



# **Clean Water Act Methods Update**

## **Overview of Proposed CWA Method Update Rule and Other Method Activities**

NEMC July 2015 • Adrian Hanley, U.S. EPA



# CWA Analytical Methods Program

- Many industries and municipalities permitted under CWA NPDES program to discharge pollutants
- They use analytical methods to analyze the chemical, physical and biological components of wastewater and other environmental samples
- CWA requires EPA, through rulemaking, to establish test procedures to measure pollutants in CWA programs
- EPA promulgates such procedures in 40 CFR Part 136



# Method Update Rule (MUR)



- Clean Water Act Methods Update Rule for the Analysis of Effluent
  - Update to 40 CFR Part 136
  - Proposed February 19, 2015
  - Comment period closed May 20, 2015
  - 175 sets of comments
  - Approximately 400 pages of comments



# 2015 MUR Proposal Summary



- Proposed ~100 method revisions from ASTM International and Standard Methods
- 6 Alternate Test Procedures (ATPs)
- 1 USGS Method (based off of an ATP)
- Revisions to Methods 608, 624, and 625
- Method Detection Limit (MDL) Revision



# Finalization Process



- Rule proposed and comments received
- Response to comments drafted
  - Modifications occur
- Response to comments reviewed and approved
  - Multi-office EPA workgroup, Office of General Counsel, senior management, Office of Policy, the Administrator
  - Further modifications occur
- Rule finalized

Important Note: Items in the proposed rule are generally accepted, rejected, or modified. New items outside of the scope of the proposed rule are generally not added to the final rule.

# Revised ASTM and SM Methods



- Proposed ASTM and SM Revisions
  - Editorial changes
  - Minor QC changes
  - Technical clarification
- Proposal Comments Summary (not all inclusive)
  - Many are highly specific and not repeated by other commenters
  - Question which method version should be in 40 CFR Part 136
  - Typographical and reference corrections



# Proposed ATPs



- **5 General use ATPs**

- The Nitrate Elimination Company Inc. (NECi) Method N07-0003, “Nitrate Reductase Nitrate-Nitrogen Analysis”
- Timberline Instruments, LLC Method Ammonia-001, “Determination of Inorganic Ammonia by Continuous Flow Gas Diffusion and Conductivity Cell Analysis”
- IDEXX Laboratories, Inc., Colilert®-18, “Coliform/*E. coli* Enzyme Substrate Test for Fecal Coliforms in Wastewater”
- Hach Company Method 10242, “Simplified Spectrophotometric Measurement of Total Kjeldahl Nitrogen in Water and Wastewater”
- Hach Company Method 10206, “Spectrophotometric Measurement of Nitrate in Water and Wastewater”

- **1 industry specific ATP**

- National Council for Air and Stream Improvement, Inc. (NCASI) Method TNTP-W10900, “Total (Kjeldahl) Nitrogen (TKN) and Total Phosphorus in Pulp and Paper Biologically Treated Effluent by Alkaline Persulfate Digestion”

# Methods 608.3, 624.1, and 625.1



## Revision – limited changes

- Updated technology
  - Capillary columns, updated references
- Method Flexibility
  - Allows more changes with internal documentation (no ATP required)
- Method Harmonization
  - Altered some QA/QC frequencies and standards to match OGWDW and SW-846 methods





# MDL Revision



- Originally Submitted by TNI
- MDL Calculation of spiked data remains unchanged.
- Addresses background contamination, and multiple instrument MDLs

Diverse Comments!





# **Other Clean Water Act Method Activities**

# CWA Microbiology Method Activities



- Method 1693 for *Cryptosporidium* and *Giardia* in disinfected wastewater, see <http://water.epa.gov/scitech/methods/cwa/bioindicators/>
- Currently validating a coliphage method in wastewater and recreational water during 2015



# CWA Chemistry Method Activities



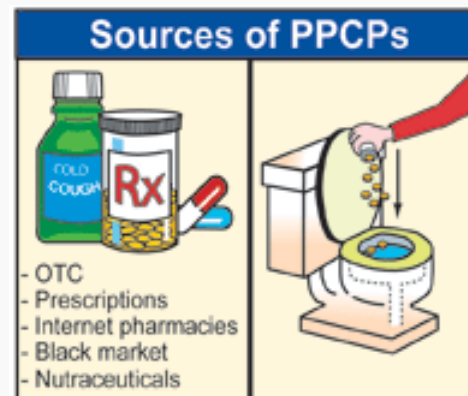
- Method Prioritization
- PCB Congener Method
- ATP Reviews



