

Meeting Minute Approval Sheet

**222-S Project Managers Meeting & Misc. Lab Issues  
(TSD: TS-2-1)**

2440 Stevens Center, Room 1600  
December 14, 2006 (informational meeting)  
February 7, 2007  
April 12, 2007  
9:30 – 10:15 p.m.

**RECEIVED**  
OCT 18 2007  
**EDMC**

DOE: af stevens 6-14-07  
Andrew Stevens Date

ECOLOGY: Deborah Singleton 10/11/07  
Deborah Singleton Date

# MEETING MINUTES

222-S Project Manager's Meeting and Miscellaneous Lab Issues (TSD:TS-2-1)

Meetings held on: 12/14/06, 2/7/07, 4/12/07

Page 1 of 1

## Meeting Attendees:

See attached list of attendees.

## Previous Meetings:

The December meeting was an informational meeting and no meeting minutes were taken. The Operational and Analytical reports for December were provided to Ecology and are included in this report for the Administrative Record. Meeting minutes are being provided for the February and April meetings in this report.

## Action Items:

There are no open Action Items.

## 222-S Laboratory TSD, RCRA Permit, or Miscellaneous Issues:

- February 2007:
  - Ecology reported that revisions to the Hanford Site RCRA Permit renewal may affect the generation of the 222S RCRA permit. Ecology is targeting the end of March to issue the draft permit and is also resolving internal comments on the 222S Waste Analysis Plan.
  - CH2M HILL requested an opportunity to discuss their concerns with method 1668 for PCB analysis.
- April 2007:
  - Ecology reported that the 222S RCRA permit is on hold until July 2007. Ecology has received EPA comments and is working to resolve their concerns.
  - CH2M HILL provided a presentation on PCB congener analysis. In the presentation, CH2M HILL introduced a method to calculate PCB congener concentrations from traditional analysis thereby providing congener concentrations with less margin of error and more cost effectively.
  - Ecology agreed to set a meeting with their internal Chemistry Team to hear the PCB presentation and discuss.

## 222-S Laboratory Operations:

The Operations Report and Analytical Report were presented and are attached.

## Next Meeting:

June 14, 2007

2440 Stevens, room 1200

9:30 – 10:00 a.m.

Attachments - 3

222-S Project Managers Meeting & Misc. Lab Issues (TSD: TS-2-1)

**Attachment 1**

**December 2007: 222-S Lab Operations and Analytical Report**

## ANALYTICAL REPORT

222-S Laboratory

December 2006

- DOE Phase I Verification of the ATL ISMS program was performed September 25-October 6, 2006. The Phase 1 Verification Review Team concluded that the Analytical Services Production Contractor's (ASPC) Integrated Safety Management System meets DOE requirements and should be considered adequate provided the identified issues are entered into the corrective action management (CAM) system and appropriately addressed prior to commencing the Phase II Verification review scheduled for CY2006.
- During the ISMS Phase 1 Verification review, an issue with ATL training requalifications was identified by the Chief Operating Officer. The issue was evaluated and it was determined that ATL technical staff had not completed their Level 3 requalifications prior to the due date. Discussions with the Analytical Technical Services Training manager and reviews of the applicable procedures confirmed that there is no grace period for this qualification. The staff with expired qualifications were notified to place their work in a safe configuration and exit the laboratory until requalification was completed. Approximately 2 years ago the 222-S facility (under CH2M HILL) redesigned the training program for technical staff. This redesign resulted in the implementation of a 2-year requalification, which had previously not been implemented in the laboratory. The first requalifications came due for ATL in August of 2006. As of September 29, approximately half of the ATL technical staff have not completed their requalifications. The issue was entered into the ATL CAM system as ATL-2006-0246. PAAA evaluation of the lapse in requalification resulted in the reporting of this issue into the Office of Enforcement Noncompliance Tracking System. A root cause analysis was completed on October 31, and included a CAP. In addition, an evaluation of the data produced during the period of the training lapse was performed and showed no adverse impact on the analytical data. ATL customers were informed of the issue.
- An American Industrial Hygiene Association (AIHA) accreditation better positions the laboratory to service the site cleanup and closure activities. ATL staff performed and passed all rounds of AIHA Proficiency Analytical Testing (PAT) beryllium and metals testing since April 2005. A site assessment for accreditation has been tentatively scheduled for mid-February.

