



# ***Keep It Pest and Contaminant Free***



*Making connections  
for healthier, more  
energy efficient homes*



## Pests Can:

- Trigger/cause asthma and allergies
- Bite
- Contaminate food
- Lead people to overreact and ignore pesticide labels
- Transmit disease
- Hitchhike in belongings

## Pesticides Can Cause:

- Eye, nose, throat irritation
- Skin rashes, stomach cramps, nausea
- Central nervous system damage
- Kidney damage
- Increased risk of cancers

# What all pests need

- Food
- Water
- Date (another pest)











# Rodents



# Integrated Pest Management

- Keep them out and give them no place to hide
  - Change surrounding landscape
  - Block pest entries, passages, hiding places
- Reduce food availability
  - Practice proper food storage and disposal
  - No dirty dishes in the sink overnight
  - Clean crumbs, grease etc.
- Knock down population
  - Traps
  - Appropriate pesticides

# Pest Control

- No Spray & Fogging for roaches & mice
- Monitoring pest populations & complaints
- Reduce asthma triggers











# Contaminant Priorities & Health Issues

- Lead & Lead-Based Paint – learning difficulties, neurological problems
- Environmental Tobacco Smoke – lung cancer, heart problems, SIDS
- Radon – lung cancer
- Asbestos – cancer, mesothelioma
- Volatile Organic Compounds (VOCs) – breathing issues, allergic reactions, headaches
- Formaldehyde - respiratory issues, nasal cancer
- Carbon monoxide – death, fatigue, headaches



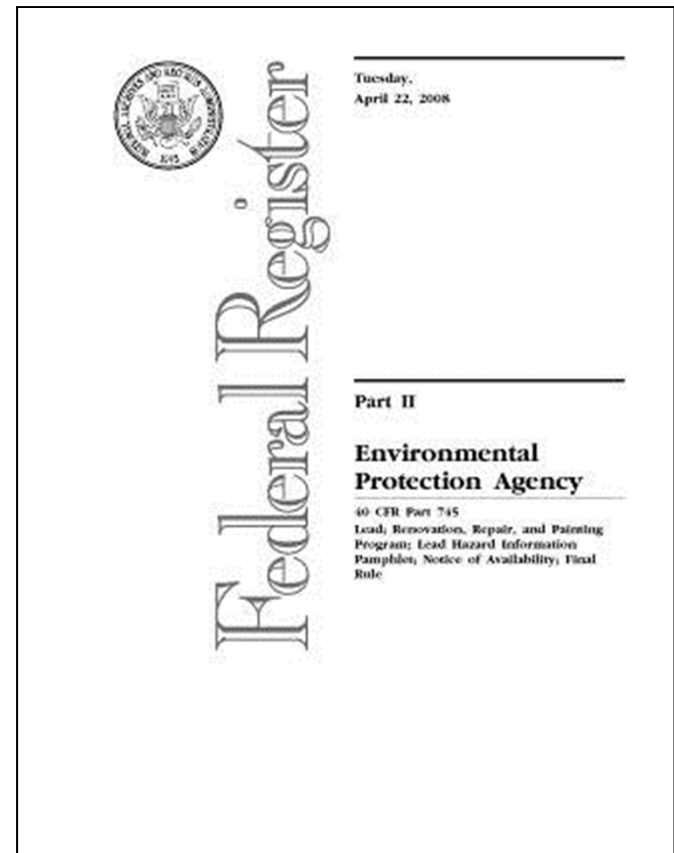
# Lead Hazards

- Peeling, flaking paint
- Lead in dust
- Lead in soil



# Basics of RRP Rule

- Effective April 22, 2010
- Applies to pre-1978:
  - Target Housing (same as disclosure rule)
  - Child-occupied facilities
- Triggers:
  - Compensation
  - Paint disturbance (a/k/a renovation) >
- 40 CFR 745.80 to 745.91
- April 22, 2008 *Federal Register*



# Major Exclusions

- Houses built in 1978 or later
- Not target housing or child-occupied facility
- Risk assessor or lead inspector has determined where lead-based paint is present and you avoid it
- Perform only minor repair and maintenance work
  - $\leq 6$  ft<sup>2</sup> painted surface/ room interior activities, or
  - $\leq 20$  ft<sup>2</sup> painted surface for exterior activities
- Do-it-yourself – no compensation
  - Realistically only applies if tenant does work on tenant's unit.



