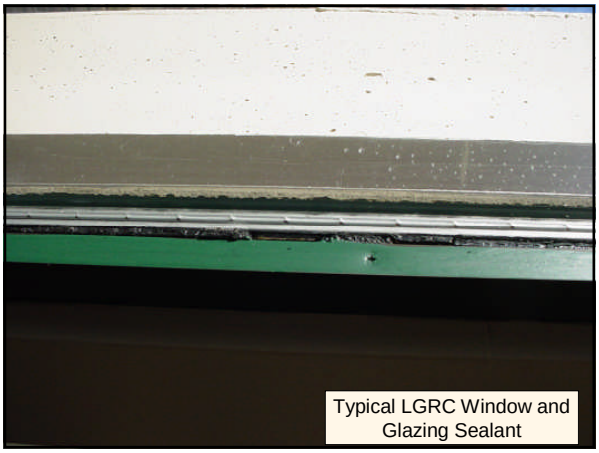
What Are PCBs?

- Synthetic organic compounds
- Produced in U.S. from 1929 to 1977
- Used in many industrial and commercial products – inexpensive, fire resistant, resistant to degradation, electrical insulating properties, etc.
- Used as a plasticizer in caulk and sealants from 1950s to late 1970s
- Toxic, persistent and bioaccumulate in the environment
- Major source of population exposure is through diet (e.g., fish)



Typical LGRC Window and Glazing Sealant

Project Timeline

- March 25, 2009 – PCBs in interior window glazing sealant sample during routine assessment for upcoming electrical work
- April 2009 – Inspection, inventory and confirmation sealant sampling
- May 2009 – Additional surfaces sampling; indoor air sampling; notifications; and data posting
- May 27, 2009 – Informational Meeting
- June 2009 – Evaluate Remedial Options

Project Timeline (con't)

- July 2009 – Pilot testing and Interim Measures Plan submitted to EPA for review/approval
- November 2009 – Meeting between UMass and EPA to discuss plan
- March 2010 – Draft Consent Agreement provided by EPA to UMass
- February – October 2010 – Continued monitoring of pilot test conditions
- November 2010 – Informational Meeting

Findings

- Window glazing sealant on majority of low-rise building and Tower A windows is visually similar and contains > 50 ppm PCBs (9,650 ppm on average)
- Concentrations exceed regulatory thresholds for authorized use
- Majority of sealant appears intact and in good condition
- Over 900 windows in the buildings

Potential Exposure Pathways – Window Glazing Sealant

- Inhalation of indoor air that may contain dust/particulate matter with PCBs
- Direct contact with glazing sealant and/or dust/particulate matter
- Incidental ingestion following direct contact
- Data collected from 2006 to 2010 to assess pathways (indoor air, surface wipes, and dust/particulate)

Exposure Limits - PCBs

- Indoor Air
  - OSHA PEL = 500 ug/m^3 (8 hour TWA)
  - ACGIH TLV = 500 ug/m^3 (8 hour TWA)
  - NIOSH REL = 1 ug/m^3 (10 hour TWA)
  - EPA (2009) Public Health Level for PCBs in Indoor School Air for 19+ ages and adults = 0.45 ug/m^3
- Surfaces
  - EPA high occupancy criteria for non-porous surfaces = 10 ug/100cm^2
  - Project – specific criteria for porous surfaces = 77 ug/100cm^2 (calculated)

Indoor Air Data Summary

- Low concentrations of PCBs detected in samples – 2006 to 2009
- All samples from Tower A below action levels (0.03 – 0.27 ug/m^3); 4 samples in 2006; 5 samples in 2008; 5 samples in 2009
- Low rise samples slightly more elevated during exterior work (23 samples); controls were implemented during work
  - All post-abatement samples (2008 [8 samples] and 2009 [6 samples]) below action levels (< 0.45 ug/m^3); ranged from 0.045 – 0.26 ug/m^3

Interior Surfaces Summary

- Window ledge samples exhibited higher concentrations than other surfaces
- Majority of samples below EPA's high occupancy criteria (2006, 2007, and 2008)
- General surface cleaning was effective in reducing concentrations
- All post-abatement samples (23) have been below EPA's criteria (< 10 ug/100cm^2) and project-specific criteria (< 77 ug/100cm^2)

Putting the Concentrations and Risks in Perspective

- Calculated surface action level= 77 ug/100cm^2
- Based on 25,000 contacts with window glazing sealant itself (with no hand washing) over 25 years
- Comparison of PCB daily intake from dietary sources to daily intake at action level:

Average dietary intake[1]	0.004 µg/kg/day
Estimated intake from window glazing[2]	0.002 µg/kg/day

[1]Taken from ATSDR, Toxicological Profile for Polychlorinated Biphenyls, http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=142&tid=26#bookmark06

[2]Based on dermal contact with glazing 4x/day with subsequent incidental ingestion

Putting the Concentrations and Risks in Perspective

- All wipe data of surfaces below Action Levels
- All post-abatement air data below EPA action level of 0.45 ug/m^3
- Summary: No Significant health risks associated with potential exposures to window glazing sealant via inhalation, dermal contact or incidental ingestion

Remedial Approach

- Current minimal PCB exposure based on indoor air and surface samples
- Regulations require sealant to be addressed
- Stabilize conditions via Interim Measure until sealant can be removed
  - Cleaning of window areas
  - Containment of window sealant using a barrier (tape and new caulk)
  - Long term monitoring until windows replaced
- Pilot testing of Interim Measure conducted to select products and approach

Pilot Test Results

- Remedial goals/cleanup levels can be achieved through direct removal of dust/particulates and cleaning of windows
- Remedial goals to minimize direct contact and reduce exposure potential to the window sealant can be achieved through the use of tape and new caulking application over the existing window glazing sealant.

New caulking over existing glazing sealant

Next Steps

- Resubmit Interim Measures Plan as part of the Consent Agreement
- EPA Approval of Interim Measure Plan
- Finalize Consent Agreement
- Implement Interim Measures
- Implement long-term/final solutions
  - Replace windows as projects come up (e.g., Tower A floors 3, 7, and 8 renovations)