**STATUS REPORT**  
**222-S Laboratory**  
**OPERATIONS AND TECHNOLOGY DEVELOPMENT**  
September – December 2006

- The repair of the 1F Hot Cell drain line is being performed in the field this week. The work has been carefully planned to minimize the risk from the high levels of radioactive contamination expected during this work evolution. An independent, registered professional engineer will certify repairs. When the repairs are completed, the failed drain line will be evaluated for the failure mode.
- The 222-S Main Stack underwent its first annual inspection to determine reliability of the sampling system. The sampling line and system were found to be free from foreign material and passed the inspection. This inspection is required for all major stacks. In a related topic, the structural dynamics study of the 222S laboratory exhaust ducts and main stack concluded that a new fan configuration (i.e., only one electric exhaust fan is run with the diesel exhaust fan) has apparently mitigated extreme vibrations that caused the stack cracking. The new fan configuration was adopted in April 2005 and no new cracks have been reported since that time.
- The first quarter FY 2007 limited emergency response exercise was conducted at the 222S Laboratory in November. The scenario involved a vehicle collision, release of radioactive waste, contamination spread to the ground and air, and personnel injury. The exercise involved a multi-contractor response and activation of the Hanford Site Emergency Operations Center. All exercise objectives were met.
- The July 2006 transfer of waste from 219S, Tank 102 to SY-101 encountered mechanical failure of the P1 pump after transferring only 800 gallons of waste. Further testing on the transfer line will be conducted during the next transfer, which is tentatively scheduled for July 2007.
- Johnson Control International (JCI), the DOE-RL contractor providing steam to 222-S, completed installation in October of the condensate catch tank at their 222S package boiler. Other steam system enhancements were completed at 222 S Laboratory and steam was returned to 222S in early October.
- ATS is conducting the annual VPP self-assessment during December. Self-assessments are part of the program to maintain VPP Star Status.
- Use of IDMS for analytical data records. Analytical data records are being submitted for electronic storage in the site electronic records system. This is a significant process improvement in analytical data records management and aids in ease, timeliness, and accuracy of record retrieval.
- Microwave Digestion method development. This digestion method for metals is being evaluated to determine if it is a more efficient digestion technique for tank waste with high levels of organics. This method will enhance the capability of the laboratory.
- IH Accreditation of 222S Laboratory Analyses. The ATS/ATL submitted a combined application for IH Accreditation to the American Industrial Hygiene Association (AIHA) in early-October. After reviewing the composite application, the AIHA requested independent accreditation of each organization. Site audit is scheduled for mid to late February 2007. Successful completion of the audit and corrective actions is a pre-requisite for accreditation. Accreditation will enhance the

**STATUS REPORT**  
**222-S Laboratory**  
**OPERATIONS AND TECHNOLOGY DEVELOPMENT**  
September – December 2006

capability of the laboratory to perform analyses requiring IH certification (i.e., radioactive beryllium). When accredited, 222S laboratory will become one of the few laboratories in the nation that can perform IH certified analyses on highly radioactive material.

- Waste shipments to PEcoS for thermal treatment are on hold because their permit expires at the end of 2006. CH2M HILL is finalizing new contracts for thermal treatment.
- Waste was received in September from T Plant from SRNL Treatability Studies of DST waste. This receipt completed the campaign to transfer liquid waste from the tests to the 219S Tank System. Two containers exhibited a separable organic layer and were prohibited from transfer to the 219S Tank System and were staged in the 11A Hot Cell pending transfer to the DMWSA. Transfer to the DMWSA occurred in early October with shipment off site for thermal treatment occurring when services of an alternate thermal treatment facility are obtained.
- Waste Shipments :
  - Hazardous Waste: 0 drums;
  - LLW shipment of one connex box;
  - Mixed low level waste: 10 drums ;
  - TRU waste: 4 drums to Central Waste Complex

222-S Project Managers Meeting & Misc. Lab Issues (TSD: TS-2-1)

**Attachment 2**  
**February 2007**  
**List of Attendees**  
**Agenda**  
**222-S Lab Operations Report**  
**Handouts**



222-S Project Managers Meeting & Misc. Lab Issues

2440 Stevens, Room 1600

February 7, 2007

8:00 – 8:45 a.m.

Agenda

1. Introductions
2. Approval of Previous Meeting Minutes
3. Status of Action Items
4. 222-S TSD
5. 222-S Permit Issues
6. 222-S Laboratory
  - 6.1. Operational and Analytical Report
7. Misc. Issues
  - 7.1. CH2M HILL request for a meeting regarding PCB analyses
8. Review of New Action Items

## **ANALYTICAL REPORT**

**222-S Laboratory**

**February 2007**

- An American Industrial Hygiene Association (AIHA) accreditation better positions the laboratory to service the site cleanup and closure activities. ATL staff performed and passed all rounds of AIHA Proficiency Analytical Testing (PAT) beryllium and metals testing since April 2005. A site assessment for accreditation is scheduled for the week of February 12.
- A blue user procedure for Inorganic Anions in Air by IC is in testing. This procedure will be used to support IH analyses and will expand the current inorganic vapor capabilities (ammonia and mercury) to include hydrofluoric, hydrochloric, hydrobromic, nitric, phosphoric, and sulfuric acids and their anions.
- A blue user procedure for Microwave Assisted Acid Digestion for Wipes for Beryllium Analysis by ICP was released for testing in January. This procedure will be used to support IH Be analyses and will be applicable to high-fired BeO.

**STATUS REPORT**  
**222-S Laboratory**  
**OPERATIONS AND TECHNOLOGY DEVELOPMENT**  
December 2006 – February 2007

- The repair of the 1F Hot Cell drain line has experienced significant in field delays. The Hot Cell door was bolted shut but this condition was not reflected on the work record from project W-087. The bolts have been removed and Phase I is on schedule for a mid-February completion. Phase I will spray fixative to minimize removable contamination and will result in the radiological characterization of the Hot Cell and work area. Phase II, removal and replacement of the drain line, is being planned as high –risk work. Field work for Phase II is scheduled to start in March, dependant on resources and work planning completion. The work is being carefully planned and reviewed to minimize the risk from the high levels of radioactive contamination expected during this work evolution. An independent, registered professional engineer will certify repairs. When the repairs are completed, the failed drain line will be evaluated for the failure mode.
- CH2M HILL has received communication from the Washington State Department of Health that they have reviewed the response to the Notice of Violation for the 222S main stack and agree that no upgrades are required to the stack or its sampling location or equipment.
- Troubleshooting and repair of the tank 104 dip tubes is on schedule to start fieldwork in February. The dip tube is part of the liquid level monitoring system for Tank 104 and appears to be experiencing plugging. The plugging results in the tank levels registering higher than can be accounted for through additions. There is no pathway for water intrusions into the tank and all discharges to the tank are tracked. After the dip tubes are blown out, the tank level readings return to normal. This work package will attempt to dislodge the plug. If the work package is not successful, further action will be required.
- 1E1 Hot Cell is on restricted access due to low air flow through the HEPAs. Work was stopped mid-project. HEPA replacement is on schedule for late February.
- IH Accreditation of 222S Laboratory Analyses. The American Industrial Hygiene Association audit of CH2M HILL is scheduled for late February 2007. Successful completion of the audit and corrective actions is a pre-requisite for accreditation. Accreditation will enhance the capability of the laboratory to perform analyses requiring IH certification (i.e., radioactive beryllium). When accredited, 222S laboratory will become of the few laboratories in the nation that can perform IH certified analyses on highly radioactive material or specialty analyses.
- Waste shipments to PEcoS are on hold until shipments of PEcoS treated waste to FH can be resumed. Shipments of mixed waste for thermal treatment continue to be on hold pending final selection of a treatment contractor.
- Waste Shipments :
  - Hazardous Waste: 0 drums;
  - LLW/PCB: 1 drum to FH;
  - Mixed low level waste: 0 drums;
  - TRU waste: 0 drums

