Air Toxics Ambient Monitoring

National Air Toxics Trends Station (NATTS) Network

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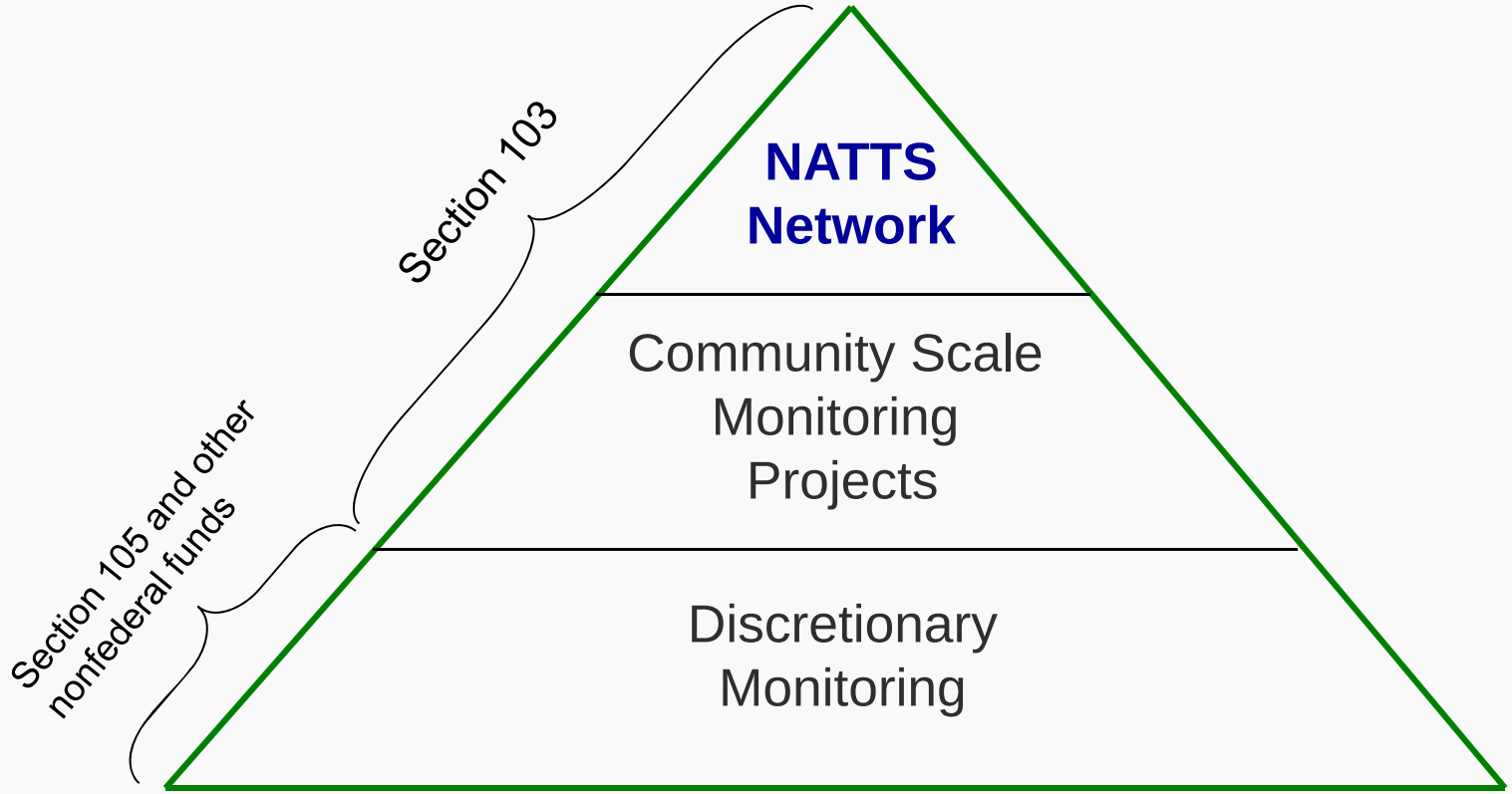
Agenda

- ✓ Program Overview
- ✓ NATTS
  - o Overview
  - o Data Reporting Assessment
  - o Network Assessment
- ✓ Conclusion