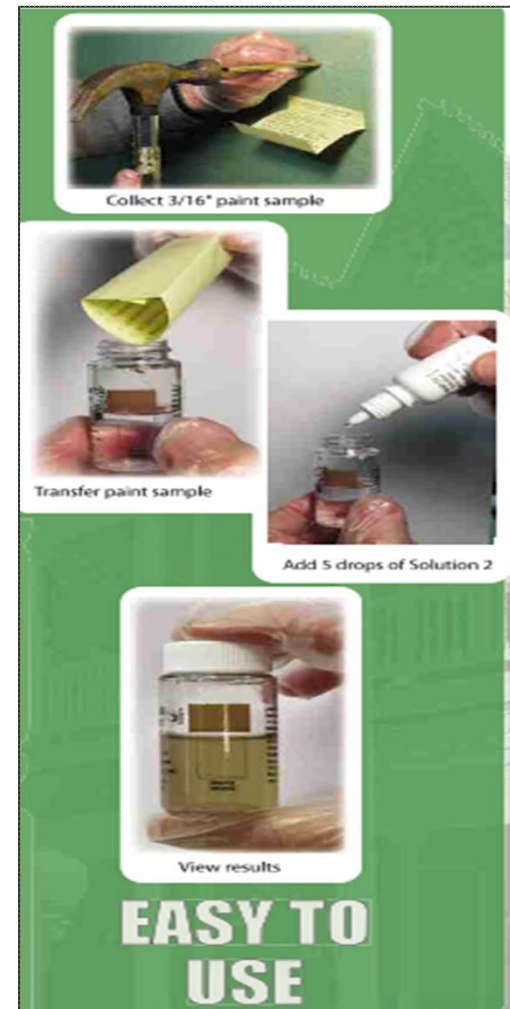
# Do You Have Lead-Based Paint?

	Percent of Housing Units <sup>1</sup> Without Lead-based Paint <sup>2</sup>		
Age	Interior	Exterior	Anywhere
Before 1940	21%	28%	13%
1940 to 1959	54%	41%	31%
1960 to 1977	84%	87%	76%
1978 to 1998 <sup>3</sup>	96%	97%	93%

1. Housing units includes rental and owner-occupied housing
2. Lead-based paint is paint with more than 1 mg of lead per square centimeter
3. Housing built after January 1, 1978 not covered by rule

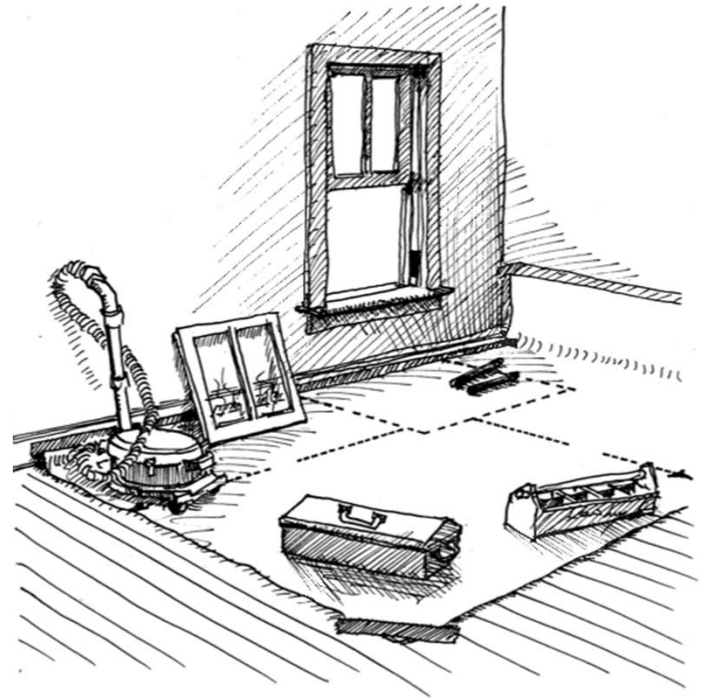
# Testing Options

- XRF by Licensed Lead Inspector
- EPA-approved test kits
  - D-Lead
  - Lead Check
  - State of MA test
  - Lead Risk Assessor/  
Inspector sent away to  
lab



# So What Will Change?

- “Certified Renovation Firm”  
Disturbs Paint
- “Certified Renovators” Supervise  
Work
- Mandatory Work Practices
  - Isolate work area
  - Contain dust
  - Thoroughly clean-up work area for  
debris and dust
- Post-renovation Cleaning  
Verification
- Documentation!





