



Welcome to:

Environmental Hazards Impact on Value

Presented by
Calypso Continuing Education



Course Instructional Design Overview

The educational offering you are about to undertake is designed to allow you to consider the main themes and accommodate assimilation of same. This is accomplished by providing video breaks and/or audio narratives that give a different perspective for the same theme presented in text.

These techniques will allow you to reflect on the course content to connect it to your prior knowledge and resolve any conflicts which new knowledge may create.

In many cases we have provided information that dates back to the late 1990s, or even 4000 years ago. In doing so, we are supplying historic perspective as a foundation for our current educational themes.



Your Instructor is: Francis X. (Rich) Finigan





The slide you are currently viewing will be highlighted. Slides you have completed will contain a **strikethrough**

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2014-2015 7 Hour Equivalent USPAP Update Course: 1.1.0

When, Why, & How USPAP Changes Occur

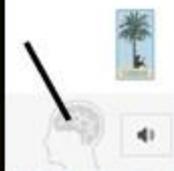
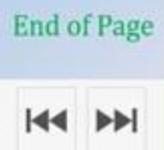
When, Why & How USPAP Changes Occur

Contact our Support Staff

Log out of your course. Our system stores your progress automatically

Use the course player buttons to move forward and backward through the course

Access all course documentation here. This information will remain available while you are completing lesson materials. It will not be available during quizzes or exams, per regulatory requirements of USPAP.





Course Orientation

The Course Orientation document is available by clicking on the “Course Orientation” link in the Learning Extras section located to the right.

If you have any questions, please contact Francis Xavier (Rich) Finigan at (802) 565-8238 or email info@calypsoedu.com



Course Objectives

Real Estate Appraisers will be able to identify three significant issues surrounding environmental hazards' impact on value and an appraiser's due diligence responsibility to disclose.

- a) The appraiser will be able to identify the health effects that can be suffered by occupants or residents when exposed to the contaminants described during the seminar.
- b) The appraiser will be able to identify what regulations and guidelines dictate the appraiser's due diligence.
- c) The appraiser will be able to identify a technique to calculate stigma in a contaminated property.



What to expect during the seminar

- We will identify the regulations and guidelines creating environmental due diligence for appraisers.
- We will share with you ways to quickly and easily conduct research needed to comply with guidelines and regulations.
- During our case study we will explore a bulletproof methodology for calculating diminution.
- Identify commonly encountered environmental hazards and how to calculate their impact on value.
- We will share some ideas and supply sample language for environmental disclosure.



Did you know:

- Any commercial property in the United States of America that is going to undergo renovation which may disturb more than 160 linear feet or 260 sq. ft. of surfaces that may contain asbestos requires an asbestos survey, regardless of the building's age;
- Contaminants, like chlorinated solvents or petroleum distillates, that were discharged 10 or 15 years ago or more may have an impact on real estate hundreds of yards away in the form of vapor intrusion;
- Radon is an inert gas that if breathed will have very little ill effects, but has a half life of 3.8 hours and breaks down to polonium that does cause lung cancer and that radon water can be more costly to remediate than radon in air.



Did you know:

- Wetlands are not necessarily designated by the proximity of a body of water exclusively, but soil types and vegetation in that displacement will typically require replication at a ratio of two to one;
- Contrary to common belief, there are guidelines, indices, and standards for mold testing and remediation;
- Mold remediation was discussed in the Old Testament?

During today's seminar you'll learn these things and more.



Common Environmental Contaminants Or Conditions

- Soil contaminants and site contamination
- Mold
- Lead based paint
- Radon
- Wetlands and floodplains
- Asbestos
- EMFs



Environmental Hazards' Impact on Value

Can They Impact Value?

When calculating the impact

Is it just cost to cure?

or

Can stigma impact also impact value?

Lender & Appraiser Due Diligence is Based Upon

Regulations & Standards

– USPAP

– HUD

Guidelines

– Freddie Mac

– Fannie Mae



Commercial and Residential

The seminar is relevant to commercial and residential real estate appraisers. The topics discuss impact on both types of properties.

Generally speaking, when confronted with a commercial property that requires ongoing remedial actions and monitoring, the appraiser can calculate the impact utilizing the income approach.

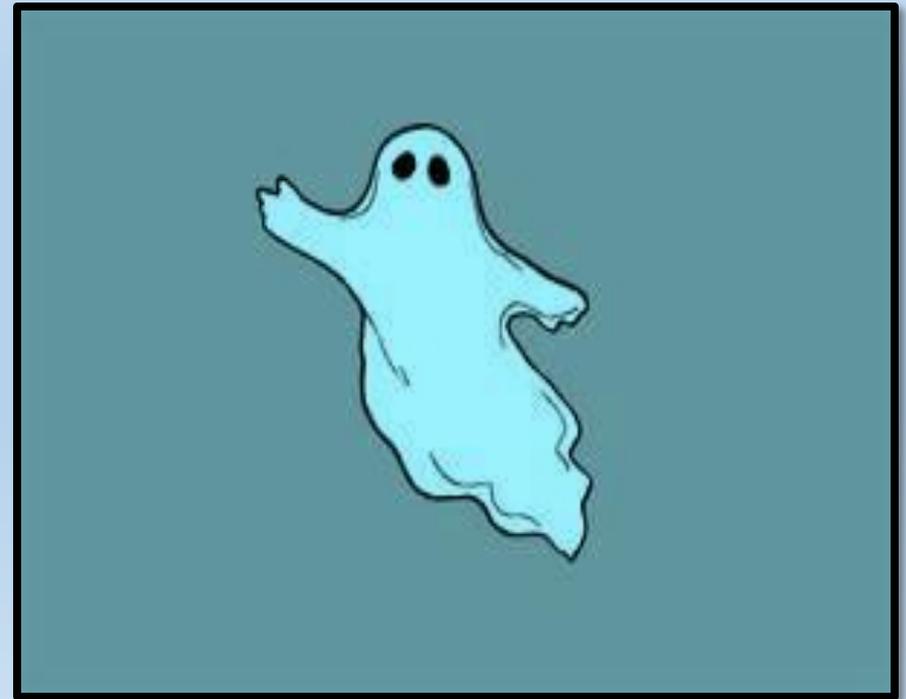
Unlike commercial properties, the income approach typically has no relevance when considering the value of a residential property, even if ongoing mitigation and monitoring is required. Also, when it comes to environmental contaminants' impact on value in a residential setting, the cost to cure usually does not include capitalization calculations required in the income approach.



Do you believe the perception of a ghost need be disclosed?

Absolutely...

Even a ghost could potentially have an impact on the value of a property





Do you believe environmental hazards can have a negative impact on the value of a property?

The answer, of course, is yes.
And so does every lender in America!





Most appraisers will agree with both of the previous questions and answers

If you're willing to disclose the perception of a ghost,

shouldn't you be ready to disclose conditions as real as environmental contamination?



Environmental Hazards' Impact on Value: Cost to Cure or Stigma?

Cost to cure?

Or diminution from stigma?

How do you calculate stigma?

What type of contamination is more

likely to cause stigma?





Chapter 1

Appraiser Due Diligence



Chapter 1

Learning Objectives

The appraiser will be able to identify appraisers' environmental responsibilities.

The appraiser will be able to identify the governmental agencies and institutions that have created those responsibilities.

The appraiser will review the regulations and guidelines that detail environmental disclosures.



Problem

Environmental Hazards can negatively impact on the value of a property.

Significant regulations and guidelines exist that require environmental due diligence of lenders and their agent the appraiser

Yet for decades they have been largely overlooked.

WHY?



Society has become litigious

Coffee anyone?

It wasn't that long ago that an individual was awarded \$2 million by a jury after she spilled hot coffee in her lap at a McDonald's and claimed it was McDonald's fault she sustained injury. Many factors influenced the verdict.

How long will it be before appraisers find themselves in the attorney's crosshairs and part of the judicial food chain?

There's an old saying, "It's better to be lucky than to be good." Members of the appraisal industry as a whole have been lucky when it comes to liability associated with environmental disclosure, but they have not been good.

In an era of Retro Forensic Field Reviews how much longer do you think appraisers can dodge the bullet?



Appraiser Environmental Due Diligence



Appraisers do not need to dress in hazmat gear or obtain a degree in environmental science to meet appraisal environmental due diligence responsibilities.

Most of the information is just a few mouse clicks away.



Appraisers' Environmental Due Diligence is Satisfied By:

1. Disclose known conditions at the subject property or proximate to the subject.
2. Where appropriate, calculate environmental impact on value.
3. Appraisers **need not be an environmental expert** to have access to data and include it in their reports
4. Just normal research and observations are required.



Lending Institutions can look to Appraiser's E&O for losses

Lending institutions have faced sizeable losses over the past several years and can look to an appraiser's E&O insurance to cover the losses.

Appraisers usually claim they are not environmental experts to comment on the type of data found in public domain data bases, however appraisers need not be an environmental expert to identify conditions that appear to be mold or may support mold growth.



Databases Available to Help Appraisers

Most people are aware of building-related issues such as mold, radon and lead-based paint; however few people understand the prevalence of records that pertain to land contamination.

Nationally there are over 1200 databases and millions of records of Superfund sites, landfills, leaking tanks, industrial permitted facilities, clandestine drug (meth) labs and spills, all that have the potential to affect the property and building's occupants.



Databases Available to Help Appraisers

These databases are at all levels of government including Federal, State, County, Municipal and Tribal.

Additionally, commercial data providers have created a number of proprietary records to fill in where public records may have gaps. In some cases these commercial data providers have assimilated the data from vast numbers of databases and distilled it for end-users.

According to the EDR (Environmental Data Resources) nationally, on average, approximately 85% of homes will have publically available environmental records of some sort of potential environmental issue within a ½ mile of the subject.



Significant Stakeholders and Their Influence

Regulations and Guidelines





We Shall Review Excerpts from the Following Documents

- FDIC Guidelines for an Environmental Risk Program
- USPAP(Uniform Standards of Professional Appraisal Practice), A09 Provision
- HUD – 4150.2 Handbook (as amended by Revised Appendix D, CHG-1 and 2005 ML-48 letter)
- HUD Valuation Conditions Sheets (formerly required to be attached, but still relevant)
- Fannie Mae, URAR (Uniform Residential Appraisal Report)
- Freddie Mac Single Family Requirements (ie. Section 44.15, 3/1/2008)



General Industry Changes

FIRREA

(Financial Institution Reform, Recovery and Enforcement Act)

Dodd Frank

(Wall Street Reform and Consumer Protection Act)



Dodd Frank

Along with a host of other Government Sponsored Entities (GSE) and regulations comes Dodd Frank and the Consumer Finance Protection Bureau.



Flood of New Rules Change Regulatory Focus to Implementation

Sorohan, Mike

FT. LAUDERDALE, FLA.--When Ken Markison uses the phrase “year of implementation,” he’s not kidding.

“These past 100 days have been an unparalleled period for the real estate finance industry,” Markison, **Mortgage Bankers Association** vice president and regulatory counsel, said here at the recent *MBA National Fraud Issues Conference*. “Virtually all of these rules must be implemented in the next year. We’ve moved from a world of regulatory development and comment to a world of implementation.”

At the top of the list is the **Consumer Financial Protection Bureau’s Ability to Repay/Qualified Mortgage** rule, announced this past January and set for full implementation in January 2014. Other rules issued by CFPB this year cover revisions to the compensation.

Markison said the *Estate Settlement* variety of other

The Ability to Repay specific criteria lender also can

A QM loan may

amortization and interest-only features. It also must not have points and fees that exceed 3 percent of the loan amount. Also, to qualify as a QM, a borrower’s maximum “back-end” debt-to-income ratio cannot exceed 43 percent or the loan must be eligible for purchase by **Fannie Mae** and **Freddie Mac** or eligible for **FHA, VA** and **Agriculture** insurance or guarantee. QM loans that have an APR less than 150 basis points over the average rate for that kind of loan obtain an MBA-sought “safe harbor” when they originate loans that meet the QM standards in the rule.

“Under the ‘ability to repay,’ lenders are going to have to satisfy eight requirements that are essentially classic loan underwriting,” Markison said. “Fairly reasonable, but considering the potential liability that comes with violations, many lenders are likely to make only QM loans.”

Other rules issued by **CFPB** this year cover revisions to... escrow; servicing; **appraisals**; and loan officer compensation.

Markison said these **new rules are only the beginning**; future rulemakings from CFPB and other agencies target *Real Estate Settlement Procedures Act/Truth in Lending Act* integration....”



(Continued)

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(Continued)

Markison said these new rules are only the beginning; future rulemakings from CFPB and other agencies target *Real Estate Settlement Procedures Act/Truth in Lending Act* integration; risk retention/*Qualified Residential Mortgage*; and a variety of other aspects of real estate finance.

The Ability to Repay/QM rule requires lenders to determine a consumer's reasonable ability to repay a loan by satisfying specific criteria, including verifying the consumer's income and assets. To gain greater legal certainty that it complied a lender also can originate a Qualified Mortgage or QM loan that has several requirements.

A QM loan may not include "risky" loan terms most closely associated with the housing crisis, including negative amortization and interest-only features. It also must not have points and fees that exceed 3 percent of the loan amount. Also, to qualify as a QM, a borrower's maximum "back-end" debt-to-income ratio cannot exceed 43 percent or the loan must be eligible for purchase by **Fannie Mae** and **Freddie Mac** or eligible for **FHA**, **VA** and **Agriculture** insurance or guarantee. QM loans that have an APR less than 150 basis points over the average rate for that kind of loan obtain an MBA-sought "safe harbor" when they originate loans that meet the QM standards in the rule.

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Consumer Protection Act (HR 4173)

MANDATORY REPORTING OF APPRAISERS

Anyone involved in the transaction will be required to report an appraiser to a state board if there is reason to believe that an appraiser is violating USPAP, state laws or is engaged in unethical practices.



Consumer Protection Act (HR 4173)

COPY OF APPRAISAL REPORT AND DISCLOSURES TO BORROWERS

Appraiser Independence mandates that in connection with a higher-risk mortgage, borrowers are to be provided one free copy of the appraisal report at least three days prior to the closing of a loan.

Further, Appraiser Independence mandates that lenders must provide disclosures to borrowers informing them that their appraisal is good for the sole use of that creditor only.

The Dodd-Frank Wall Street Reform and Consumer Protection Act (HR 4173) was signed into law July 21, 2010 and may represent the most sweeping change to financial regulation in the United States since the Great Depression. The Act is categorized into 16 titles and 243 rules.



FDIC Guidelines for an Environmental Risk Program

The potential adverse effect of environmental contamination on the value of real property and the potential for liability under various environmental laws have become important factors in evaluating real estate transactions and making loans secured by real estate.

Environmental contamination, and liability associated with environmental contamination, may have a significant adverse effect on the value of real estate collateral, which may in certain circumstances cause an insured institution to abandon its right to the collateral.

FDIC *Source: FDIC Financial Institution Letter (FIL--14--93), dated February 25, 1993*



FDIC Interagency Guidance

Appraisal and Evaluation Guidelines

FIL-82-2010 December 2, 2010

Financial Institution Letters:

<http://www.fdic.gov/news/news/financial/2010/fil10082.html>

Summary:

The federal financial regulatory agencies are issuing the attached ***Interagency Appraisal and Evaluation Guidelines*** (Guidelines) to update and replace existing supervisory guidance to reflect changes in appraisal and evaluation practices. The Guidelines build on longstanding, prudent standards for valuing real property. The Guidelines clarify that an analytical method or technological tool, such as an automated valuation model, cannot be substituted for an appraisal when the transaction requires an appraisal. Further, the Guidelines enhance the requirements for collateral valuation methods for transactions that permit the use of an evaluation.



FDIC Interagency Guidance Appraisal and Evaluation Guidelines

Highlights

Recognize that while borrowers' ability to repay real estate loans according to reasonable terms remains the primary consideration in a lending decision, sound collateral valuation practices are an integral part of the loan underwriting process.

Update and replace existing supervisory guidance to reflect developments regarding appraisals and evaluations as well as changes in appraisal standards and advancements in regulated institutions' collateral valuation methods.

Clarify that collateral valuation methods that use an analytical method or technological tool, such as an automated valuation model, cannot be substituted for an appraisal when the transaction requires an appraisal.



FDIC Interagency Guidance

Appraisal and Evaluation Guidelines

Highlights

Enhance the requirements for collateral valuation methods for transactions that permit the use of an evaluation and specify that valuation methods that do not provide a property's market value, such as a broker price opinion, are not acceptable as an evaluation.

Instruct institutions to file a complaint with the appropriate state appraiser regulatory officials when they suspect that a state certified or licensed appraiser fails to comply with the Uniform Standards of Professional Appraisal Practices, applicable laws, or engages in other unethical or unprofessional conduct, and to file a suspicious activity report (SAR) with the Financial Crimes Enforcement Network when the suspicious activity meets the SAR filing criteria.



FDIC Interagency Guidance Appraisal and Evaluation Guidelines

Appraiser environmental due diligence

Lender environmental due diligence

Lender and appraiser environmental due diligence is inextricably linked.

The existing regulations and the current sweeping changes have woven a complex fabric of environmental regulatory due diligence.



In today's litigious society, are regulatory changes, like the following, an invitation for liability?

Lending institutions will be held accountable for the actions of AMC's that they engage.

CFPB has set up a hotline to report violations to the new regulations including an attempt to influence appraisers and the appraisal process.

The lenders must supply a residential home buyer with a copy of the real estate appraisal at least three days prior to closing.



Reading Assignment

Please read [FDIC Guidelines for an Environmental Risk Program](#) in its entirety located in the Learning Extras.



USPAP



Congress has authorized
The Appraisal Foundation as
the source of Appraisal
Standards and Appraisal
Qualifications

THE APPRAISAL FOUNDATION

Every appraiser should have
a current copy of USPAP.

AO9 provision provides
guidance regarding
environmental disclosure due
diligence.

Please read the [AO-9](#)
provisions located in the
Learning Extras to your right



USPAP

USPAP contains guidance documents known as Advisory Opinions (AO). The preamble to the AO section reads as follows: *“This communication by the Appraisal Standards Board (ASB) does not establish new standards or interpret existing standards. Advisory Opinions are issued to illustrate the applicability of appraisal standards in specific situations and to offer advice from the ASB for the resolution of appraisal issues and problems.”*

“AO-9: The Appraisal of Real Property That May Be Impacted by Environmental Contamination”

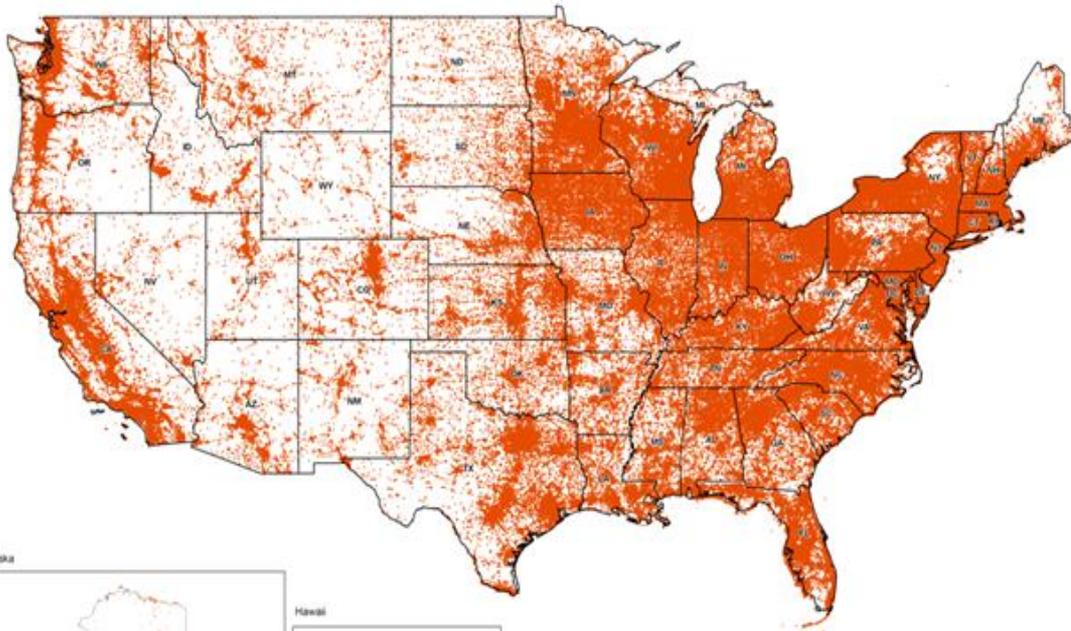
AO9 cites Standards Rule 1-4: *“In developing a real property appraisal, an appraiser **must** collect, verify, and analyze all information necessary for credible assignment results.”*



State of the Union

National Property Environmental Records

Sites Across U.S.



According to Environmental Data Resources, a major aggregator and supplier of environmental data, the proliferation of property contamination records since 1990 is represented as approximately 23 million records of property contamination

Including:

- Superfund sites
- Brown fields
- Old gas stations
- Landfills
- Meth labs
- Spills
- State hazardous waste sites
- And more



USPAP A09

It further states: “Consistent with Standards Rule 1-1(a): in the appraisal of a property as impacted by environmental contamination, an appraiser **must** *be aware of, understand, and correctly employ those recognized methods and techniques necessary to produce a credible appraisal.*

Accordingly, an appraiser must have the requisite knowledge about appropriate methods, and be able to assemble the required information. An appraiser who lacks knowledge and experience in analyzing the impact of environmental contamination on the value of real property must take the steps necessary to complete the assignment competently, as required by the COMPETENCY RULE. **However, an appraiser need not be an expert on the scientific aspects of environmental contamination**, and in most situations the appraiser will utilize scientific and other technical data prepared by others, such as environmental engineers.

In these situations, the **appraiser should utilize an extraordinary assumption** [see Standards Rule 1-2(f)] regarding the information obtained from other experts that is used in the appraisal. This is especially important in situations where there is conflicting information about such information.”



USPAP on Stigma

“When the appraiser addresses the diminution in value of a contaminated property and/or its impaired value, the appraiser must recognize that the value of an interest in impacted or contaminated real estate may not be measurable simply by deducting the remediation or compliance cost estimate from the opinion of the value as if unaffected (unimpaired value).”



HUD

United States Department of Housing and Urban
Development

Guidelines for appraisers are embodied in the 4150.2 manual.
**(See in learning extras, right side bar, and download for future
reference.)**

APPENDIX D: VALUATION PROTOCOL of HUD 4150.2 as of 2006

The appraisal process is the lender's tool for determining if a property meets the minimum requirements and eligibility standards for a FHA-insured mortgage. Underwriters bear primary responsibility for determining eligibility; however, the appraiser is the on-site representative for the lender and provides preliminary verification that the General Acceptability Criteria standards have been met.



HUD 4150.2 Handbook

The following provisions are especially relevant to environmental conditions:

CHAPTER 4 LOCATION ANALYSIS

SECTION 2 SPECIAL NEIGHBORHOOD HAZARDS AND NUISANCES

CHAPTER 5 PROPERTY ANALYSIS

SECTION 5-12: CONDITIONS REQUIRING REPAIR

- A. TYPICAL CONDITIONS
- D. HEALTH & SAFETY

SECTION 5-14: **LEAD-BASED PAINT** (first paragraph)

CHAPTER 12 MISCELLANEOUS

SECTION 20: UREA – FORMALDEHYDE – FOAM INSULATION

SECTION 21: ASBESTOS



Locations considered unacceptable by HUD from 4150.2 Appendix–D 2006

(See in learning extras, right side bar, and download for future reference.)

Unacceptable Locations

FHA guidelines require that a site be rejected if the property being appraised is subject to hazards, environmental contaminants, noxious odors, offensive sights or excessive noises *to the point of endangering the physical improvements or affecting the livability of the property, its marketability, or the health and safety of its occupants*. Rejection may also be appropriate if the future economic life of the property is shortened by obvious and compelling pressure to a higher use, making a long-term mortgage impractical.

If the condition is clearly a health and safety violation, contact the lender for further instructions before completing the appraisal. The lender must clear the condition and may require an inspection or reject the property. If there is any doubt as to the severity, report the condition and submit the completed report. For those conditions that cannot be repaired, such as site factors, the appraised value is based upon the existing conditions.



Locations considered unacceptable by HUD from 4150.2 Appendix–D 2006

Site Hazards And Nuisances

The appraiser must note and comment on all hazards and nuisances affecting the subject property that may endanger the health and safety of the occupants and/or the structural integrity or marketability of the property, including:

- Subsidence
- Operating and abandoned oil and gas wells
- Abandoned wells
- Slush pits
- Heavy traffic
- Airport noise and hazards
- Runway clear zones/clear zones
- Proximity to high pressure gas
- Liquid petroleum pipelines or other volatile and explosive products
- Residential structures located within the fall distance of a high-voltage transmission line, radio/TV transmission tower, etc.
- Excessive hazard from smoke, fumes, odors
- Stationary storage tanks containing flammable or explosive material



Conditions considered site hazards and nuisances by HUD from 4150.2 Appendix–D 2006

If hazards or nuisances are observed, the appraiser must describe the condition(s) and make a requirement for repair and/or for further inspection, and prepare the appraisal “subject to repairs” and/or “subject to inspection” in the **site section** of the report.

Supporting documentation provided by the appraiser may include extra photos or copies of site studies or analyses, property reports, surveys or plot plans, etc.

Any and all references to Valuation Condition items addressed in Chapters 2 and 3 are to be addressed in the appropriate section of the applicable appraisal reporting form. For example, Chapter 2, Sec. 2-2-E, Slush Pits, instructs: “If there is any readily observable evidence of slush pits, mark the "yes" column in VC-1”.

The new protocol will require the appraiser to address this condition in the site section of the appraisal report and note that the property may not be eligible for FHA financing referencing the information contained in Chapter 2; otherwise, the guidance provided by Chapters 2 and 3 remains in effect.