222-S Project Managers Meeting & Misc. Lab Issues (TSD: TS-2-1)

**Attachment 3**  
**April 2007**  
**List of Attendees**  
**Agenda**  
**222-S Lab Operations Report**  
**Handouts**

222-S Laboratory  
 Project Managers' Meeting  
 2440 Stevens, room 1600  
 April 12, 2007  
 9:30 - 10:15 am

ATTENDEES

Name	Affiliation	MSIN	Phone
Lucinda Borne man	CH2MHILL		
John Roberts	Ecology		372-7906
Andy Stevens	ORP		376-8235
Jon Hwang	ATL		375-5200 ext 236
Beats Hill	CH2MHILL		372-3076
Jeanne Wallace	Ecology		372-7931
Lou Huffman	ORP		376-004
Mark Marcus	CH2		373-3026

222-S Project Managers Meeting & Misc. Lab Issues  
2440 Stevens, Room 1600  
April 12, 2007  
9:30 – 10:15 a.m.

Agenda

1. Introductions
2. Approval of Previous Meeting Minutes
3. Status of Action Items
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5. 222-S Permit Issues
6. 222-S Laboratory
  - 6.1. Operational and Analytical Report
7. Misc. Issues
  - 7.1. CH2M HILL discussion of PCB analyses
8. Review of New Action Items