# Cleaning Verification Card

**EPA Post-Renovation Cleaning Verification Card**



**Unused Wet Disposable Cleaning Cloth**



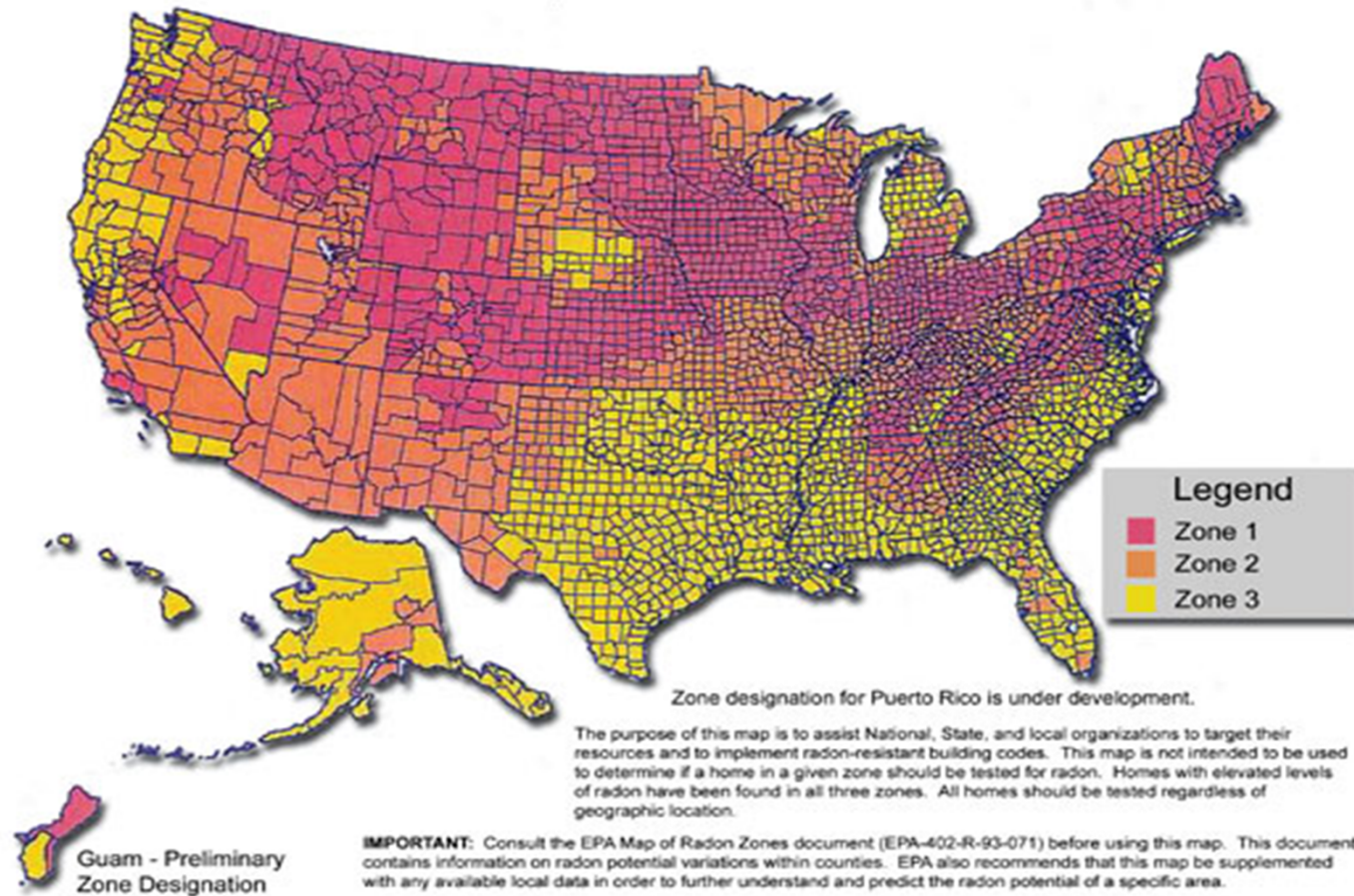
**Marginally Passing Wet Disposable Cleaning Cloth**

This card is good until last day of the month and year indicated below.

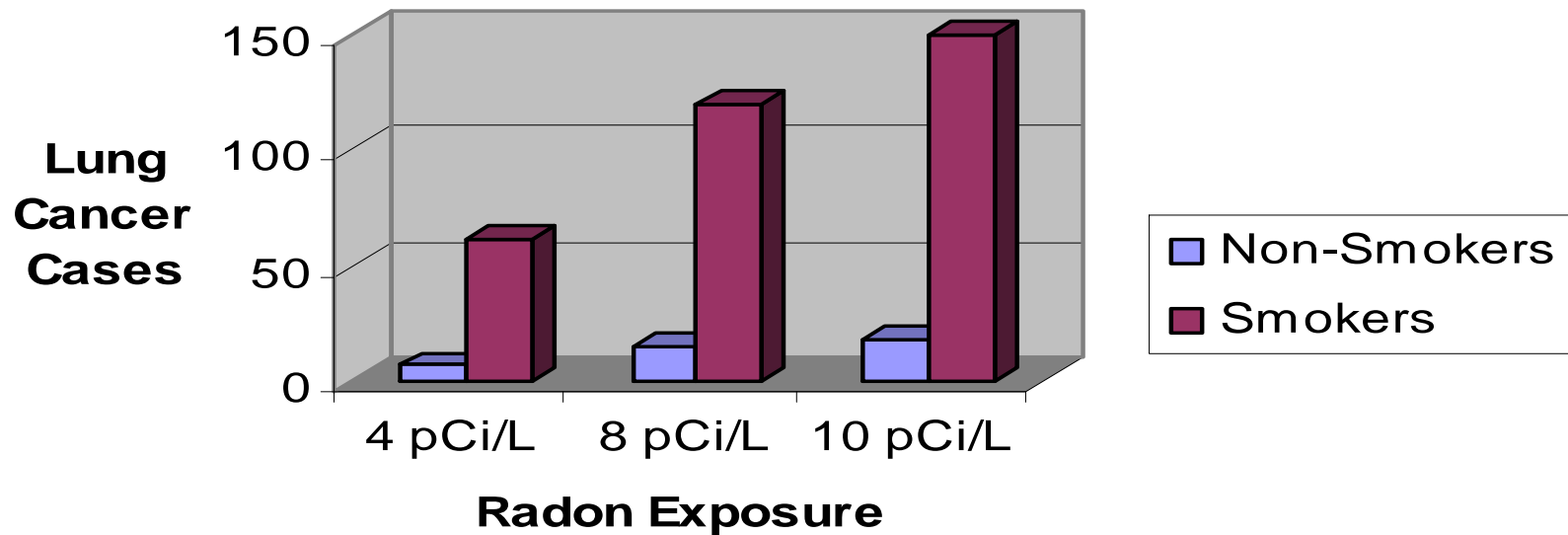
Month	1	2	3	4	5	6	7	8	9	10	11	12
Year 20xx	10	11	12	13	14	15	16	17	18	19	20	21

