EBC New Hampshire Program
How to Successfully Manage PCBs in Buildings and / or the Environment
Welcome from the Committee Chair

Bob Varney

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Welcome to Eversource

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Eversource Energy
Overview of PCBs in Building Materials and the Environment

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HOW TO SUCCESSFULLY MANAGE PCBs IN BUILDINGS AND/OR THE ENVIRONMENT

EBC NEW HAMPSHIRE PROGRAM
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Presented by:
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PRESENTATION OUTLINE

PCBs IN BUILDING MATERIALS

- WHY IS THIS TOPIC WORTH DISCUSSING NOW?
- WHERE TO INVESTIGATE PCBs IN BUILDINGS?
- WHEN TO CONSIDER ADVISING CLIENTS TO INVESTIGATE?
- WHAT SITUATIONS SHOULD PROMPT YOUR AWARENESS?
- HOW TO INVESTIGATE PCBs IN BUILDINGS?
- HOW TO MANAGE RISKS IF PCBs ARE PRESENT?
- WHAT ARE THE KEY ISSUES TO DISCUSS WITH CLIENTS?
AWARENESS OF THIS ISSUE IS GROWING

- EPA website
- Technical conferences
- Press releases/TV
  - High profile cases
- Social media
- Disposal facilities
- Scientific research
EXAMPLE OF GROWING AWARENESS

Number of Publications listed in Academic Search Engines

Increase in scientific studies

PubMed
Web of Science
EXAMPLES OF GROWING AWARENESS

High-profile cases

- **2005 – Parent tested caulk in Yorktown, NY**
  - Elevated PCBs in caulk and soils were found and removed
  - School District settlement with Monsanto (2009)

- **Other cases:**
  - 2008-present: New York City schools
  - 2009-present: Lexington, MA schools – 2012 class action
  - 2011-present: Westport, MA schools – 2014 class action
  - 2014-2017: Malibu, CA schools

Growing awareness is contributing to increased pressure to address the issue.
WHY DISCUSS THIS NOW? . . .

. . . THE RISKS!

- **Legal**
  - Regulatory compliance (TSCA)
    - Unauthorized use
    - Disposal requirements
  - Claims
    - Personal injury
    - Toxic tort

- **Financial**
  - Project cost
  - Lost use of assets
  - Business interruption
  - Construction delays

- **Reputational**
WHERE TO INVESTIGATE PCBs IN BUILDING MATERIALS?

Partial list:

- Caulk/glazing/join compounds
- Fluorescent light ballasts
- Paints
- Lacquers, varnishes
- Laminating adhesives, tapes, mastics
- Flame retardants
- Waterproofing coatings
- Sealants
WHERE TO INVESTIGATE?

Caulk in expansion joints
WHERE TO INVESTIGATE?

Window caulk and glazing
WHERE TO INVESTIGATE?

Fluorescent light ballasts
WHERE TO INVESTIGATE?

Varnish

Mastic

Paints

Sealants
WHERE TO INVESTIGATE?

External environment – near buildings with PCBs on the exterior
WHEN TO ADVISE CLIENTS TO CONSIDER INVESTIGATING?

* The age of the building materials is relevant
  • Construction or renovation from 1950-1978+

Situations that should trigger awareness:
• Renovations or demolitions
• Due diligence/mergers & acquisitions
• Site assessments (non-transactional)
• Property condition assessments?
• Liability valuation
  • Financial accruals (reserves)
  • AROs (FAS 143/Acctq. Stds. Codification 410)
WHEN TO ADVISE CLIENTS TO CONSIDER INVESTIGATING?

**Situations that should trigger awareness:**

- **Stakeholder concerns**
  - Lease/mortgage obligations
  - Occupational health
  - Exposure potential
  - Owner/employer/employee/tenant/contractor/lender/other

- **Crumbling/deteriorated caulk**

- **Fluorescent light ballasts**

- **Others (e.g., agency/lender funding requirements)**?
HOW TO INVESTIGATE PCBs IN BUILDING MATERIALS?

- Decide if, and how, you want to sample!
  * No current regulatory requirement to do so
    - Direct (source) sampling
      - Evaluates sources first
    - Indirect sampling – air samples (for volatilized PCBs); wipe samples (for PCBs in dust)
      - Evaluates exposure routes first
      - Opposite of common approach
    - No sampling – PCBs assumed present

There can be significant risks in investigating – and not investigating – PCBs in building materials that should be well considered in forming an overall project strategy.
HOW TO INVESTIGATE?