## ANALYTICAL REPORT

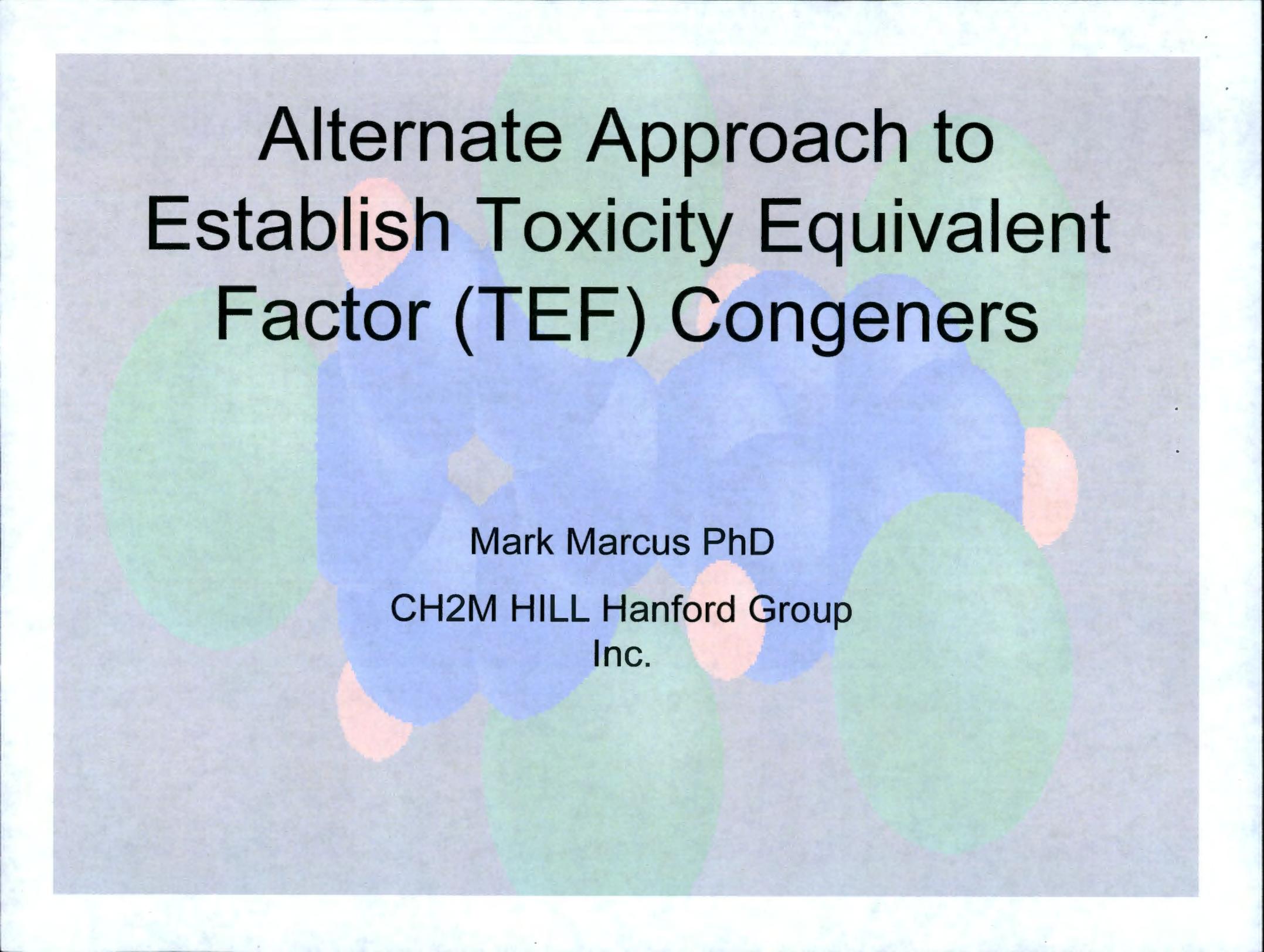
222-S Laboratory

April 2007

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- A blue user procedure for Inorganic Anions in Air by IC is in testing. This procedure will be used to support IH analyses and will expand the current inorganic vapor capabilities (ammonia and mercury) to include hydrofluoric, hydrochloric, hydrobromic, nitric, phosphoric, and sulfuric acids and their anions.
- A blue user procedure for Microwave Assisted Acid Digestion for Wipes for Beryllium Analysis by ICP was released for testing in January. This procedure will be used to support IH Be analyses and will be applicable to high-fired BeO.

**STATUS REPORT**  
**222-S Laboratory**  
**OPERATIONS AND TECHNOLOGY DEVELOPMENT**  
March – April 2007

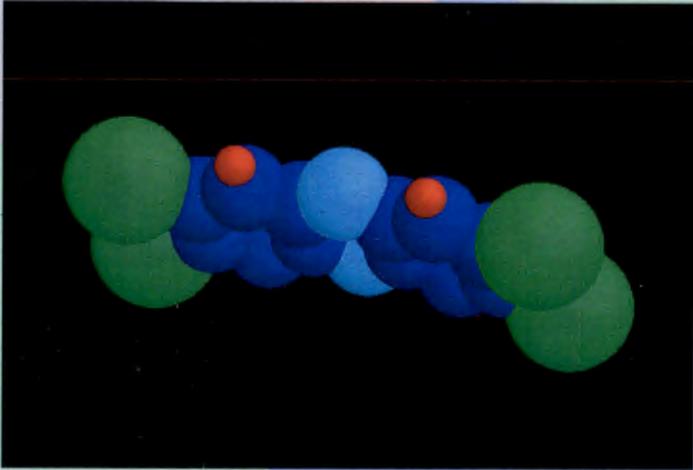
- The 1F Hot Cell drain line replacement activities continue. The drain pan and drain lines have been removed. On March 27<sup>th</sup>, the leak test of the intact line was performed to validate the integrity of the drain line downstream of the removed sections. The leak test indicated that the remaining portion of the drain line is intact. Remaining activities include the final fabrication, assembly, and installation of the drain pan and drain line. Planning has started on the evaluation of the drain line's failed portion. This evaluation will help determine location of the leak, likely mode of failure, and modifications needed to operational methods.
- Housekeeping activities on the 219S Waste Handling Facility platform have started. The platform has held hand tools needed for work on the 219S Tank System. Some of these tools were determined to be contaminated and posed an airborne contamination potential to personnel. This work effort will remove all hand tools and extraneous equipment from the platform. These activities are pre-requisite for the Tank 104 dip tube repair.
- Repair of the dip tubes on Tank 104 in the 219-S Waste Handling Facility has completed planning and is ready to work. The dip tubes have experienced intermittent plugging or narrowing which give falsely high level tank readings. The tubes are easily cleared with compressed air, therefore level readings remain accurate.
- 1E1 Hot Cell is on restricted access due to low air flow through the HEPAs. Work was stopped mid-project. HEPAs will be replaced in May when resources become available after completion of the work on 1F Hot Cell and 219S Waste Handling Facility.
- The Cathodic Protection system for the underground mixed waste lines leading to the 219S Waste Handling Facility was taken out of service recently to determine static potential of the system. This activity is part of a company wide initiative to determine the status and effectiveness of the Cathodic Protection systems.
- The Scanning Electron Microscope installation was completed in March.
- IH Accreditation of 222S Laboratory Analyses. The American Industrial Hygiene Association audited CH2M HILL in late February 2007. Corrective actions were completed and submitted in March. ATS is waiting for the evaluation of the responses. Successful completion of the audit and corrective actions is a pre-requisite for accreditation. Accreditation will enhance the capability of the laboratory to perform analyses requiring IH certification (i.e., radioactive beryllium). When accredited, 222S laboratory will become one of the few laboratories in the nation that can perform IH certified analyses on highly radioactive material or specialty analyses.
- Waste Shipments. No waste shipments occurred during this reporting period.



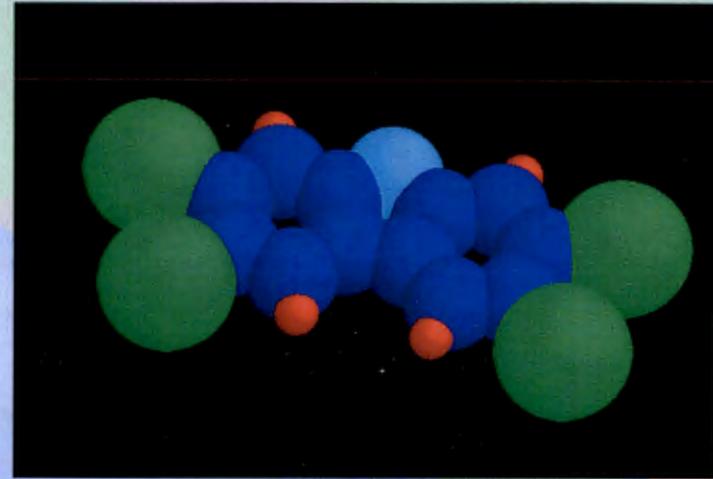
# Alternate Approach to Establish Toxicity Equivalent Factor (TEF) Congeners

Mark Marcus PhD  
CH2M HILL Hanford Group  
Inc.

