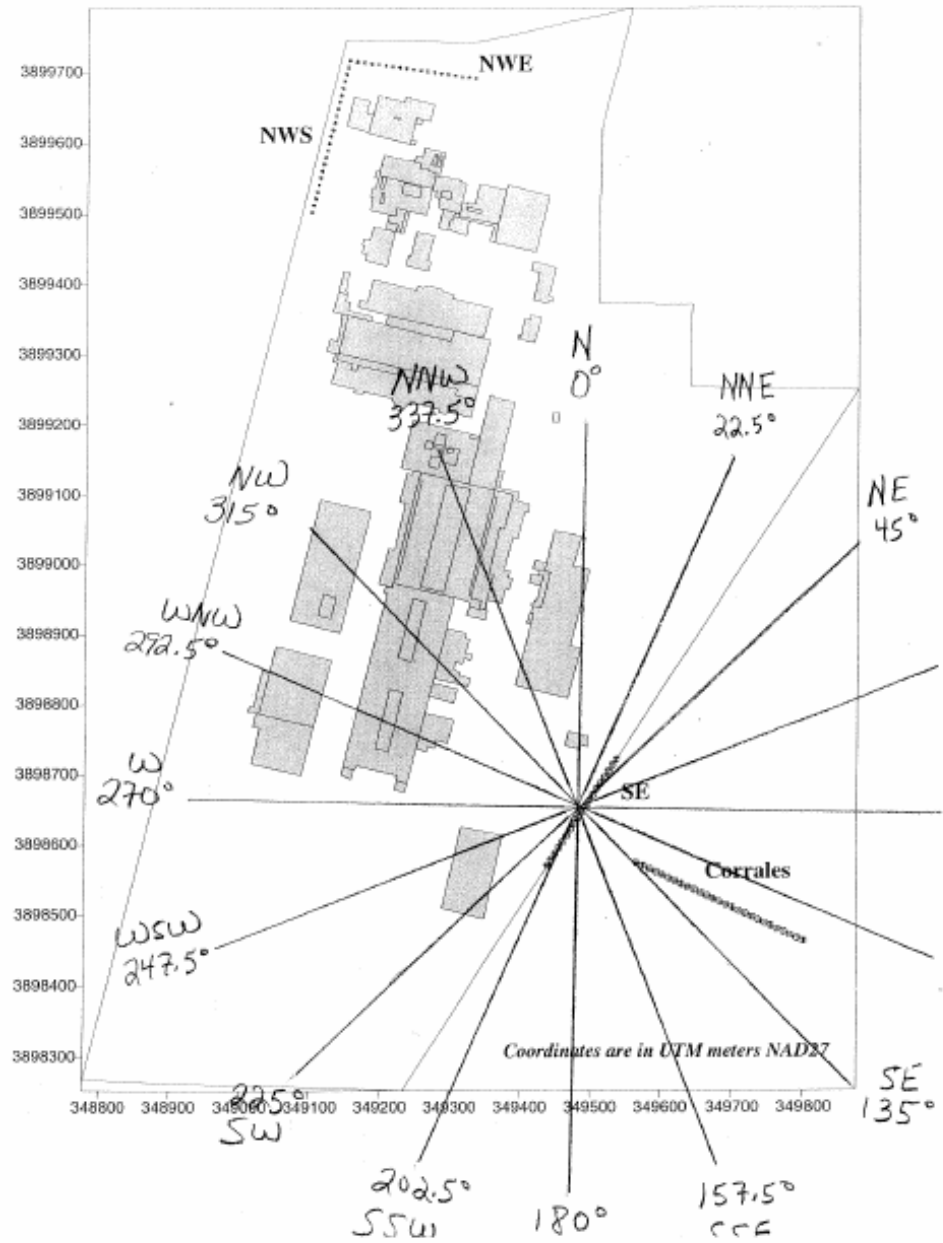
Carbon tetrafluoride detection counts by wind direction
at the SE OP-FTIR monitoring location
(downwind-of-facility wind directions are from W to NNE)



Analysis by wind direction, cont.

SE OP-FTIR monitoring
path with compass grid
to illustrate upwind and
downwind directions of
wind flow.

(downwind-of-facility wind
directions are from W to NNE)



Analysis by time of day

- OP-FTIR results grouped into ‘daytime’ and ‘nighttime’
 - Daytime defined as 06:00 to 20:00 hours
- Rationale for examining and statistically analyzing results by time of day:
 - Nighttime hours typically have a more stable atmosphere
 - Less mixing and less dilution
 - Some substances may be emitted or formed primarily during certain times/portions of the day

Analysis by pairwise correlation

- Examine the extent that substances coexisted
 - Present/detected at the same time
- Rationale for this statistical evaluation:
 - Potential for toxicological interaction among substances depends on presence of a mixture
 - Substances detected concurrently may have the same or similar sources

Excerpt of wind-direction results

- By % of time detected & concentration (ppb):

NW-S location Substance	Percentage (%) of time detected		Mean concentration (ppb) of detectable events	
	Downwind	Upwind	Downwind	Upwind
acetaldehyde	5.4	13	46	32

Excerpt of time-of-day results

- By % of time detected & concentration (ppb):

NW-S location	Percentage (%) of time detected		Mean concentration (ppb) of detectable events	
Substance	Daytime	Nighttime	Daytime	Nighttime
acetaldehyde	8.4	1.3	32	11

Excerpt of pairwise correlation results

- Substances measured at the same time (concurrently)

NW-E monitoring location (11,079 measurements)					
Substance	By substance	Correlation coefficient	Number of times detected concurrently	Number as percentage of maximum possible	Significance probability of correlation
benzene	ammonia	0.69	19	18%	0.001

General aspects of project

- First-ever evaluations or first-ever statistical analyses complement other studies/work
 - Improved understanding and communication of risk
- Data used in project have been in the public domain since '04 (as posted on NMED web site: <http://www.nmenv.state.nm.us/aqb/projects/Corrales/index.html>)
- Generate realistic hypotheses about the sources, behavior, and mixture conditions of the substances measured in the air-quality study

Going Forward

- CEWG to review the report and its methods and results?
- Other?