EPA Clarification of Terms in SW-846

Kim Kirkland: Team Leader
Office of Resource Conservation and Recovery (ORCR)
Greetings

EPA appreciates the invitation to come to this meeting

Mark, Charles, Greg, Shen-Yi, Kim, Jim
Purpose of Presentation

- To provide an update regarding discussions between EPA and ELAB
- Present information regarding:
  - A *draft new* "policy" *statement* and
  - *Clarified terms* used in SW-846
- Promote consistency with the use of SW-846 as appropriate
- Help **YOU** to fully understand terminology used in SW-846
- Provide information to better assist you
- Give you the **411** on Update V to SW-846
EPA / ELAB Discussions
Timeline on Related Terms

- **July 11, 2008: ELAB Letter to George Gray**
  - Requested “Unique Identifiers” for SW-846 Methods
  - Requested clarification of: deleted, obsolete, previous versions, or revised methods
  - Requested position statement regarding previous versions of methods
  - Requested Implementation Plan for releasing Updates

- **August 2008 – January 2009**
  - Response letters, conference calls and face-to-face meetings between EPA and ELAB

- **January 12 - 13, 2009: Miami Meeting**
  - EPA participated in clarifying issues

- **April 2009: EPA / ELAB Meeting**
  - EPA finalized draft terms
    - Following management and OGC approval
SW-846 Methods Compendium

- A analytical methods manual designed for testing and monitoring under the Resource Conservation and Recovery Act (RCRA) Program
- Methods are generally appropriate and reliable for the complexity of RCRA waste matrices
- New methods incorporated through a lengthy validation process:
  - Comprehensive technical evaluation
  - Agency review
- Existing methods are also edited, as needed
  - Following a formal evaluation process by analytical experts (e.g., SW-846 work and focus groups) and an announcement of method availability and request for public comment in the Federal Register as a Notice of Data Availability (NODA)
Use of SW-846 Methods Compendium

USEPA ORCR Policy Statement

- Divided into 3 Parts:
  1. Background
  2. General guidance on procedures for adopting methods into SW-846
  3. Summary of definitions and terms
Methods Innovation Rule (MIR) [June 14, 2005 (70 FR 34537)]

- Provides **flexibility** in choice of methods for wastes regulated under RCRA
- Exception only for **method-defined parameters** (MDPs) (see 40 CFR 260.11)
- **Formal rulemaking no longer required** for publication of updates to SW-846 method
  - Updates are made available through Notice of Data Availability (NODA)

**PBMS approach**
- Method users have the flexibility to employ an SW-846 method or “any appropriate method” from a reliable source
- When using an alternative method, the focus should be on measurement objectives, rather than on measurement technologies
- Demonstration of performance is important
- **Strongly promoted by ORCR**
Use of latest SW-846 method version **strongly** encouraged by ORCR

- In new monitoring situations
- Earlier versions of SW-846 methods may still be used where appropriate or required
  - Existing permits
  - Consent decrees
  - Waste analysis plans
  - Sampling plans
Guidance on Adoption of Methods into SW-846

- Guidance or required??? Both!
  - SW-846 is a guidance manual of appropriate / reliable methods for RCRA-related analytical testing and monitoring
  - Also contains required methods for determining MDPs
    - SW-846 method is the only one capable of measuring a particular property
    - Required by a specific regulation
- A new SW-846 method number is assigned when:
  - New analytical “technology” is introduced
  - Revised quality control requirements induce changes in data comparability with the previous version
- Addition of Methods to SW-846:
  - Officially completed through a lengthy process of technical evaluation and Agency review
- Revisions of SW-846 Methods:
  - Performed as needed
  - Involves a formal evaluation process by analytical experts (SW-846 work and focus groups)
  - Published announcement of method availability and request for public comment made via a NODA in the FR
- The Agency posts the most recent version (final method)
  - On the USEPA web
    - www.epa.gov/epawaste/hazard/testmethods/index.htm
Question 1

How will I know what is the latest version of a method in SW-846?
How will I know what is the latest version of a method in SW-846?