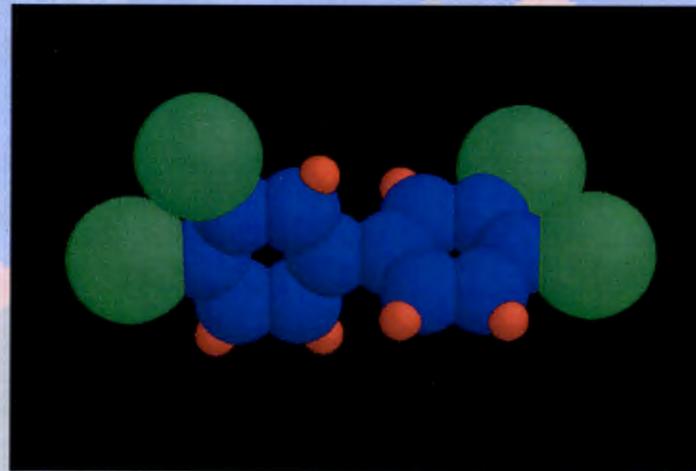
# Basis for TEF



**2,3,7,8-Tetrachlorodibenzodioxin**



**2,3,7,8-Tetrachlorodibenzofuran**



**3,3',4,4'-Tetrachlorobiphenyl**

# Nomenclature

PCB Nomenclature

BZ# Ballschiter and Zeil

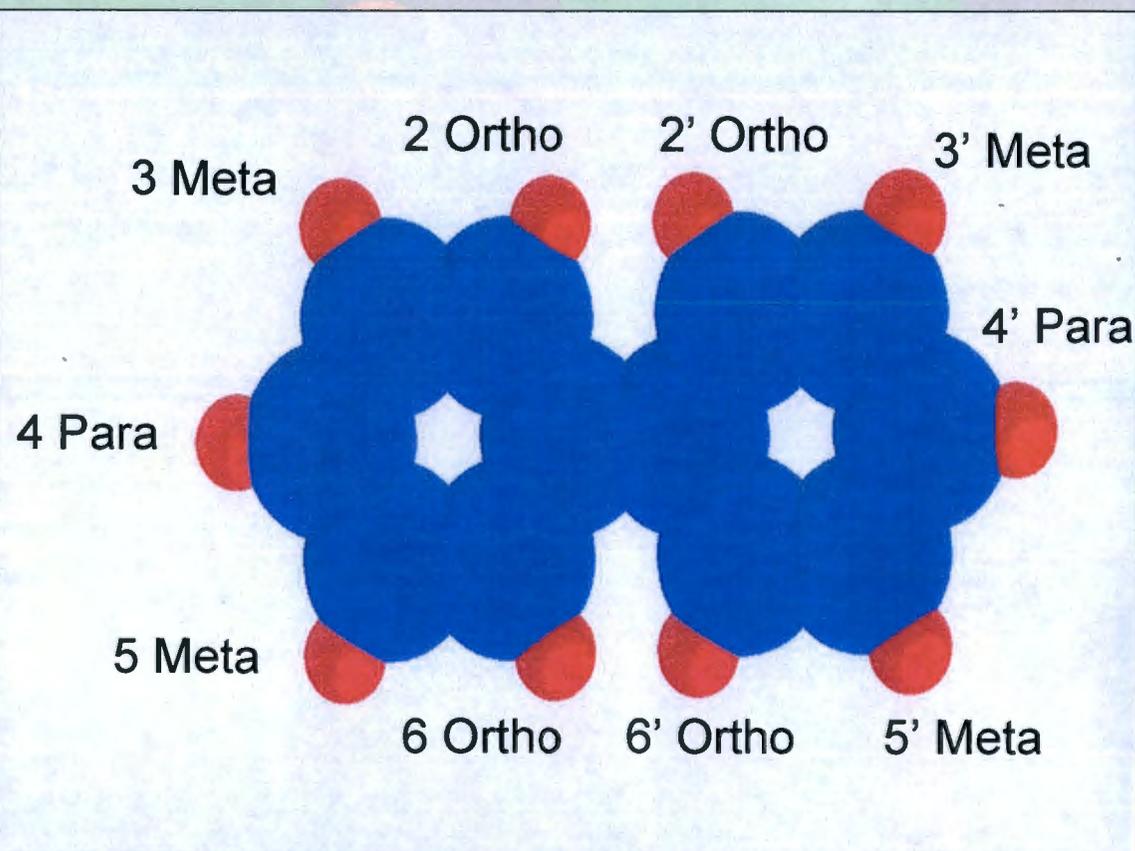
IUPAC# International Union of  
Pure and Applied Chemistry

