EPA Method TO-15A

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Quick Recap of History

- *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 1988, Winberry et al.
- Last updated in 1999
- Performance based
- Guideline methods: Air toxics are not regulated
- No process for updating

Steps to Address Updates

- Formed Toxic Organics (TO) Methods workgroup at EPA to address issues
- Sought support of EPA's National Exposure Research Laboratory (NERL) and Office of Air Quality Planning and Standards (OAQPS) management to allow the update of methods
- Decided to update Method TO-15 first

Steps (cont.)

- Solicited comments and proposed changes from the air toxics community
- Reviewed and decided a course of action on comments received
- Initiated a work assignment with Battelle to incorporate EPA's updates in a draft document

Naming Convention

Continuing the convention started with Methods TO-11A and TO-14A, the new method will be referred to as

Method TO-15A

"**Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)**"

Method TO-15A

- Written as a performance-based method – defines and incorporates updated performance criteria
- Compiles the best practices and lessons learned by users over the past ~20 years
- Addresses and incorporates improvements in canister sampling, preconcentration, and analytical instrumentation technologies
- Recommends specific procedures

Method TO-15A (cont.)

- Presents users with basic canister sampling and analysis information
  - General approach provides technical detail to give users an understanding of the “hows and whys” of the method
- Aligns with National Air Toxics Trends Stations (NATTS) Technical Assistance Document
- Allows and encourages development of future technologies and improvements

“No-Brainer” Updates to Method

- Removing outdated figures and schematics – moving from “home built” systems to a focus on commercially available systems
- Incorporating advances in measurement technology and commercial products (time of flight MS systems, moisture management, silicon-ceramic coatings, etc.)
- Replacing the table of 97 VOCs (subset of 189 hazardous air pollutants listed in the Clean Air Act Amendments of 1990) with a table of the VOCs generally considered quantifiable by TO-15A

“No-Brainers” (cont.)

- Deleting references to other compendium methods so that each individual method stands alone
- Recommending the use of particulate matter filters on canister sampling flow control devices
- Including quick-reference tables for specified performance criteria for key measurements, sampling flow rates, and canister-cleaning parameters
- Expanding quantitation processes to include the most appropriate calibration curve fit such as quadratic curves

“Big Deals”

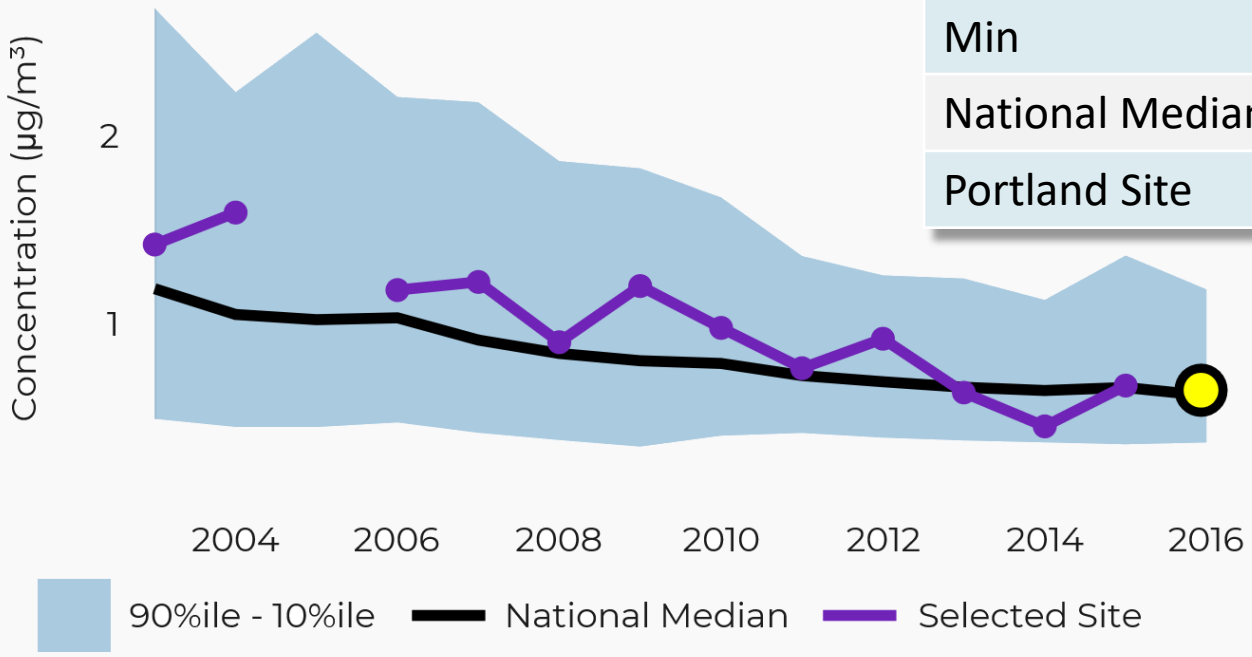
- Recommending canister bias checks in addition to canister cleanliness checks
- Amending the instrument performance acceptance criteria to allow tuning either as recommended by the manufacturer or by using a bromofluorobenzene (BFB) performance check standard
- Recommending use of secondary source calibration standard

“Big Deals” (cont.)

- Reflecting both real-world VOC concentrations and improvements in measurement technologies:
  - Applicable concentration range reduced from 0.5–25 ppbv to 0.01–10 ppbv
  - Method detection limits reduced from ≤0.5 ppbv to ≤0.010 ppbv (≤10 pptv)

EPA's 2018 Annual Report on Air Quality – Our Nation's Air Status and Trends Through 2017

Year 2015 – Portland, Oregon		
Benzene	µg/m³	pptv
Max	4.93	1540
Min	0.06	19
National Median	0.66	207
Portland Site	0.67	210



“Big Deals” (cont.)

- Considering the continuing downward trends in concentrations of VOCs in ambient air, canisters need to be cleaner; therefore
  - Canister cleanliness criterion is reduced from 0.2 ppbv at 30 psig to ≤0.020 ppbv (≤20 pptv) at 0 psig
  - Impact of fill volume on canister cleanliness acceptance criteria is addressed

TO-15A Canister Blank Acceptance Criteria Based on Fill Pressure

PSIA Reading	PSIG Reading	Final Air/N_2 Volume 1 L Canister (approx.)	Final Air/N_2 Volume 2.7 L Canister (approx.)	Final Air/N_2 Volume 6 L Canister (approx.)	Final Air/N_2 Volume 15 L Canister (approx.)	Acceptable Concentration (pptv)
45.0	30.3	3.1	8.3	18.4	45.9	≤ 6.5
40.0	25.3	2.7	7.3	16.3	40.8	≤ 7.4
35.0	20.3	2.4	6.4	14.3	35.7	≤ 8.4
30.0	15.3	2.0	5.5	12.2	30.6	≤ 9.8
25.0	10.3	1.7	4.6	10.2	25.5	≤ 11.8
20.0	5.3	1.4	3.7	8.2	20.4	≤ 14.7
14.7	0	1.0	2.7	6.0	15.0	≤ 20.0
13.0	-1.7	0.9	2.4	5.2	13.3	≤ 23.0

Method TO-15A Status and Next Steps

- Draft document is currently undergoing review and revision by EPA workgroup
- Anticipate submitting for external peer review shortly
- Will be revised as necessary based on external peer review comments
- Will be released as a final document on the Ambient Monitoring Technical Information Center (AMTIC) website
- Notification of the final document release will be by email blast

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