Conditions considered site hazards and nuisances by HUD from 4150.2 Appendix–D 2006 Soil Contamination

Check readily observable evidence of hazardous substances in the soil.

Conditions that could indicate soil contamination include pools of liquid, pits, ponds, lagoons, stressed vegetation, stained soils or pavement, drums or odors. If any of these conditions exist, further analysis or testing is required.

Note the proximity to dumps, landfills, industrial sites or other sites that could contain hazardous wastes.

If there is any readily observable surface evidence of leakage from an underground storage tank, further analysis or testing is required. If there is readily observable evidence of on-site contamination, make a requirement for further inspection in the **site section** of the report.



HUD

Until recently (2005) appraisers conducting FHA appraisals were required to answer yes or no to each item on the HUD Valuation Condition sheet a.k.a. VC sheet. Even though the VC sheet is no longer required, appraisers are still required to consider the conditions posed as questions of VC – 1 and VC -- 2. The following slides have a list of those conditions appraisers must consider:



HUD: VC-1

Inspection Check List (See in learning extras, right side bar, and download for future reference.)

VC-1 Location Hazards And Nuisances

- Subsidence/Sink holes
- Operating oil or gas wells within 300 feet of existing construction (**Includes gasoline stations within 300 feet of home; however, it would not necessarily render the property unacceptable.**)
- Operating oil or gas wells within 75 feet of new construction
- Abandoned oil or gas wells within 10 feet of new/existing construction
- Readily observable evidence of slush pits
- Excessive noise or hazard from heavy traffic area
- New/proposed construction in airport clear zone
- High-pressure gas or petroleum lines within engineering 10 feet of property
- Overhead high voltage transmission lines within engineering (designed) fall distance (**Low voltage power lines may not pass directly over the primary living unit , including pools, on the property being insured by HUD**)
- Excessive hazard from smoke, fumes, offensive noises or odors
- New/proposed construction in Special Flood Hazard Areas
- Stationary storage tanks with more than 1000 gallons of flammable or explosive material



HUD: VC-2

PROPERTY CONSIDERATIONS:

VC-2 Soil Contamination

1. On-site septic system shows readily observable evidence of system failure (**Visually inspect septic system and its surrounding area**)
2. Surface evidence of an Underground Storage Tank (UST)
3. Proximity to dumps, landfills, industrial sites or hazardous materials
4. Presence of pools of liquid, pits, ponds, lagoons, stressed vegetation, stained soils or pavement, drums or odors

Nowhere in the 4150.2 manual does it described what proximate means. Later information in the seminar will help you gain a greater understanding of what proximate means when dealing with environmental contaminants.



Secondary Mortgage Market and Due Diligence

Secondary mortgage market

Surrogate regulators?

Has the secondary mortgage market Freddie Mac, Fannie Mae, etc. become a “surrogate regulator”? Throughout the rest of this chapter we will explore that question more deeply.



Secondary Mortgage Market Lenders like:

Freddie Mac and Fannie Mae

Have become significant influences on appraisal practice.

They have effectively become surrogate regulators.



What is the Secondary Mortgage Market?

The Secondary Mortgage Market is the market where mortgage loans and servicing rights are bought and sold between mortgage originators, mortgage aggregators (securitizers) and investors. The secondary mortgage market is extremely large and liquid.

A large percentage of newly originated mortgages are sold by their originators into the secondary market, where they are packaged into mortgage-backed securities and sold to investors such as pension funds, insurance companies and hedge funds. The secondary mortgage market helps to make credit equally available to all borrowers across geographical locations.



Repurchase and Retroactive Reviews

Fannie Mae and Freddie Mac are enforcing contracts that require lenders to buy back loans that didn't meet underwriting standards.

Lenders say they are resisting buybacks because McLean, Virginia-based Freddie Mac and Washington-based Fannie Mae are unfairly second-guessing old appraisals, accusing originators of failing to verify income, or pinning failed loans on minor technical errors.



Post Dodd Frank Era

Comprehensive retro reviews of appraisals dating back to 2005.

The future is now! How will lending actions be perceived in 10 years (2024)?



Freddie Mac

The **Federal Home Loan Mortgage Corporation (FHLMC)**, known as **Freddie Mac**

Surrogate regulator?



About Freddie Mac

Freddie Mac Single Family Seller/Servicer Guide

Freddie Mac was chartered by Congress in 1970 with a public mission to stabilize the nation's residential mortgage markets and expand opportunities for homeownership and affordable rental housing. Their statutory mission is to provide liquidity, stability and affordability to the U.S. housing market.

Freddie Mac participates in the secondary mortgage market by purchasing mortgage loans and mortgage-related securities for investment and by issuing guaranteed mortgage-related securities, principally those we call PCs. The secondary mortgage market consists of institutions engaged in buying and selling mortgages in the form of whole loans (i.e., mortgages that have not been securitized) and mortgage-related securities.



About Freddie Mac

Freddie Mac Single Family Seller/Servicer Guide

On September 7, 2008, Federal Housing Finance Agency (FHFA) put Fannie Mae and Freddie Mac under the conservatorship of the FHFA (see [Federal takeover of Fannie Mae and Freddie Mac](#)) because of financial losses.

Freddie Mac's three core business lines provide a constant source of mortgage funding for the nation's housing markets – helping to make homeownership and rental housing more affordable for America's families:

1. Single-Family Credit Guarantee Business
2. Multifamily Business
3. Investment Business

Although Freddie Mac does not do business directly with consumers, they do require that lenders that sell loans to them abide by their guidance documentation. **The principle guidance document is called the Freddie Mac Single Family Seller/Servicer Guide**



Freddie Mac Single Family/Single-Family Seller/Service Guide, Volume 1/Chs. 39-45: SECTION 44.15 (03/01/08)

Section d.(2)

Impact of Contaminated Sites, Hazardous Substances and other adverse conditions: the appraiser must consider any known Contaminated Sites or Hazardous Substances that affect the property or the neighborhood in which the property is located.

The appraiser must also note the presence of Contaminated Sites or Hazardous Substances in the appraisal report making appropriate adjustments to reflect any impact on market value and comment on the effect they have on the marketability of the subject property.

Examples of matters about which the appraiser must note and comment include, but are not limited to:

- Any presence of asbestos, urea-formaldehyde or any similar insulation in the dwelling
- Proximity of the property and/or its neighborhood to a Contaminated Site
- Proximity of the property to ground water contamination, chemical or petroleum spills or other Hazardous Substances that are expected to impact the area for more than one year



Examples of matters about which the appraiser must note and comment include, but are not limited to:

Proximity of the property to areas that may affect the value or marketability of the property including, but not limited to, the following:

- Industrial sites
- Waste or water treatment facilities
- Commercial establishments (other than retail establishments that serve the residential neighborhood)
- Airport approach paths
- Floodplains
- Landslide areas
- Improvements section



Fannie Mae

Federal National Mortgage Association

Founded in 1938 during the Depression as part of the “New Deal”.

Commonly referred to as Fannie Mae



Not to be confused with "Fannie Mae"

A 1959 song by American blues and R&B singer Buster Brown. It was a # 1 hit on the R&B charts in 1960.



About Fannie Mae

Federal National Mortgage Association aka Fannie Mae is a Government-Sponsored Enterprise(GSE), though it has been a publicly traded company since 1968. The corporation's purpose is to expand the secondary mortgage market securitizing mortgages in the form of Mortgage-Backed Securities (MBS). This allows lenders to reinvest their assets into more loans and, in effect, increases the number of lenders in the mortgage market by reducing the reliance on Savings and Loan-type Banks. The idea was, and is, to make more loans available in order that more people can realize the American Dream.



Uniform Residential Appraisal Report

January 1, 1994, Fannie Mae required the use of the then new Uniform Residential Appraisal Report (URAR) form. In the comment section it required appraisers to comment on “adverse environmental conditions (such as, but not limited to, hazardous wastes, toxic substances, etc.) present in the improvements, on the site, or in the immediate vicinity of the subject property.”

The newest revision was recently made to the reporting methodologies employed when completing a URAR. These reporting-style changes are known as UAD (Uniform Appraisal Datasets) continues to include a requirement to comment on environmental hazards that may impact on the subject property; whether on the subject property or proximate to same.



URAR

Uniform Residential Appraisal Report File

The purpose of this summary appraisal report is to provide the lender/client with an accurate, and adequately supported, opinion of the market value of the subject property.

Property Address		City	State	Zip Code
Borrower		Owner of Public Record		
Legal Description				
S	Assessor's Parcel #	Tax Year	R.E. Taxes \$	
N	Neighborhood Name	Map Reference	Census Tract	
J	Occupant <input type="checkbox"/> Owner <input type="checkbox"/> Tenant <input type="checkbox"/> Vacant	Special Assessments \$	<input type="checkbox"/> PUD	HOA \$ <input type="checkbox"/> per year <input type="checkbox"/> per month
P	Property Rights Appraised <input type="checkbox"/> Fee Simple <input type="checkbox"/> Leasehold <input type="checkbox"/> Other (describe)			
T	Assignment Type <input type="checkbox"/> Purchase Transaction <input type="checkbox"/> Refinance Transaction <input type="checkbox"/> Other (describe)			
L	Lender/Client	Address		
Is the subject property currently offered for sale or has it been offered for sale in the twelve months prior to the effective date of this appraisal? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Report data source(s) used, offering price(s), and date(s).				
<input type="checkbox"/> I did <input type="checkbox"/> I did not analyze the contract for sale for the subject purchase transaction. Explain the results of the analysis of the contract for sale or why the analysis was not performed.				
Contract Price \$ Date of Contract Is the property seller the owner of public record? <input type="checkbox"/> Yes <input type="checkbox"/> No Date Source(s)				
Is there any financial assistance (loan charges, sale concessions, gift or downpayment assistance, etc.) to be paid by any party on behalf of the borrower? <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, report the total dollar amount and describe the items to be paid.				

Dimensions	Area	Shape	View						
Specific Zoning Classification		Zoning Description							
Zoning Compliance <input type="checkbox"/> Legal <input type="checkbox"/> Legal Nonconforming (Grandfathered Use) <input type="checkbox"/> No Zoning <input type="checkbox"/> Illegal (describe)									
Is the highest and best use of the subject property as improved (or as proposed per plans and specifications) the present use? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, describe									
S I T E	Utilities	Public	Other (describe)	Public	Other (describe)	Off-site Improvements—Type	Public	Private	
	Electricity	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Street	<input type="checkbox"/>	<input type="checkbox"/>
	Gas	<input type="checkbox"/>	<input type="checkbox"/>	Sanitary Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Alley	<input type="checkbox"/>	<input type="checkbox"/>
	FEMA Special Flood Hazard Area	<input type="checkbox"/> Yes <input type="checkbox"/> No	FEMA Flood Zone	FEMA Map #	FEMA Map Date				
	Are the utilities and off-site improvements typical for the market area? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, describe								
Are there any adverse site conditions or external factors (easements, encroachments, environmental conditions, land uses, etc.)? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, describe									

General Description	Foundation	Exterior Description	materials/condition	Interior	materials/condition
Units <input type="checkbox"/> One <input type="checkbox"/> One with Accessory Unit	<input type="checkbox"/> Concrete Slab <input type="checkbox"/> Crawl Space	Foundation Walls		Floors	
# of Stories	<input type="checkbox"/> Full Basement <input type="checkbox"/> Partial Basement	Exterior Walls		Walls	
Type <input type="checkbox"/> Det. <input type="checkbox"/> Att. <input type="checkbox"/> S-Det./End Unit	Basement Area sq. ft.	Roof Surface		Trim/Finish	
<input type="checkbox"/> Existing <input type="checkbox"/> Proposed <input type="checkbox"/> Under Const.	Basement Finish %	Gutters & Downspouts		Bath Floor	

Finished area ABOVE grade contains:	Rooms	Bedrooms	Bath(s)	Square Feet of Gross Living Area Above Grade
Additional features (special energy efficient items, etc.)				
Describe the condition of the property (including needed repairs, deterioration, renovations, remodeling, etc.).				
Are there any physical deficiencies or adverse conditions that affect the livability, soundness, or structural integrity of the property? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, describe				
Does the property generally conform to the neighborhood (functional utility, style, condition, use, construction, etc.)? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, describe				



URAR

As of 2011 the site section of the URAR asks the following question:
“Are there any adverse site conditions or external factors (easements, encroachments, and environmental conditions, land uses, etc.)?”

Yes No If Yes, describe

On those 3 blank lines that follow, many appraisers use perfunctory comments such as “not applicable”, “none noted”, “none apparent”. We think in most cases these comments are not accurate and the appraiser has not clearly identified the conditions.



Are there any adverse site conditions or external factors (easements, encroachments, and environmental conditions, land uses, etc.)?

When the "no" box is checked after that question, and the appraiser additionally comments with: "*not applicable*", "*none apparent*", or "*none noted*", have they provided an indication to the users of the report that they have, in fact, conducted some sort of review or research?



URAR Limiting Conditions

STATEMENT OF ASSUMPTIONS AND LIMITING CONDITIONS: The appraiser's certification in this report is subject to the following assumptions and limiting conditions:

1. The appraiser will not be responsible for matters of a legal nature that affect either the property being appraised or the title to it, except for information that he or she became aware of during the research involved in performing this appraisal. The appraiser assumes that the title is good and marketable and will not render any opinions about the title.
2. The appraiser has provided a sketch in this appraisal report to show the approximate dimensions of the improvements. The sketch is included only to assist the reader in visualizing the property and understanding the appraiser's determination of its size.
3. The appraiser has examined the available flood maps that are provided by the Federal Emergency Management Agency (or other data sources) and has noted in this appraisal report whether any portion of the subject site is located in an identified Special Flood Hazard Area. Because the appraiser is not a surveyor, he or she makes no guarantees, express or implied, regarding this determination.
4. The appraiser will not give testimony or appear in court because he or she made an appraisal of the property in question, unless specific arrangements to do so have been made beforehand, or as otherwise required by law.
5. The appraiser has noted in this appraisal report any adverse conditions (such as needed repairs, deterioration, the presence of hazardous wastes, toxic substances, etc.) observed during the inspection of the subject property or that he or she became aware of during the research involved in performing this appraisal. Unless otherwise stated in this appraisal report, the appraiser has no knowledge of any hidden or unapparent physical deficiencies or adverse conditions of the property (such as, but not limited to, needed repairs, deterioration, the presence of hazardous wastes, toxic substances, adverse environmental conditions, etc.) that would make the property less valuable, and has assumed that there are no such conditions and makes no guarantees or warranties, express or implied. The appraiser will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because the appraiser is not an expert in the field of environmental hazards, this appraisal report must not be considered as an environmental assessment of the property.
6. The appraiser has based his or her appraisal report and valuation conclusion for an appraisal that is subject to satisfactory completion, repairs, or alterations on the assumption that the completion, repairs, or alterations of the subject property will be performed in a professional manner.



URAR Limiting Conditions

In Section 5 of the Limiting Conditions appraisers make the following statements:

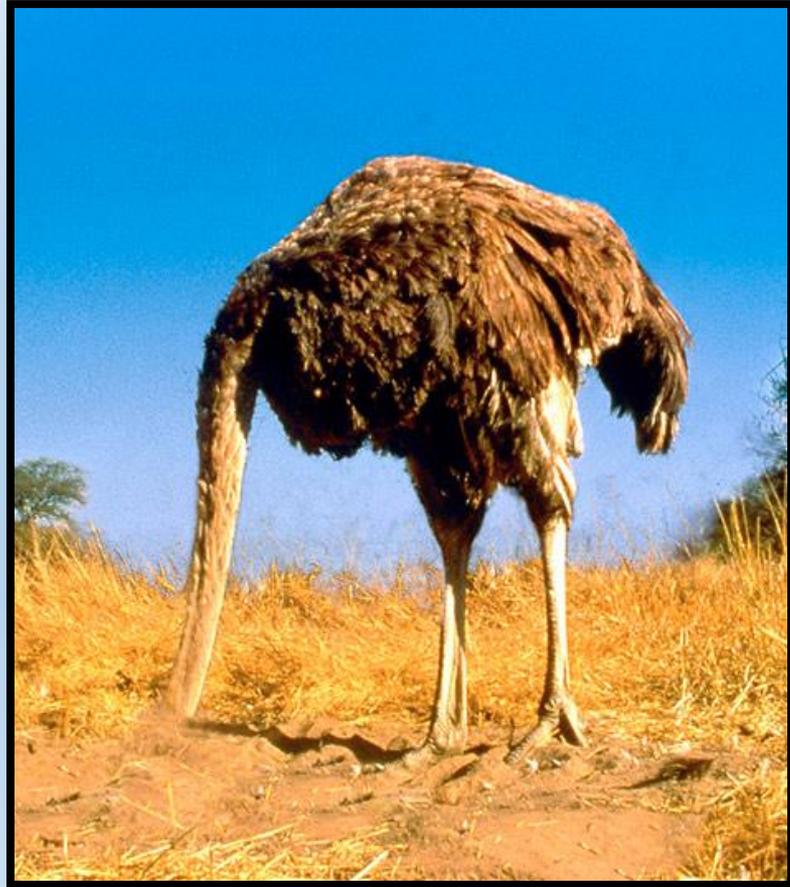
Because the appraiser is not an expert in the field of environmental hazards, this appraisal report must not be considered as an environmental assessment of the property.

The appraiser has noted in this appraisal report any adverse conditions (such as needed repairs, deterioration, the presence of hazardous wastes, toxic substances, etc.) observed during the inspection of the subject property or that he or she became aware of during the research involved in performing this appraisal.



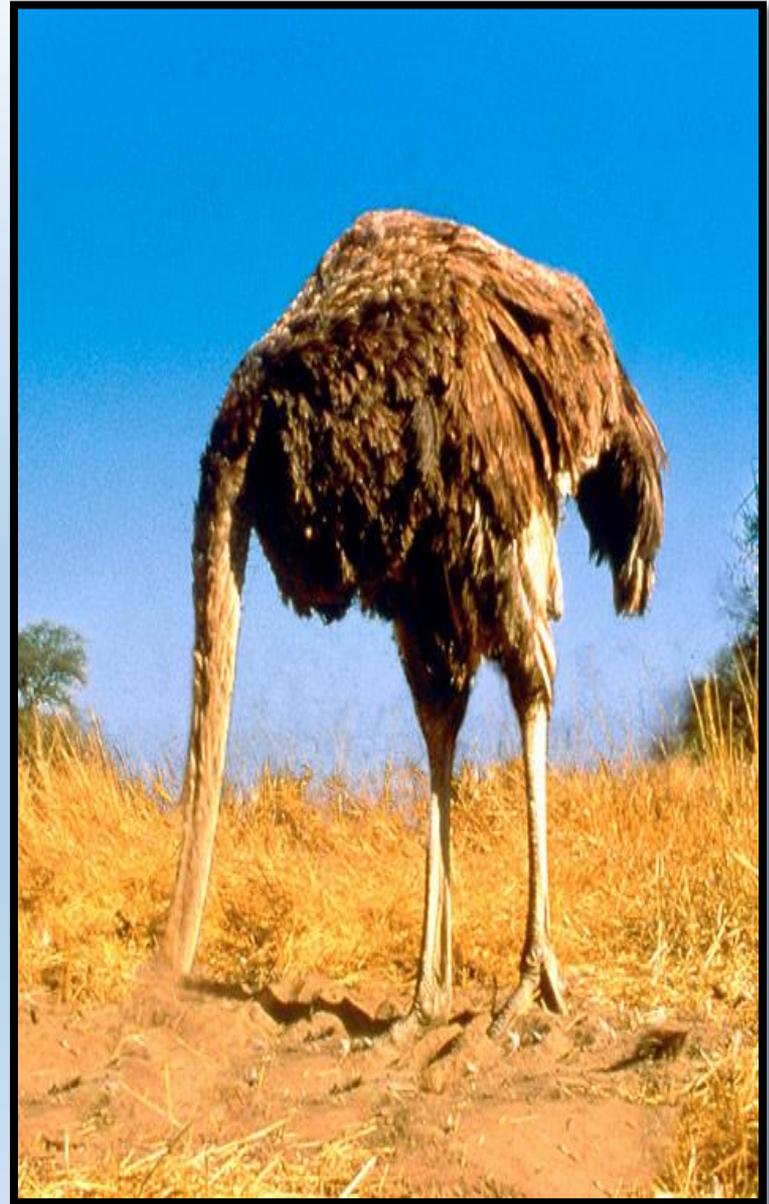
Appraisers View of How to Comply With Environmental Due Diligence

Appraisers have told me they are not environmental experts.....





The Lender's view effectively became the same as the appraiser's!





It's Not Just About Money

Lenders Reputations are at stake

and.....



In Residential Settings, Taking Someone's American Dream





Turning it Into a Nightmare!





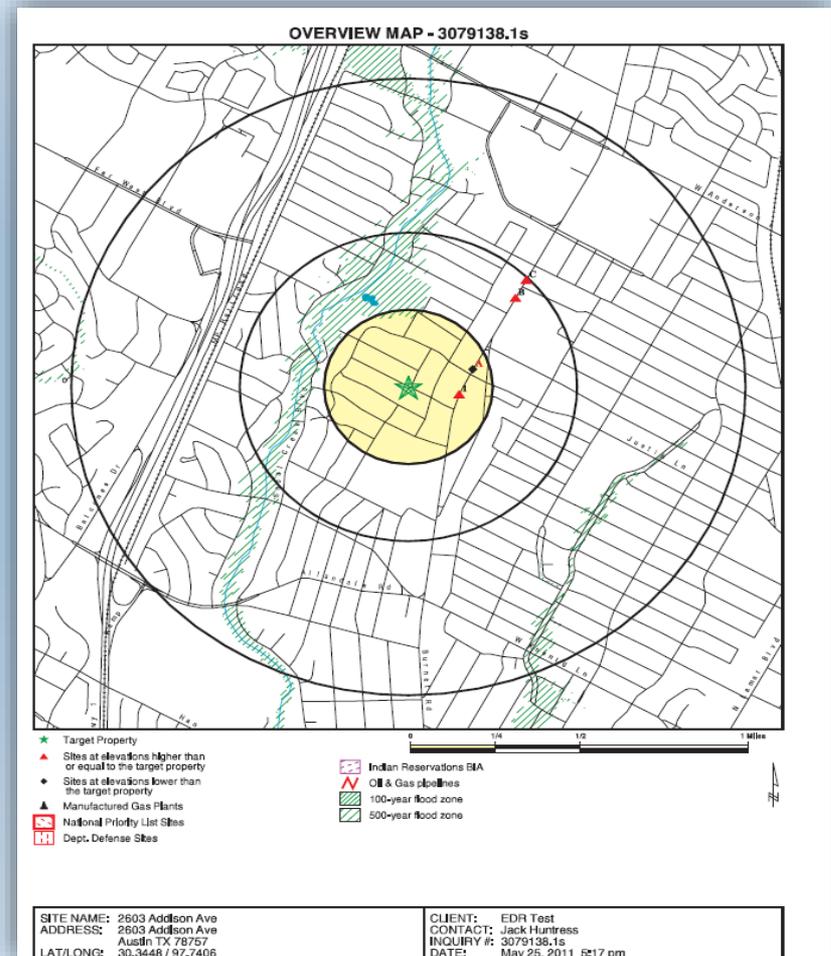
The key to avoiding liability in meeting regulatory responsibilities.....

- Is really simple
- It's about disclosure
- To effectively disclose environmental conditions lenders and appraisers need not be an environment expert
- In fact, it's probably better if they are not
- But a little knowledge can go a long way to protecting lenders, the secondary-mortgage market and their investors, appraisers, and end-users from liability
- **Most of the time there will be no direct impact to value**
- Disclosure, it's a win, win, win, win, win situation!



Historically speaking, when environmental disclosure requirements began in the early to mid 90s, to comply literally was virtually impossible for the appraiser.

- 1994 FANNIE MAE adds environment disclosure requirement to URAR
- Compliance was virtually impossible
- With today's digital revolution the same information is just a few mouse clicks away!





Lender Environmental Supplement

Uniform Residential Appraisal Report

File #

The purpose of this addendum is to assist the lender/client to comply with GSE's appraisal guidelines related to adverse site environmental conditions.

Property Address **8269 Forrest Avenue** City **Philadelphia** State **PA** Zip Code **19150**

Report data source(s) used and date(s)

Research from electronically available public and private land records deemed reliable included the following: National Priority List, Comprehensive Environmental Response, Compensation, and Liability Information System, RCRA Corrective Action, Hazardous Sites Cleanup Act Site List, Storage Tank Release Sites, Operating Facilities, Drycleaner Facility Locations, Voluntary Cleanup Program Sites, EDR Historical Dry Cleaners, EDR Historical Gas Stations.
Source: Environmental Data Resources, Inc. (EDR), searched on February 22, 2013.

Are there any adverse site conditions or external factors (environmental conditions)? Yes No If Yes, describe

The subject property is listed on the Storage Tank Release Sites regulatory databases as 8269 Forrest Avenue, Philadelphia, PA. Status is Open. Information about property value that may be impacted by environmental contamination may be found in Advisory Opinion 9 (see below in Specialized Terms and Conditions).

This section consistent with Freddie Mac Form 70 (March 2005) and Fannie Mae Form 1004 (March 2005)

INTENDED USE: The intended use of this Addendum is as attached and included by reference to the appraisal report for the lender/client on the property that is the subject of the appraisal for a mortgage finance transaction. This document assists in complying with research related to adverse environmental conditions for the Residential Appraisal Report (URAR) for residential properties.