# CWA Method Prioritization



- Task still in development
- Potential method projects identified repeatedly through both outreach and research:
  - Continuous Monitoring
  - Total Nitrogen
  - Update/revise Method 1694 for PPCPs
  - Continued QPCR method development



# Method Prioritization Cont.



## Other Topics of Interest

- Perfluorinated Chemicals (PFCs, including perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS))
- Phthalates (Diisobutyl phthalate, Di-n-pentyl phthalate, Diisononyl phthalate, Diisodecyl phthalate)
- Expanded Pesticide Analytes (EPA Method 1699)
- Hexabromocyclo-dodecane (HBCD)
- Steroids and hormones (EPA Method 1698)
- Toxic Release Inventory Chemicals





# PCBs: Background



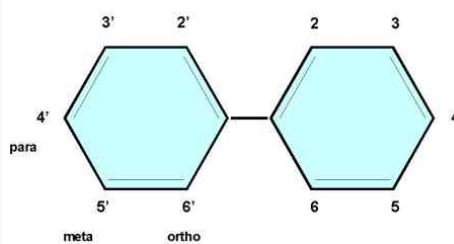
- Historically, many industrial applications of Aroclors, most commonly in electrical capacitors and transformers
- Domestic manufacture 1927-1977
- Very stable in the environment
- Nonflammable and insulating
- An oily liquid or waxy solid
- Insoluble in water
- Bioaccumulates
- PCB congeners are produced as unintentional by-products of various combustion processes involving chlorine-containing materials



# Why PCB Congeners?



- CERCLA/CWA Collaboration at Superfund Sediment Sites National Workgroup
- Major Concern: Sediment recontamination
  - PCB Source Control
  - High volume low concentration effluents
  - Not detected using current regulated wastewater method
  - Accumulation of contamination in sediment



Structure of Polychlorinated Biphenyl (PCB) Molecule

# Still a Relevant Contaminant



## Fish

- Approximately 42% of lake acreage and 36% of river miles are under a fish consumption advisory, and 23% of these advisories are for PCBs

## Impaired Water

- PCBs rank 6<sup>th</sup> among all causes of water quality impairments, representing 8% of all 303(d) impaired listings (over 5,000 waters)
  - Fewer than 1% of completed TMDLs are for PCBs