The Agency will:

- Continue to update the Methods Status Table
- Provide a summary table of revision to each method
- Provide terms that clarify the status of methods in SW-846
# Methods Status Table

<table>
<thead>
<tr>
<th>METHOD NUMBER</th>
<th>FINAL UPDATE I (9/86)</th>
<th>FINAL UPDATE II (9/94)</th>
<th>FINAL UPDATE III (12/96)</th>
<th>FINAL UPDATE IV (2/07)</th>
<th>OTHER METHODS (<a href="http://www.epa.gov/SW-846">www.epa.gov/SW-846</a>)</th>
<th>METHOD TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>THIRD EDITION (9/86)</td>
<td>FINAL UPDATE I (7/92)</td>
<td>IIA (8/93)</td>
<td>IIB (1/95)</td>
<td>IIA (4/98)</td>
<td>IIB (11/04)</td>
<td>(7/05) Assisted Extraction, Selective Solvent Extraction and/or Solid Phase Extraction</td>
</tr>
<tr>
<td>3500</td>
<td>3500A</td>
<td>--</td>
<td>3500B (Up. III)</td>
<td>3500C</td>
<td>--</td>
<td>Organic Extraction and Sample Preparation</td>
</tr>
<tr>
<td>3510</td>
<td>3510A</td>
<td>3510B (Up. II)</td>
<td>3510C (Up. III)</td>
<td>--</td>
<td>--</td>
<td>Separatory Funnel Liquid-Liquid Extraction</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3511 (11/02)</td>
<td>Organic Compounds in Water by Microextraction</td>
<td></td>
</tr>
<tr>
<td>3520</td>
<td>3520A</td>
<td>3520B (Up. II)</td>
<td>3520C (Up. III)</td>
<td>--</td>
<td>--</td>
<td>Continuous Liquid-Liquid Extraction</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3535 (Up. III)</td>
<td>3535A</td>
<td>--</td>
<td>Solid-Phase Extraction (SPE)</td>
</tr>
<tr>
<td>3540</td>
<td>3540A</td>
<td>3540B (Up. II)</td>
<td>3540C (Up. III)</td>
<td>--</td>
<td>--</td>
<td>Soxhlet Extraction</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>3541 (Up. II)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Automated Soxhlet Extraction</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3542 (Up. III)</td>
<td>--</td>
<td>3542A (5/05)</td>
<td>Extraction of Semivolatile Analytes Collected Using Method 0010 (Modified Method 5 Sampling Train)</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3545 (Up. III)</td>
<td>3545A</td>
<td>--</td>
<td>Pressurized Fluid Extraction (PFE)</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3546</td>
<td>--</td>
<td>Microwave Extraction</td>
</tr>
<tr>
<td>3550</td>
<td>--</td>
<td>3550A (Up. II)</td>
<td>3550B (Up. III)</td>
<td>3550C</td>
<td>--</td>
<td>Ultrasonic Extraction</td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3560 (Up. III)</td>
<td>--</td>
<td>--</td>
<td>Supercritical Fluid Extraction of Total Recoverable Petroleum Hydrocarbons</td>
</tr>
</tbody>
</table>
Summary of Definition and Terms

Terms regarding the use of methods that have been adopted in SW-846:

- Final
- Draft
- Revised
- Superseded
- Withdrawn
- Minor Modification
- Major Modification
- Preliminary Version
SW-846 Terms

**Final -**
- The latest official, *preferred* version of a method included in the SW-846 Compendium and posted on the EPA web site
- After being published as a Draft method, the method version was announced as a NODA in the FR as part of an update to SW-846
  - For review and comment