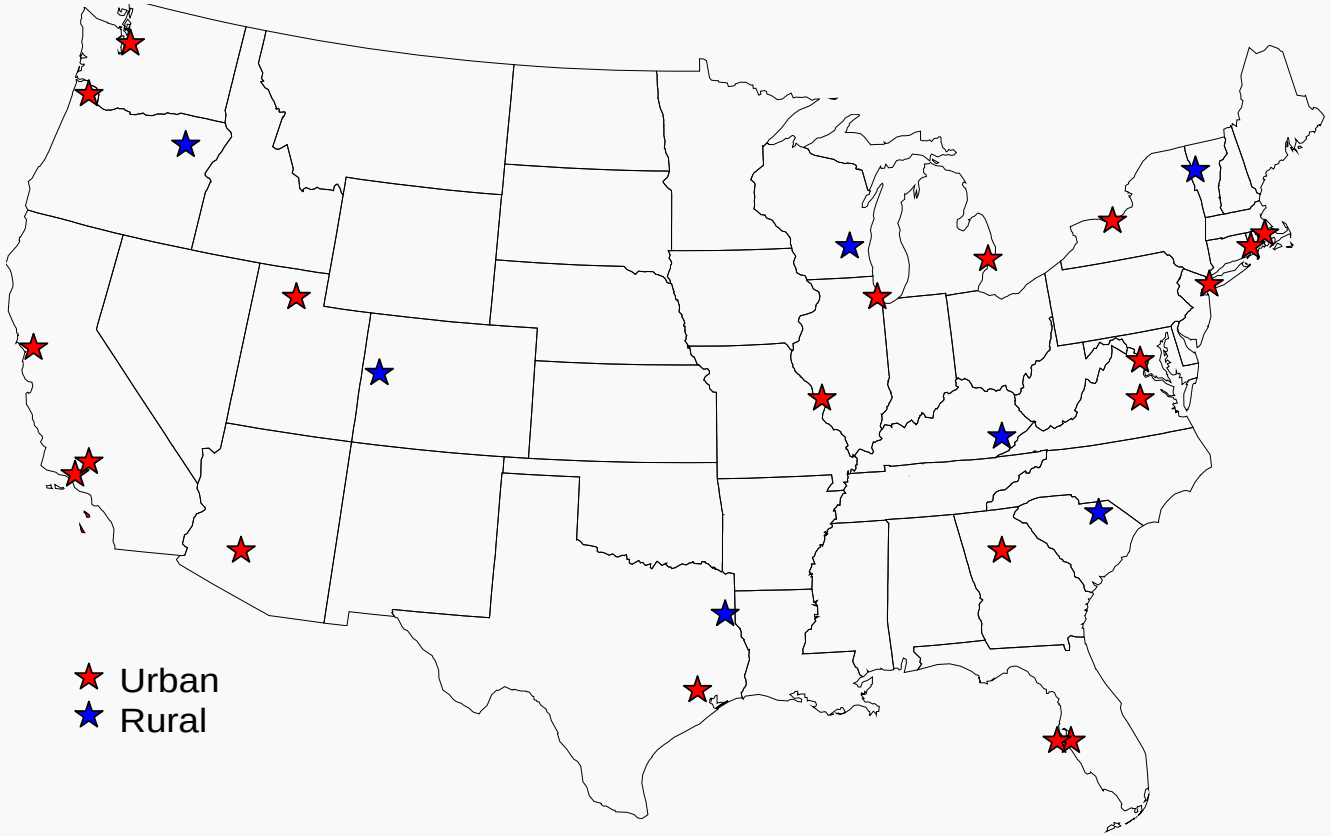
National Air Toxics Ambient Monitoring Program



NATTS Objectives / Data Uses

- ✓ Provide quality assured, standardized ambient data
  - o Identify and assess trends / program progress
  - o Ground truth air quality and human exposure models
  - o Direct input into source-receptor models
  - o Assess exposure and risk

NATTS Network



Minimum Required NATTS Analytes

VOCs
Acrolein
Benzene
Chloroform
1,3-butadiene
Vinyl Chloride
Perchloroethylene
Carbon Tetrachloride
Trichloroethylene
1,2-dichloropropane
Dichloromethane

Carbonyls
Formaldehyde
Acetaldehyde

PAHs
Benzo(a)pyrene
Naphthalene

PM10 Metals
Nickel compounds
Arsenic compounds
Cadmium compounds
Manganese compounds
Beryllium compounds
Lead compounds

TSP Hexavalent Chromium

Other Key Requirements

- ✓ Sampling
  - o 1 in 6 day frequency
  - o 10% field blanks
- ✓ Analysis
  - o Specific methods and target MDLs
  - o 10% replicate analyses
- ✓ Reporting
  - o Data to AQS within 120 days
  - o Data below MDL

Data Reporting Assessment: What We Did

- ✓ In anticipation of network assessment, OAQPS conducted data "pre-screen" (Data Reporting Assessment)
  - o Data retrieval
    - Nineteen required analytes
    - All NATTS (2003 – 2009)
  - o Assessed
    - Requisite data present
    - MDLs
    - Data completeness
    - Data censoring, flagging, etc.