# EPA Radon Zones

EPA Map of Radon Zones



## Estimated Lung Cancer Cases In a Population of 1,000 (US EPA, 2005)



✓ 1/15 homes may have an elevated radon level (above EPA action level of 4 pCi/L).



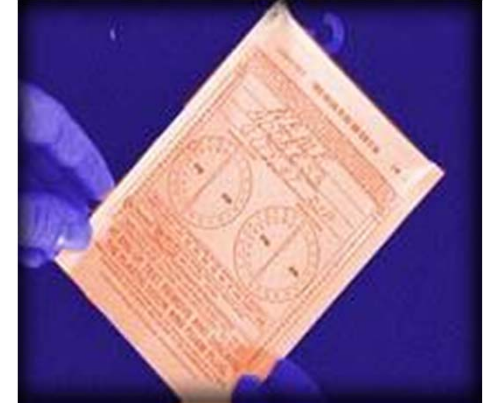
# How Radon Gets into a Home



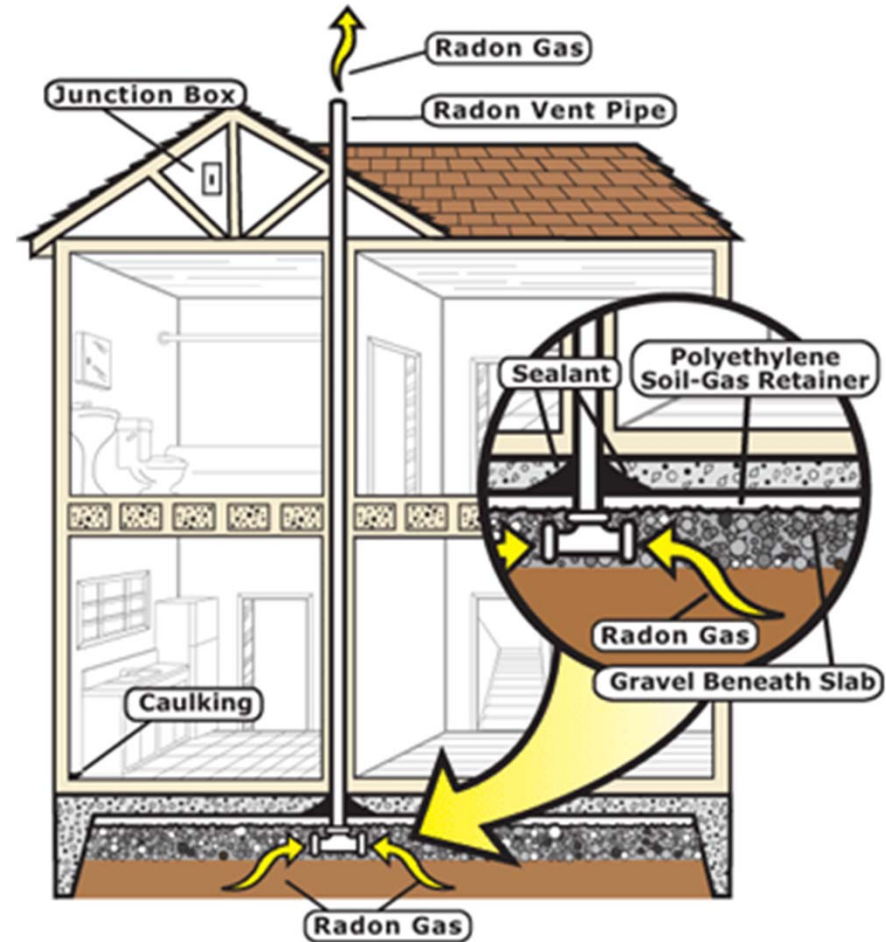
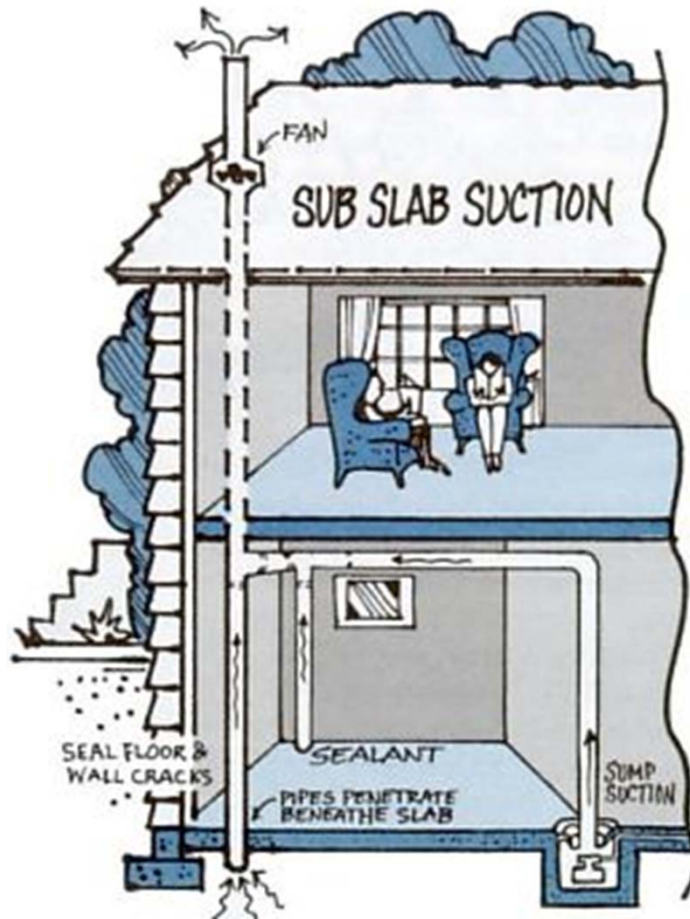
- Cracks in solid floors
- Construction joints
- Cracks in walls
- Gaps in suspended floors
- Gaps around service pipes
- Cavities inside walls
- Other openings
- Water supply