CAS# Chemical Abstract Service

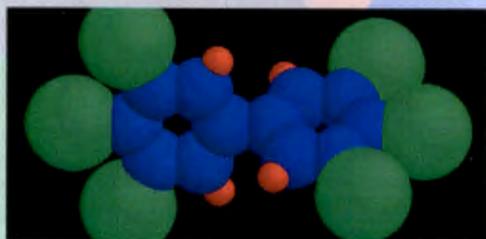
Congeners

Homolog

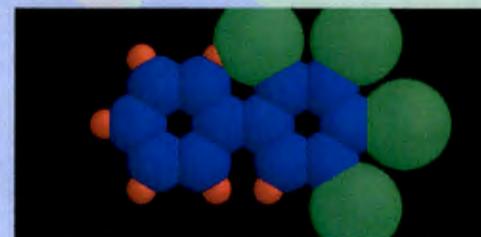
Aroclors



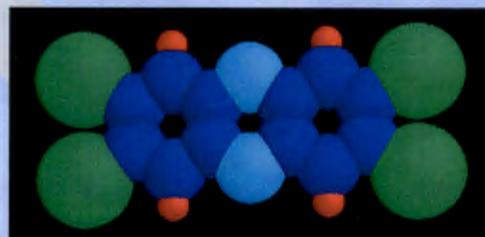
# Congener Selection for TEF



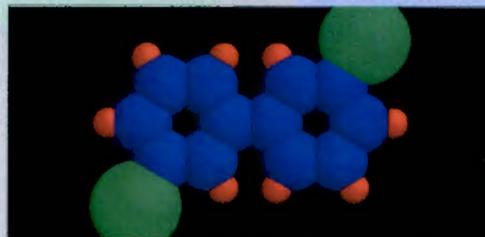
68 Coplanar



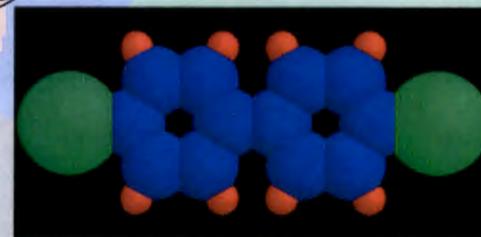
169 Tetra-Chloro



12 Dioxin Like

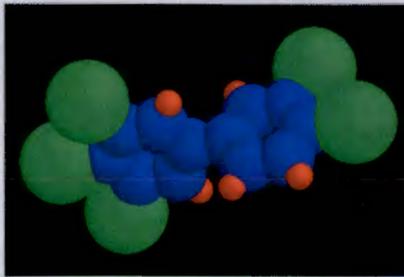


140 Meta

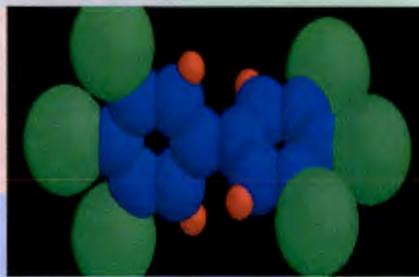


55 Para-Chloro

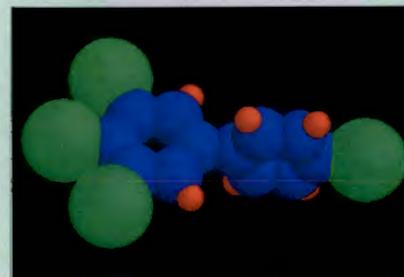
# 12 TEF Congeners of PCBs



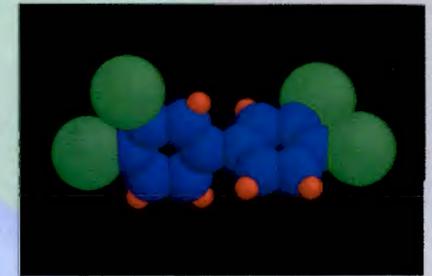
BZ#126 TEF 0.1



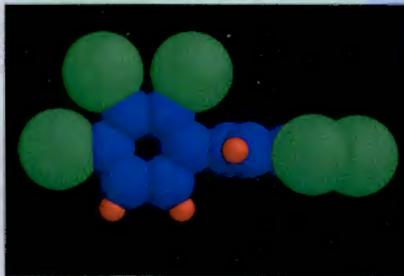
BZ#169 TEF 0.03



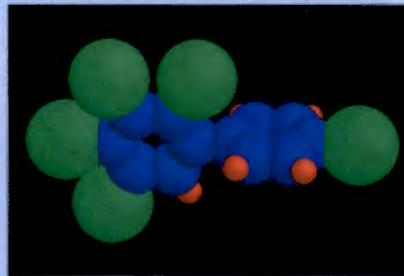
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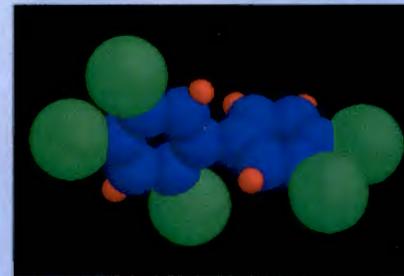
BZ#77 TEF 0.0001