Data Reporting Assessment: What We Found

- ✓ Most sites monitored / reported for all requisite HAPs
- ✓ Data completeness – generally good
- ✓ Data censoring – not prevalent
- ✓ Data flagging – spotty / inconsistent
- ✓ MDLs
  - o Not everyone reports them
  - o Good news: significant improvement with time

NATTS MDL Ratios (Reported vs. Target): Two Sites, 2003 - 2009

Site A

Year	1,3-Butadiene	Acrolein	Benzene	Carbon tetrachloride	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic PM10	Beryllium PM10	Cadmium PM10	Manganese PM10	Nickel PM10
2003	11.1		6.76	47	4.89	20	5.38	11.6			10.9	1.2	0.9	0.11	1.19
2004	8.49	10.8	5.2	36.7	3.82	15.4	4.15	8.98	2.39	1.1	4.28	0.44	0.3	0.04	0.41
2005	1.37	10.3	1.06	9.08	0.87	2.46	0.75	1.54	2.27	1.05	1.34	0.1	0.04	0.02	0.07
2006	0.72	10.2	0.87	3.61	0.44	1.23	0.44	0.65	2.26	1.04	1.42	0.1	0.04	0.02	0.07
2007	0.55	0.62	0.78	2.47	0.33	1.05	0.41	0.6	2.21	1.02	1.44	0.1	0.04	0.02	0.07
2008	0.5	0.55	0.68	1.13	0.18	0.78	0.3	0.49	2.21	1.02	1.52	0.1	0.04	0.02	0.07
2009	0.7	0.56	0.63	2.39	0.34	1.09	0.47	0.6	2.19	1.01	1.12	0.04	0.02	0.01	0.03

Site B

Year	1,3-Butadiene	Acrolein	Benzene	Carbon tetrachloride	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic PM10	Beryllium PM10	Cadmium PM10	Manganese PM10	Nickel PM10
2003	3.44		3.06	15.8	1.36	6.06	1.47	3.13	0.06	0.03	0.03	0.06	0.04	0.03	0.13
2004	1.12		1.08	9.32	0.45	2.72	0.7	0.89	0.08	0.03	0.01	0.09	0.01	0.04	0.13
2005	1.33	0.74	0.97	5.75	0.48	1.73	0.57	1.24	0.07	0.03	0.33	0.26	0.14	0.05	0.11
2006	0.55	2.37	0.28	1.68	0.17	1.02	0.22	0.52	0.08	0.02	0.61	0.34	0.25	0.06	0.09
2007	0.46	0.61	0.61	1.59	0.19	0.53	0.2	0.59	0.02	0.01	0.65	0.38	0.26	0.06	0.09
2008	0.13	0.47	0.26	0.77	0.11	0.32	0.04	0.16	0.05	0.02	0.77	0.59	0.3	0.08	0.08
2009	0.09	0.36	0.16	0.58	0.06	0.2	0.02	0.1	0.04	0.02	0.77	0.58	0.3	0.08	0.08