# Testing for Radon

- Short Term
  - Minimum 48 hours - \$10-\$20
  - Useful results (home sales, occupancy, energy upgrades)
- Long Term
  - 91 days to 1 yr - \$20-\$30
  - Better indicator of need to mitigate
- If result is 4 pCi/L or higher take a follow-up test OR mitigate radon
- Energy Upgrades: If work increased levels > 4 pCi/L mitigate radon
- [www.sosradon.org](http://www.sosradon.org)



# Radon Resistant Systems





# Radon Precautions – Cover Soil



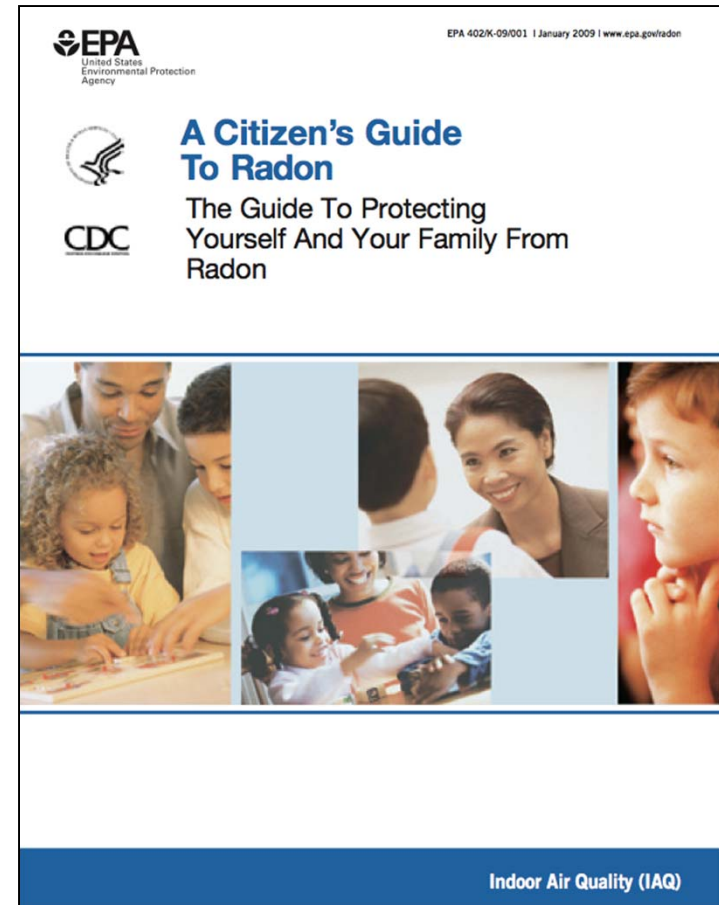


# Radon Mitigation Costs

	Average Costs
New Construction	
- Passive only	\$350 - \$500
- Active system	\$650 - \$800
Existing Homes	\$800-\$2,500

# Resources

- EPA Home Buyer's and Seller's Guide to Radon
- EPA Citizens Guide to Radon
- State resources



# Asbestos Uses



# Asbestos – Health Effects

- Asbestosis
- Lung cancer
- Mesothelioma
- Smokers are at greater risk!