- Develop inspection and sampling plans
- Use proper procedures (regulations and policies)
  - Sampling (location and collection requirements)
    - Characterization
    - Verification
  - Decontamination
  - Laboratory methods (including extraction)
  - Data validation
  - Consider regional differences within EPA
**HOW TO MANAGE RISKS IF PCBs ARE PRESENT?**

- Know the TSCA requirements for clean-up and disposal
  - Excluded PCB product
  - PCB bulk product waste
  - PCB remediation waste
    - Self-implementing (prescriptive clean-up goals)
      - High vs. low occupancy areas
    - Performance-based
    - Risk-based

Clients should be advised that the various clean-up and disposal options in TSCA can have significant schedule, cost, and risk management considerations.
HOW TO MANAGE RISKS IF PCBs ARE PRESENT?

• Source removal (examples)
  • Bulk removal (caulk, porous materials)
  • Sandblasting (paint, concrete)
  • Scarification (concrete)
  • Sawcutting (concrete, caulk)

• Mitigation (examples)
  • Engineering controls
    • Encapsulation, physical barriers, ventilation
  • Administrative controls
    • Best management practices
**HOW TO INVESTIGATE?**

- **Assume >50 ppm**
  - **Mitigate**
    - **Bulk sample**
    - **Air and/or wipe sampling**
    - **Determine Exposure Limit (EL)**
      - Abate and/or mitigate if >50 PPM
      - No Action if <50 PPM
      - Direct sampling if > EL
      - No action if < EL
  - **Re-sample**
  - Re-sample
  - Re-sample

- **Abate**
  - **Simplified decision tree: Suspect PCB-containing building materials**

- **Eng. and Admin. controls if > EL**
  - Abate and/or mitigate if >50 PPM
  - No action if < EL
KEY ELEMENTS FOR SUCCESS

PCBs in Building Materials

- Regulatory
- Technical
- Project Strategy
- Communications
- Risk Management
SUMMARY

• Growing awareness → increased pressure

• Significant legal, financial, and reputational risks

• PCBs exist in multiple inside/outside locations

• Situations that should trigger awareness

• Engage experienced experts
  • Multiple technical disciplines and regulatory expertise
These projects demand a strategic plan which considers:

- Risks of investigating/not investigating
- Project cost and schedule
- Optional regulatory pathways available
- Characterization and verification approach
- Risk assessment/cleanup goals
- Remediation/mitigation methods
- Risk communication
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SIGNIFICANT COSTS FOR THESE PROJECTS

• Not a lot of consistent data yet (caulk example)
  • 100’s-1,000’s of samples (~$65-$130/sample)
    • Characterization and verification
  • Caulk removal w/disposal (~$50-$170/LF)
  • Substrate removal (~$55-$120/LF)
  • Caulk & substrate repairs (~$50-$125/LF)
  • Encapsulation (~$55/LF)
  • Remedy effectiveness sampling (additional)
    • Air and wipe samples
  • Excludes other building materials, consultant & attorneys fees
DEFINITIONS

- **Excluded PCB products** - PCB materials which appear at concentrations less than 50 ppm and which were legally manufactured, processed, distributed in commerce, or used before October 1, 1984.

- **PCB bulk product waste** - waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal was ≥50 ppm PCBs.

- **PCB remediation waste** - waste containing PCBs as a result of a spill, release, or other unauthorized disposal . . . (certain dates and concentrations apply)
DUE DILIGENCE CONSIDERATIONS

• **State of knowledge** – consultant/legal awareness

• **Standard of care** – evolving

• **ASTM 15270-13**: General consultant consensus – falls within the building materials exclusion

  *XI.1.4.3.2 Building Materials Exclusion* - This exclusion applies to releases from products that are part of a building that result in exposure within that structure. This exclusion has been frequently invoked to challenge claims for abatement of asbestos-containing building materials but can also apply to Lead-Based Paint (LBP). To fall within this exclusion, the release must be from a product that is part of the structure **AND** result in exposure within the structure.