**Draft -**
- Method that has *not* been adopted into the SW-846 method compendium, but has undergone technical review by EPA, i.e.:
  - Technical work group approval and/or
  - Inter-laboratory validation
- Included on the Agency web site for immediate use by the public
- *User must demonstrate method capability*
SW-846 Terms cont'd

- **Revised** -
  - A final method version or other guidance included in SW-846
  - Updated to reflect changes
    - Either editorial in nature or
    - Not significant to the technical aspects of the method
    - Do not impact data or performance capability
    - The method number does not change, however the footer suffix and date represent the last change to the method (e.g., 8270, 8270A and 8270B)
    - Revised versions of superseded methods should be viewed as the preferred method

- **Superseded** -
  - The previous version of a "Revised" method
    - A method that is no longer included in SW-846 Compendium
    - Has been revised and displaced by a newer version
    - May be available in future on web site (to be decided)
    - Not precluded from use when adequate justification for usage exists
    - "Superseded" is shown in the method title
      - As listed on the EPA web site for prior versions of final methods followed by the date of supersession
Withdrawn -

Method or other guidance that EPA *strongly recommends* should *not* be used; **Example:**

- The cyanide and sulfide reactivity procedures removed from SW-846, Chapter Seven as part of the MIR
- EPA determined that such procedures or methods are technically inadequate and/or no longer meet the use or objectives of the data collection project
- Withdrawn methods are not technically precluded from being used if:
  - Proper justification and demonstration is provided, and
  - The method is determined to be appropriate for use
- However, EPA would not expect an adequate justification for using such methods could be developed

**EPA employs a logical management process**

- **Assures** that official EPA revisions to a final method are *clearly communicated to the user community*
- The new numerical designation for the method is determined based on an evaluation
  - Major or minor revision
- These definitions are used by ORCR and the terms may vary for other program offices
Minor modification

- A change to a final method that is not significant to the technical aspect of the analytical procedure

Such a change *does not*

- Alter the technology
- Compromise the analytical intent of the method

Such a change *may*

- Clarify guidance
- Add or revise guidance boilerplate

The numerical designation for methods with minor modifications remains unchanged

Beginning in September 2010:

- EPA will:
  - Initiate documentation of minor changes to methods in the "Summary" section of the Revised version
  - Assign a new version date
- The revision date of methods that undergo minor modification will be documented in the method
- Significant changes to older methods can be found in the RCRA docket or response to comments document for each update
SW-846 Terms cont'd

- **Major modification** -
  - Significant change to a final method that includes either:
    - A technology change, that results in an alteration of the method performance or resulting data comparability
      - Example: Alteration of the determinative technique from a colorimetric procedure to an ion chromatography quantitation
    - Substantial modification to the technical aspect of the analytical procedure that may change the scientific outcome of a method
      - Example: The use of an alternate extraction solvent results in the recovery of a greater number of target analytes of interest
    - A major modification will result in the assignment of a new method number for the modified procedure
**Method-specific Example: Major Modification to 7196A**

- When analyzing a wastewater for hexavalent chromium, the analyst employs an *"ion chromatography"* technique in place of the *spectrophotometric* quantitation indicated in the method.
  - Basis for change: Ion chromatography used to meet designated holding-time requirements.

- This alternative quantitation approach would be considered a **major modification to Method 7196A**.

- **Note:** Any data generated using this technique, should not be referenced as Method 7196A.
Preliminary Version (PV) -

- Denotes a method that has **not** been endorsed by EPA, but is under consideration for inclusion into SW-846
  - **Example** - Preliminary version of Method 1313:
    "LIQUID-SOLID PARTITIONING AS A FUNCTION OF EXTRACT pH FOR CONSTITUENTS IN SOLID MATERIALS USING A PARALLEL BATCH EXTRACTION"

- Derived from previously-published procedures (e.g., peer-reviewed papers, academic studies, other agency methods) using reviewed and accepted methodologies
  - **Example** for Method 1313:

- The method has been submitted to the ORCR and is currently under review for development of inter-laboratory validation studies to generate precision and bias data
Who can/ will decide which version of a method to use???