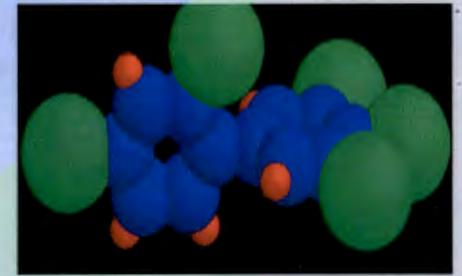
BZ#105 TEF 0.00003



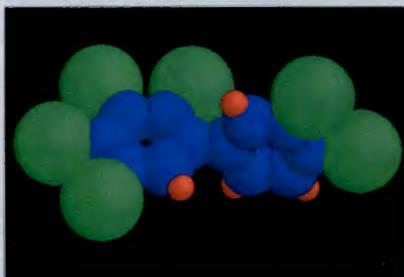
BZ#114 TEF 0.00003



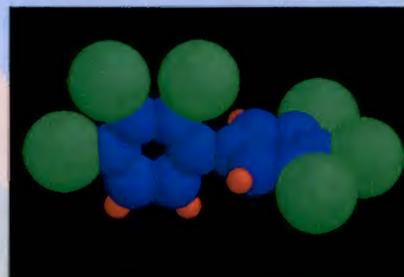
BZ#118 TEF 0.00003



BZ#123 TEF 0.00003



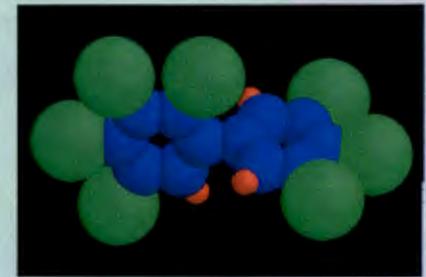
BZ#156 TEF 0.00003



BZ#157 TEF 0.00003



BZ#167 TEF 0.00003



BZ#189 TEF 0.00003

# Aroclor Congener Composition

PCB BZ#	Chlorine position										WHO TEF 2005		Monsanto Technical Material %COMPOSITION BY CONGENERS		
	2	2'	3	3'	4	4'	5	5'	6	6'	1016*	1221**	1232		
1	X										0.54	35.8	15.84		
2			X								0.03	3.81	1.94		
3					X						0.16	20.44	10.2		
4	X	X									3.66	6.19	5.38		
5	X		X								0.17	0.74	0.5		
6	X			X							1.69	3.82	3.01		
7	X				X						0.3	1.7	1.09		
8	X					X					8.31	12.34	10.72		
9	X						X				0.59	1.74	1.29		
10	X							X			0.23	0.8	0.58		
11			X	X						ND		0.16	ND		
12			X		X						0.07	0.59	0.35		
13			X			X					0.25	1.12	0.72		
14			X				X			ND		0	0.02		
15				X				X			2.49	4.18	3.19		
16	X	X	X								3.88	0.31	1.79		
17	X	X			X						3.98	0.34	1.82		
18	X	X					X				10.86	0.78	4.83		
19	X	X							X		1.01	0.08	0.47		
20	X		X	X							0.89	0.07	0.42		
21	X		X		X					NM		NM	NM		
22	X		X			X					3.51	0.26	1.62		
23	X		X				X				0.02	ND	0		
24	X		X						X		0.17	0.02	0.08		

# Identification of PCBs in Tank Samples

Tank Name	Constituent Name	Aggregation Level	Data Status	Result Type	Reported Value	Reported Units	Standard Value	SI
241-AN-102	Aroclor 1254	Tank Composit	Utilized/Pre-Tr	DUPLICATE_F	0.017	ug/g	0.017	ug
241-AN-102	Aroclors (Total	Tank Composit	Utilized/Pre-Tr	DUPLICATE_F	0.079	ug/g	0.079	ug
241-AN-102	Aroclor 1260	Tank Composit	Utilized/Pre-Tr	DUPLICATE_F	0.03	ug/g	0.03	ug
241-BY-109	Aroclor 1254 (c	Sol Core Comp	current	DUPLICATE_F	2800	ug/kg	2.8	ug
241-C-201	Aroclor 1254 (c	Grab Sample	Current	DUPLICATE_F	72	ug/kg	0.072	ug
241-C-203	Aroclor 1254 (c	Grab Sample	Current	DUPLICATE_F	450	ug/kg	0.45	ug
241-C-203	Aroclor 1254 (c	Grab Sample	Current	DUPLICATE_F	600	ug/kg	0.6	ug
241-AW-104	Aroclor 1254 (c	Segment Solid	Current	PRIMARY_RE	329.2	ug/kg	0.3292	ug
241-AX-102	Aroclor 1254 (c	Sol Tank Com	Current	PRIMARY_RE	188.6	ug/kg	0.1886	ug
241-AW-105	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	2546	ug/kg	2.546	ug
241-AW-105	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	442.2	ug/kg	0.4422	ug
241-AY-101	Aroclor 1254	Grab Sample	current	PRIMARY_RE	275	ug/kg	0.275	ug
241-B-106	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	610	ug/kg	0.61	ug
241-B-107	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	270	ug/kg	0.27	ug
241-B-109	Aroclor 1254 (c	Segment Solid	current	PRIMARY_RE	6000	ug/kg	6	ug
241-BX-103	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	19000	ug/kg	19	ug
241-BX-103	Aroclor 1248 (c	Sol Core Comp	current	PRIMARY_RE	18000	ug/kg	18	ug
241-BX-109	Aroclor 1248 (c	Sol Core Comp	current	PRIMARY_RE	2600	ug/kg	2.6	ug
241-BX-109	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	7700	ug/kg	7.7	ug
241-BY-102	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	380	ug/kg	0.38	ug
241-BY-102	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	400	ug/kg	0.4	ug
241-BX-112	Aroclor 1254 (c	Auger Lower H	current	PRIMARY_RE	720	ug/kg	0.72	ug
241-BY-103	Aroclor 1254 (c	Auger Sample	current	PRIMARY_RE	590	ug/kg	0.59	ug
241-BY-103	Aroclor 1254 (c	Auger Sample	current	PRIMARY_RE	120	ug/kg	0.12	ug
241-BY-105	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	132	ug/kg	0.132	ug
241-BY-107	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	89	ug/kg	0.089	ug
241-BY-105	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	31.33	ug/kg	0.03133	ug
241-BY-109	Aroclor 1254 (c	Sol Core Comp	current	PRIMARY_RE	2800	ug/kg	2.8	ug