STATEMENT OF ASSUMPTIONS AND LIMITING CONDITIONS: This Addendum is subject to the following assumptions and limiting conditions:

1. The Addendum has examined select electronically available environmental databases provided by EDR from governmental agencies and private sources and has noted whether the property may be subject to adverse environmental conditions. Because the appraiser is not an expert in environmental conditions, the appraiser makes no guarantees, express or implied, regarding this determination.
2. This Addendum includes sites identified during the research to identify adverse environmental conditions that may be associated with the property. Unless otherwise stated, the appraiser has no knowledge of any hidden or unapparent adverse conditions associated with the property that may make the property less valuable, and has assumed that there are no such conditions and makes no guarantees or warranties, express or implied.
3. To research adverse environmental conditions from known releases of hazardous substances into the surface water, ground water or soil, this Addendum searches available electronic databases using standard geocoding methodology in a Geographic Information Systems (GIS). GIS systems may have limitations, including, but not limited to, geocoding errors, misplots and unplotable sites. Sites with petroleum releases are searched 100' from the property as geocoded and sites with other types of releases are searched 365' from the property as geocoded. Sites identified as having been remediated or closed or that have "no further action" letters from the applicable regulatory agency are not included in this report.
4. Nothing in this Addendum should be construed as being certified by the appraiser or supervising appraiser.

SPECIALIZED TERMS AND CONDITIONS:

Environmental contamination: Sites with known hazardous releases derived from a search of electronically available databases.

Adverse environmental conditions: conditions resulting from the release of hazardous substances into surface water, groundwater or soil that can impact the subject property. Generally, the concentrations of these substances would exceed regulatory limits established by the appropriate federal, state, and/or local agencies. Source: Appraisal Standards Board ADVISORY OPINION AO-9 2012-2013

Advisory Opinion 9 (AO-9): The Appraisal of Real Property That May be Impacted by Environmental Contamination: There are assignments that require an appraisal of the "as is" condition of a property, with full consideration of the effects of environmental contamination. In these assignments, the appraiser is asked to analyze the effects of known environmental contamination on the value of the subject property. An appraiser need not be an expert on the scientific aspects of environmental contamination, and in most situations the appraiser will utilize scientific and other technical data prepared by others, such as environmental engineers. Source: Appraisal Standards Board ADVISORY OPINION AO-9 2012-2013

Electronic databases: As specified above and where available EDR searches NPL Superfund Sites, State and Federal Hazardous Waste Sites, Leaking Underground Tanks Sites, Landfills, Clandestine Drug Labs, Present and/or former Gas Stations and Dry Cleaners.

More detailed report for the appraiser

2603 Addison Ave
2603 Addison Ave
Austin, TX 78757

May 25, 2011

Inquiry Number: 3079138.3s

The EDR Environmental Report™



440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.624.0470
www.edrnet.com

EDR Neighborhood Environmental Report™

May 25, 2011

Property Information:

2603 ADDISON AVE
2603 ADDISON AVE
AUSTIN, TX 78757



Neighborhood Summary

ENVIRONMENTAL RECORDS WITHIN 300 FEET: **NO FINDINGS**

This report found no environmental records within 300 feet of the property located at 2603 ADDISON AVE. Additional information is located in Section A.

ENVIRONMENTAL RECORDS BEYOND 300 FEET **6 RECORDS**

The report found 6 environmental records beyond 300 feet of the property. For additional information, see Section B.

About This Report

This report has been compiled by Environmental Data Resources, Inc. (EDR). EDR is the leading national provider of environmental risk information to environmental and home inspection professionals. This report compares the property address against selected government databases of known and potential contamination sites. This report provides no information on the status of the interior structures on the property such as, but not limited to, the existence of mold, asbestos, lead, radon, vapor intrusion or other issues.

For your convenience, this report is organized into the following sections:

Section A provides information about records of known and potential environmental records within a 300 foot radius of the street address provided.

Section B provides information about records of known and potential environmental issues beyond 300 feet of the street address provided. The selected databases are searched to distances most commonly used by environmental professionals.

Section C provides information about records that lack sufficient address information for sites to be accurately located. Records where EDR can identify the site status as "closed" or "no further action" are not included in this section.

Section D provides descriptions and explanations of the databases used, and contact information for government agencies. If you have concerns about the findings in this report, we recommend that you contact the relevant government agency that can provide additional information about specific environmental issues.



Is the future already here?

We all agree environment hazards can impact ~~on~~ value.

It's clear that regulations and guidelines requiring environmental disclosure have existed for almost 20 years.

If the secondary mortgage market, lenders, real estate appraisers, and other stakeholders are going to employ a wink and nod, don't ask don't tell system, why bother?

It may be 2014 when the next round of comprehensive retro reviews answers that!



Appraiser Environmental Due Diligence Summarized

In 1994 Fannie Mae formally introduced environmental due diligence to the appraisal industry.

The Appraisal Journal in January of 1995 published an article that reviewed then new environmental reporting requirements put in place by Fannie Mae. The article said the section, “clarifies an appraiser's responsibility to report what he or she discovers during the inspection of the property and the normal research.”

The article went on to clearly identify an appraiser’s due diligence stating it must be “more than answering ‘none noted’ and relying on a limiting condition.”



Appraiser Environmental Due Diligence Summarized

The 1995 Appraisal Journal article cited USPAP and the G9 provision for guidance; sounding a cautionary note with, “there are tens of thousands of known hazardous sites. Don't be the appraiser who overlooks the site next door, or worse, the subject property.”

It is my opinion, as a real estate appraiser in 1994, before the digital revolution, it was almost impossible to gather the data necessary to meet the Fannie Mae guideline if interpreted literally.

Almost 2 decades have gone by since that article was written. Just last year (2011?) Fannie Mae revised its appraisal reporting requirements with the UAD (Uniform Appraisal Datasets).

Not much has changed in reporting environmental conditions; appraisers are still hoping that they have limited their liability with the Limiting Conditions in the URAR regarding not being an environmental expert. Appraisers are still making comments like, “not apparent”, “none obvious”, or “not applicable”.



Appraiser Environmental Due Diligence Summarized

There is an old sports' adage "it's better to be lucky than to be good", but when it comes to appraisers protecting themselves from liability associated with reporting environmental conditions, as an industry, they have been lucky, not good. In an era where Fannie Mae and lending institutions are doing retro appraisals going back to 2005 and 2006 in an attempt to recover from appraisers and their insurance companies for errors made to value; can we continue to count on our luck?

According to Environmental Data Resources (EDR) "Approximately 85% of the subject properties appraised in the United States will have public records of potentially sensitive environmental sites within 1/2 mile."

Over the years there have been a number of court cases against real estate appraisers who have failed to effectively report environmental contamination that resulted in loss in value or personal injury, but they are not commonplace.



Appraiser Environmental Due Diligence Summarized

There are several factors and organizations that dictate the terms and conditions under which an appraiser must report environmental contamination. They include regulations from HUD and states influenced by the ASB (Appraisal Standards Board). There are others I describe as “surrogate regulators”, most prominently, Freddie Mac and Fannie Mae. These big secondary mortgage market players create guidelines that have the same influence as regulations.

First and foremost we have USPAP and A09 provision (formerly G9). G9 was only about $\frac{3}{4}$ of a page but has been expanded to 5 pages in A09. The ASB has done a much better job in the A09 provision at providing guidance to the appraiser regarding due diligence for environmental conditions. Some of the more important provisions:

Clarify that the Advisory Opinions are issued to illustrate the applicability of appraisal standards in specific situations and to offer advice from the ASB for the resolution of appraisal issues and problems.



Appraiser Environmental Due Diligence Summarized

Establish that both the Ethics and Competency rules are applicable.

State “ an appraiser need not be an expert on the scientific aspects of environmental contamination, and in most situations the appraiser will utilize scientific and other technical data prepared by others, such as environmental engineers. In these situations, the appraiser should utilize an extraordinary assumption [see Standards Rule 1-2(f)] regarding the information obtained from other experts that is used in the appraisal.”

Cites elements of the Competency rule stating, “an appraiser must have the requisite knowledge about appropriate methods, and be able to assemble the required information. An appraiser who lacks knowledge and experience in analyzing the impact of environmental contamination on the value of real property must take the steps necessary to complete the assignment competently.”



Appraiser Environmental Due Diligence Summarized

One of the best ways to accomplish this is to take a continuing ~~Ed~~ education class or attend a webinar that is specifically designed to address these issues head-on with common sense.

HUD has specific requirements regarding environmental condition described in the 4150.2 manual. They include the requirement to report proximity to landfills or other potentially environmentally sensitive sites.

In Freddie Mac Single Family/Single-Family Seller/Service Guide's Property description and analysis section (44.15) the following directive appears:

“Examples of matters about which the appraiser must note and comment include, but are not limited to:”

Proximity of the property and/or its neighborhood to a Contaminated Site.



Appraiser Environmental Due Diligence Summarized

Proximity of the property to groundwater contamination, chemical or petroleum spills or other Hazardous Substances that are expected to impact the area for more than one year.

Proximity of the property to areas that may affect the value or marketability of the property including, but not limited to, the following: space needed here

- Industrial sites
- Waste or water treatment facilities
- Commercial establishments (other than retail establishments that serve the residential neighborhood)
- Airport approach paths
- Floodplains
- Landslide areas



Appraiser Environmental Due Diligence Summarized

Lending institutions have faced sizeable losses over the past several years and are now conducting industry-wide, retro-review appraisals in an attempt to recover some of their losses from the appraiser's E&O insurance. Appraisers usually disclaim any environmental expertise to explain their lack of research; however appraisers need not be an environmental expert to have access to data and include it in their reports. Almost all are publically available or can be accessed from several national data providers for just a few dollars per appraisal.

If an appraiser doesn't want to purchase information from a provider that distills and summarizes environmental information, they can visit their EPA region website and numerous state websites to obtain some of the same information.



Appraiser Environmental Due Diligence Summarized

I recently interviewed Jack Huntress the vice president of residential services at Environmental Data Resources (EDR). They maintain over 1400 databases of environmental and historic data containing more than 23 million records. EDR uses these resources to supply information for the majority of the phase 1 of environmental assessments conducted in the United States.

About five years ago EDR developed a product called Neighborhood Environmental Reports (NER). NERs represent a summary of the environmental and historic data within a 1-mile radius of any given subject property. They now offer it on a subscription basis for as little as \$33 per month.



Appraiser Environmental Due Diligence Summarized

Adding a report like an NER to your appraisal will supply the information that has been previously so hard to gather. The AO9 provision provides language to more clearly describe the environmental conditions and how they may impact ~~on~~ the subject property. You may consider replacing comments like not applicable, none apparent, and none obvious with something that more clearly identifies the limitations of your observations and reporting. Appraisers may consider a comment something like the following:

“There is (not) sufficient data in the marketplace to indicate or calculate stigma, reduction, or other diminution in value, unless otherwise stated herein. The appraiser is not an environmental expert, but has relied on information obtained from “SOURCE (Public records, EDR, etc.)”, attached and included by reference. This appraiser has made extraordinary assumptions regarding the subject property’s value based on data gathered from such environmental reports and recent sales or other relevant data from records of the neighborhood.”

(Note: this comment is intended for informational purposes only; and is not intended to be a legal recommendation. We recommend any additional comments be reviewed with your state real-estate appraisal board and/or attorney to ensure compliance with state and local regulations.)



Appraiser Environmental Due Diligence Summarized

I have included NERs in my appraisal reports and language like the above and have not received complaints from underwriters. (I do not work with AMCs so I cannot comment regarding what their reaction might be.)

By clearly identifying limitations of your observations and reporting while including summaries of environmental conditions in the community you will remove the burden of liability from your shoulders and place it squarely where it belongs; on the shoulders of a lending institution and secondary mortgage market.

Other factors come into play when the site is actually contaminated. They include a determination whether or not the impact on value is solely cost to cure or is this stigma or other diminution because of highest and best use changes. I'll explore these with you in a future article "calculating stigma in a contaminated property".



Reading Assignment

Next, please download the PDF version of the Land Contamination and Residential Properties Summit. This is located to the right of your screen and is titled “EDR – LCRPS – 0426-2012. Read pages 1-30 before proceeding.



Chapter 1 Summary

The first chapter is the most difficult to wade through and you've managed. It's steeped in regulation and guidelines created by an alphabet soup of organizations. Here's are some of the things we hope you will retain: space needed here

HUD, FDIC, and The Appraisal Foundation create standards, regulations, and/or guidelines that have the same effect as regulations and influence an appraiser's due diligence responsibilities regarding environmental disclosure.

Freddie Mac and Fannie Mae are secondary mortgage industry lenders. Although, they are not regulators, their guidelines influence appraiser's due diligence responsibility, regarding environmental disclosure, almost as much as government regulations.

Nearby environmental contamination may negatively impact the value of the property even if the site itself is not contaminated.

The negative impact on value may not be calculated simply as a cost to cure item that may be affected by stigma.



Chapter 2

Site Contamination



Chapter 2

Learning Objectives

The appraiser will be able to define where to get important environmental data.

The appraiser will be able to identify laws that describe contamination.

The appraiser will be able to describe various types of contamination such as leaking underground storage tanks.



Site Contamination

Contamination on and proximate to the Subject is relevant to the appraisal process.

What is proximate? Does the appraisal industry have a definition for proximate? **Space needed here**

For some contaminants, a record 1 mile away may be relevant whereas for others, $\frac{1}{2}$ or $\frac{1}{4}$ would be relevant.

Anytime your industry, in this case the appraisal industry, does not have a definition for an important term, look to an industry that is professionally involved in the subject matter in question and, when it appears relevant, adopt the definition from that industry.

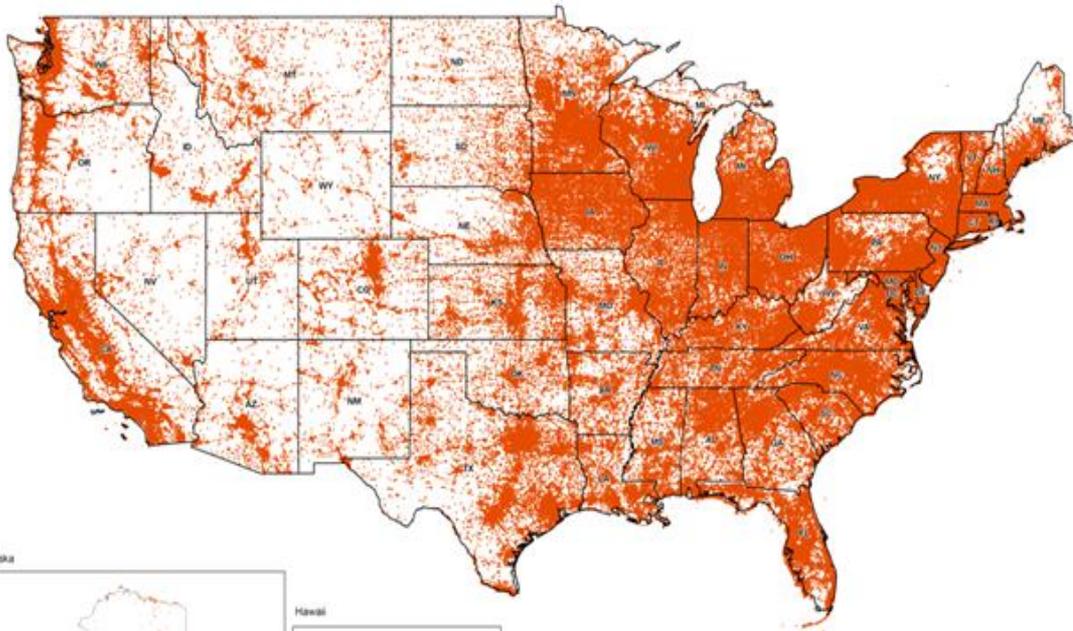
Be sure to include the definition and your reasoning behind the definition in your additional comments section of your appraisal. Once you've created it, it lives there.



State of the Union

National Property Environmental Records

Sites Across U.S.



There has been an enormous proliferation of property contamination records.

23 million records of property contamination since 1990,

Include:

- Superfund sites
- Brown fields
- Old gas stations
- Landfills
- Meth labs
- Spills
- State hazardous waste sites
- And more



Site Map Utilized by Environmental Consultants

Environmental consultants review site maps that contain

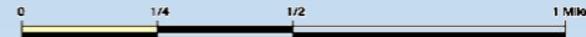
- Quarter mile
- Half mile
- 1-mile radius

These consultants pay special attention to spills within 300 feet of the subject property or as they call it the target property.

Maps and data of this sort are available commercially for virtually every property in the United States and may provide a basis for defining proximate in an appraisal report.



- Target Property
- Record Found
- Several Records Found
- National Priority List Sites
- Dept. Defense Sites
- CDC Health Assessment Sites





Environmental Consultants

Data and maps of this sort are available commercially for virtually every property in the United States and would provide a basis for defining proximate in an appraisal report. Also, state environmental agencies and EPA have numerous databases to search.

The next slide contains names and addresses of vendors supplying the type of data described herein.



Commercial Environmental Data Services followed by their telephone numbers

EDR Environmental Data Resources (www.edrnet.com)

800 – 352 – 0050 (See in learning extras, right side bar, and download for future reference.)

Data Forensics

678 – 406 – 0106

Environmental Data Banks

800 – 531 – 5255

The above is a list of three commercial companies that supply environmental data. In my real estate appraisal practice I use EDR because of the low cost and convenience of accessing the data. I use the Neighborhood Environmental Reports NER.

Another place to obtain info is www.EPA.gov



Site Contamination

Most residential and many commercial properties exist under negative air pressure. Exhaust fans, range hoods, furnaces, boilers, and natural convection currents (warm air rises) create a vacuum or suction. For instance, a fireplace of medium size requires about 300 ft.³ of air per minute to support combustion.



Vapor Intrusion

Vapor intrusion is the general term given to the migration of volatile chemicals from subsurface contaminated soils and groundwater into the indoor air spaces of overlying buildings through openings in the building foundation (such as cracks and utility openings).

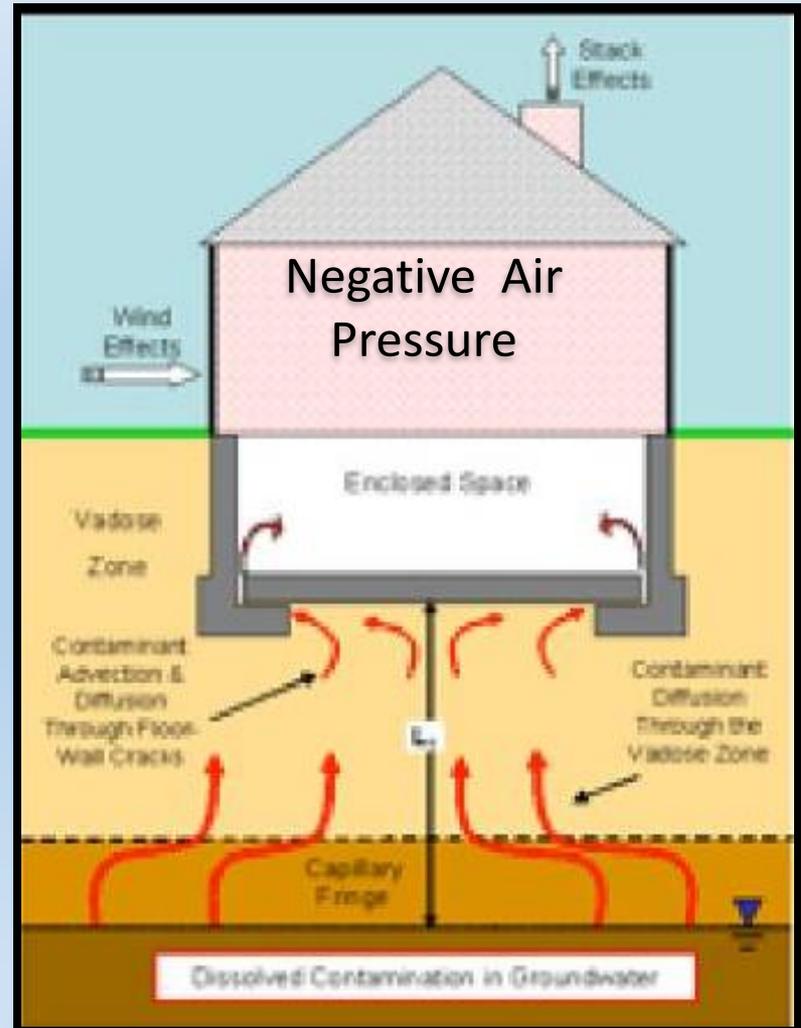


Houses typically exist under negative air pressure; assisting vapor intrusion

When vapor intrusion exists, the most common post-construction methodology for mitigating the problem is effectively identical to those systems used to mitigate radon concerns (sub-slab depressurization).

If there is the opportunity to install a mitigation system pre-construction, there are a variety of chemical vapor barriers that can be installed beneath the foundation to prevent vapors from entering the building.

The cost for a typical post-construction vapor intrusion mitigation system is in the \$1,800 to \$2,800 range for an average-size home.





Contaminated Sites

How is it determined that a site is contaminated?

Where can appraiser look to find the basis for determining contamination?

Federal Laws



Contaminated Sites Federal Laws

The following slide contains a list of federal laws that provide the backdrop that influences state laws and ultimately dictates the parameters that describe various forms of contamination. After the list and alphabet soup of acronyms is a brief synopsis of each one. In the following synopsis you'll see a category of parties called "innocent person" or "almost innocent". To be considered one of these and exonerated from liability associated with a contaminated site an individual must have conducted all appropriate inquiry. EPA has developed a rule for just that; All Appropriate Inquiry (AAI). AAI mirrors the ASTM (American Society for Testing and Materials) E1527 which provides the three phase 1 environmental assessment. E. 1527 has been utilized by environmental consultants for 20 years. Recently a portion of that standard was promulgated as its own standard ASTM E2600. E2600 provides guidelines for screening properties during a real estate transaction for vapor encroachment a.k.a. vapor intrusion.



Contaminated Sites Federal Laws

- CWA-Clean Water Act
- SDWA-Safe Drinking Water Act
- CERCLA-Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
- SARA-Superfund Amendment & Re-authorization Act
- CAA -Clean Air Act
- RCRA-Resource Conservation and Recovery Act
- FIFRA-Federal Insecticide, Fungicide and Rodenticide Act
- IRAA-Indoor Radon Abatement Act of 1988
- Title Ten(X)- The Residential Lead Based Hazard Reduction Act of 1992



Clean Water Act (CWA)

Introduction:

The Clean Water Act (CWA) was enacted in 1972 as the Federal Water Pollution Control Act of 1972. The purpose of the Act is to restore the "chemical, physical and biological integrity of the Nation's waters" by eliminating the discharge of pollutants to navigable waters by 1985. The CWA is designed to accomplish three primary tasks: (1) regulation of discharges from point sources (primarily industrial plants and municipal sewage treatment plants) (2) regulation of spills of oil and hazardous substances, and (3) financial assistance for construction of municipal sewage treatment plants. Provisions of the Act also regulate the disposal of dredge material and vessel sewage, and establish a pretreatment program to regulate the discharge of pollutants to publicly owned treatment works.



Clean Water Act

Although the CWA has been amended several times since 1972, the basic structure has remained the same. The CWA controls water pollution from point sources through a permit system entitled the National Pollutant Discharge Elimination System. The CWA bans the discharge of any pollutant except in compliance with an NPDES permit or other applicable requirement of the Act. Permit provisions translate requirements of the Act into particular limitations tailored to the individual point source. NPDES permits set forth the permissible levels for pollutants discharged by a point source. Any discharge of pollutants above permit levels is an actionable violation of the CWA.

The limits contained in NPDES permits issued to industrial point sources are generally grounded on technology-based national effluent limitations. These effluent limitations establish the permissible discharge levels of pollutants for categories of point sources. EPA considers such factors as the age of facilities and the process utilized at the facility to establish these effluent limitations.

The categories are established by industry, such as iron and steel manufacture, grain mills, and organic chemicals. These categories are further divided into subcategories within each category.



The Safe Drinking Water Act (SDWA)

Introduction:

The Safe Drinking Water Act (SDWA) was passed in 1974 as comprehensive legislation to protect the nation's drinking water. SDWA does not cover all drinking water, only public water supplies. For the purposes of the act, a public water supply is defined as any water source serving at least 15 locations or 25 people.

Under SDWA, the EPA has set a list of possible water pollutants and the maximum contaminant levels (MCL) legally allowed to be present. If a public water supplier exceeds an MCL, the supplier is required to notify customers within three weeks. Notification is necessary even if the provider is granted a variance. The EPA also has the authority to force a supplier to meet a timetable of water quality improvement or shut down the water source **together** if the water fails to meet one or more MCL. Failure to meet an EPA-required timetable also requires consumer notification.



The Safe Drinking Water Act (SDWA)

SDWA also mandates the testing of other materials for which an MCL has not been set. These include organic chemicals (which are regulated by some states through MCL's), sodium, corrosives, and toxic plumbing materials. Notification must be provided if a supplier fails to meet these testing and monitoring requirements.

In 1986, amendments were adopted which provided protection for sole-source aquifers. Any area deriving most of its drinking water supply from underground can be designated by the EPA as a sole-source aquifer. Such a designation has two main policy effects:

1. Any project which is deemed to pose a risk of contamination of the aquifer is ineligible for any kind of federal financial assistance.
2. The aquifer becomes eligible for federal assistance by establishing a "critical aquifer protection area demonstration." If a state develops a management plan for protecting the aquifer and its project is approved by the EPA as bringing substantial overall benefit, the state receives up to 50% of project cost in federal funding assistance. Funding can be provided up to \$4 million.



The Clean Air Act (CAA)

Introduction:

The Clean Air Act evolved in response to public concern over the dangers of air pollution. Increased urbanization, industrial development, and expanded use of motor vehicles have resulted in mounting dangers to the public health and welfare. Since the problem of air pollution transcends state boundaries and local jurisdictions, federal leadership and financial aid were considered essential in formulating a cooperative federal and state program to prevent and control air pollution. The purpose of the Act is multi-fold: to protect and enhance air quality, to accelerate a national research and development program to prevent and control air pollution; and to provide technical and financial assistance to state and local government in formulating their own air pollution programs.