Method Detection Limits

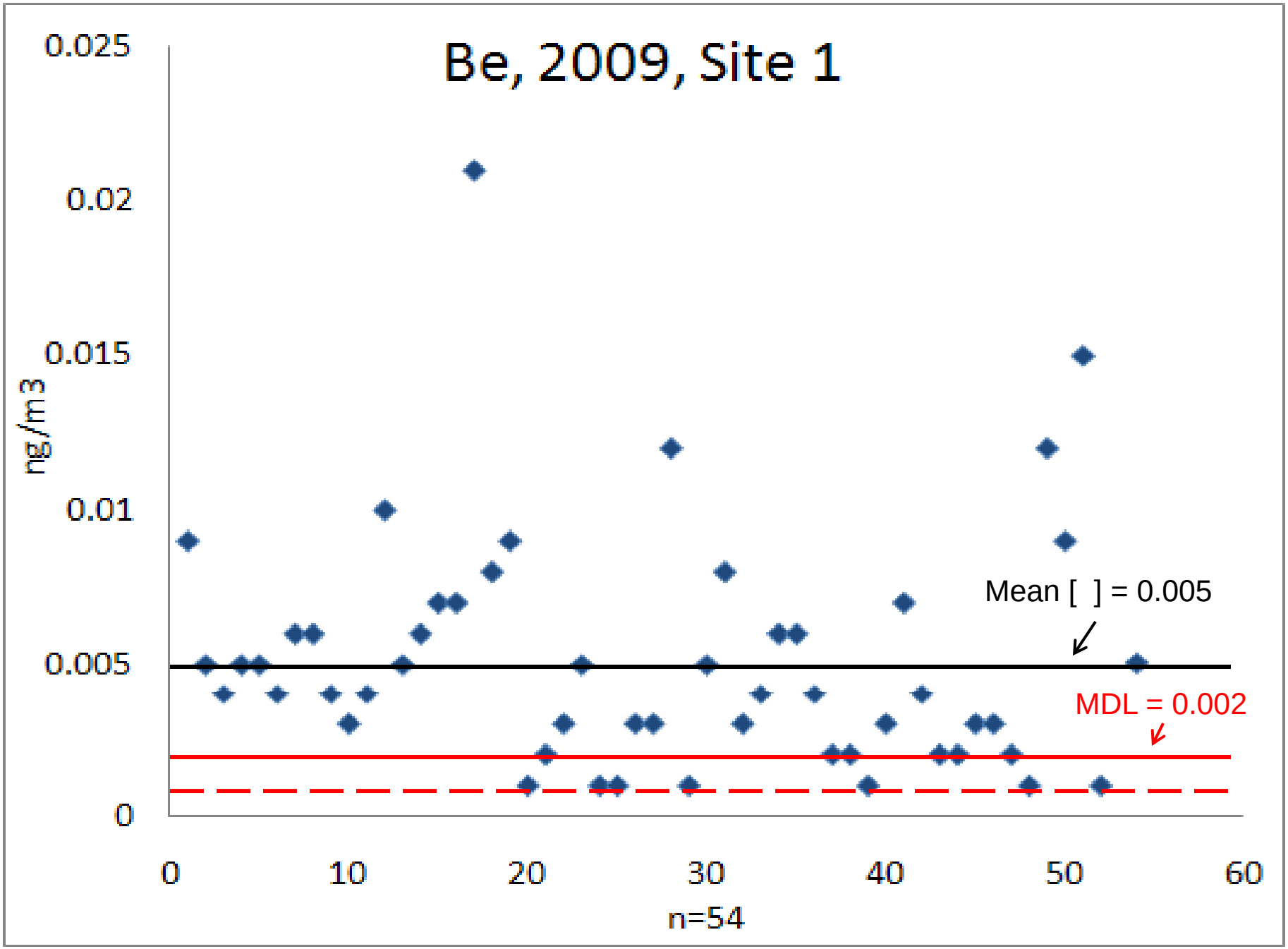
"… the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero…"