# PCBs are Everywhere

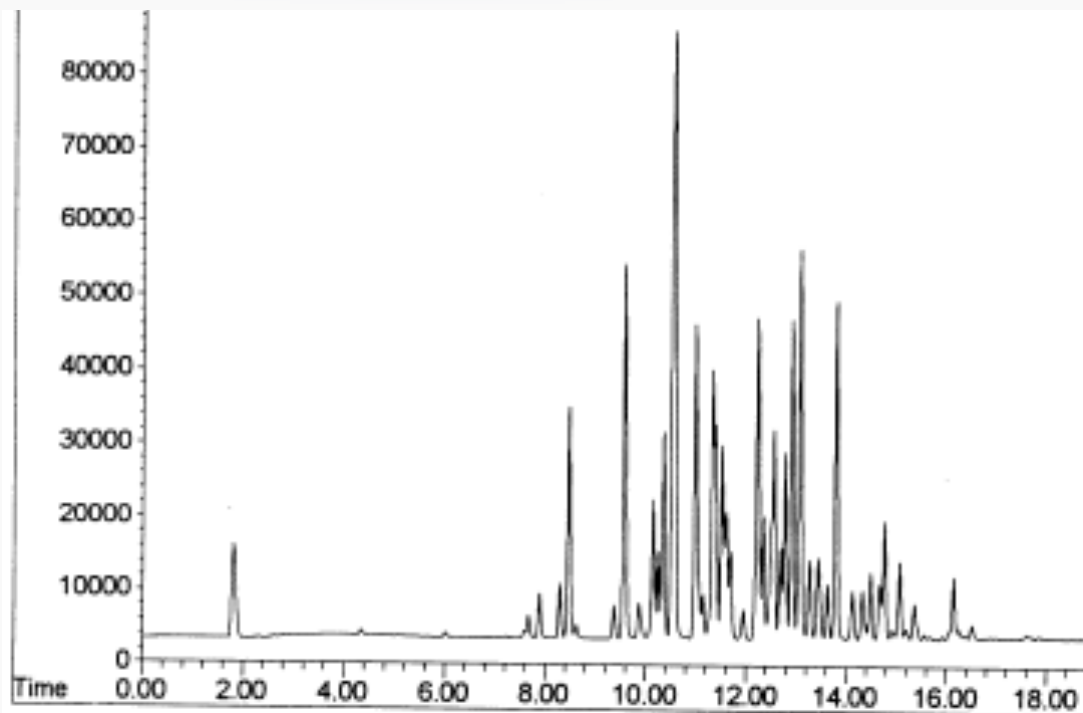


## **EPA Recommended Water Quality Standard for Total PCBs: 64 pg/L**

- Arctic Ocean, 8 meters below the ice cap<sup>1</sup>: 0.54 to 1.96 pg/L (only 15 congeners measured)
- Mediterranean lagoon with no industrial history<sup>2</sup>: 138 to 708 pg/L (only 7 congeners measured)
- Houston, TX Urban Waterways<sup>3</sup>: 460 to 9,400 pg/L (all 209 Congeners measured)
- Delaware River<sup>4</sup>: 1,000 to 7,000 pg/L (all 209 Congeners measured)
- Delaware River Watershed air deposition<sup>5</sup>: from 0.26 to 76 ng/m<sup>2</sup> per day
  - The lowest reading was on a dry day at Lum's Pond State Park, DE
  - The highest reading was on a wet day in Camden, NJ

*References are available upon request and in the notes section of this slide*

# EPA Method 608



Aroclor 1242 Standard

- Only measures the 7 common Aroclor mixtures, not congeners
- Published MDL: 65,000 pg/L
- Approximately \$80 per sample
- Currently the only promulgated method for PCBs at 40 CFR 136; the only NPDES regulations are for Aroclors.