The Clean Air Act (CAA)

The Clean Air Act regulates both stationary and mobile emissions sources. The term stationary source is defined in the Act to mean any building, structure, facility or installation which emits or may emit any air pollutant. Mobile sources refer to motor vehicles, motor vehicle engines and aircraft. In summary, the Act requires the Administrator of the EPA to promulgate national ambient air quality standards for each criteria pollutant, that is, an air pollutant which the EPA determines to be detrimental to public health and welfare. Responsibility has been delegated to each state to promulgate plans to implement these standards, known as state implementation plans (SIPs). The SIPs must be reviewed and approved by the EPA. Finally, the Act generally provides for monitoring and compliance testing of air quality, delineation of prohibited acts, and enforcement. In general, discharges of pollutants in excess of emission standards are actionable violations of the CAA.

Mobile emission sources (motor vehicles and aircraft) are regulated in Subchapter III. Emission and fuel standards and compliance testing and certification are included under this subchapter. The penalties for the acts prohibited under this subchapter are civil only. General provisions relating to administration of the clean air program, citizen suits, policy review and economic impact are contained in Subchapter III. Subchapter IV deals with noise pollution, noise abatement and authorization of appropriations. No prohibited acts or penalties have been included under this subchapter.



Resource Conservation and Recovery Act (RCRA)

Introduction:

RCRA was enacted by Congress in 1976 as amendments to and a complete overhaul of the federal Solid Waste Disposal Act. It was designed to fill the gap left by the Clean Water Act and the Clean Air Act concerning regulation of the treatment, storage and disposal of hazardous wastes. Further amendments were enacted in 1980 and extensive changes to the Act were signed into law on November 9, 1984.

RCRA provides a multifaceted approach to the problems of solid waste management. It was created to accomplish four specific goals. First, a "cradle-to-grave" system was created for regulating hazardous waste. This system is administered by the federal government unless the states choose to accept the federal plan as their own. Second, states are encouraged to establish solid waste control plans including provisions for closing open dumps. Third, the Act encourages research and development in the field of recycling material. Finally, an Office of Solid Waste was established within the EPA. Although all sections of the Act are important, this review will focus only on those sections of the Act which regulate hazardous waste.



Resource Conservation and Recovery Act (RCRA)

The Act directs EPA to establish an extensive regulatory scheme for hazardous waste. Under that scheme, once a specified waste is identified as hazardous; owners and operators of facilities which treat, store, or dispose of that waste must have permits. Generators of hazardous waste must ensure that their waste is transported to a permitted facility. Transporters are prohibited from transporting hazardous waste to anything but a permitted facility. The Act provides for administrative, civil and criminal penalties for violations of the Act; EPA regulations and permits issued thereunder.



Definitions:

The following are a few definitions that will assist the appraiser in better understanding environmental reports.

Absorbent -- the EPA defines this term to mean a material that is capable of physically holding a liquid within pores or interstices by physical forces such as tension or capillary action. Common examples are vermiculite, fullers earth, bentonite, fly ash, fine-grained sands, shredded paper, and sawdust.

Discharge --The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on land or water.

Disposal --The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land.

Manifest --The shipping document originated and signed by the generator which contains the information required in the regulations.

Operator --The person responsible for the overall operation of a facility.

Owner --The person who owns a facility or part of a facility.

Person --An individual, trust, firm, joint stock company, federal agency, corporation (including a government corporation), partnership, association, state, municipality, commission, political subdivision of the state, or any interstate body.



Definitions:

Point Source --Any discernible, confined, and discrete conveyance, including; but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling rock, and concentrated animal feeding operations.

Publicly --Any device or system used in the treatment of owned treatment municipal sewage or industrial wastes of a liquid. (not sure this is correct)

Sludge --Any solid, semi-solid or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, or air pollution control facility exclusive the treated effluent from a wastewater treatment plan. (not sure this is correct after facility)

Spill -- The accidental spilling, leaking, pumping, pouring, emitting or dumping of hazardous wastes into or on any land or water.

Surface Impoundment --A facility or part of a facility which is a natural topographic depression, a man-made excavation, or a dike area formed primarily of earthen materials, which is designed to hold an accumulation of free liquid wastes or wastes, and which is not an injection well.



Definitions:

Tank --Stationary device designed to contain an accumulation of hazardous waste, which is constructed primarily of non-earthen materials (e.g.: wood, concrete, steel, plastic) which provides structural support.

Treatment --Any method, technique or process (including neutralization); designed to change the physical, chemical, or biological characteristics or composition of any hazardous waste so as to neutralize such waste and render it non-hazardous or less hazardous.

Vessel --Every description of watercraft used or capable of being used as a means of transportation on water.

Wastewater Treatment Unit -- A device which (1) is part of a wastewater treatment facility subject to regulation under Section 402 or 307(b) of the Clean Water Act, and (2) receives and treats or stores an effluent wastewater which is a hazardous waste, or generates and accumulates a sludge which is a hazardous waste, or treats or stores such sludge; and meets the definition of tank.



The Federal Insecticide, Fungicide and Rodenticide Act

Introduction:

The Federal Insecticide, Fungicide and Rodenticide Act ("FIFRA" or "The Act") is aimed primarily at the registration and classification *of* pesticides. The Act generally provides that no person may distribute, sell, offer for sale, hold for sale, ship, deliver for shipment, or receive any pesticide which is not registered with the Environmental Protection Agency ("The Agency"). Also, a person who has received such an unregistered pesticide *may not* deliver or offer to deliver it to any other person. This requirement applies both to pesticides produced and distributed solely within a state and those produced for interstate commerce.



The Federal Insecticide, Fungicide and Rodenticide Act

The Act requires the Administrator of the Agency to classify a pesticide for either general or restricted use. A pesticide is classified for general use if it will not generally cause unreasonable adverse effects on the environment when applied according to directions or in accordance with commonly recognized practice. A restricted use classification applies if the pesticide, when applied either according to directions or to widespread practice, may cause unreasonably adverse effects in the environment, including injury to the applicator.

Additional provisions *of* the Act set forth guidelines and requirements for registrations, protection *of* trade secrets, cancellation *of* registrations, and enforcement *of* experimental use permits, as well as prohibited acts and definitions *of* terms. The 1978 Amendments to FIFRA grant primary enforcement responsibility for pesticide use violations to states, provided that they either make the appropriate showing to the Administrator regarding their enforcement program or have entered into a cooperative program with the Agency.



Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA or Superfund)

Introduction:

CERCLA was enacted in 1980 to provide authority to respond to releases of hazardous substances and pollutants and contaminants into the environment. It was created to address hazardous waste problems not covered by existing legislation. Existing legislation such as RCRA regulated the handling and disposal of hazardous substances thus preventing many hazardous waste accidents. However, a mechanism was needed to address the problems created by past practices and future hazards that occur despite this regulation.



Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA or Superfund)

CERCLA authorizes the federal government to respond directly to releases, or threatened releases of hazardous substances, and releases or threatened releases of pollutants or contaminants which may endanger public health or the environment. The Act establishes a federal program to monitor hazardous substances and to clean up sites where wastes have been released. Costs were generally to be covered by an original \$1.6 billion fund, 86 percent of which is financed by taxes on the manufacture or import of certain chemicals and petroleum. The remainder of this amount comes from general revenues. This fund is reimbursable. The government generally can take legal action to recover its cleanup costs from those subsequently identified as responsible for the release or conditions leading to the release.

CERCLA requires the EPA to designate as a hazardous substance, in addition to any substances described in the definition of hazardous substance contained in the Act 1/ any elements, compounds, mixtures, solutions or substances which may present a substantial danger to public health or welfare or the environment.



SUPERFUND AMENDMENT AND REAUTHORIZATION ACT (SARA)

Introduction:

The Superfund Amendments and Reauthorization Act of 1986(SARA) contain a number of elements. First, Congress substantially increased financing for the superfund program - from the original \$1.6 billion over five years to \$8.5 billion over five years. Congress also completed a major overhaul of the original superfund law, rather than the anticipated fine tuning.

SARA re-codified the liability concepts included in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. In particular, Congress validated the principles of strict, joint and several liabilities for responsible parties. The Department of Justice persuaded Congress that these principles, which hold each responsible party potentially liable for the full cost of a cleanup, provide the necessary legal "club" to induce parties to enter into cleanup settlement agreements with the government. Congress did not explicitly incorporate these concepts in the language of the superfund amendments; but it reaffirmed the applicability of strict, joint, and several liabilities throughout its consideration of the superfund amendments.



SUPERFUND AMENDMENT AND REAUTHORIZATION ACT (SARA)

SARA expanded the tools available to the federal government in obtaining settlements from responsible parties for cleaning up superfund sites. Settling parties receive explicit protection against contribution actions brought by non-settling third parties. Similarly, they will receive a "covenant not to sue" from the government. Consistent with current practice, such covenants typically will not insulate settling parties from unanticipated future liability that may arise from a cleanup. The amendments, however, will encourage the government to provide settling parties with more sweeping covenants not to sue when permanent cleanup remedies are applied at superfund sites.



SUPERFUND AMENDMENT AND REAUTHORIZATION ACT (SARA)

In addition to these settlement inducements, the amended law provides the federal government with explicit authority to apply "mixed funding" solutions for cleanups. In so doing, Congress endorsed the practice of applying money from the superfund to supplement cleanup funds contributed by responsible parties that settle. To encourage cleanup contributions by private parties further, the Act gives the federal government the discretionary authority to make a "nonbinding allocation of responsibility" (NEAR) among responsible parties. The intent of this process is to put a preliminary allocation on the negotiating table in the hope that the proposed allocation will facilitate a settlement agreement.

Consistent with its goal of encouraging timely cleanups, the Act limits opportunities to challenge cleanup actions in court. Specifically, the Act sharply limits the right of parties to obtain pre-enforcement review of cleanup decisions, and it also limits the nature of the relief that can be obtained in the courts.

SARA is an especially important amendment as it provides "innocent" or "almost innocent" landowners some relief from the strict liability imposed by CERCLA for cleanup costs.



Superfund Liability

CERCLA provides that past or present owners or operators, waste generators, transporters, or anyone else exercising control over a contaminated property or any hazardous waste is strictly liable for cleanup costs. Strict liability means that potentially responsible parties (P.R.P.) are liable whether or not they were negligent in any way.

Under CERCLA, the only way a PRP could avoid liability was to prove that the release of hazardous material was solely caused by an act of war; an act of God; or an act or omission of a third party.



The Innocent Landowner

SARA tightened restrictions to CERCLA's third party defense by clarifying that deeds, land contracts or other methods of transferring title in fact confer a 'contractual relationship' between parties. On this basis, lenders and other title holders do not have a 'third party' relationship and therefore are liable under CERCLA. At the same time, however, SARA extends the exemptions of Superfund liability to 'innocent landowners'.

To be considered 'innocent', a landowner must establish, by the preponderance of the evidence; that they acquired the property after the hazardous waste had been released, had no reason to know of the disposal, and had no knowledge of the hazardous waste.



The Innocent Landowner

To establish that a landowner had no reason to know of any hazardous waste, "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" must be undertaken. The 'appropriate inquiry' standard indicates the ignorant buyer is not necessarily 'innocent' and imposes an affirmative duty on the buyer to seek information about the purchased property. Although 'appropriate inquiry' is not specifically defined, the statute instructs the courts to consider: if the buyer possessed special knowledge or experience; any difference between the selling price and the property's value if uncontaminated; commonly known or reasonably ascertainable information about the property and its owners; and obviousness of contamination, i.e. the ease of or ability to detect the hazardous waste by appropriate inspections.

If the landowner addresses to the 'appropriate inquiry' standard and employs reasonable inspection practices, it is unlikely that site contamination will be overlooked. By these standards, the likelihood that a landowner using reasonable inspection practices to minimize liability will be unable to detect contamination is probably small. However, this does affirm the need for quality comprehensive environmental assessment to rule out hazardous waste before purchase.



The Almost Innocent Landowner

SARA provides another escape of full liability for landowners by authorizing the EPA to enter into "de minimis settlements" with two classes of potentially responsible persons: Contributors of minor amounts of waste or- 'Almost Innocent' PRP'S.

To meet the 'almost innocent' criteria; a person must not have contributed to, permitted by, action or omission, or have any knowledge of the hazardous waste. The difference, however; between 'almost innocent' and 'innocent' is the lack of an 'appropriate inquiry' as described above.

If these conditions are met, the EPA may choose at its discretion to enter into a settlement but is under no obligation to do so.

The importance of these two additional exemptions to Superfund liability is that they allow some consideration of negligence in an otherwise strict liability framework. 'Innocent' or 'almost innocent' PRP's are no longer subjected to full liability for cleanup of waste that was not under their control. Again, because of these rules, it is vital for all potential buyers to fully assess any potential purchase property, as well as its previous owners and usage, before purchase.

A complete, thorough environmental evaluation should allow a buyer to avoid Superfund liability by qualifying as an innocent landowner should hazardous waste be found at some time in the future.



Indoor Air Quality Research and Radon Abatement Act

Indoor Air Quality Research Act of 1986

Radon Gas and Indoor Air Quality Research

Title IV of the superfund amendments is entitled the "Radon Gas and Indoor Air Quality Research Act of 1986". It requires creation of an advisory committee and an EPA-sponsored implementation plan for a comprehensive radon gas evaluation program.

The radon gas issue addressed in this act requires the EPA to provide Congress with a national assessment of the radon gas problem. It also calls for a demonstration program to test methods and technologies for reducing or eliminating radon gas.

Indoor Radon Abatement Act of 1988 (IRAA)

IRAA was created 2 years later as Congress began to recognize the broad number of homes and individuals who may be affected by radon gas.

IRAA requires the EPA to develop guidelines for testing and abatement of radon gas. The EPA guidelines and programs that presently exist are voluntary.



Lead - Based Paint Hazard Elimination

Department of Housing and Urban Development (June 6, 1988)

In these regulations HUD describes and defines the responsibilities of all parties customarily dealing with HUD subsidized housing or loans. These regulations apply to a specific group of people who are taking part in HUD programs and not the population as a whole.

The descriptions of responsibilities include those of lending institutions and real estate fee appraisers. Under these regulations a real estate appraiser has an affirmative responsibility to identify whether or not the subject property was constructed prior to 1978 and therefore conclude that the property may contain lead-based paint. Also, if the subject property has deteriorated paint surfaces, they must be disclosed.



Lead - Based Paint Hazard Elimination

Title Ten Residential Lead Based Hazard Reduction Act of 1992

An act signed into law in 1992 describes lead poisoning among children as a "national crisis". Signed into law by President George Bush In November of 1992 it goes on to state that as many as 3,000,000 children under the ages of 6 may suffer from lead poisoning.

The act requires the EPA to develop lead paint testing and abatement guidelines and regulations.

It also requires disclosure of lead hazards which may be present in residences constructed before 1978 (target housing). This disclosure must be made by all landlords to tenants and sellers to buyers of all post 1977 residences unless they have been certified as lead free.

The purpose of the disclosure is to allow buyers and sellers to make an informed decision regarding the environmental conditions and hazards they may be exposing their families to. This is also known as informed consent.

Title Ten also encourages states to adopt lead paint laws through a series of financial incentives.



How do contaminants from spills off site move from one location to another?

- Contaminants like petroleum distillates, chlorinated solvents, etc.
- Migrate with the flow of groundwater
- Contaminants can become volatile creating vapors
- Many are called VOCs
 - Volatile Organic Compounds

Vapor intrusion has become such a widespread issue that the Department of Housing and Urban Development has begun developing a protocol for review in multifamily properties they are financially involved. ASTM (American Society of Testing and Materials) after years of review and study recently released the vapor intrusion standard formerly part of the phase 1 environmental assessment standard.



A Common Example

Leaking underground storage tanks (LUST) from gas stations

Leaking underground storage tanks at gas stations are not an uncommon occurrence. A leaking underground storage tank might be discovered by reconciling the fuel records or by distressed vegetation at the surface. It also may be recognized because of vapor intrusion occurring in neighboring properties.



Paper Chase

A phase 1 of our new assessment is mostly “paper chase”. The consultant will access databases that will provide information about historic uses of the property and sensitive environmental sites within 1 mile. The consultant will conduct an interview of the owners or operators of the property. In the property depicted above during the interview they might request a reconciliation of the fuel logs. This would lead them in the direction of a potential leak. Last but not least it would conduct a reconnaissance of the site looking. During the reconnaissance the consultant is looking for obvious signs of potential environmental contamination like; distressed education, sinkholes, slurry pits, drums and debris, abandoned vehicles, etc.



Sensitive Environmental

A phase 1 environmental assessment will identify not only sites that have had releases of contaminants, but “sensitive environmental” sites that have the potential to release contaminants i.e. landfills, agricultural facilities, drilling operations, etc.



LUST

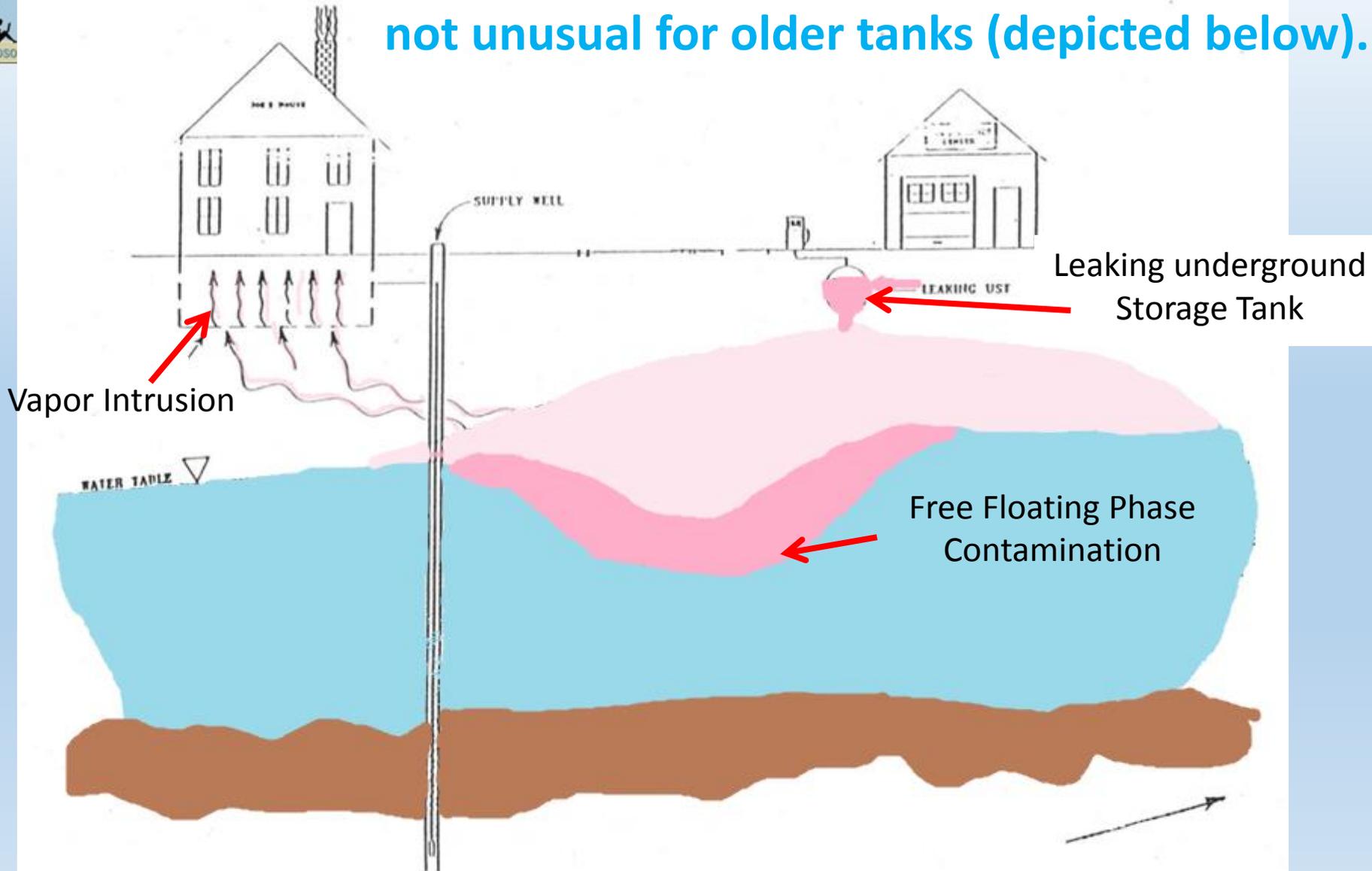
Once the red flags go up during the phase 1 environmental assessment, the next phase of evaluation typically follows.

During the next phase of evaluation invasive testing, such as, core samples and monitoring wells are employed.

Noninvasive testing utilizing air quality testing techniques may also be employed.

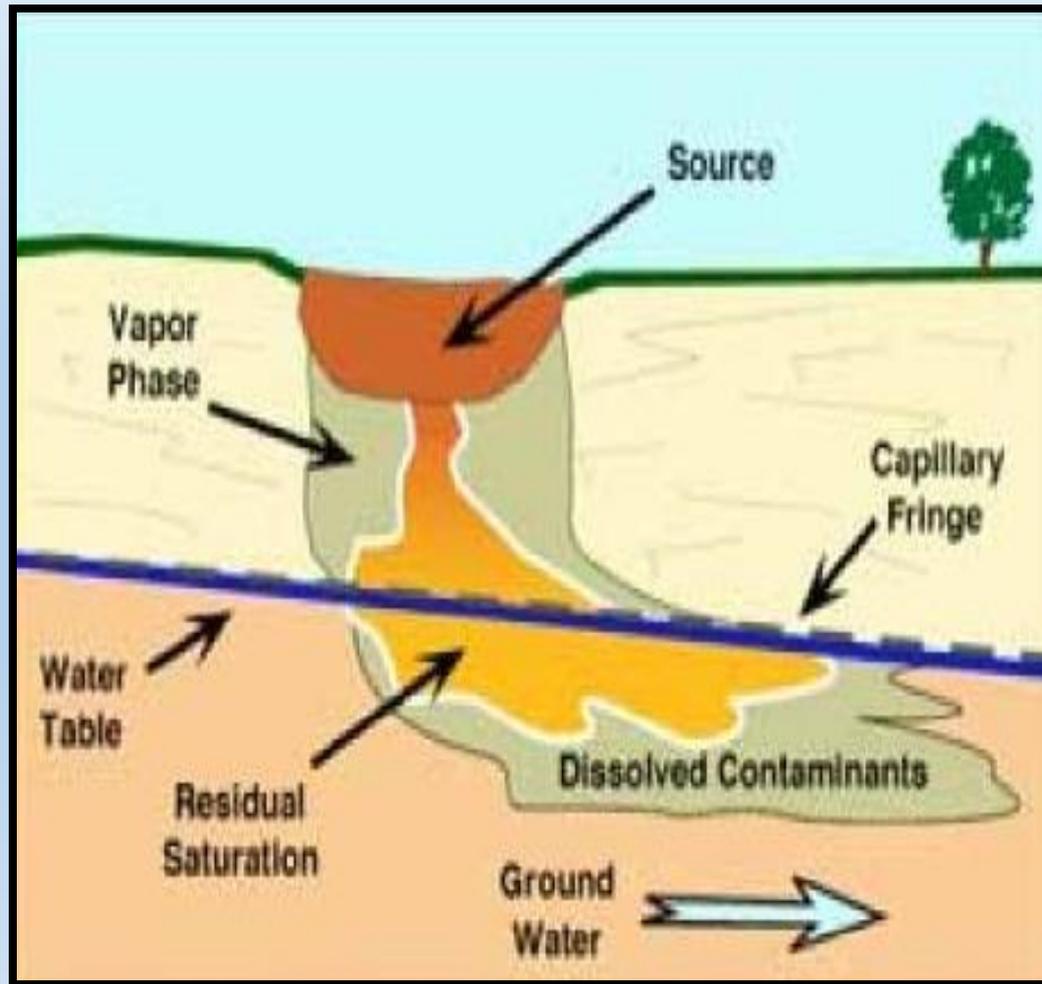


Leaking underground fuel storage tanks are not unusual for older tanks (depicted below).