# Concerns for Energy Upgrades

- Disturbing insulation
  - Pipes
  - Vermiculite
- Consider vermiculite testing
- Precautions during blower door testing; pressurize vs. depressurize



# Volatile Organic Compounds

EPA found concentration of VOC's to be 2-5 times greater in the home.

During or immediately after paint stripping activities, VOC levels can be 1,000 times higher than the outdoors



# Volatile Organic Compounds

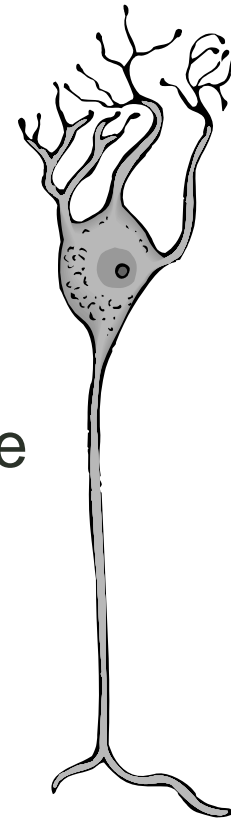
- Air Fresheners
- Cleaning Products
- Sprays & Coatings
- Wood Products
- Carpets
- Vinyl Floors
- Hobbies
- Home Maintenance



# Why Avoid VOCs?

## Potential health effects:

- Eye, nose, throat irritation
- Headaches, nausea, coordination
- Liver, kidney, and brain damage
- Some can cause cancers
- Child development





## Potential VOCs and Contaminants During Energy Upgrades

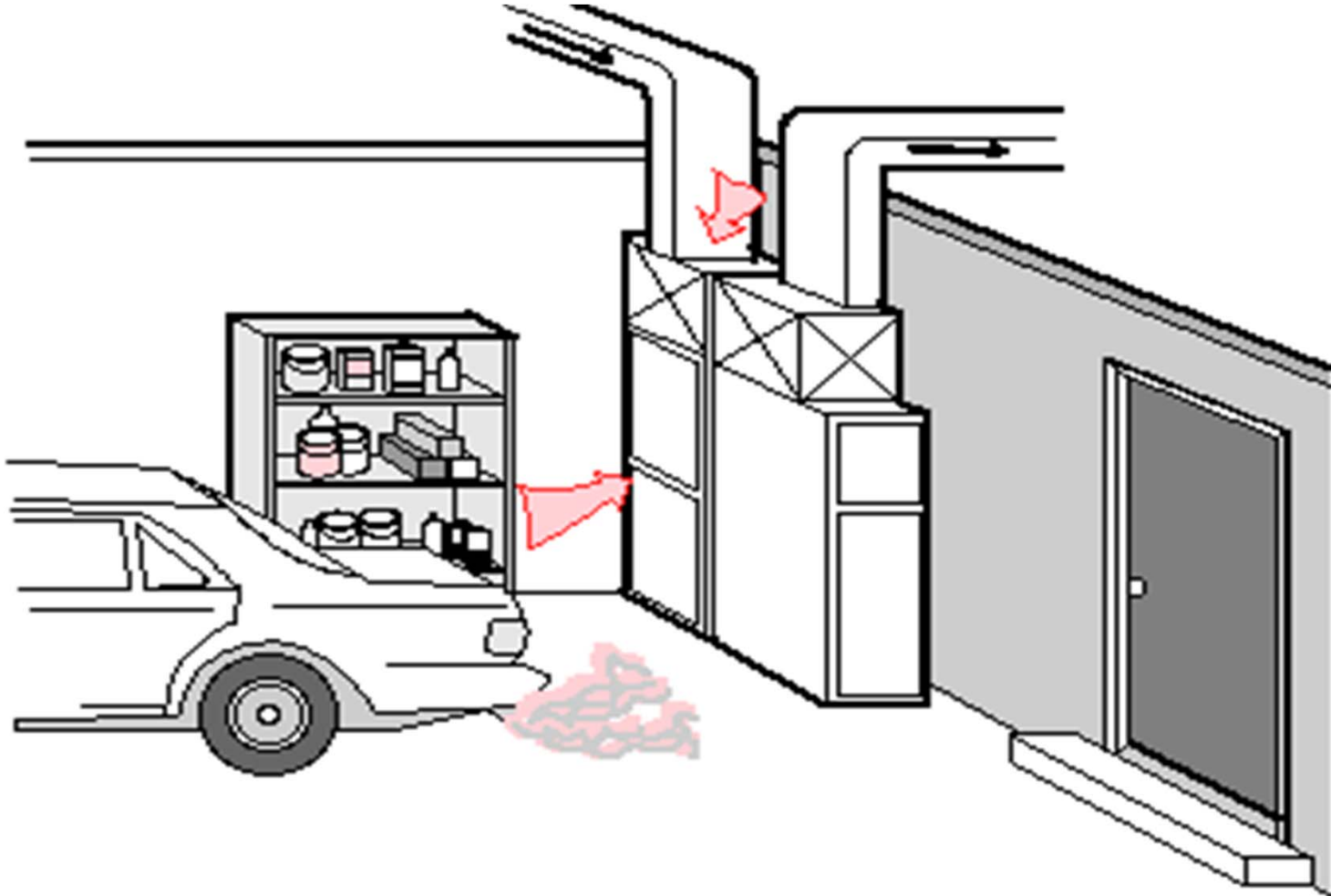
Potentially Created	Possibly Brought in During Work
Lead Hazards	Cleaning Products
Carbon Monoxide Hazards	Spray Foam
Elevated Radon Levels	Paints, Coatings, Flooring
Elevated Vocs & Formaldehydes When Homes Are Air Sealed	Pressed Wood Cabinets and Products - Renovation
Spread Of Pest Droppings Or Molds During Air Sealing Or Insulation	Removal or Installation of Insulation