• **Environmental impacts?**
PCBs IN INDOOR AIR

Figure 5-1. Illustration of the complexity of PCBs in school buildings
Main Plasticizer Uses:

- Paints and surface coatings (usually 10-12%, but up to 30% PCBs; various Aroclors)
- Adhesives (up to 11% PCBs; various Aroclors)
- Caulk and joint sealants (10% PCBs or greater, typically A1254)
- Insulation and other building materials (4-70% PCBs; typically A1254 and A1268)

Adapted from Durfee et al, 1976 and Erickson & Kaley, 2010
Timeline: 1929 to Present

- **1929**: PCBs first commercially manufactured
- **1950**: PCBs first used in caulk (approx)
- **1968**: PCBs found in fatty tissues of birds (Riseborough)
- **1971**: OSHA PELs
- **1976**: TSCA enacted
- **1977**: NIOSH REL
- **1979**: PCB use prohibitions
- **1981**: PCBs found in indoor air in offices, labs, and homes (MacLeod)
- **1991**: PCBs in indoor air linked to sealants (Benthe)
- **1994**: Proposed Mega Rule
- **1998**: Mega Rule
- **1999**: PCB Use Prohibitions
- **2004**: Caulk tested in Boston schools (Herrick)
- **2009**: USEPA issues Public Health Levels of PCBs in school indoor air and BMPs for caulk
- **2010**: EPA issues ANPRM for reassessing NLPCBs
- **2010**: NYC Consent Agreement for PCB caulk in schools
- **1977-1990s**: EPA’s primary focus on sources of liquid PCBs
- **1970-1979**: PCB Phase Out
- **1970-1979**: Use of PCBs in Bldg Materials
- **1979 onwards**: Limited authorizations of non-totally enclosed uses

**Categories:**
- **History**
- **Rulemaking**
- **Papers**
- **Criteria**
1970S – PCBs START TO BE CONTROLLED

- 1970/1971 – Monsanto voluntarily stops selling PCBs for use in plasticizers/coatings and open systems
- 1973 – FDA rules to prevent contamination of foods from contaminated feed, environmental sources, and packaging materials.
- 1976 – Toxic Substances Control Act
- 1979 Rule – “PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions”
  - All use of PCBs in other than a totally enclosed manner banned after July 2, 1979, unless authorized. Continued use in building materials not authorized.
  - Note to disposal requirements at §761.10 says PCBs need not be retired early per that subpart, but that early removal may be required under other subparts
1998 PCB MEGA RULE

- 1991 – USEPA announces TSCA regulations to be overhauled
- 1994 – Proposed regulations issued
  - USEPA stated that while use of unauthorized pre-TSCA PCB materials “is a violation of the existing PCB regulations”, premature removal is difficult and “enormously expensive”
  - Proposed authorizing continued use of PCBs in pre-1979 solid products subject to notification, marking, compliance with indoor air criteria, and periodic monitoring
- 1998 – Mega Rule promulgated
  - Proposed 1994 language that would have authorized continued use of PCBs >50 ppm in solid products was NOT PROMULGATED
  - Brief section established standards for managing disposal of “bulk product wastes” containing PCBs >50 ppm, including construction materials
Liquid PCBs and remediation of contaminated media were primary focus

- 1990 Superfund guidance
- Releases from electrical equipment, pipelines, and other authorized uses

PCBs were generally considered to have low volatility and mobility at this time

PCB-contaminated building materials, e.g. concrete could be managed in place if cleaned and encapsulated

- Limitations of encapsulation have since been established

Limited attention to the presence of PCBs in solid products
INITIAL FOCUS HAS BEEN LARGELY ON SCHOOLS

• 2004 – Herrick survey of Boston structures triggered interest in United States
• 2005 – Parent tested caulk in Yorktown, NY
  • Elevated PCBs in caulk and soils were found and removed
  • School District settlement with Monsanto (2009)
• Other high-profile cases:
  • 2008-present: New York City schools
  • 2009-present: Lexington, MA schools – 2012 class action
  • 2011-present: Westport, MA schools – 2014 class action
  • 2014-present: Malibu, CA schools
A has been slow to enforce regulations regarding unauthorized PCBs in building materials.

Focus on impacts in schools has been growing due to results of studies and increased sensitivity regarding potential exposure of children to PCBs.