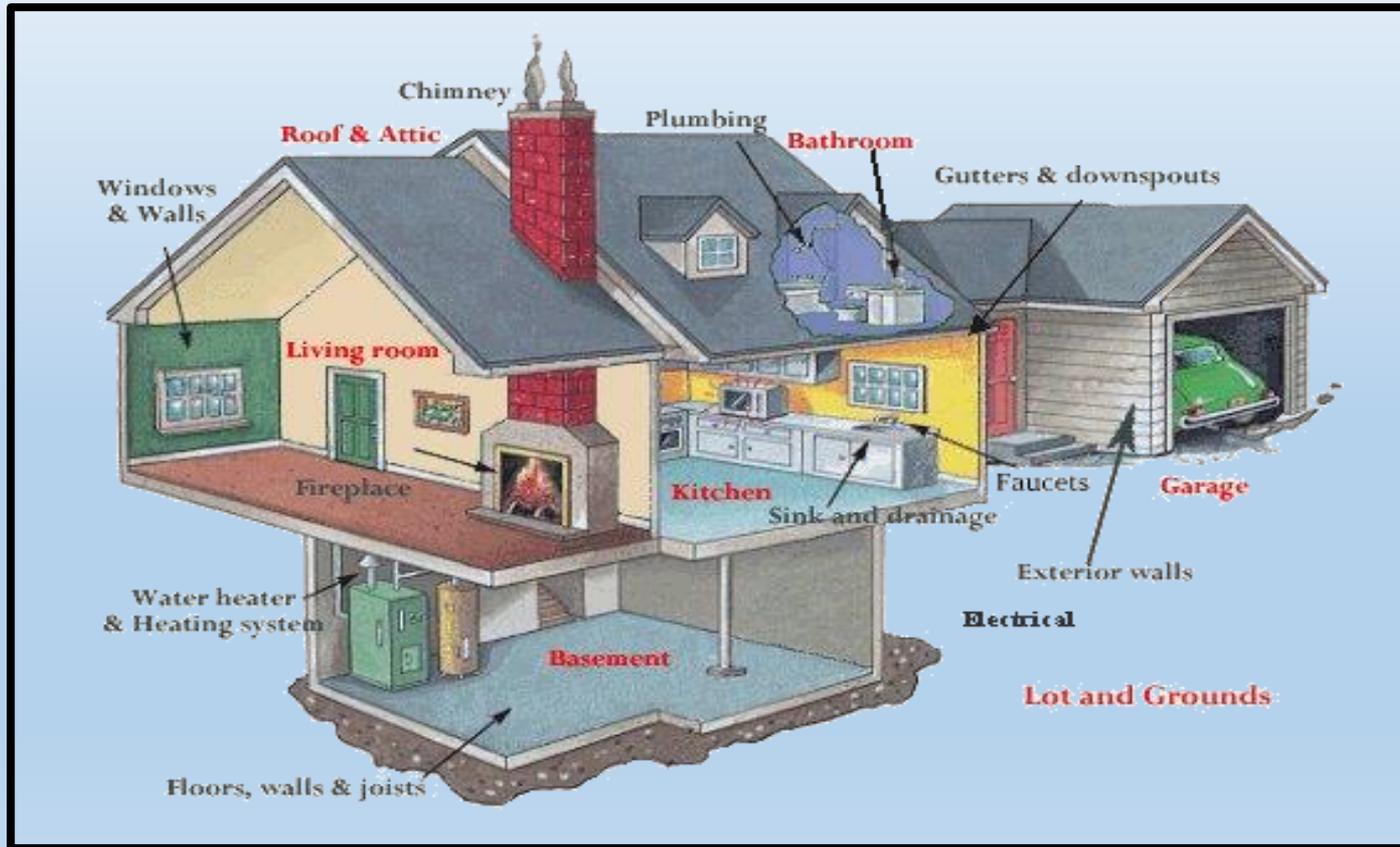


Contaminants in the soil migrate in and on ground water





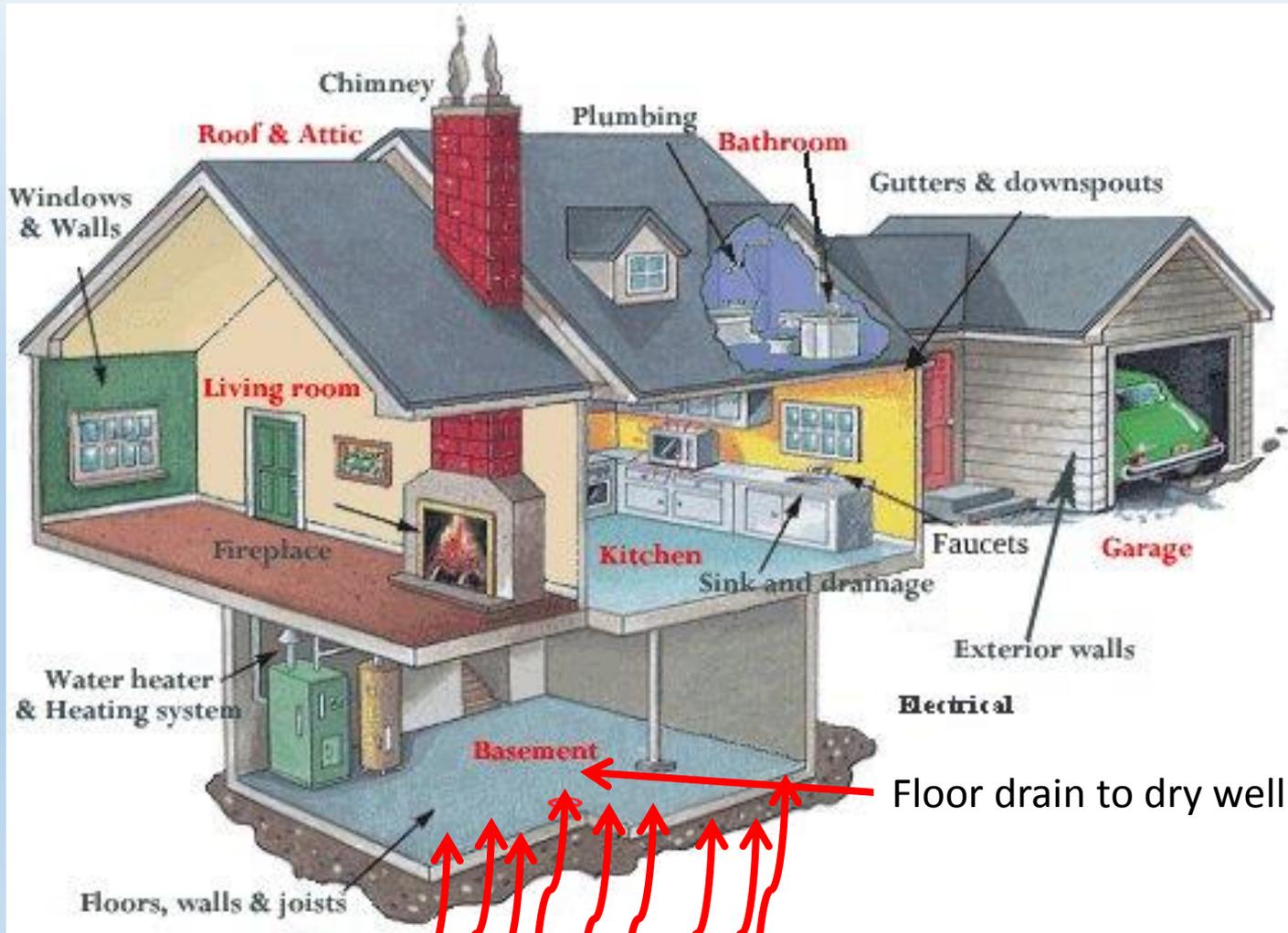
Will the exterior skin of the house, foundation and basement floor protect from vapor intrusion?



The answer is no. With the tremendous amount of negative pressure developed in the living areas and in the basement of a home minor cracks and voids in the foundation and floor will allow for vapor encroachment a.k.a. vapor intrusion to occur.



Vapor intrusion can occur in fine well-built homes.



Vapor intrusion

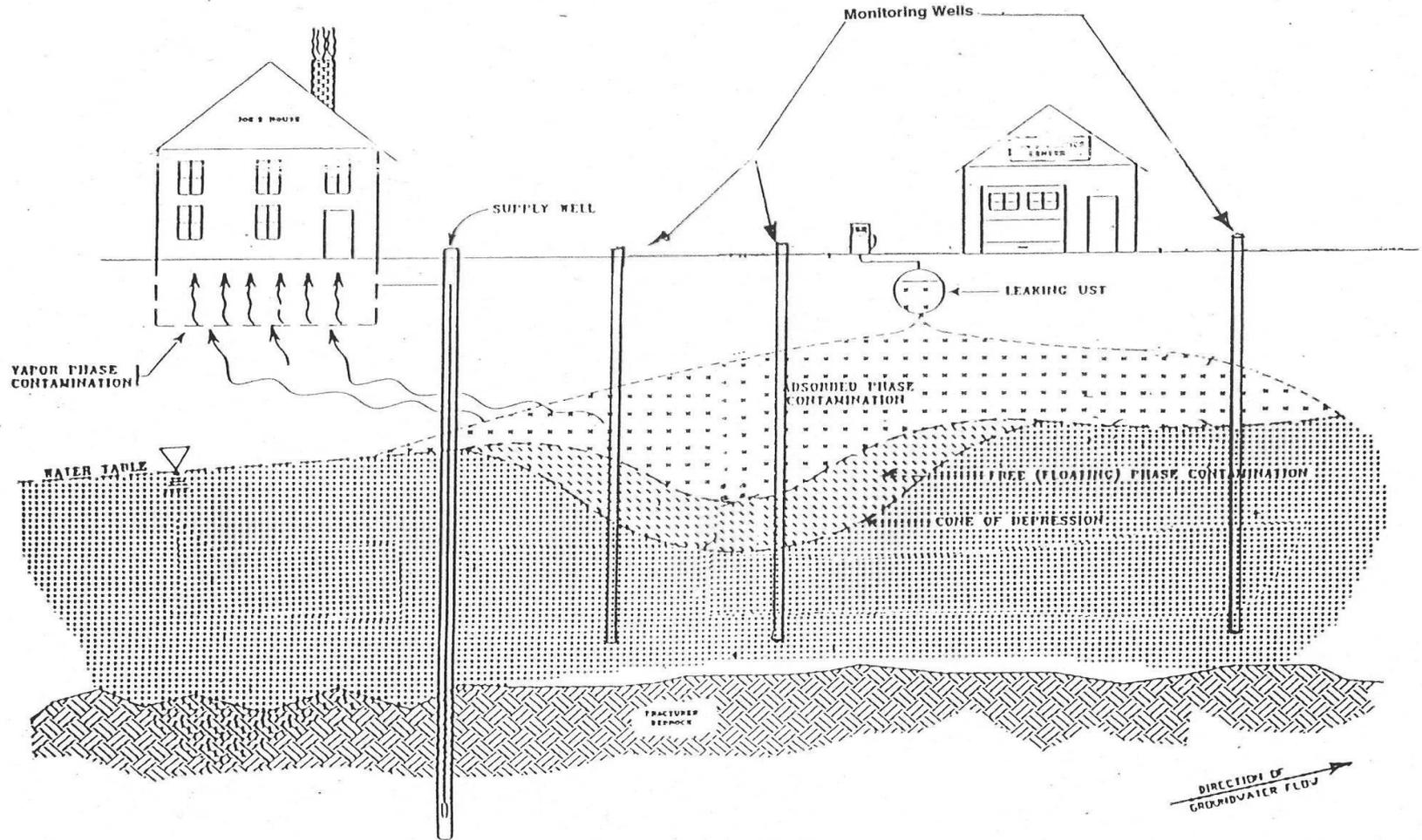


MONITORING WELLS



Monitoring wells are installed in order that technicians may obtain samples from groundwater for laboratory analysis. The results from the laboratory provide information regarding the concentration of contaminants present.

Phase Two Soil Samples & Cores Taken Monitoring Wells Installed



Monitoring wells and/or core samples supply valuable information regarding the concentration of contaminants below the ground. Also, monitoring wells assist consultants in tracking the movement of a contamination plume.



Contaminants

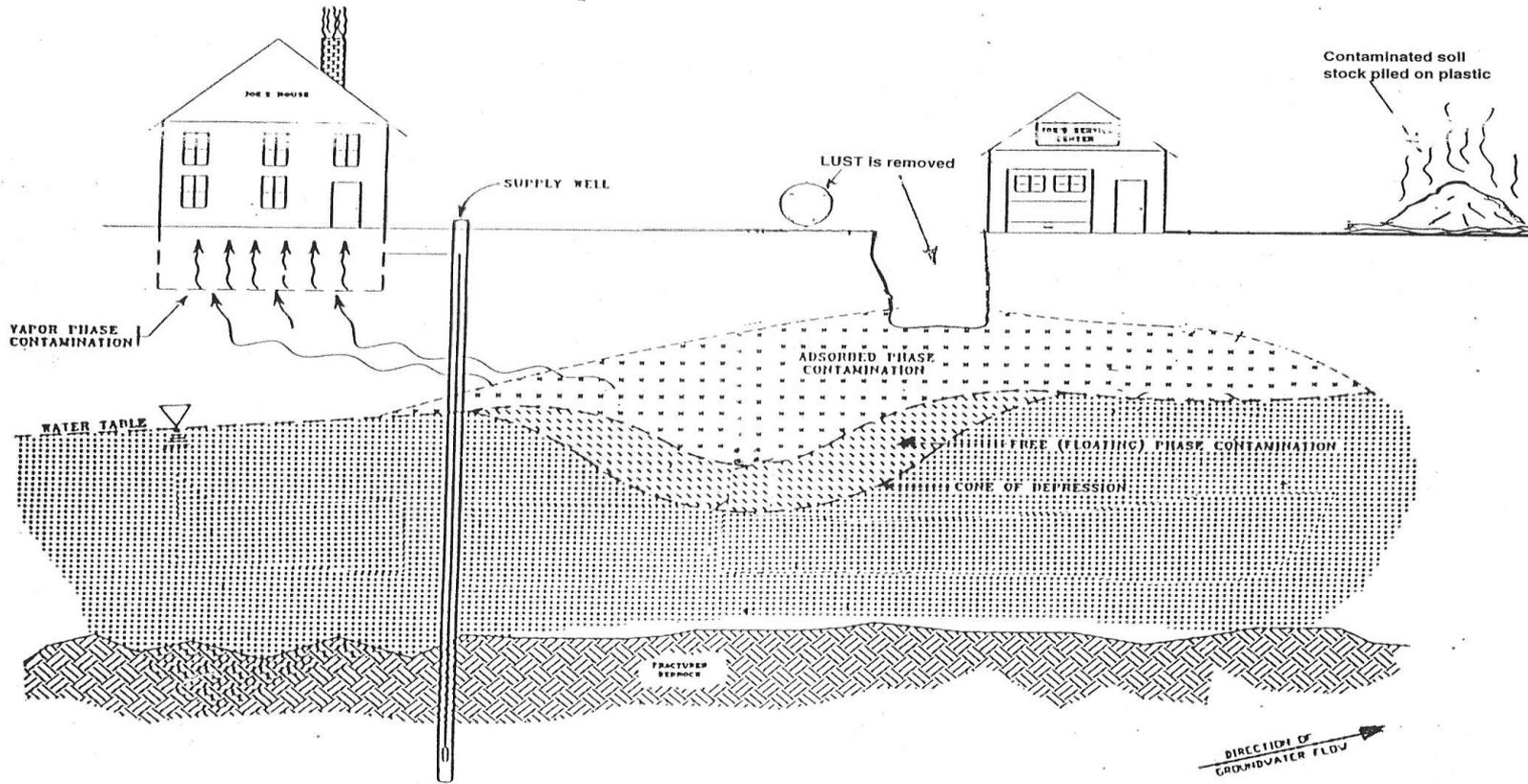
The concentrations of contaminants indicated by the monitoring wells is then transferred to a map format identifying the location of the underground contaminants.

Contaminants that are discharged into the soil move from one location to another on **groundwater**.

Groundwater contour maps are available for many areas of the United States. Typically the groundwater contours match the contours of the surface but not always.



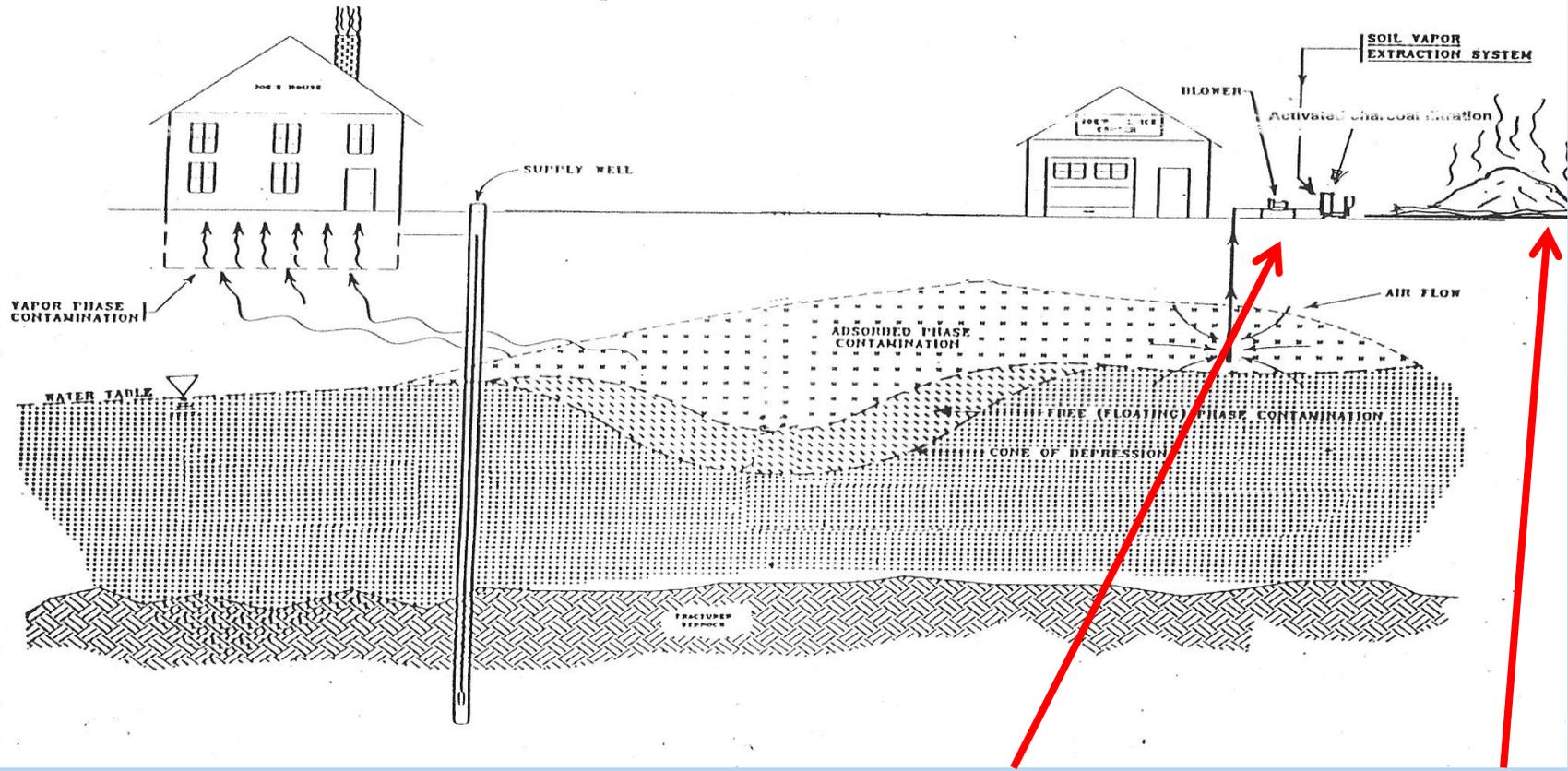
Phase Three Remediation Leaking Underground Storage Tank (LUST) Purged, Removed And Transported In Accordance With RCRA Contaminated Soil Is Stock Piled And Allowed To Aerate



The third phase; clean up or remediation. The first step in the remediation of this nature involves the removal of the leaking underground storage tank. **U**nderground **S**torage **T**anks are identified by the acronym **UST**. Leaking **U**nderground **S**torage **T**anks are identified by the acronym **LUST**. **LUST** is BAD!



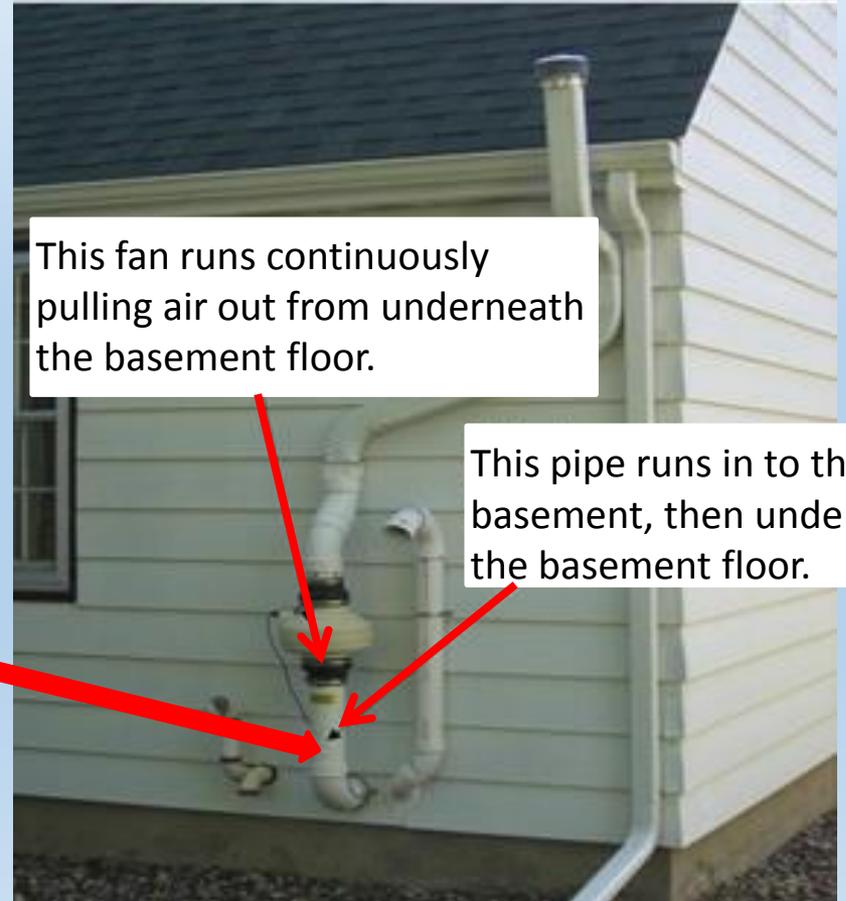
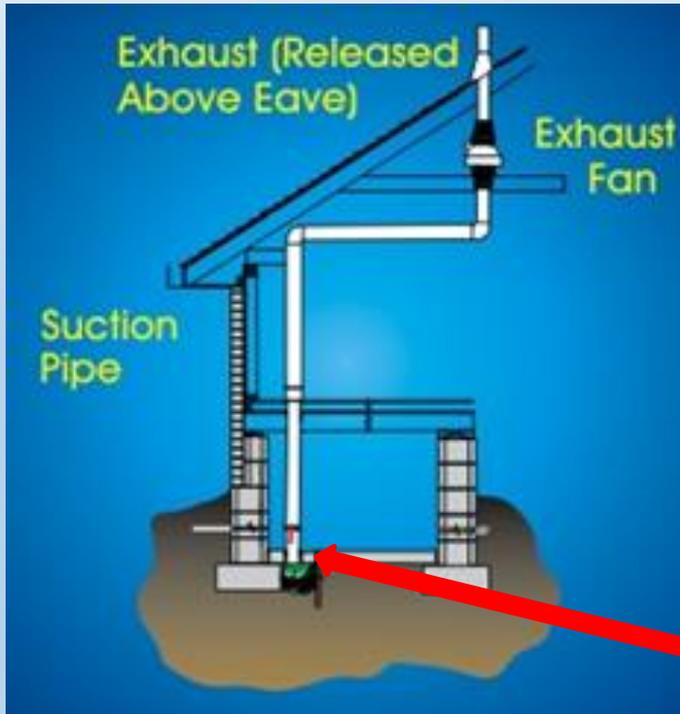
Phase Three Remediation Soil Vapor Extraction System Installed Using Activated Charcoal Filtration And Blowers Or Incineration



Another important step during the remediation process is the elimination of vapor intrusion from the site or properties proximate to the site. In some cases the contamination is so slight that the soils might be excavated and placed on plastic to volatilize into the air naturally. A depiction of volatilizing contaminated soil is located in the upper right-hand corner of the schematic. In other cases active fans cause suction in the adsorbed phase of the soil and filter the contaminants with activated charcoal.



Residential Vapor Extraction System





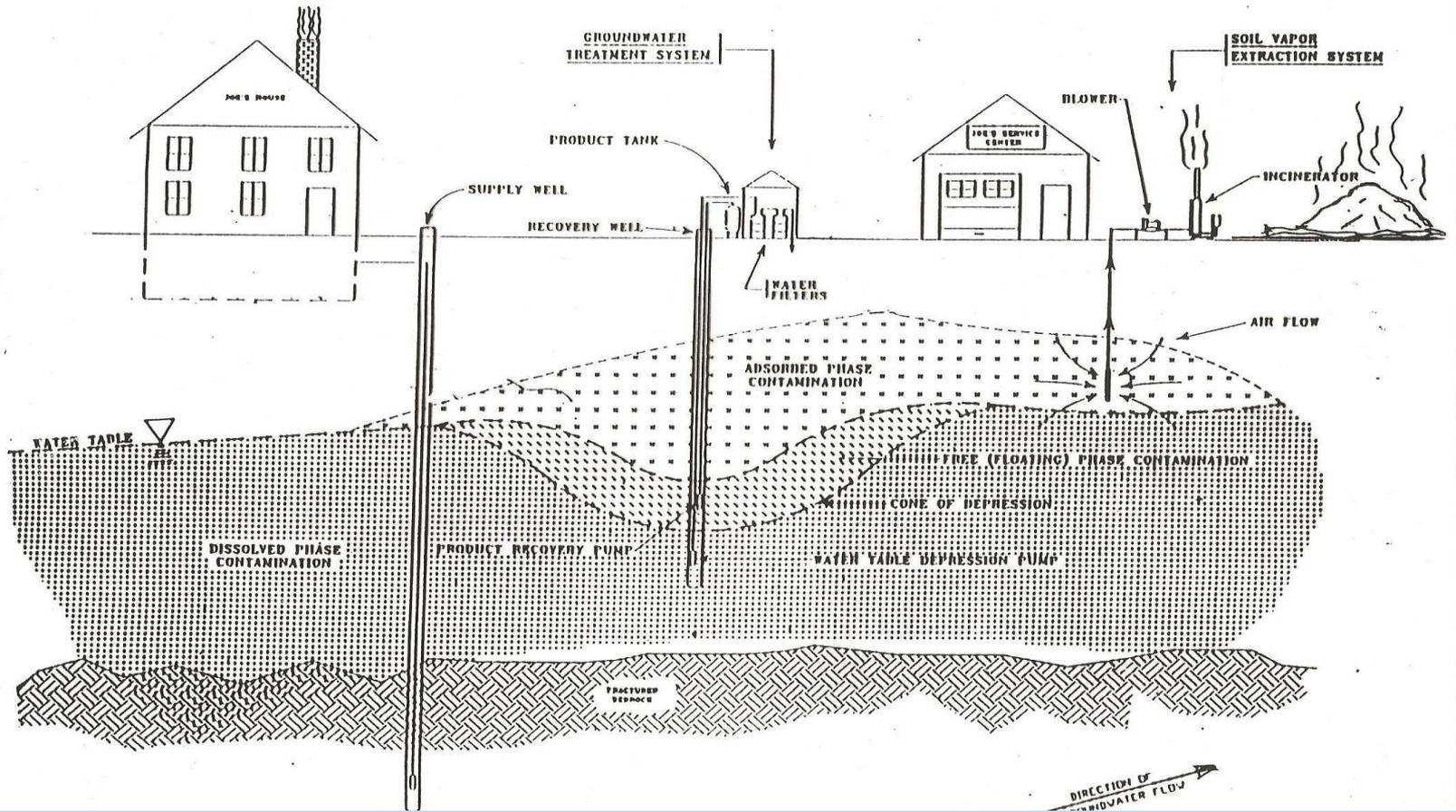
Residential Vapor Extraction System

A home or building might be retrofitted with a vapor extraction system. It's similar to a radon mitigation system and causes a vacuum below the slab of the house or building that captures the vapors before they enter the building.