# Formaldehyde

- Pressed wood, adhesives containing urea-formaldehyde (UF) resins
  - Cabinets; particle board
  - Hardwood plywood paneling



# Garage Sources



# Steps to Control VOCs

- Control the source
  - Avoid using products that contain VOCs
  - Use lower VOC options (i.e. paints)
  - Seal containers; store far from air intake
  - Remove unwanted products from home
- Ventilate
  - - Open doors and windows, run fans
- Seal between garage and home, avoid air handlers or duct work in garage



# Third-Party Certifications

- Buildings
  - Green Communities – [www.greencommunitiesonline.org](http://www.greencommunitiesonline.org)
  - Energy Star with Indoor Air Package – [www.energystar.gov](http://www.energystar.gov)
  - LEED for Homes – [www.usgbc.org/LEED/homes/](http://www.usgbc.org/LEED/homes/)
- Products and Services
  - Green Seal – [www.greenseal.org](http://www.greenseal.org)
  - EcoLogo - [www.ecologo.org](http://www.ecologo.org)
  - EPA's Design for the Environment – [www.epa.gov/dfe](http://www.epa.gov/dfe)
  - GreenShield Certified (for pest control) – [www.greenshieldcertified.org](http://www.greenshieldcertified.org)

# Industry Stewardship Programs

- Understand the Motivations & Research the Options
- Examples
  - QualityPro Green for Pest Management – [www.qualityprogreen.org](http://www.qualityprogreen.org)
  - Green Label for Carpet and Rugs – [www.carpet-rug.org](http://www.carpet-rug.org)
  - Environmental Stewardship Program for Kitchen Cabinet – [www.greencabinetsource.org](http://www.greencabinetsource.org)
  - Ingredient Communications for Consumer Chemicals – [www.cspa.org/public/media/info/cpici.html](http://www.cspa.org/public/media/info/cpici.html)
  - [www.hhcontractors.org](http://www.hhcontractors.org) - healthy homes assessment & remediation
- Other Programs

# Insulation

- Vermiculite
- Dust particles
- Some new concern with worker risks and spray foams



## HAVE YOU READ THE MSDS?

BEFORE USING ANY SPRAY POLYURETHANE INSULATION PRODUCT, YOU MUST...

### READ AND UNDERSTAND THE ENTIRE MATERIAL SAFETY DATA SHEET (MSDS)

Sections 1, 2, 3\*

#### CHEMICAL IDENTIFICATION HAZARD WARNINGS COMPOSITION

Do you know the **hazards** of every chemical you are handling:

- Component A (Isocyanate);
- Component B (Resin, Polyol, Amine Catalyst, Blowing Agent, Fire Retardant);
- Solvents;
- Cleaning Solutions;
- Coatings?

Section 8\*

#### PERSONAL PROTECTION

Are you using the correct **Personal Protection Equipment** for the job:

- Supplied-Air Respirator,
- Eye Protection,
- Gloves,
- Coveralls,
- Boots?

Sections 6 & 7\*

#### ACCIDENTAL RELEASES STORAGE AND HANDLING

Are you **storing** and **handling** the chemicals as directed?

- Do you know how to properly contain and clean a **spill**?

Section 4\*

#### FIRST-AID

What should you do if there is an **accidental exposure**?