- 2009 BMP for PCBs in caulk
- 2009 USEPA public health guidance
- 2009-2012 USEPA studies on emissions from caulks and light ballasts, secondary sources, encapsulation, chemical scrubbing of paint, and characterization of PCB conditions in six schools

- 2010 – USEPA issued ANPRM for re-assessing use of non-liquid PCB materials
  - No rulemaking to date
COMMERCIAL/INDUSTRIAL FACILITIES ARE ALSO NOW RECEIVING SCRUTINITY

- High-profile school cases have increased the awareness of PCBs in building materials
- Expansion/maintenance projects generate paint and sealant wastes
  - Disposal facilities have been sensitized to PCBs in C&D material; screening often required
  - Manifesting rules require exception reporting to generator and USEPA
- Due diligence may identify potential for PCBs in building materials
DEVELOPING A STRATEGY FOR ADDRESSING PCBs IN CONSTRUCTION MATERIALS

- Cost and schedule implications for abatement can be very significant for owners, tenants, et al.
- No obligation to test specified in TSCA rules, but if detected >50 ppm, is an unauthorized use which must be addressed.
- May need to consider potential impacts to other media (e.g. soils next to buildings, plant lubrication system, products stored/produced in a facility).
- Agency guidance is not well-defined – currently in a state of flux and inconsistent among regions.
- Approach will be highly dependent on site context, e.g. schools cf. commercial/industrial building; owner, tenant, etc.
PCB & Remediation: Options & Strategies
Clear State Of PCBs

1. What the Client wanted
2. How the Client explained it
3. How the project manager understood it
4. How the Architect visualised it
5. How the Engineer designed it
6. How Health & Safety wanted it
7. How the Contractor built it
8. When it was delivered
9. What the Client paid for
10. What the Client received
11. What the client really needed
Approach

• Standard of Care for Contractors
  • Public vs private bids
  • Specifications vs Design Build
• BMP for contractors are typically outlined...but to what degree
  • Based on each company policy and procedures
Approach

• Type of disposal plan will impact cost and project direction
• Scope of Work should coincide with EPA disposal option
• Design Specifications typically have many conflicting agendas
  • Owner – Architects – Consultants – Contractors
  • Lender and insurance
Bulk Product

- Cost Effective and no need for EPA involvement
- No contractor work plan – although not bad practice to have the contractor develop one
- Good option for demolition and window replacements
- Complications around segregation of BPW and Remediation Waste
- Confusion around cut lines into substrate and clearance sampling
  - Window replacements – Jump the frame
  - Contractor safety
Self-Implementing

- Approved SIP
  - Allows for comprehensive and competitive bids with least likely scenario to generate change orders
- Clear on clearance sampling
- Approval process can be lengthy and costly
- Good option for re-occupancy or minimize long term liability having EPA approval
- Soil issues would likely trigger this direction based on volume – which could lead to other questions
Risk Based

• Typically involves similar process as a SIP with Risk Based approach to leave material in-place (or cap)
• Usually involves renovation projects with structural issues
• Encapsulants
  • SIKA products – Sika Guard
  • 62 Durable 2 part epoxy – multi colors
  • 760 is a clear coat – water based

• Prep of surface is key
• Caution of pre-treatment
• Application – roll vs spray
Chemicals For Decon

- Approved PODFs (performance-based organic fluid)
  - Kerosene, Diesel Fuel, Terpene Hydrocarbons (turpentine)

- Alternate Decon Materials
  - Capsur – aqueous based solvent – suspend pcbs
  - AMTS (activated metal treatment)
    - Reductive dichlorination
Paint & PCBs

• Paint on walls
• Difficult to assess which option for abatement
  • Scrap, Power wash, sandblast, Dry Ice, chemical

• Care to not imbed paint into porous surfaces
• Chemical may lead to indoor air issues
• Cost analysis of bulk disposal vs manual removal
Paint & PCBs

Painted Steel

- Considered a porous surface on a non-porous surface – 761.79
- RCRA /TSCA Issue unless TCLP falls out
- Scrap Metal Recovery Ovens (Transformers)
- Smelters – No known approved facilities
- Paint On Wood (Mills)
Waste Approach

Establish Waste Profile

• Samples (bulk or TCLP)

• If the waste doesn’t pass a TCLP, as required by disposal
  • remediation waste

• When removing PCB caulk (with significant concentrations) only without substrate it may fail TCLP
Waste Approach Continued