The system similar to the one depicted in the previous graphic above is a clear indication that there is some sort of contamination somewhere on the site.



Phase Three Remediation Ground Water Treatment System Installed Including Product Tanks, Pumps And Recovery Well(S)



In some ways the cleanup of petroleum distillates is easier than solvents that are water-soluble. Petroleum distillates pool up on the surface of the ground water and are extracted via a recovery well and pump system. You may have seen some of those stainless steel pump systems at abandoned gas stations.



Post-System Mitigation Installation.

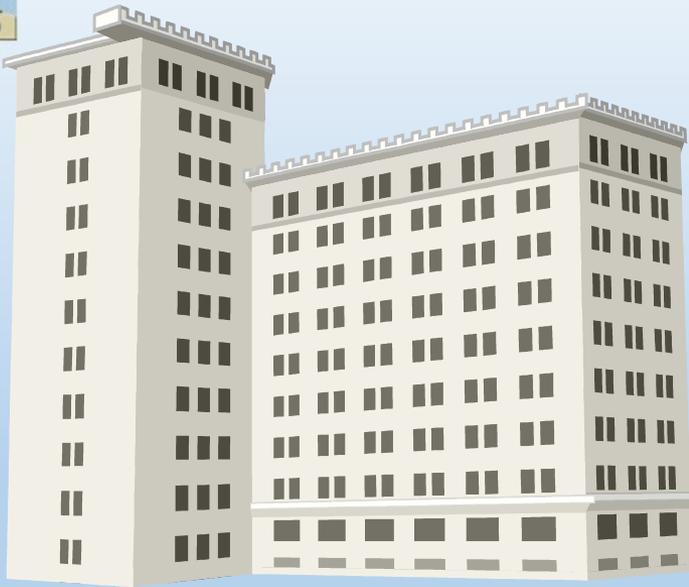
After the system is installed, ongoing costs occur.

They include the following:

- Ongoing air monitoring at properties.
- Ongoing groundwater contamination monitoring.
- Ongoing costs are typically associated with remediation.
- These costs may impact the value of residential property differently than commercial property.



Appraisal Industry Due Diligence



Commercial

Vs.



Residential

In a residential setting you will probably have stigma associated with a vapor extraction system that will impact the value of the property greater than the ongoing cost. The effects of stigma must be drawn from the marketplace. We all know the three most important rules of real estate; location, location, location. These rules don't have the same impact when property is contaminated and suffering from stigma. Just calculate the stigma you need to find with other properties that suffer from the same type of contamination. In a commercial setting cost to cure reconciled with the cost approach coupled with calculations regarding the ongoing expenses calculated using the income approach will assist the appraiser in reaching their opinion of value.



Issue

Contaminants in and on the Subject or from off site may have an effect on residential and commercial property. Such as:

- Negatively Impacting Value
- Creating Dangerous Conditions
- Creating Unsafe & Unhealthy Conditions

One very important reason to make disclosures; relates directly to the potential health effects occupants may suffer when occupying a contaminated property.



Disclosure

Create an environmental disclosure that clearly identifies the limitations of your observations.

If you were to carefully read the questions that relate to environmental issues, the guidelines, and regulations presented in Chapter 1, and your environmental disclaimer in the limiting conditions, I believe you will see they don't quite match up.

My recommendation is to spend some time after you've completed the seminar ~~and~~ to develop an effective disclosure that clearly identifies the limitations of your knowledge and observations.



Reading assignment

Please download and read the EDR *Land Contamination and Residential Properties Summit* report EDR-LCRP, pages 3 - 31.

(See in learning extras, right side bar, and download for future reference.)



Chapter 2

Summary

Places like Environmental Data Resources, Data Forensics, and Environmental Data Banks all supply environmental data that would include site contamination.

The following list of federal laws help define different types of contamination:

- CWA-Clean Water Act
- SDWA-Safe Drinking Water Act
- CERCLA-Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
- SARA-Superfund Amendment & Re-authorization Act
- CAA -Clean Air Act
- RCRA-Resource Conservation and Recovery Act
- FIFRA-Federal Insecticide, Fungicide and Rodenticide Act
- IRAA- Indoor Radon Abatement Act of 1988
- Title Ten(X)- The Residential Lead Based Hazard Reduction Act of 1992



Chapter 3

Mold



Chapter 3

Learning Objectives

The appraiser will be able to identify mold contamination.

The appraiser will be able to define what mold is.

The appraiser will be able to describe health effects of mold exposure.



Mold: A Growing Concern

- History
- Public awareness
- Liability
- Mold: its place, purpose and life style
- Health effects
- Testing
- Remediation
- To do's and not to do's



What Is Mold?

Mold is ubiquitous. Contrary to most people's belief, there are guidelines established by credible sources like; EPA, with their ERMI (EPA Environmental Relative Moldiness Index) which uses DNA testing to speciate fungi and algorithms from thousands of case studies to develop their indices, or ACGIH (American Conference of Governmental Industrial Hygienists) in "Bio Aerosols Assessment and Control" 1999 edition, they identify comparisons that may indicate significant mold contamination.



How Long Has Mold Been A Problem?

From Leviticus Chapter 14, verses 39-47

On the seventh day the priest shall return to inspect the house. If the mildew has spread on the walls, He is to order that the contaminated stones be torn out and thrown into an unclean place outside the town. He must have all the inside walls of the house scraped and the material that is scraped off dumped into an unclean place outside the town. Then they are to take other stones to replace these and take new clay and plaster the house.

If the mildew reappears in the house after the stones have been torn out and the house scraped and plastered the priest is to go and examine it and if the mildew has spread in the house, it is a destructive mildew: the house is unclean. It must be torn down - its stones, timbers and all the plaster - and taken out of the town to an unclean place.

Anyone who goes into the house while it is closed up will be unclean till evening.

Anyone who sleeps or eats in the house must wash his clothes....



Public Awareness

What creates public awareness?

Media exposure

Court cases followed by media exposure, followed by more court cases, and more media exposure are prominent in creating public awareness.

The problem with both venues is that the information is seldom delivered in a balanced manner.



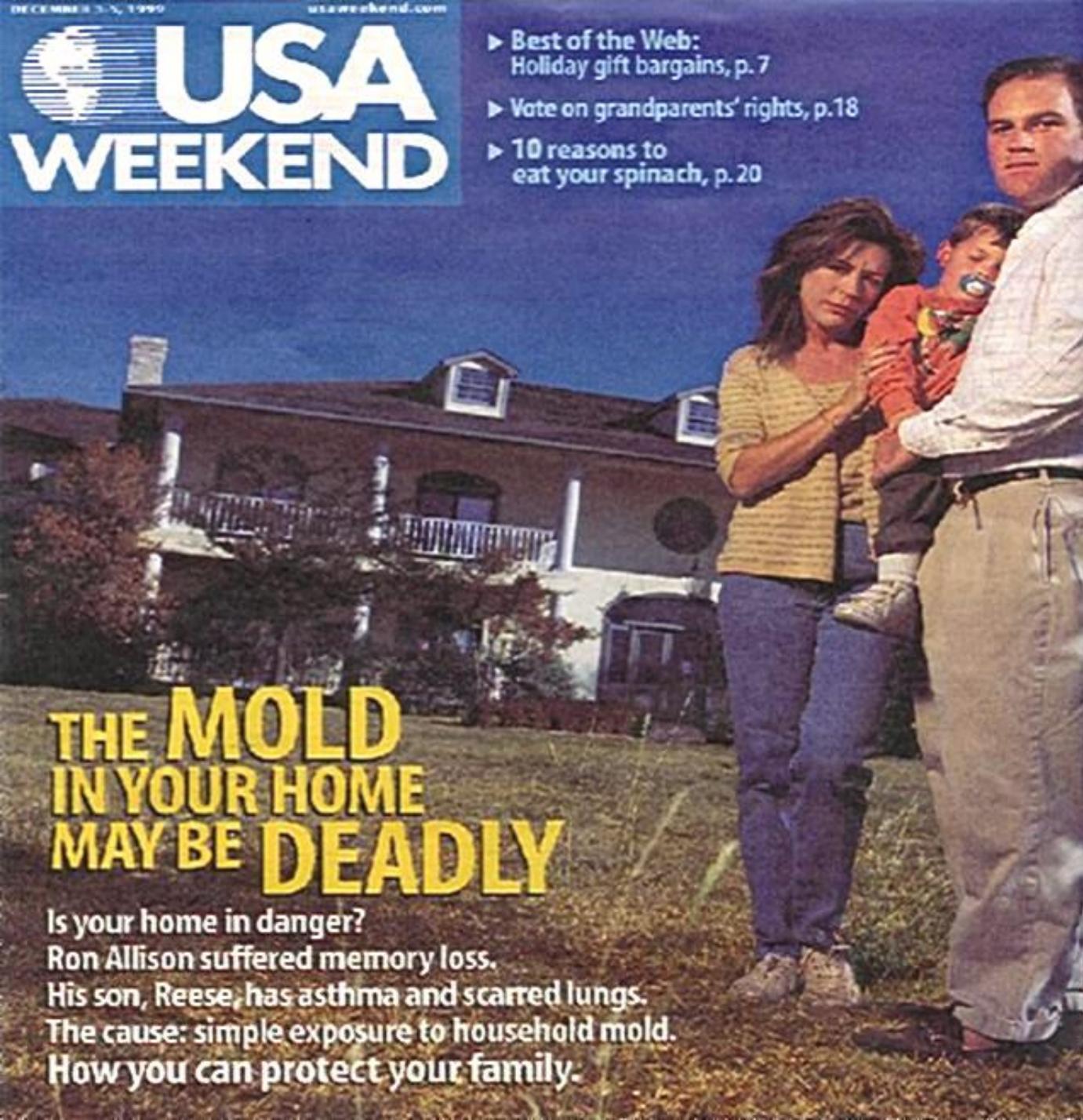
Public Awareness

Even though mold has been known to be a problem in homes for over 4000 years, public awareness really began to grow at the beginning of the new millennium (2000).

The following slides will give you an idea of the broad exposure that erupted during the first part of that decade (2000-2010).

USA WEEKEND

- ▶ Best of the Web:
Holiday gift bargains, p. 7
- ▶ Vote on grandparents' rights, p.18
- ▶ 10 reasons to
eat your spinach, p.20



THE MOLD IN YOUR HOME MAY BE DEADLY

Is your home in danger?
 Ron Allison suffered memory loss.
 His son, Reese, has asthma and scarred lungs.
 The cause: simple exposure to household mold.
 How you can protect your family.

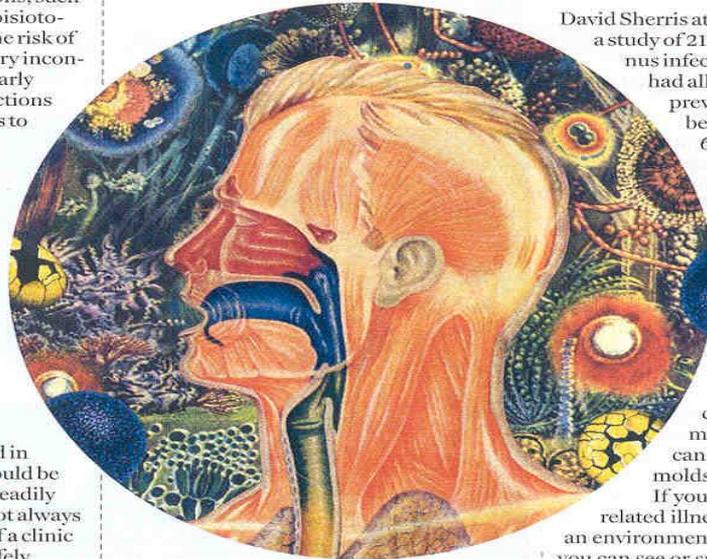
USA Weekend December 1999

Ran a story titled *The Mold In Your Home May Be Deadly* about the health effects mold had on the Allison family.

YOUR HOME

A Hidden Health Hazard

Sneezing and sniffing? Maybe the problem isn't a cold but mold. It's more dangerous than you think.



David Sherris at the Mayo Clinic performed a study of 210 patients with chronic sinus infections and found that most had allergic fungal sinusitis. "The prevailing medical opinion has been that mold accounted for 6 to 7 percent of all chronic sinusitis," says Sherris. "We found that it was 93 percent—the exact reverse."

More rarely, molds appear to cause problems like Karabell's. These aren't just allergies but reactions to toxins. Certain molds produce poisons in order to kill off competing fungi and bacteria. Risks of toxicity increase with the amount of mold—and flooding and leaks can supply the moisture that molds need to thrive.

If you believe you have a mold-related illness, consult an allergist or an environmental-health specialist. (If you can see or smell mold, that's a good clue.) They will at least be able to confirm the diagnosis and proceed accordingly. The best remedy of all is simply to get rid of the mold. Small blooms on the surface of walls can be removed with a weak solution of chlorine bleach. Wear rubber gloves, open the windows for ventilation and throw out the sponge afterward. A face mask could also be a good idea. "Dead or alive, mold still contains the proteins that provoke allergies," says J. David Miller, a mold specialist at Carleton University in Canada.

If your home has more extensive water damage, remediation may be the only answer. Seek professional help. You need to fix leaks, replace moldy drywall and improve ventilation. Beware of built-in humidifiers in forced-air heating systems. "Molds and slime build up there and never get cleaned out," says Jack Spengler of Harvard. New York City has guidelines on remediation at www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1.html. California state also has fact sheets at cal-iaq.org/iaqsheet.htm to help you to a healthier home environment.

says Ob-Gyn David Campbell Walters, author of "Just Take It Out!" He says the evolution of the human head has made it too big to fit comfortably into the birth canal. A 1997 study found that 31 percent of female British obstetricians would prefer to deliver their own babies by cesarean.

Vaginal delivery can have serious—and costly—medical consequences. Especially if doctors use mechanical interventions, such as forceps, vacuum extraction or episiotomy, vaginal delivery can increase the risk of lasting problems like gas and urinary incontinence. And long labors—particularly when followed by unplanned C-sections (and lawsuits)—can add thousands to the overall price tag.

Vaginal births after cesareans (VBAC) can be dangerous. Many women with prior cesareans don't want to risk rupturing the uterus during labor, so they often reject the medical establishment's encouragement to undergo a VBAC. "If a woman ruptures her uterus, you have about 17 minutes to have the baby out before you begin to have [brain] damage," says Dr. Roger Freeman, chair of the American College of Obstetricians and Gynecologists task force on cesarean-delivery rates. ACOG said in August of 1999 that a physician should be "immediately" available, not just "readily available," during VBACs. That's not always possible, especially in rural areas. If a clinic isn't equipped to perform VBAC safely, cesarean delivery isn't just a convenience but a practical necessity.

In the end, both sides are half right. Vaginal delivery is the cheaper method of childbirth—and, unlike a cesarean, is not major abdominal surgery. But from the perspective of some Ob-Gyns, restricting a woman's right to choose a form of childbirth makes no more sense than forcing her into the cheaper of two cancer therapies. "In natural childbirth," says Walters, "we don't even mention that there is an alternative. They're not told their bladder is likely to be negatively impacted. They're not told about the possibility of worse sexuality. We are keeping the advantages of cesarean delivery secret."

A cesarean isn't for everyone—and insurance may not cover it if you're doing it just for your own convenience. Talk to your doctor to decide whether a C-section is right for you. Wanting more peace of mind after a previous cesarean or being certain your own doctor is on hand may be reason enough. Just make sure you understand the risks as well as the benefits.

BY ANNE UNDERWOOD

DEENA KARABELL HAD LIVED in her New York City apartment for 15 years, so when she fell ill in 1983, she never suspected that her apartment itself could be to blame. Over the next 15 years she grew progressively weaker. Finally, in the spring of 1998, she lost 30 pounds and went into anaphylactic shock three times. She literally lay dying in her bedroom when a hired nurse noticed a strong odor of mold in the closet. Suddenly things clicked. Karabell's family moved her out immediately. Today—at a safe distance from the mold—she is almost back to normal. "People are amazed at my recovery," she says.

Molds have been an underrecognized health problem, but that is changing. Health-care professionals now know that molds can cause allergies, trigger asthma attacks and increase susceptibility to colds and flu. Anyone with a genetic predisposition can become allergic if exposed repeatedly to high enough levels. Last year Dr.

Newsweek
December 2000

The title: A Hidden Health Hazard

Subtitle:
Sneezing and sniffing?
Maybe the problem isn't a cold, but mold. It's more dangerous than you think.



www.businessweek.com

BusinessWeek

JUNE 5, 2000

A PUBLICATION OF THE MCGRAW-HILL COMPANIES

China
Counterfeit
goods:
A losing battle

Cisco
Does it have
a Microsoft
problem?



**Inside
Story**
Why 3M banned
Scotchgard

**Daimler-
Chrysler**
The fight for
control —
the untold
story



IS YOUR OFFICE KILLING YOU?

The dangers of sick buildings

By Michelle Conlin

PAGE 114



Business Week June 2000

Ran a story titled *The Dangers of Sick Buildings* about sick buildings that included significant discussions regarding mold.

CASE STUDY

IMPROVED ASTHMA CONTROL AFTER REMEDIATION OF ENVIRONMENTAL *STACHYBOTRYS* CONTAMINATION

Christopher D. Miller, MD; Susan M. Flappan, MS, CIH; Jay M. Portnoy, MD

INTRODUCTION

Fungal mycotoxins have been implicated in human and animal disease. In this case report, we propose that a non-IgE-mediated mechanism, and probably fungal mycotoxins, were responsible for a worsening of asthma symptoms in a toddler. We also demonstrate the importance of environmental assessment and the effects of environmental remediation.

CASE REPORT

A 2-year-old white male with a previous history of asthma was brought to our allergy clinic with asthma symptoms that were not well controlled by his current medical therapy of a β -agonist. The patient's symptoms of cough,

rhinorrhea, sneezing, ocular irritation, and wheezing first arose when he was 8 months old. His symptoms were perennial and more prevalent in the morning and evening. His family history was negative for atopic disease.

On physical examination, the patient appeared to be an active 2-year-old in no apparent distress. He was in the 20th percentile for height and weight and, according to his parents, his growth and development were normal. Physical examination was unremarkable except for pale nasal mucosa. Respiratory wheezing was documented during prior visits to his primary care physician.

Initial workup included prick skin testing, which yielded negative results for molds, cat, dog, dust, cockroach, and dust mite. The patient had appropriate positive and negative controls. His serum IgE was 27

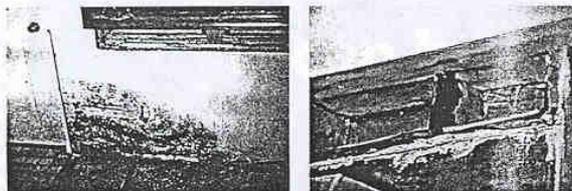


Figure 1. Walls contaminated with a black, slimy fungus later identified as *Stachybotrys*.



Figure 2. Photomicrographs of *Stachybotrys* isolated from contaminated surface.

IU/mL, with normal being 0 to 99 IU/mL.

Daily anti-inflammatory treatment consisting of fluticasone delivered through a spacer and mask was started. Long- and short-acting β -agonists were also prescribed for worsening or breakthrough symptoms.

Despite these interventions, the patient's symptoms persisted. Because the initial history revealed water leakage in the basement of his home, it was decided to perform a home environmental assessment—some-

thing for which his parents expressed a great deal of enthusiasm.

The patient's home was a 12-year-old, detached, bi-level house in an upper-middle-class suburb. It had a wood-burning fireplace, a central gas forced-air heating system, central air conditioning, and a finished walkout basement with carpeting. Severe water leakage in the basement occurred on two occasions after heavy rainfall. After the first event, the wet carpet

pad was removed and the original carpet was reinstalled.

An inspection of the basement identified two areas of wallboard and wood structure with what appeared to be fungal contamination (Figure 1). Surface samples of these areas later revealed numerous fungal species, including *Stachybotrys*, *Chaetomium*, and *Cladosporium* (Figure 2). Air samples, collected with a volumetric grab sampler, revealed elevated spore counts throughout the house (Table 1). In particular, the spore counts were highest in the patient's bedroom and in the playroom located in the basement. *Stachybotrys* spores were also identified in the basement air samples.

It was therefore assumed that the patient's asthma symptoms might have been related to his exposure to fungi. However, further testing for *Stachybotrys* showed that the patient's IgG response to the organism was less than 3 μ g/mL, with normal being less than 34 μ g/mL. His IgE response to *Stachybotrys* was 279 counts, with normal being less than 3,600.

Nevertheless, his family arranged for environmental remediation in the home. This consisted of removing contaminated building materials, cleaning ductwork, steam-cleaning all carpets, using a vacuum cleaner with a high-efficiency particulate-arresting (HEPA) filter, and installing a pleated furnace filter.

The patient's quality of life, assessed with a tool described by Juniper et al.,¹ improved dramatically with home remediation (Figure 3). In addition, he was weaned from his anti-inflammatory medications and has remained asymptomatic, with no further wheezing exacerbations and a significant decrease in rhinitis symptoms. Follow-up air

TABLE 1
RESULTS OF AIR SAMPLE TESTS (SPORES/M³)*

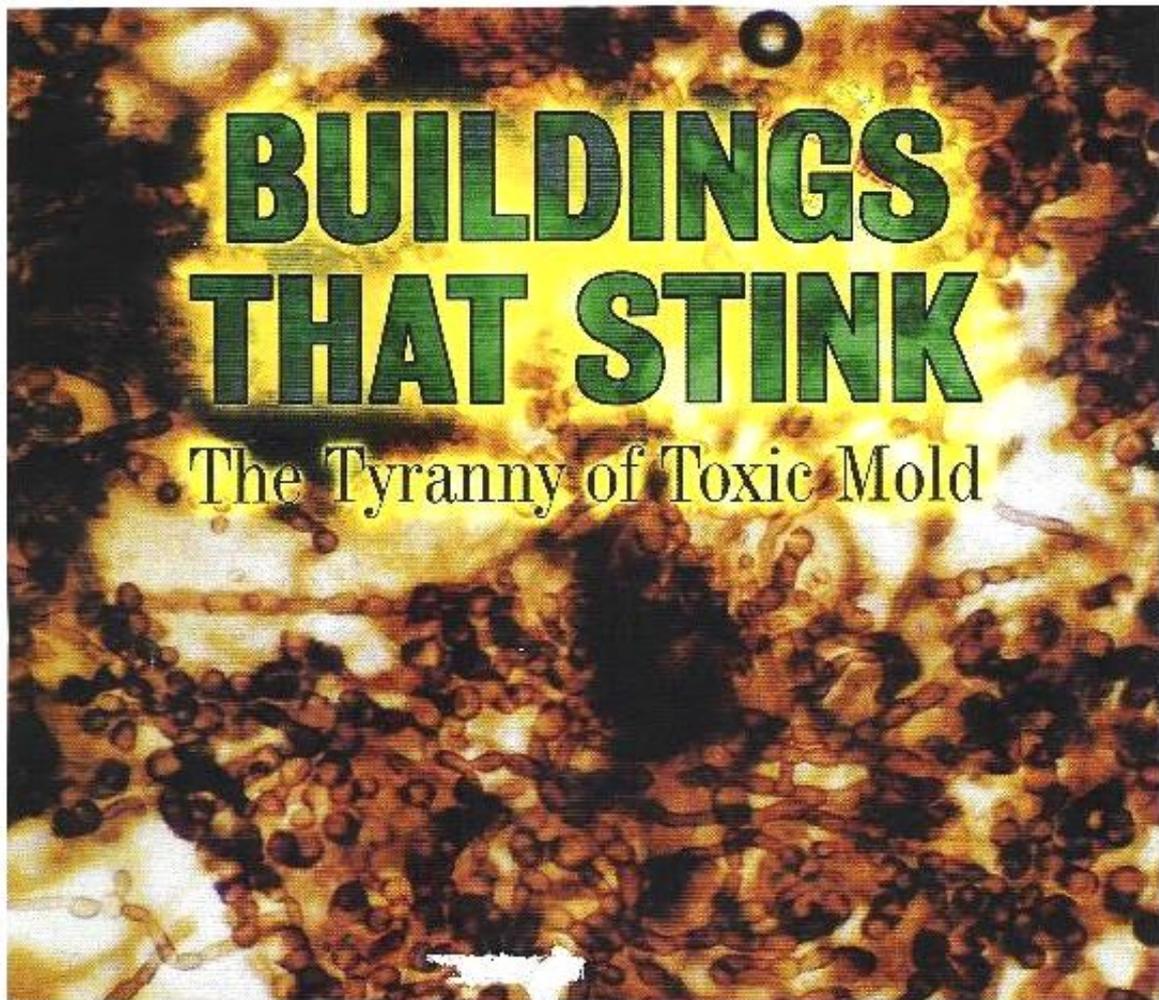
	Sample Dates		
	11/13/97	12/11/97	2/12/98
Kitchen	10,000	800	0
Patient's room	11,200	1,600	100
Basement	12,200*	3,600	100

*Spores identified as *Stachybotrys*.