# Conventional Analysis as Aroclors

## METHOD 8082

### POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY

#### 1.0 SCOPE AND APPLICATION

1.1 Method 8082 is used to determine the concentrations of polychlorinated biphenyls (PCBs) as Aroclors or as individual PCB congeners in extracts from solid and aqueous matrices. Open-tubular, capillary columns are employed with electron capture detectors (ECD) or electrolytic conductivity detectors (ELCD). When compared to packed columns, these fused-silica, open-tubular columns offer improved resolution, better selectivity, increased sensitivity, and faster analysis. The target compounds listed below may be determined by either a single- or dual-column analysis system. The PCB congeners listed below have been tested by this method, and the method may be appropriate for additional congeners.

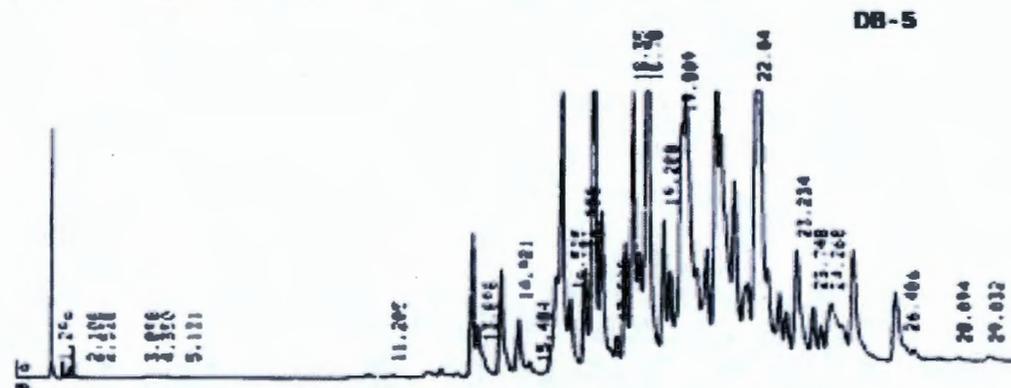


FIGURE 6. GC/ECD chromatogram of Aroclor

# EPA TEF Data for Aroclors

BZ#	TEF	Aroclors ug/g							
	TEF	1221	1232	1016	1242	1248	1254	1260	
77	0.0001	12.6	2150	40.9	2590	4440	174	33.8	
81	0.0003	0.51	111	1.96	156	221	16.4	3.33	
105	0.00003	55.9	3030	69.5	4840	17300	33800	434	
114	0.00003	4.04	248	6.03	443	1320	1930	17	
118	0.00003	88.1	4460	110	6980	24200	78900	5610	
123	0.00003	3.33	164	4.72	277	806	1150	5.02	
126	0.1	0.28	21	0.56	33.6	98	37.3	2.13	
156	0.00003	7.49	90.7	3.72	255	654	8440	4860	
157	0.00003	1.46	22	1.03	70.9	171	1870	252	
167	0.00003	2.52	32.4	1.1	80.7	207	3100	1990	
169	0.03	0.08	0.17	0.13	0.11	0.21	0.81	0.82	
189	0.00003	1.17	4.36	0.12	4.53	11	246	1290	
TEQ		0.03673	2.595	0.0705	4.0576	11.657	7.6597	0.676	

Aroclor data from A. Beliveau (EPA)

# Congener Determinations

SW-846 MDL for Aroclor 1254 in soil is 70 $\mu$ g/kg

BZ# 126 in Aroclor 1254 is 37.3 $\mu$ g BZ #126/gram of Aroclor 1254

If at Aroclor 1254 MDL:

70  $\mu$ g Aroclor 1254/kg soil x 37.3 $\mu$ g BZ  
#126/gram of Aroclor 1254 = 2.6 picograms  
BZ #126/gram of soil

# Congener Determinations

Method 1668 Estimated Detection Level for BZ#126 is 50 picograms BZ #126/gram of soil

Determination by method 8082 is 20 times more sensitive

For BZ #169 it is 890 times more sensitive.

# Congener Determinations

<u>Method</u>	<u>Congener Determination</u>	<u>Limit</u> ( $\mu\text{g}/\text{kg}$ )	<u>Limit</u> ( $\text{ng}/\text{g}$ )	<u>Limit</u> ( $\text{pg}/\text{g}$ )
Method 8082	Congener 126	1	1	1,000
Method 1668	Congener 126			2,000
Method 8082	Aroclor 1254	33	33	33,000
Method 8082	Aroclor 1254 – using the 0.0000373 fraction of Congener 126			1.23

# What PCB Concentration Exceeds Universal Treatment Standard for TCDD?

- UTS for TCDD is 0.001mg TCDD/kg soil
- Assume this is also the TEQ limit (none set yet)
- Therefore: 0.001 mg TEQ/kg soil
- TEQ for Aroclor 1254 is 7.6 ug/g Aroclor 1254
- $(0.001 \text{ mg TEQ/kg soil}) / (7.6 \text{ ug TEQ/g Aroclor 1254}) = 130 \text{ ug Aroclor 1254/g soil}$
- 130 ppm Aroclor 1254 exceeds UST TEQ for TCDD

# Conclusions

If an Aroclor pattern is detected by method 8082, TEFs can be determined in the picograms per gram level in soil

Method 1668 for BZ#126 is 20 times higher detection level than determined by method 8082 in this way.

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