EPA’s Experience in Operating the Burdens Creek Station

A few things we have learned along the way......
Why is OAQPS Operating a Monitoring Station?

- Evaluation of NCore related monitoring technologies.
  - Precursor gas monitors
  - Meteorological measurements
  - DAS strategies
- Support training opportunities for NCore operators.
- Test-bed for SOP, QAPP, and QA procedural updates.
- Promote value of multi-pollutant stations among data users.
- Provide real world data comparisons with nearby monitoring stations.

Precursor gas training workshop
Check your Calibrator Flows on Regular Basis*

Environics 9100 MFC (ZAir) Calibration 8/21/06

\[ y = 0.998x + 0.114 \]
\[ R^2 = 1.0000 \]

Environs 9100 calibrator certified versus BIOS Dry Cal – 8/21/2006
Gas mass flow controller was ~6% off

*EPA recommends that calibrator flows be certified on a minimum frequency of every 6 months with a target accuracy of +/- 1%.
Anticipate Gas Standard Needs (1 of 2)

QC checks, MDL tests, Zero air challenge

- Need a wide range of cylinder concentrations to complete required and recommended QC checks.
  - Low standard concentrations needed to accommodate decreased instrument ranges.
  - Very low standard concentrations needed for MDL tests.
  - Challenge species (NPN, IPN) for NOy converter tests.

- Initial NIST-traceable standard certifications may be for short time periods (6 months).
  - Will need extra cylinders to maintain QC check capability while recertification process being completed.

- Multi-blend cylinders recommended but they don’t come cheap so budget accordingly.

- Discuss specifications for ultrapure cylinders with your vendor – can they get below LDL’s?
## Anticipate Gas Standard Needs (2 of 2)

### EPA’s Cylinder Inventory for Precursor Gas Monitoring

<table>
<thead>
<tr>
<th>Cylinder#</th>
<th>CO</th>
<th>NO</th>
<th>SO2</th>
<th>NPN</th>
<th>Last Certification</th>
<th>Certification Expires</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>JA02190</td>
<td></td>
<td></td>
<td>0.983</td>
<td>NPN</td>
<td>7/24/2006</td>
<td>1/24/2007</td>
<td>SO2 MDL Tests</td>
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<tr>
<td>JA02187</td>
<td></td>
<td></td>
<td>0.729</td>
<td>NPN</td>
<td>7/24/2006</td>
<td>7/24/2007</td>
<td>NO MDL Tests</td>
</tr>
<tr>
<td>CA06079</td>
<td>10.07</td>
<td>10.26</td>
<td>13.13</td>
<td>NPN</td>
<td>Pending</td>
<td></td>
<td>CO MDL Tests</td>
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<tr>
<td>CA06708</td>
<td>308</td>
<td>10.05</td>
<td>13.10</td>
<td>NPN</td>
<td>9/13/2006</td>
<td>9/13/2008</td>
<td>Daily QC</td>
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<tr>
<td>JA02206</td>
<td></td>
<td></td>
<td>1.095</td>
<td>NPN</td>
<td>7/24/2006</td>
<td>1/24/2007</td>
<td>NOy converter check</td>
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<tr>
<td>JA02195</td>
<td></td>
<td></td>
<td>1.115</td>
<td>IPN</td>
<td>7/24/2006</td>
<td>1/24/2007</td>
<td>NOy converter check</td>
</tr>
</tbody>
</table>
Easy ESC 8816/8832 Serial Port Expansion

- 8816 option SP.
- Expand your available serial ports from 2 to 4.
- Enhances ability to use GSI digital interface.
- Important for monitors that cannot be multi-dropped.
- ESC has to enable ports remotely after hardware installation.
Collocated Trace Level CO Monitors
How do they compare?

- Thermo Electron 48C-TLE and Teledyne-API 300EU
- Identical operating procedures
  - Auto-zeroing every 4 hours.
  - Daily zero, Level 1 span (4500 ppb), and precision check (500 ppb).
  - Periodic multi-point calibrations.
  - Plumbed to same manifold, calibrator, zero air system, and cylinder standard.
- Ambient data very comparable with some tendency for Teledyne-API unit to read higher.
  - Consistent with calibration results.
Collocated Trace Level CO Monitors

TECO Mean = 280.3 ppb    T-API Mean = 312.9

[Graph showing comparison between TECO 48C-TLE and T-API 300 EU over different months with PPB on the y-axis and months on the x-axis.]
Comparison of Trace Level CO Response
(Burden’s Creek Data for 10/11-10/26/2006)
Zero Air Response
(Burden’s Creek Data for 10/11-10/26/2006)
Precision Check Response
(Burden’s Creek Data for 10/11-10/26/2006)
Closing Observations

• Calibrator flows need to be checked on regular basis, even in the most sophisticated “smart” calibrator.
• Review your cylinder inventory and anticipate NCore-related purchases to facilitate dilution to lower concentrations.
• Existing loggers can be upgraded to expand digital signal capabilities.
• Precursor Gas Team will be investigating differences in readings from trace-level CO units.
  – Design?
  – Operation?