Dr. Miller is an allergy fellow, Dr. Portnoy is Program Director/Chief, and Ms. Flappan is an indoor air quality specialist, all at The Children's Allergy Hospital, Section of Allergy, Asthma and Immunology, Kansas City, Mo.

Case Studies

There have been tens of thousands of articles and case studies in print and on the internet about mold.



Magazines

Engineering and building magazines are not exempt from the continually growing public awareness.



Liability

My client is not an environmental expert

My client relied on his appraisal



Lawyers are in some ways social samurais. They fight other people's battles, as they may be. There have been thousands of court cases about mold. I've personally been involved in several high-profile court cases as an expert.

- ▶ [USA Archives](#)
(all years)
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- ▶ [E-Mail Alert](#)
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LAWYERS WEEKLY USA

THE NATIONAL NEWSPAPER FOR SMALL-FIRM LAWYERS

October 2, 2000

Cite this Page: 2000 LWUSA 853

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Article of the week from *Lawyers Weekly USA*:

TOXIC MOLD

... the Next Asbestos?

By Sylvia Hsieh

Claims for personal injury and property damage caused by mold growing inside buildings are on the rise, plaintiffs' lawyers and insurance defense attorneys tell *Lawyers Weekly USA*, and some experts predict they will be the next big tort wave.



Liability

With all of the potential for liability that a real estate appraiser is exposed to every day, it seems miraculous that we as an industry have by and large remained out of the judicial food chain when it comes to environmental disclosure. The problem will arise the day that we as a group get in the crosshairs of attorneys around America looking for the next asbestos.



Liability

OCTOBER 6, 2000



DENNIS MCCOY / SACRAMENTO BUSINESS JOURNAL

Tom Anderson, with son Alan, said Allstate offered \$17,300 to do \$30,000 in home repairs

Mold verdict: \$18 million

KELLY JOHNSON / STAFF WRITER

A federal court jury in Sacramento on Tuesday awarded a 96-year-old Placerville man \$18 million in punitive damages in his bad-faith insurance claims-handling lawsuit against Allstate Insurance Co.

"Allstate could have repaired my house for a little over \$30,000 to start with," Tom Anderson said after the decision.

Allstate, the nation's second-largest home and car insurer, plans to appeal.

Anderson's house was damaged more than 3½ years ago when a water pipe burst and mold took hold throughout the modest structure. He rejected Allstate's offer of \$17,300 to repair the house and sued Allstate in July 1999.

"Thank God it's over," he said Tuesday.

Anderson won't collect any money while the case is on appeal. "Usually it's a two- to three-year process," said Ron Haven of the plaintiff's law firm, Shepard & Haven, in Sacramento. Anderson's lead attorney was Stan Parrish.

son said, he had killed down the mold, but didn't eliminate it. Now the house must be torn back down to the frame.

At trial, an Allstate expert disagreed. Tom Anderson, who has been living with his son, misses his own home, yard and neighbors.

A year ago Alan Anderson figured that Allstate was waiting for his father to die because the bad-faith lawsuit would have died with him. Now, if Tom Anderson were to die before the appeal is decided, the economic and punitive damages would remain, while the non-economic damages would be lost, Haven said.

"It is a big victory," Alan Anderson said, "for the little guy."



The article at the left is from the October 2000 issue of the Sacramento Business Journal.

Critics like this \$18 million award winner with only \$30,000 worth of damages prompted insurance companies in 2003 to seek state regulatory approval for limiting their liability regarding mold. In most states and on most residential homeowner insurance policies as well as commercial insurance policies there are either mold exclusions or limits of liability. For that matter most of our real estate appraisal error and omission policies, or professional liability policies as they are also known, have exclusions for environmental contaminants. These factors make it even more important for the appraisal community to be more vigilant in their disclosure.

Mold & Mildew: A Creeping Catastrophe

By Everette L. Herndon, Jr. and Chin S. Yang

In February 2000, a Texas grand jury found reason to continue a criminal investigation of child endangerment charges against an insurance company for its handling of a water damage claim. This investigation was prompted by a criminal complaint filed by the policyholder and follows the filing of a \$100 million lawsuit in 1999 against the same insurance company for its handling of the claim. The policyholders say that the insurance company did not act properly or in a timely manner following the water damage claim. The allegation is that the house is now uninhabitable.

The family claims that, following the water damage, and while they were still living in the house during repairs, they were coughing up blood. The husband, the family claims, is now suffering from a cognitive dysfunction, among other injuries.

The problem? Mold. *Stachybotrys chartarum* (a.k.a. atra) to be specific. The mold developed following a water damage loss in 1998. The policyholders allege that neither the insurance company

There are still ways for individuals or businesses to exceed the limitations described in a policy, but there are greater burdens of proof than previously existed.



Wall Street Journal 2004

On February 12, 2004, the *Wall Street Journal* led its "Personal Journal" section with an article entitled: "Forget Plastics. The Future Is in Mold." Michelle Higgins, writing for the *Journal*, concluded that, since there are no federal or state regulations that control mold companies, mold inspectors and remediation companies have sprouted like mushrooms in a dark, warm basement. None of these companies require licenses or certification to operate.

The new industry—[mold remediation](#)—is trying to create standards. For example, the Institute of Inspection, Cleaning and Restoration, has issued a mold remediation Certification Standard (IICRC S520), as has the U.S. Occupational Safety and Health Administration (OSHA). No local, state, or federal agency, however, has imposed standards or required licensing of [mold inspection](#) or remediation companies.

Sickening: Families blame black mold for illnesses at apartment complex

Posted: May 06, 2011 4:14 PM EDT Updated: May 06, 2011 4:36 PM EDT



Several families in Sheffield Township who say they are getting sick believe their apartments are to blame.



19 Action News visited Sheffield Estates, where residents claim black mold consuming a vacant unit is spreading into their bodies.

Brandon Robinson, Kassondra Secrist and Corie Igo are all concerned about their children and their own health after discovering the black mold spreading through their building. The outbreak was so bad that the Lorain County Health Department and Fire Department were called out to the apartments last week.

Resident Brandon Robinson spoke of his concerns to 19 Action News saying "we have infants that live in our house, three of them. They told us it could shut down their respiratory systems it's so bad...we have to get them all checked out by the doctor, I'm waiting on my results now." Robinson also says his family suffers from chest pains, headaches, nausea. "I'm always tired which are all signs of black mold poisoning" says Robinson.

After three days in a hotel, courtesy of the American Red Cross the families were back at Sheffield Estates because they have nowhere else to go at this time. Most residents aren't convinced the danger has been completely cleaned up.

19 Action News went looking for answers at the leasing office Friday afternoon, nobody answered the door. In the meantime, residents say they are packing up and ready to get out of harm's way.

Channel 19 Action News Cleveland, Ohio



Claims Are Based Upon...

The presumption that real estate professionals know or should have known about mold and its potential negative impact on property and therefore disclosure should have been made.

Misinformation can help fuel the sort of negligence that claims may be based upon.

Misinformation can come from the most trusted of sources. For instance the Internet has tens of thousands of articles about mold. Very few of them have been peer-reviewed by experts. This can influence how information is disseminated and used by the public or professionals interacting with the public. The next slide is an example of just that.



Health Effects

The following is not a criticism of the author of the article, *Is Mold in Your Home a Health Hazard?* by Debbie Lynn Dadd. The author conducted research and used information that I'm sure she deemed reliable. Unfortunately, it was not in the article was electronically delivered via the Internet to hundreds of thousands of real estate professionals around the country.

- Her statement "Relax. Most molds in homes are not a big deal. The most common indoor molds are *Cladosporium*, *Penicillium*, *Aspergillus*, and *Alternaria*, none of which are toxic." is factually incorrect.
- She is correct in her statement "most molds in homes are not a big deal." Subject to the concentration. Also, there are hundreds of species of *Penicillium* and *Aspergillus*, some of which do produce mycotoxins.

The following is a quote from Dr. Edward Sobek director of Assured Bio Laboratories in Oak Ridge, Tennessee. Dr. Sobek is an expert in fungi and has worked closely with EPA on the usage of Mold Specific Quantitative Polymerase chain reaction as a methodology for speciation of fungi.

- *He states, "Aspergillus ustus is one of the most widely spread species of Aspergillus. It has been isolated from diverse soils from around the world, salt marshes, estuaries, foods, bat caves and uranium mines. Sporulation of A. ustus is stimulated by light. This species produces several mycotoxins and has been responsible for endocarditis and infections of the lungs and skin. It is possible that infection by A. ustus is nosocomial, but diagnoses of this mycosis are rare."*
- Again this is not a criticism of the author, more an observation of a general pattern of misinformation that has been provided to the public making it difficult to weigh one's responsibilities when it comes to mold contamination.

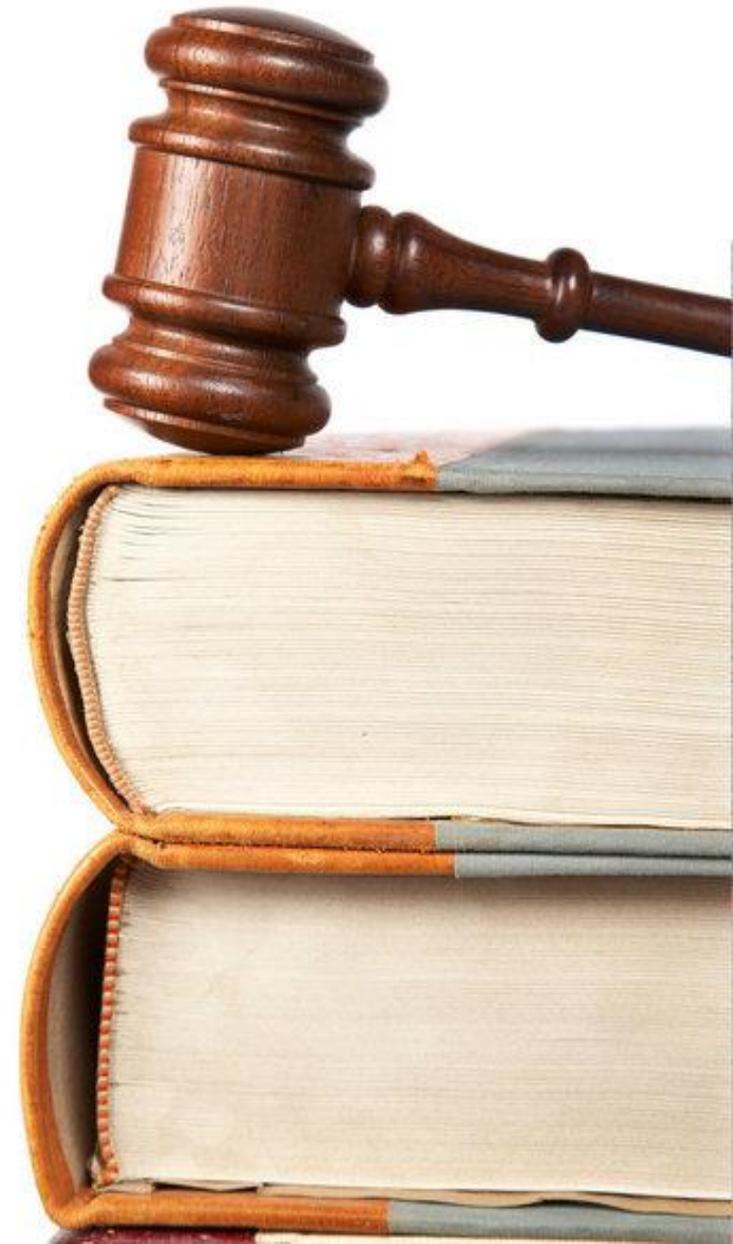


Liability

Do you really think ignorance is a defense in a court of law!?

Like lead, meeting your due diligence responsibility for reporting observations about mold is easier than you think.

It's actually just a few simple observations that are important to make followed by accurate disclosure statements.





Apartment mold claim advances on Building Code theory excerpted from VLW January 21st, 2011 · [No Comments](#) · [Judge James R. Spencer, Landlord-Tenant, Toxic mold Sanders v. UDR Inc](#)



A Richmond federal judge says a couple who alleges damage from [mold infestation](#) can sue their landlord for negligence per se, on a theory the landlord violated Virginia's Uniform Statewide Building Code.

The Supreme Court of Virginia has not addressed this kind of negligence per se claim based on the state Maintenance Code, said Richmond U.S. District Judge James R. Spencer.

The cases that do [apply](#) negligence per se to violations of the Building Code generally, or to its Maintenance Code specifically, "are not between residential [landlords and tenants](#)," or "precede the General Assembly's 2008 amendments to Virginia landlord-tenant law that established an ordinary care standard for statutory violations," Spencer wrote in his Jan. 12 opinion in [Sanders v. UDR Inc](#).

No precedent "directly answers the post-amendments question of whether a residential tenant may properly claim negligence per se based on a landlord's alleged failure to adhere to provisions of" the Maintenance Code, Spencer said.

UDR argued that allowing the negligence per se claim would make landlords "virtual guarantors of the perpetual pristine condition of leased premises under their control." But Spencer said the parties still are free to argue the elements of negligence per se, and to debate whether UDR violated the Maintenance Code and whether any such violation was excusable.

The court also denied UDR's motion to dismiss the tenants' fraud claims alleging misrepresentations in the maintenance staff's response to the Sanderses' complaint and the defendant's attempts at a remedy.



What Is Mold?

Before 1969 mold was thought to be a plant but, because it didn't produce photosynthesis, it was then classified in its own kingdom known as the FUNGI kingdom. In the fungi kingdom there are molds, yeasts, and mushrooms.



What Is Mold?

How does mold reproduce and grow?

Asexually w/conidia

Hyphae

Enzymes

Sporangium

or with spores

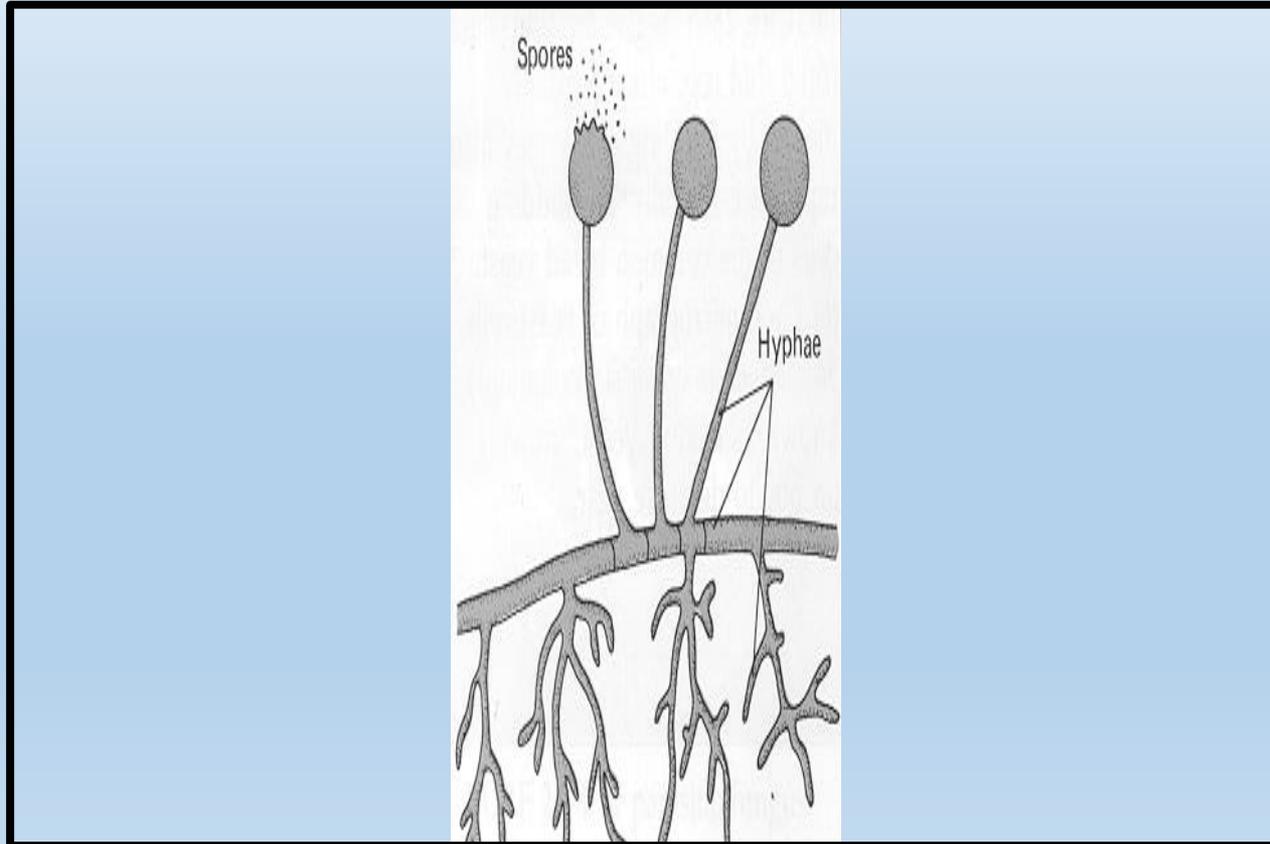
Many mold spores are very aerodynamic and travel on air currents. They indiscriminately land on surfaces. If the surface is a warm moist host material, the spore will begin to grow.

One spore can develop into millions of colony forming units.

The graphic on the next ~~to~~ two slides depicts mold growth propagation and growth.



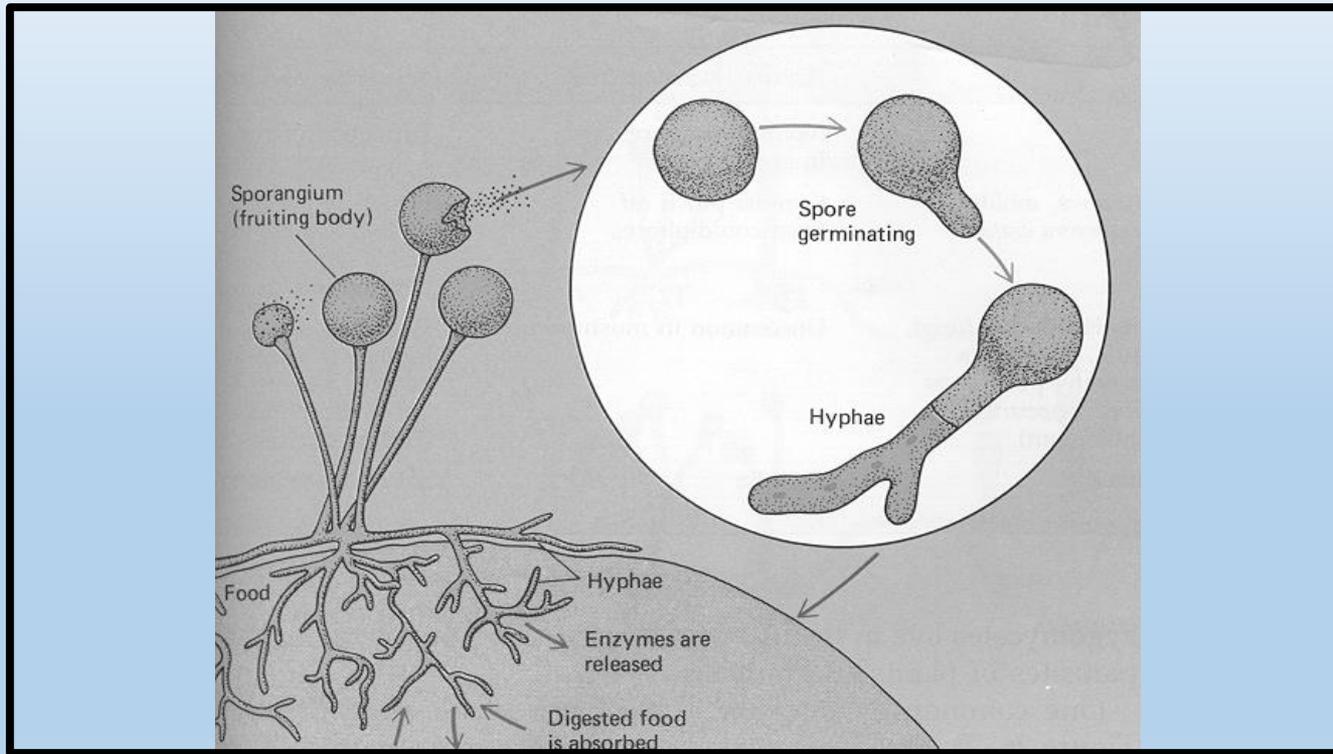
What Is Mold?



As the spore grows, it produces appendages that are similar to fruiting bodies or flowers and Hyphae that are similar to roots of a plant.



What Is Mold?



The mold excretes enzymes from the Hyphae and digests the host material. It absorbs nutrients through the Hyphae. As the fruiting body develops, in this case a Sporangium, capable of producing millions of spores. The aerodynamic spores travel on air currents. If they land on a warm moist material that is typically their food source, they will begin proliferating. Once incubated by a water source, some molds can proliferate at 60% relative humidity.



What Is Mold?

What does mold need to grow?

Heat

Moisture

Food



What Is Mold?

What does mold “eat”?

Organic materials

Especially things like cellulose

Where can we find cellulose in a house?

- Wall studs
- Sheetrock
- Paper on insulation
- Wallpaper
- Adhesives
- Carpet
- Siding
- Dust and dirt in duct work

Mold likes to eat many of the building materials and furnishing in your home or office. Environments that are comfortable for people to live in are typically very good for mold to live in as well.



What Is Mold?

The following series of slides are graphic illustrations and pictures to help you recognize the conditions you should consider disclosing and how you might disclose those conditions in your appraisal report.

These conditions either indicate or have the ability to support mold growth.



Water Stained Ceiling Tiles



In a condition of improvements section of your appraisal you may consider identifying the following:

“I observed grayish to black staining exhibiting the characteristics consistent with past or active water leakage.”



Water Stained Ceiling Tiles

Finished basements are notorious for water stained ceiling tiles. You might consider making a comment like the following, “I observed brown and gray staining at ceiling tiles in the basement that exhibited the characteristics consistent with past or active water leakage. I did not determine whether or not the ceiling tiles were wet during my site visit.”

“All observations contained herein are based on casual, visual observation of readily accessible areas, typical of real estate appraisal site inspection.”

Feeling the tiles with your fingers would not be an appropriate test. The tiles are about 5/8 of an inch thick ~~in~~ and the finished surface may have dried while the opposite unfinished portion of the tile may remain damp and have mold growing in abundance. When it comes to environmental **conditions**, don't make assumptions.

Clearly and accurately ~~identified~~ **fy** limitations of your observations.



What Is Mold?



The minute I walked into that room I knew there was a moisture and **potentially** mold problem. Heck there is so much moisture in the room there was a rainbow. Just some levity.



Abundant Mold Growth



As a real estate appraiser and environmental expert, absent testing the surfaces depicted, I would describe them in my report as follows: “At the interior finish wall surfaces of the subject property I observed gray to black stains and growth exhibiting the characteristics consistent with mold growth. This condition covered most of the wall surface and existed throughout all of the first floor rooms.”

Small Cracks Can Cause Big Problems



Cracks in the foundation on the outside can lead to conditions like the one on the inside of the finished basement (depicted in the photo at right).



Roof Deterioration



Deteriorated roofing can lead to significant problems inside the subject property.



Health Effects

What are the health effects from mold?

Allergen

What is an allergic reaction? It is a response to any antigen entering the body. Allergic responses include swelling, development of rashes, watering of eyes, coughing, sneezing, etc.

Pathogen

Some mold can cause severe infections and even pulmonary hemorrhaging.

Toxin (mycotoxin)

Mycotoxosis, the toxins interfere with the development of healthy cell walls.



Health Effects

Mold can cause allergic reactions, pathogenic illnesses, or toxic responses depending upon the mold and the concentration in the individual exposed to the mold.

Not everyone will respond the same way to the allergic properties of some molds.

The reaction to mycotoxins on the other hand from individual to individual will be very similar depending upon the concentration or dose and duration of exposure.

The very young and the very old, as well as, individuals that suffer from diseases that suppress the immune system like; lupus, HIV, or have recently had pneumonia, or the flu will be more susceptible to the adverse health effects associated with mold.



Case Study – Pittsburgh July 2000

13 years ago in 2000 I was hired as a consultant to determine when and how mold contamination had begun in a house just outside of Pittsburgh, Pennsylvania.

Background:

A young couple with two children purchased the home. Upon moving everyone in, the family developed coughs, itchy eyes, runny nose, and flulike symptoms. After about a week they noticed that the upper respiratory distress would abate when they went to school or work, but return within a few hours of being home in the evening.

After being in the home for about 10 days they experienced an overflow of a toilet at the lowest level of the house. During the cleanup process a piece of wallpaper in the same bathroom became disengaged from the substrate. That is when they noticed..... the entire wall beneath the wallpaper was covered with black mold!

The family hired an environmental consultant to do testing whose advice was to leave all of their personal possessions behind, because they were contaminated, and move out of the contaminated house immediately!

After several years of litigation with their insurance company, they received a settlement of more than double what they paid for the house.

They paid \$103,000 for the house and received a \$280,000 settlement from the insurance company. I was later hired in other litigation.



Case Study - Pittsburgh July 2000



Seven months after they had moved out of the house I was asked to investigate and determine what caused the mold contamination.
(If you see someone, dressed the way I was above, in front of a property you recently appraised, it's probably not a good thing)



Case Study - Pittsburgh July 2000



I made a careful investigation of the physical conditions at the subject property. It was a very well constructed. The only condition I discovered, was a repair around the chimney, a repair at the joint between the wall and asphalt roof surface (step flashing), and a missing shingle. From the outside, these conditions didn't appear to be that significant.