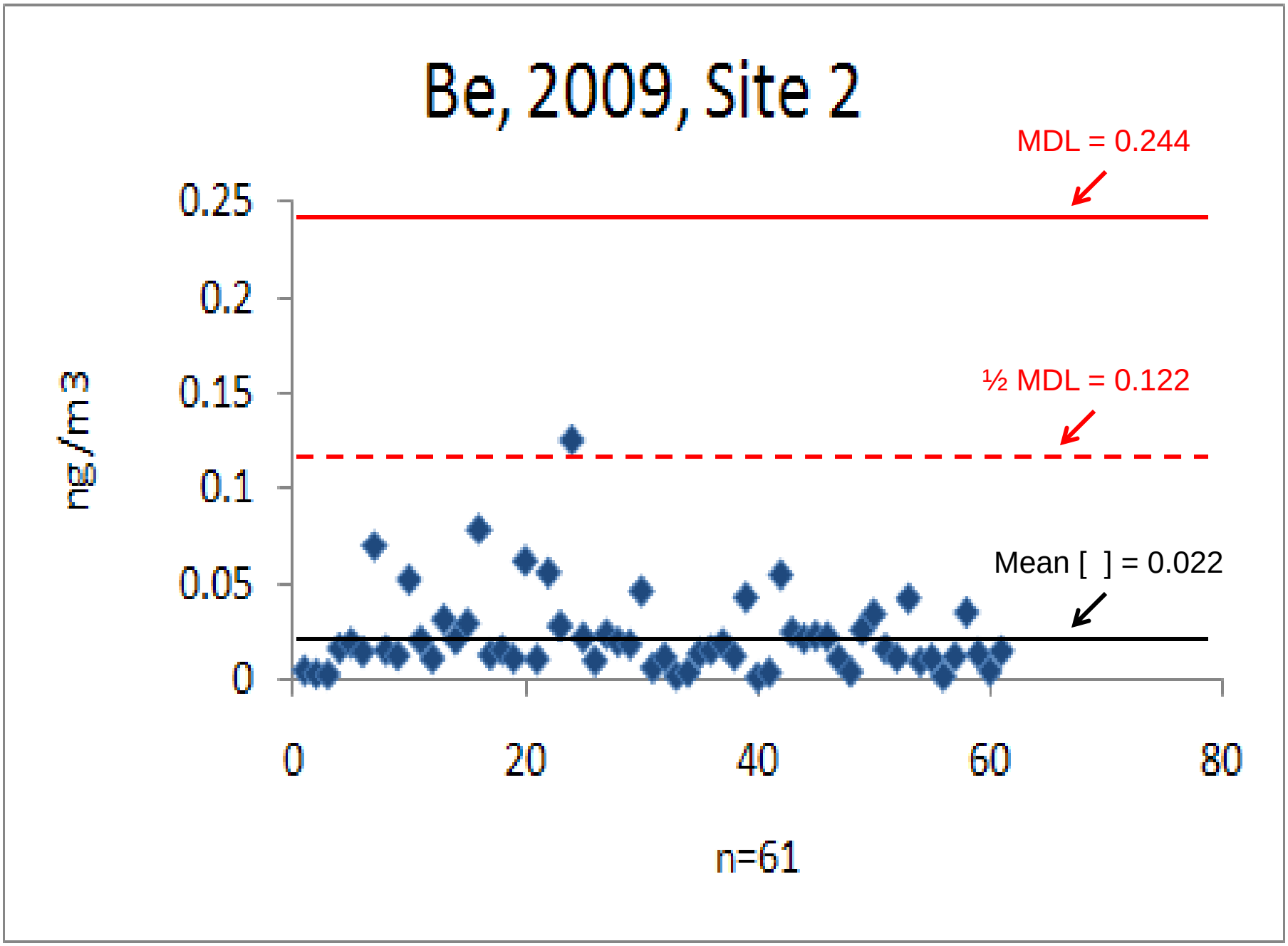
40 CFR Appendix B to part 136

Method Detection Limit (MDL) Development and Standardization

Julie Swift, ERG, 2009 National Ambient Air Monitoring Conference

http://www.epa.gov/ttnamti1/files/2009conference/swift.pdf


Be, 2009, Site 1
0.025
0.02
0.015
0.01
0.005
0
ng/m3
0
10
20
30
40
50
60
n=54
Mean [ ] = 0.005
MDL = 0.002


Be, 2009, Site 2
MDL = 0.244
½ MDL = 0.122
Mean [ ] = 0.022
ng/m3
0.25
0.2
0.15
0.1
0.05
0
0
20
40
60
80
n=61

Network Assessment

"… structured evaluation of a monitoring network to determine if the goals and objectives for that network are being met…"

National Ambient Air Monitoring Strategy, Section 5, Pg 5-1

"… the NATTS must be evaluated, and modified as needed, on 6-year intervals to assure continued relevancy…"

National Ambient Air Monitoring Strategy - Air Toxics Component, Section 1, Pg 6

Network Assessment - Process

- ✓ Assessment will include data through 2010
- ✓ All 2010 data in AQS by 3/31
- ✓ OAQPS data retrieval on 4/1
- ✓ Data verification by 5/2
- ✓ OAQPS provides data to contractor
  - o Network assessment begins
- ✓ Assessment structured as series of discreet steps
  - o Interim deliverables

Network Assessment – Focus Areas

- ✓ Degree to which network has met stated goals and objectives?
- ✓ Continued relevance of network goals and objectives?
  - o Optimal for addressing current and projected program priorities / data needs?
  - o If not, revised goals and objectives?
- ✓ Adequacy of number and location of sites?
  - o Appropriate geographic distribution and urban / rural mix?
  - o Appropriately sited for urban- or rural-scale representativeness?

Conclusions

- ✓ Greatest challenge: achieving consistency
  - o Data comparability directly related to utility
- ✓ NATTS making progress
  - o Kudos to the NATTS state and local agencies
- ✓ Still have work to do
  - o Data reporting and network assessments will further the progress