- Do you know **first-aid** procedures?
- Do you have first aid materials at the work site?

Sections 5, 9-16\*

#### OTHER INFORMATION "READ THE ENTIRE MSDS"

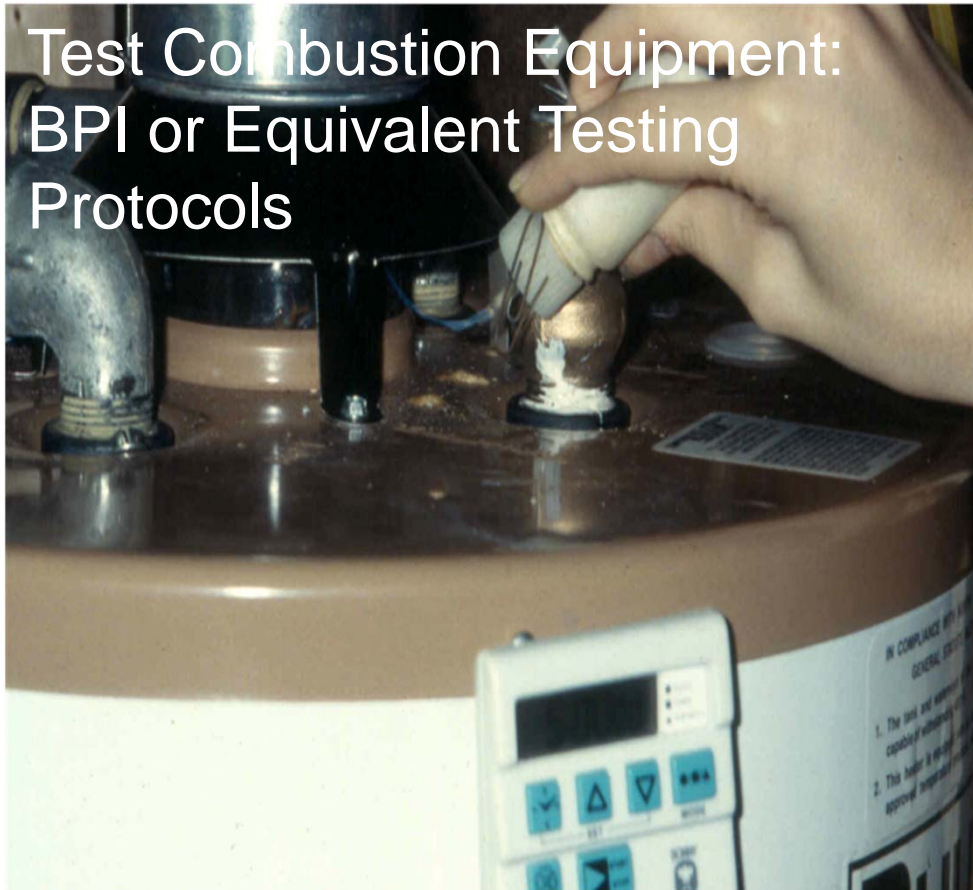
Did you know that other information is provided on an MSDS?

- Fire-Fighting Measures;
- Physical-Chemical Properties;
- Stability and Reactivity;
- Toxicology;
- Disposal;
- Transportation; and
- Regulatory information?



# Carbon Monoxide

Test Combustion Equipment:  
BPI or Equivalent Testing  
Protocols



# Unvented Space Heaters

- Remove unvented space heaters
- Secondary heat source allowed under WAP if meets ANSI Z21.11.2



# Opportunities During Energy Upgrades

- Test CO & address high levels
- Exclude pests
- Lead Safe Work Practices
- Radon testing – Don't make it worse
- Do not disturb asbestos/vermiculite – test?
- Enhance filtration heating/cooling systems
- Seal garage connection
- Minimize contaminants in products

# Assessment Questions

- Do gas appliances produce high CO
- Rodents, roaches or other pests
- Home pre-1978 – lead safe work practices
- Peeling, flaking paint
- Radon testing & results: Don't make it worse
- Vermiculite or asbestos present
- Attached garage
- Occupant health concerns



# Health Related Work Practices

- Safe spray foam use – gloves, respirator etc.
- Add pest exclusion to air sealing
- Seal garage connection
- Install efficient filters > MERV 6
- Install poly on dirt crawl spaces, cover sump pumps to reduce radon & gases
- Work lead safe
- Window replacement & repairs working lead safe (helps with general dust)



# WAP Required Activities

- Combustion safety testing & proper venting
- Lead Safe Work Practices & EPA RRP

# WAP Eligible Expenses

- Pest removal & exclusion where infestation would prevent weatherization
- CO alarms
- Radon testing, poly on dirt floors & other radon control precautions
- Unvented space heater removal, except secondary sources complaint with ANSI



# EPA Protocols for Energy Upgrades

- Identify EPA minimum precautions
- Identify EPA additional actions