# Weathering of Aroclors

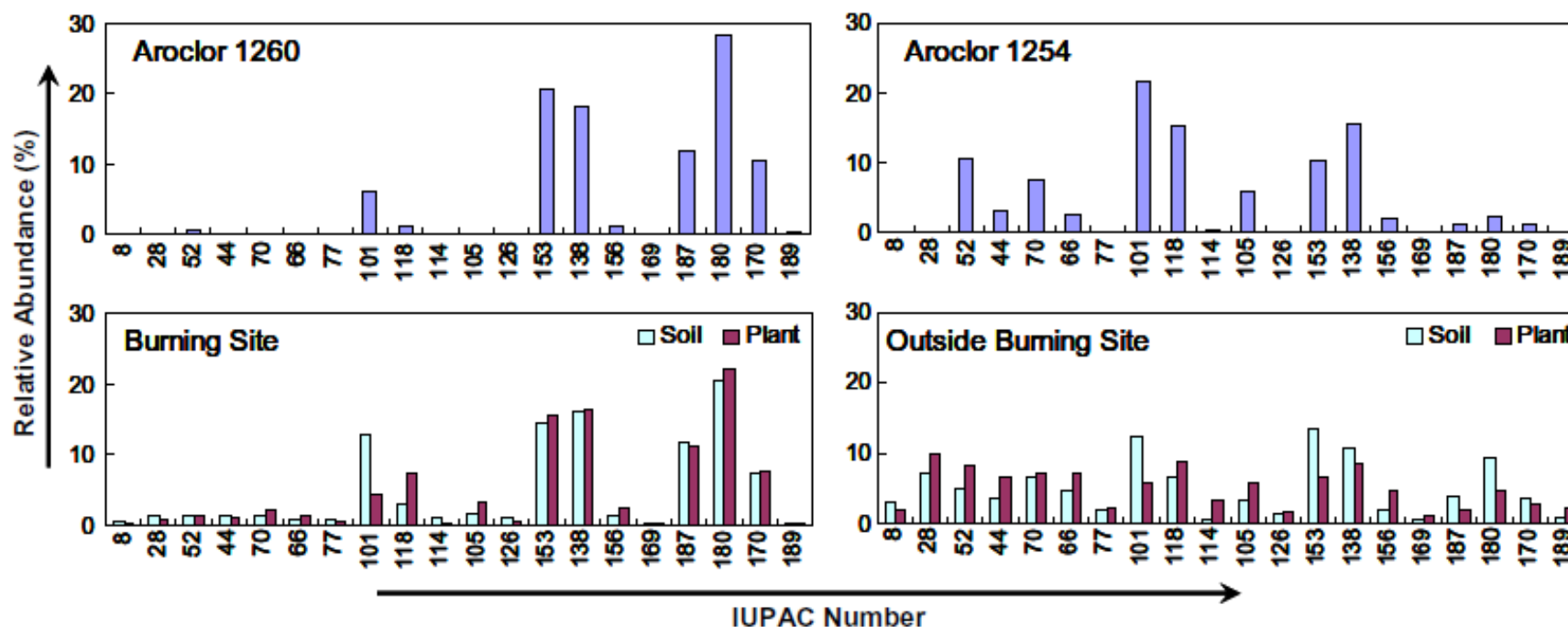


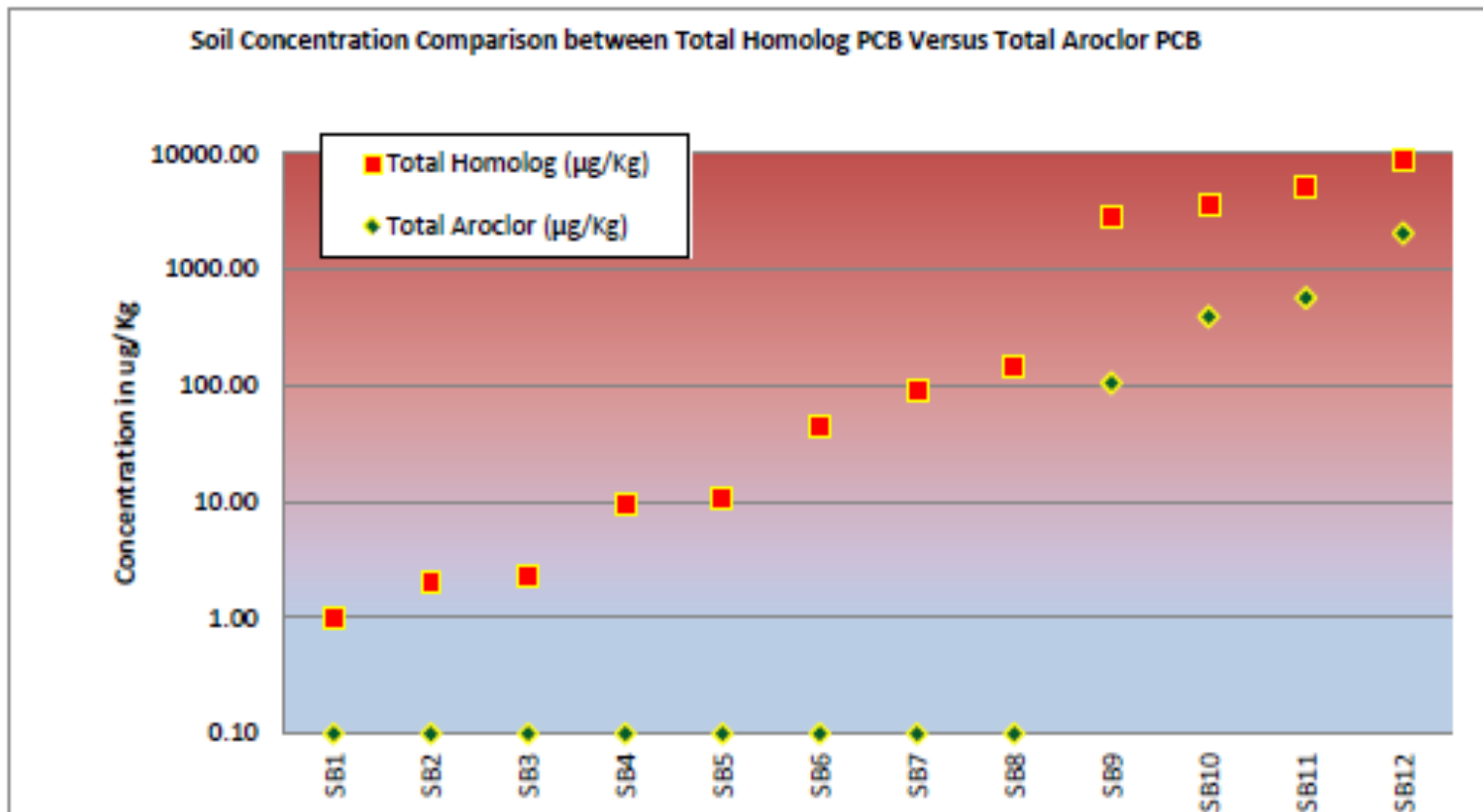
Fig. 3. Compositions (%) of 20 PCB congeners in samples and commercial Aroclor mixtures.

Y. Wang et al. / Chemosphere 85 (2011) 344–350

- When an Aroclor mixture is exposed to environmental conditions over a long period, it “weathers” and its composition changes.
- Method 608 measures the 7 common Aroclors. Its performance declines as the sample results look less like fresh Aroclor standards.



# Measuring Aroclor Mixtures vs. Individual Congeners



**Figure 8:** *Another comparison of Soil Total Homolog concentration versus Total Aroclor concentration.*

Taken from Wischkaemper et al, "U.S. EPA Region 4 Technical Services Section Issue Paper for Polychlorinated Biphenyl Characterization at Region 4 Superfund and RCRA Sites."

# Contact Information



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