**Everyone!**

- The regulator, the laboratory, the region, state etc.
- It is everyone’s responsibility to determine which methods will provide data that meets the project-specific needs

**Bottom Line:**

- Keep a written (paper) record of all decisions
- Have accessible data, QAPPS, SAPS, or whatever supporting document(s) that have been approved for use

Who has the authority to approve methods???

**There is no one single answer**

- It may be project specific
- The state, region, or regulation may dictate which method will be used, or which method allows for flexibility
- Work out the details in the planning stages
**Summary: Important Things to Remember!**

- ORCR strongly advises the use of the latest version of SW-846 methods, especially in new monitoring situations.
- When choosing a reliable alternative method.
- In situations where it may not be appropriate to use the latest method in SW-846, earlier versions may be used. These may include but are not limited to situations where an earlier version of a method is required for:
  - Existing permits
  - Consent decrees waste analysis plans or sampling analysis plans
- The focus should be on measurement objectives, not on measurement technologies.
- The user must demonstrate that the method generates data that is appropriate for its intended use.
- EPA strongly promotes the PBMS approach because it enables the method flexibility necessary for the analysis of complex RCRA wastes.
- **Demonstration of method applicability and capability is important!**
- EPA recommends:
  - Regulated entities seek approval before applying any method on a specific project, including situations where the method is used verbatim.
  - A regulated entity should seek approval of method modifications before use on a specific project.
Update V is on the Fast Track

By November 2010, ORCR plans to adopt 20 additional methods as final to the SW-846 compendium:

8000C  Determinative Chromatographic Separations
7199A  Determination of Hexavalent Chromium in Drinking Water, Groundwater and Industrial Wastewater Effluents by Ion Chromatography
6010D  Inductively Coupled Plasma-Atomic Emission Spectrometry
6020B  Inductively Coupled Plasma-Atomic Emission Spectrometry
6850   Perchlorate in Water, Soils and Solid Wastes Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry
6860   Perchlorate in Water, Soils and Solid Wastes Using High Performance Ion Chromatography/Electrospray Ionization/Mass Spectrometry
8260C  Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
8330B  Nitroaromatics, Nitramines and Nitrate Esters by High Performance Liquid Chromatography (HPLC)
9016   Free Cyanide in Water, Soils and Wastes by Microdiffusion
8015D  Nonhalogenated Organics Using GC/FID
5020A  Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis
5030C  Purge-and-Trap for Aqueous Samples
9013A  Cyanide Extraction Procedure for Solids and Oils
9014A  Titrimetric and Manual Spectrophotometer Determinative Methods for Cyanide
9015   Metal Cyanide Complexes by Anion Exchange Chromatography and UV Detection
3200   Mercury Species Fractionation and Quantification by Microwave-assisted Extraction, Selective Solvent Extraction and/or Solid Phase Extraction
8323   Determination of Organotins by Micro-Liquid Chromatography-Electrospray Ion Trap Mass Spectrometry
8271   Assay of Chemical Agents in Solid and Aqueous Samples by Gas Chromatography/Mass Spectrometry, Electron Impact (GC/MS/EI)
8272   Parent and Alkyl Polycyclic Aromatics in Sediment Pore Water by Solid-Phase Microextraction and Gas Chromatography/Mass Spectrometry in Selected Ion Monitoring Mode
8276   Toxaphene Congeners by GC/NIMS
Relevant Contact Information
THANKS!!!

- Methods Team Home Page: www.epa.gov/SW-846
- Methods Information Communication Exchange (MICE)
  - Phone: (703) 676-4690
  - E-mail: mice@cpmx.saic.com
- Kim Kirkland
  - Phone: (703) 308-0490
  - E-mail: kirkland.kim@epa.gov
Method Selection

Do not do it blindly!