Obtain Approvals
• Questions may be asked about other hazards in material

Storage & Shipment
• PCB Bulk Product Waste
  • non-hazardous material Under 761.62 does not require hazardous waste manifests or labeling
• Containers
• Shipping Paperwork
Useful Recent Events Continued

Property Transactions & Lawsuits

• Peer reviews
• Presents critique of work
• Standard of care
• Waste management
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PCB Disposal Considerations

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Operational Issues

Waste Management Considerations

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Waste Management

Turnkey Recycling and Environmental Enterprises (TREE)

• Located in Rochester, NH - RCRA Subtitle D Landfill
  - Accepting non-hazardous Special Wastes
  
  - TSCA authority - Permit references (PCB’s) that are regulated under the Toxic Substances Control Act, *as amended*, (ref. 40 CFR Part 761). The purpose of the as amended language is to insure that TREE’s permit would remain consistent with the requirements of 40 CFR 761 as they change.

  - Authorization letters from the NH DES for the management of PCB Bulk Product Waste, and PCB Remediation Wastes (less than 50ppm PCB)
Waste Management
Disposal of PCB Bulk Product Waste

• TREE can accept PCB Bulk Product Wastes under 40 CFR 761.62(b) Disposal in solid waste landfills.
  - Federal regulations are the minimum standard
  - Generator and disposal state regulations may impact disposal options.

• Facility Specific Requirements:
  - Bulk Product Waste > 50 must pass TCLP PCB (results less than 10ug/L)
PCB Bulk Product Wastes
Non-liquid Manufactured Product

Sampling Requirements
- Bulk Product Waste
  • Representative Samples of waste stream proposed for disposal (TCLP Required)
  • TCLP PCB
  • ACM
  • Metals analysis if painted
  • Other contaminants of concern

Considerations:
• 15 Day Notification
• Language Specified in TSCA.
• The more information submitted for the approval also expedites the approval process (sampling plans, work plans)
• BPW removed from substrate not accepted
PCB Bulk Product Wastes
Non-liquid Manufactured Product

Considerations:

• 15-Day Notification - 40 CFR 761.62(b)(4)
  
  - “Notice shall state that the PCB bulk product waste may include components containing PCBs at ≥ 50 ppm based on analysis of the waste in the shipment or application of a general knowledge of the waste stream (or similar material) which is known to contain PCBs at those levels, and that the PCB bulk product waste is known or presumed to leach <10 μg/L PCBs.”

• Shipping documentation - cannot terminate a hazardous waste manifest at a non-hazardous landfill.
PCB Remediation Wastes
Materials impacted as a result of a spill

Considerations:
• Sampling plan(s) and results must be clearly defined in approval package
• EPA authorization in the form of a SIP or Risk Based Approval
• Shipping documentation - cannot terminate a hazardous waste manifest at a non-hazardous landfill.
• Remediation wastes at 50 ppm PCB or greater will need to be managed at a hazardous waste landfill
PCB Remediation Wastes
Materials impacted as a result of a spill

Considerations:
• 15-Day Notification - 40 CFR 761.61(a)(5)(iv)
  - The generator must provide written notice to each off-site facility where the waste is destined for an area not subject to a TSCA PCB Disposal Approval
    • quantity to be shipped
    • highest concentration of PCBs
    • at least 15 days before the first shipment of bulk PCB remediation waste
Questions?

What’s Left After PCB Abatement?
Case Study Presentations

Jason Wilkinson

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CASE STUDIES
CASE STUDY #1

- Industrial Building Constructed Pre-1979
  - Potential Property Transaction
    - Seller: Has not tested building materials for PCBs
    - Buyer: Looking to turn building into mixed use, significant renovations would likely be required as part of site development
CASE STUDY #2

• Multi-story Office Building Constructed Pre-1979
  • Potential Property Transaction
    • Seller: Has not tested building materials for PCBs
    • Buyer: Looking to continue use of building for office space, with a daycare; no plans to renovate or demolish
CASE STUDY #3

• Multi-story Office Building Constructed Pre-1979
  • Owner:
    o Has not tested building materials for PCBs
    o Plans to demolish
CASE STUDY #4

- Industrial Building with an Electrical Transformer Spill
  - Owner
    - During site investigation activities, stained soil adjacent to transformers. No indication on transformers if it contains PCBs
QUESTIONS???