Case Study - Pittsburgh July 2000



Inside the attached garage was a utility room. The utility room housed a furnace and air conditioning unit. The furnace was gas-fired forced warm air. The chimney that I had observed on the outside (with the repair at the junction between the roof and chimney) traveled directly down into the utility room. As you can see in the photo above, the ceiling where the metal chimney traversed had water stains.

I described in my report as follows, “Brownish to reddish staining at the ceiling exhibiting the characteristics consistent with past or current water leakage.”

End of Page



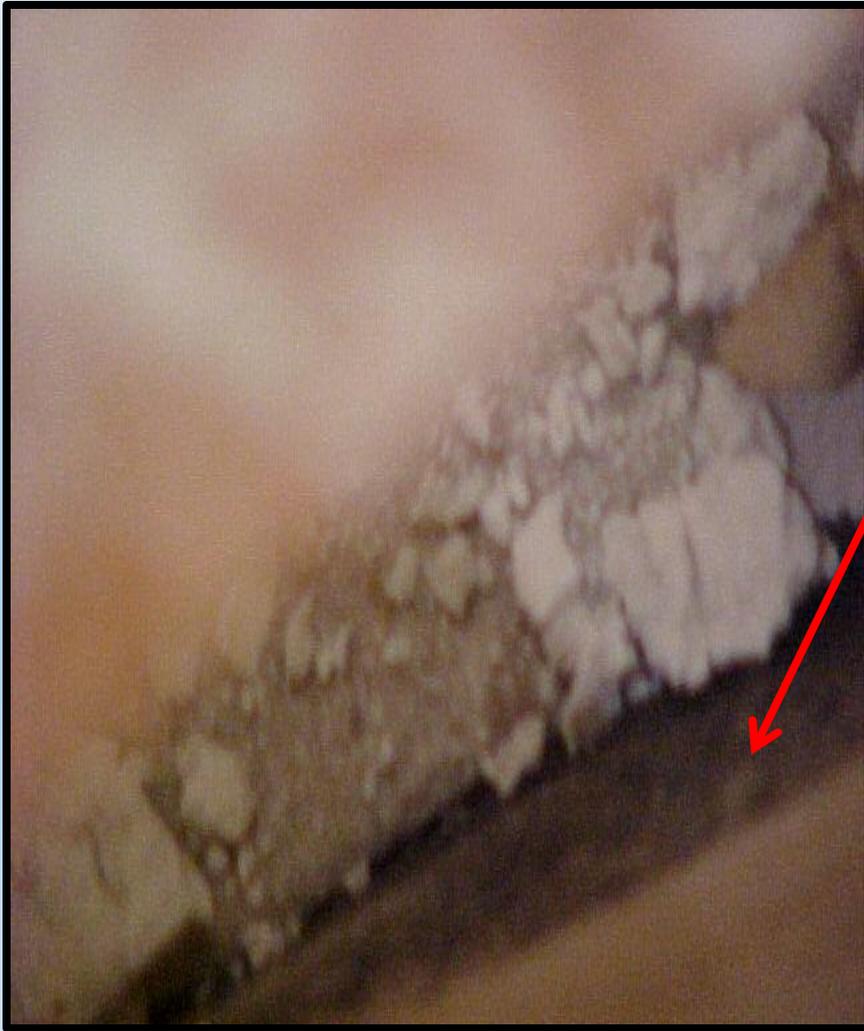
Case Study - Pittsburgh July 2000



Inside the house and adjacent to the utility room of the garage was the bathroom where a toilet overflowed. This is also the area where mold was originally discovered. There were signs on the painted copper water pipe (reddish brown rust staining- copper does not corrode reddish-brown its corrosion is typically green) of water migrating from the ceiling in the adjacent utility room and flowing down behind the corner vanity. The area behind the vanity without removing a portion of the wall. (not sure about this statement)



Case Study - Pittsburgh July 2000



Mold growing on drywall immediately adjacent and behind the vanity.



Case Study - Pittsburgh July 2000

The drywall behind the vanity adjacent to the floor still had black and gray stains exhibiting the characteristics consistent with mold growth. These conditions existed seven months after the water had been turned off to the subject property and had been supported by the periodic leakage migrating down the chimney, across the ceiling, and down the water pipe to be absorbed by the drywall behind the vanity.

My conclusion was that the mold originated behind the vanity allowing spores to travel throughout the house and propagate on surfaces that had become moist from relative humidity in the air (some mold can proliferate at 60% relative humidity).



Case Study - Pittsburgh July 2000



The only indicators of possible water leakage were the two small repair areas. One repair around the chimney the other at the joint between the step flashing and the brick wall. The missing shingle supplies a clue regarding the potential wind force. The appraiser never mentioned the repairs, missing shingle, or the water stains at the utility room ceiling. He was included in the lawsuit.

The severe mold contamination at this home outside of Pittsburgh was caused by occasional windblown rain. Capillary action allowed leakage to migrate down the chimney, across the utility room ceiling, and then down the painted copper waterline. The leakage pooled up on the floor. The sheetrock on the back of the wall in front of the vanity absorbed the water from the floor. The sheetrock grew mold, as it almost always will when it becomes wet.



Case Study - Pittsburgh July 2000

What would appear to be a relatively insignificant minor roof condition caused hundreds of thousands of dollars in litigation and the family to have to abandon their home and all their personal possessions. This is a true case study not a hypothetical condition.

The lending institution allowed the family to sell the property as a short sale; and did not attempt to collect the difference between the \$100,000 mortgage and the \$55,000 that the property sold for in the contaminated state.

What might a real estate appraiser consider disclosing that may have helped the family, lending institution, and reduce their potential liability?

I believe that Sgt. Friday from Dragnet, should've been a real estate appraiser. "Just the facts ma'am, just the facts," was his constant refrain.

Statement on the appraisal: The roof shingle is missing at the garage roof and an asphalt repair was noted at the chimney and roof connection to the house wall. The appraiser observed staining at the ceiling adjacent to the metal chimney exhibiting the characteristics consistent with past water leakage. The staining observed was below the area of repair and roof shingle missing at the ceiling of the utility room. The appraiser has no knowledge regarding leakage history or whether or not the leakage has been repaired.

At that point in time the appraiser should provide the information necessary for the lending institution to order any additional testing they deemed appropriate in order to accept the real estate as collateral for a loan.



Remediation Procedures

Remediation Techniques

- Eliminate source of moisture
- Component removal (porous materials)
- Cleaning with biocides (non porous materials)
- Air duct cleaning in accordance with NADCA (National Air Duct Cleaners Association) standards. (<http://www.nadca.com>)

Mold remediation is typically conducted in accordance with IICRC S520 (Institute of Inspection, Cleaning and Restoration Certification) mold remediation standard.

- The standard is an ANSI standard and widely accepted throughout the industry.

The following 4 slides are excerpts from S520. They are provided to supply the appraiser with insights regarding the significant cost associated with mold remediation.

For more detailed information visit <http://iicrc.org/>



What is S520?

ANSI/IICRC S520-2008 is a procedural standard and reference guide for the remediation of mold damaged structures and contents. ANSI/IICRC S520 is based on reliable remediation and restoration principles, research and practical experience, and attempts to combine essential academic principles with practical elements of [water damage restoration](#) for technicians facing “real-life” [mold remediation](#) challenges. The S520 is written for use by those involved in the mold remediation industry, and is the result of collaboration among microbiologists and other scientists, public health professionals, industrial hygienists, remediation contractors, restoration service companies, cleaning and restoration training schools, trade associations that service the professional restoration industry, allied trade-persons, and others with related professional and practical experience.



Remediation Procedures – S520

The following are excerpts from IICRC S520 (Institute of Inspection, Cleaning and Restoration Certification). It describes the sophistication and care that must be employed when conducting mold remediation. Mold remediation is an expensive process.

Excerpt from Standard for Professional Mold Remediation S520

This excerpt describes the procedures to be followed and the precautions to be taken when mold remediation is performed in residential, institutional, and commercial buildings. It also describes the considerations employed when dealing with personal property or other contents of those structures.

The Standard explains mold remediation techniques, the principles of which may apply to other microbial remediation projects or services. This standard assumes that the determination and correction of the underlying cause of mold contamination is the responsibility of the property owner and not the remediator, although the property owner may contract with the remediator or other professionals to perform these services.



Remediation Procedures – S520

It is the purpose of this Standard to define criteria and methodology to be used by the remediator for inspecting and investigating abnormal moisture and mold contamination, and for establishing remediation and safety plans and procedures.

Because of the unique circumstances encountered in mold remediation projects, it is impractical to prescribe procedures that apply to every situation. In certain circumstances, deviation from portions of this Standard may be appropriate. Carelessness is never acceptable and common sense and professional judgment are to be exercised in all cases.

Among other things, S520 does not address *Histoplasma capsulatum*, *Cryptococcus neoformans*, hanta virus, animal-derived pathogens or other highly infectious agents, including those from bird and bat droppings. Refer to the Center for Disease Control (CDC) and/or the National Institute for Occupational Safety and Health (NIOSH) for appropriate decontamination procedures for these contaminants. See, for example, *Histoplasmosis, Protecting Workers At Risk*, NIOSH and NCID, U.S. Department of Health and Human Services, 1997.



Definitions

Cross-contamination: the spread of contaminants from an affected area to an unaffected area.

Engineering controls: the utilization of methods, equipment or containment in such a manner that they limit the exposure of remediation workers and occupants to contaminants and prevent the introduction of contaminants to surrounding uncontaminated areas and contents.

Fungus (plural “fungi”): one of the five kingdoms into which living things are categorized. The other kingdoms are Animal, Plant, Bacteria, and Protista. Fungi have distinct nuclei and include a variety of types, such as molds, mildews, yeast, and mushrooms. Fungi range in size generally from 2 to 20 microns and are ubiquitous in soils, water and air. Unicellular fungi are called yeasts. Fungi formed by long chains of cells are called molds. Fungi are ubiquitous and are found in moist environments.

HEPA: an acronym for “high efficiency particulate air”, which describes an air filter that removes 99.97% of particles down to 0.3 microns in diameter.

Mold: a common term for filamentous fungi, often seen as a superficial or “wooly” growth of long chains of fungi cells formed on damp organic materials. Toxigenic molds may produce a potentially harmful substance called a mycotoxin. Mold growth can degrade materials and present potential health risks to humans.

Post-remediation evaluation: an inspection performed by a remediator after a remediation project, which may include visual and/or olfactory methodologies to confirm that the remediation process has been completed.



Engineering Controls

To the extent feasible, engineering controls must be used to assure worker safety and health, and to prevent cross-contamination. Engineering controls may include but are not limited to: contamination source control, isolation barriers, pressure differentials, dust suppression methods, HEPA vacuuming and filtration, detailed cleaning, temperature and humidity control, and a sanitary approach.

PPE for workers must be used when appropriate to supplement, but not to replace, engineering controls. It is highly recommended that engineering controls (e.g., contaminant, AFDs) protecting Condition 1 areas not be removed until post-remediation evaluation and/or verification have been completed. It is highly recommended that any alteration of designed engineering controls during a project take into account the potential environmental impact.



Source Control, Isolation Barriers and Containments

Source control methods may be used alone to address relatively small areas of mold growth, or in combination with other engineering controls to reduce the level of spore release and dust generation.

Local or “mini” containments may be used when moderate levels of mold growth are visible or suspected. Full-scale containments normally are used when significant or extensive mold growth is present or suspected, and cannot be effectively controlled and remediated with source or local containment methods.

Isolation barriers include containment and critical barriers. Isolation barriers are used to isolate portions of the building, mechanical system, elevator, elevator shaft or other building openings. It is highly recommended that containment barriers and decontamination chambers be used, as appropriate, to separate Condition 1 areas of the building from areas classified as Condition 2 or 3. Additional containment barriers may be necessary when mold conditions are discovered to be more extensive than previously determined. More than one type of containment method may be used simultaneously for control in the same area.

Construction of containment barriers and other engineering controls may result in collateral damage to surfaces. It is recommended that care be taken by remediation workers to avoid damage to surfaces and that responsibility for collateral damage repairs be discussed by appropriate parties and documented before beginning the remediation project.



Pressure Differentials

Pressure differentials are used to manage airflow. The use of pressure differentials is a matter of professional judgement. If pressure differentials are used, it is highly recommended that they be created using HEPA air filtration devices (AFDs) set up as negative or positive air machines. It is recommended that exhaust air from AFDs be vented outdoors when possible. When venting an AFD indoors, it is recommended that a laser particle counter be used to monitor particle output.

If pressure differentials are used, contaminated areas must be negatively pressurized relative to unaffected or clean areas of the building to prevent cross-contamination and it is highly recommended that the integrity of the containment and negative air pressure differentials be maintained throughout the remediation project, including the clean up process. It is recommended that containment performance be checked visually and documented at appropriate intervals. It is highly recommended that work be stopped any time there is a breach in containment or loss of pressurization, and not resumed until the containment has been repaired and the pressure differential re-established. Report any breach in the Integrity of the containment to a supervisor. It is highly recommended that containment barriers be constructed so that if pressure differentials are lost, containment flaps will close to prevent a loss of control.



Mold Remediation Costs

Are considerably higher than conventional demolition costs

Need to be carefully considered as a cost to cure item

Ongoing monitoring costs may also be a consideration



Diminution – By Definition

Diminution of value, or diminished value, is the loss of financial worth of something because of damage. This concept often refers to vehicles and property.

With property, the amount of diminished value depends on the extent of contamination, and/ or the costs associated in correcting the contamination.

Diminished value in homes can also be due to casual wear, zoning changes, or general neighborhood changes (crime rate, etc.)



Calculating Diminution

Most Relevant Consideration:

Type of contaminant



Calculating Diminution of a Contaminated Property

If you are appraising an environmentally contaminated property, you may need to consider more than just the cost of remediation (cost to cure). The property may suffer from stigma associated with the contamination. Stigmatized properties can take months and even years to recover from a blighted image.



Calculating Diminution of a Contaminated Property

The Uniform Standards of Professional Appraisal (USPAP) describe stigma in the A09 provision (2012-2013)... **“Environmental Stigma:** An adverse effect on property value produced by the market’s perception of increased environmental risk due to contamination...” When the appraiser addresses the diminution in value of a contaminated property and/or its impaired value, the appraiser must recognize that the value of impacted or contaminated real estate may not be measurable simply by deducting the remediation or compliance cost estimate from the opinion of the value as if unaffected (unimpaired value).”



Calculating Diminution of a Contaminated Property

At first glance most real estate appraisers don't appear to be prepared for the type of assignment contaminated properties present. Every appraiser utilizes the same methodologies when they are developing an opinion of value. The most common and usually the most reliable method for appraising contaminated residential properties is the market approach. You may also need to consider the cost and income approaches in developing an opinion of value. All three may come into play when calculating diminution caused by stigma.



Calculating Diminution of a Contaminated Property

Assignments of this nature require considerably more research. To effectively complete an assignment of this sort may cost thousands of dollars. They typically cannot be priced as a flat fee but should be charged based on an hourly rate with a cost range described.



Calculating Diminution of a Contaminated Property

Market Approach and Stigma Factor

The most common method used for residential real estate is the market approach. The three rules of real estate value typically come into play during the market approach. They are- location, location, and location. But these rules go out the window when appraising a contaminated property. The most significant factor in choosing comps lies in the type of contamination. In choosing comps you should choose those that have sold with the same type of environmental contamination. Today, mold is a very common environmental contaminant impacting the value of properties everywhere. For this reason we will use mold contamination as our example.



Calculating Diminution of a Contaminated Property

The first question to ask is how many homes in your neighborhood are contaminated with the same type of environmental contamination? In reality, the search for properties contaminated by mold may take the appraiser to other neighborhoods or even other geographic regions. An appraiser may need to conduct as many as four different appraisals in trying to accurately derive the value of a property rendered uninhabitable by fungal contamination. All four may be in different geographic markets and require assistance from other appraisers in those regions.



Calculating Diminution of a Contaminated Property

The appraiser will need to locate similar properties suffering from the same type of contamination. Factors to consider include but are not limited to the type of contamination, the habitability restrictions specifically attributable to the contamination and the cost of remediation to cure the defect. This is not as difficult as it sounds- as more and more contaminated homes emerge on a daily basis, more information regarding remediation costs is becoming readily available.



Calculating Diminution of a Contaminated Property

The next step is to establish a baseline value for each property (subject and three comparables) by performing a hypothetical appraisal and developing an opinion of value as if the properties are not contaminated. Obtain estimates for the cost to cure the contamination at the subject property. Research is necessary to determine how much buyers spend to remediate the environmental conditions. I have found that most people are quite forthcoming and willing to brag about the good deal they got on the property and what they spent to remediate. This number represents the actual cost to cure.



Calculating Diminution of a Contaminated Property

The sale price of the comp as it sold in the contaminated state plus the new owner's cost to cure is then subtracted from the comp's uncontaminated hypothetical value (baseline). The resulting number is an indication by the marketplace of the stigma suffered by that property. We can call this the *stigma factor*.



Calculating Diminution of a Contaminated Property

Divide the stigma factor by the hypothetical value of each comp to create a percentage ratio. This is the ***diminution ratio*** suffered by each comparable sale.

A weighted average for the percentage of loss is created from the three diminution ratios derived from the three comps. The average must be weighted based on similarities in property styles, neighborhoods, or size to the subject property. You have now created a ***diminution factor***.



Calculating Diminution of a Contaminated Property

Diminution Factor/Impact on Value

The diminution factor is then factored against the uncontaminated theoretical value of the subject property (e.g. 30 percent of \$240,000 equals \$80,000). Add the dollar amount calculated by the diminution factor to the cost to cure estimates. We will call this the *impact on value*. Subtract our impact on value (cost to cure plus diminution factor) from the hypothetical value of the subject property and, bingo, we have a defensible opinion of value.



Calculating Diminution of a Contaminated Property

Confirming Stigma

Stigma can last for months or even years. An appraiser can confirm stigma by asking lending institutions if they would be interested in providing financing for a theoretical "virtual subject" similar to the subject property. Another way is to contact local Realtors to ask if they are interested in listing the "virtual subject" property. I have even contacted insurance companies regarding the feasibility and cost of insuring the "virtual subject."



Calculating Diminution of a Contaminated Property

I was appraising a mildly contaminated commercial property in Vermont. To test my belief that stigma existed, I contacted three lending institutions asking if they would be interested in exploring a loan with my financially sound client who wanted to buy this property. Although the responses were polite, they all declined the opportunity and gave no indication of how much time would need to pass before they might be interested.



Calculating Diminution of a Contaminated Property

In the preceding summary we have utilized elements of the cost approach and market approach to calculate the stigma associated with a specific type of contamination.

I have used this market methodology successfully in court cases and have had it accepted by probate courts, the IRS, and heirs to property. This methodology employs sound appraisal practice in accordance with USPAP and is highly defensible in the event of litigation.

Another important factor regarding this methodology is that it is easy for individuals outside the appraisal industry to understand. That's important if you are in front of a judge, jury, or quasi judicial board, etc.



Calculating Diminution of a Contaminated Property

There may be other factors to consider when appraising a contaminated property, including, how the contamination may impact the income for the property.



FX
Finigan



Calculating Diminution of a Contaminated Property



The income approach is typically not a reliable methodology for calculating the value of a residential property, but extremely important in developing an opinion of value for commercial property.



Calculating Diminution of a Contaminated Property



Income capitalization converts anticipated cash flows into present value by “capitalizing” net operating income by a market derived "capitalization rate".



Calculating Diminution of a Contaminated Property

Essentially, a capitalization rate is a rate of return on investment much like a dividend earned on a stock. It is used by real estate investors as a benchmark for determining how much they should pay for a property and by appraisers in developing an opinion of value for a commercial property.

In appraisal practice, capitalization rates are extracted from "sales" of similar investment properties and applied to the net income of a subject property to develop an opinion of value.



Calculating Diminution of a Contaminated Property

There are a number of ways to estimate value using "capitalization". Two common methods include "direct capitalization" and "yield capitalization".

Direct capitalization is the most widely used and simplest approach to apply. It is used when income is not expected to vary significantly over time.



Calculating Diminution of a Contaminated Property

For example, direct capitalization may be used to value a 14-unit apartment building that produces a consistent annual operating income and has generally short-term leases.

The importance of the short-term leases is that they allow the building owner to keep pace with the market.

Also in this case study the subject property has been contaminated by the migration of chlorinated solvents from the site a quarter-mile away.

A vapor extraction system has been installed with an expected economic life of 15 years.

The typical mortgage for this type of property is 15 years.

Monitoring wells have been installed at the property.

Air testing for VOCs in the ambient air in the basement of the building and bulk samples from the monitoring wells are required biannually at an aggregate annual cost of \$7600.



Calculating Diminution of a Contaminated Property

The table to the right provides a simplified extracting of a capitalization rate from the market.

In an ideal world capitalization rate will be obtained from properties that suffer from the same type of contamination as the subject property.

	Sale 1	Sale2	Sale 3
Sale price:	\$125,000	\$375,000	\$260,000
Net operating income:	\$12,500	\$36,000	\$26,525
Implied cap Rate:	.10	.096	.102
Average of the three implied Rates:	10%		



Calculating Diminution of a Contaminated Property

- In the previous table is there a factor that may influence the capitalization rate?
- The answer is of course yes, there may be ongoing remediation expenses or monitoring expenses that are required for a given period of time.
- If the three properties we extracted the capitalization rate from had dramatically differing ongoing expenses associated with environmental contamination, the rate could be skewed.
- To determine whether or not the capitalization rate is skewed you'll need to back out the ongoing expenses associated with environmental contamination and develop a hypothetical capitalization rate. Compare this to the capitalization rate for similar properties that are not contaminated.
- For the rest of this case study we will use a 10% capitalization rate.



Calculating Diminution of a Contaminated Property using the Income Approach ...Indicated Value \$799,760 (Yes or No?)

Potential Gross Income 14 units @ \$900 per month x 12 months			\$ 151,200
•Less: Vacancy/Collection Loss	-5%	\$ (7,560)	
Effective Gross Income			\$ 143,640
Less Operating Expenses			
•Property Taxes		\$ (13,500)	
•Plowing and Lawn Care		\$ (3,500)	
•Supplies/Maintenance		\$ (8,500)	
• Remodeling (3 Units annually @ \$2400)		\$ (7,200)	
• Common Lighting		\$ (1,400)	
•Water & Sewer		\$ (4,600)	
• Hazard Insurance		\$ (7,100)	
• Management fee (10% EGI)		\$ (14,364)	
• Reserves		\$ (3,500)	
Gross Operating Expenses			\$ (63,664)
Net Operating Income			\$ 79,976
\$79,976 "Capitalized" @ 10 % ... ($\\$79,976 / .10$) = Indicated Value			\$ 799,760



Calculating Diminution of a Contaminated Property using the Income Approach ...Indicated Value \$799,760 (Yes or No?)

What have I overlooked in my case study?

You may need to return to the previous slide to make that determination.





Calculating Diminution of a Contaminated Property using the Income Approach ...Indicated Value \$799,760 (NO)

- I failed to include the ongoing environmental monitoring of \$7600 annually as an expense.
- This changes our gross operating expenses
- ($\$63,664 + \$7,600 =$ Gross operating Expense) $\$71,264$
- Effective Gross Income $\$143,640 - \$71,264 =$
- Net Operating Income= $\$72,376$
- $\$72,376$ Capitalized at 10%= $\$723,760$
- **Indicated Value \$723,760**



Calculating Diminution of a Contaminated Property

That was fun. Let's move on to the chapter summary...



Chapter 3

Summary

Mold is a fungus.

Any signs of moisture can be a sign of mold contamination. Be on the lookout for musty smells and water stains as well as cracks in the foundation and problems with the roof.

Mold can be an allergen, pathogen, or toxin (mycotoxin) depending on the type of mold as well as the severity of the contamination.



Chapter 4

Wetlands



Wetlands and Floodplains



Wetlands and floodplains can impact value, but not always negatively. Waterfront property frequently sells at a premium.



Chapter 4

Learning Objectives

The real estate appraiser will be able to identify where to obtain information regarding floodplains.

The real estate appraiser will be able to identify some of the challenges associated with locating a property in a floodplain.

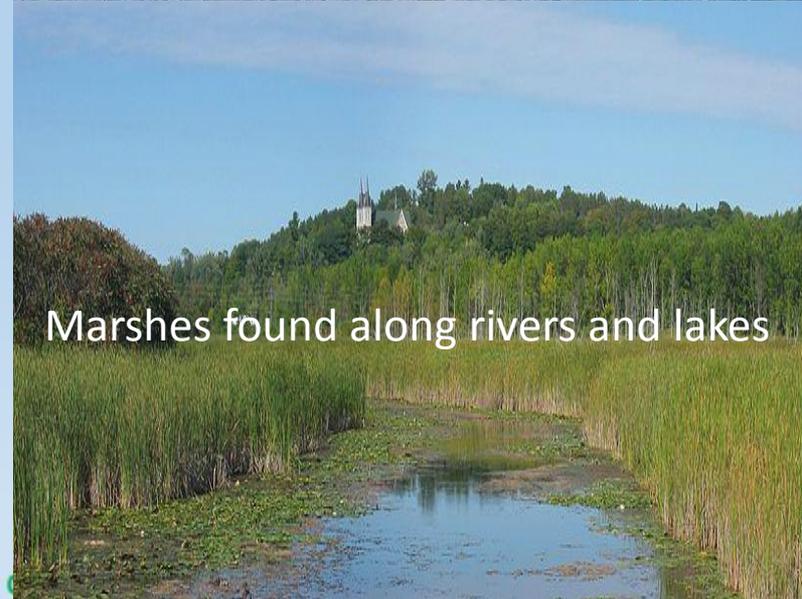
The real estate appraiser will be able to identify whether or not a property may be in a floodplain or wetland.

The real estate appraiser will be able to identify the difference between a floodplain and wetland.



Wetlands

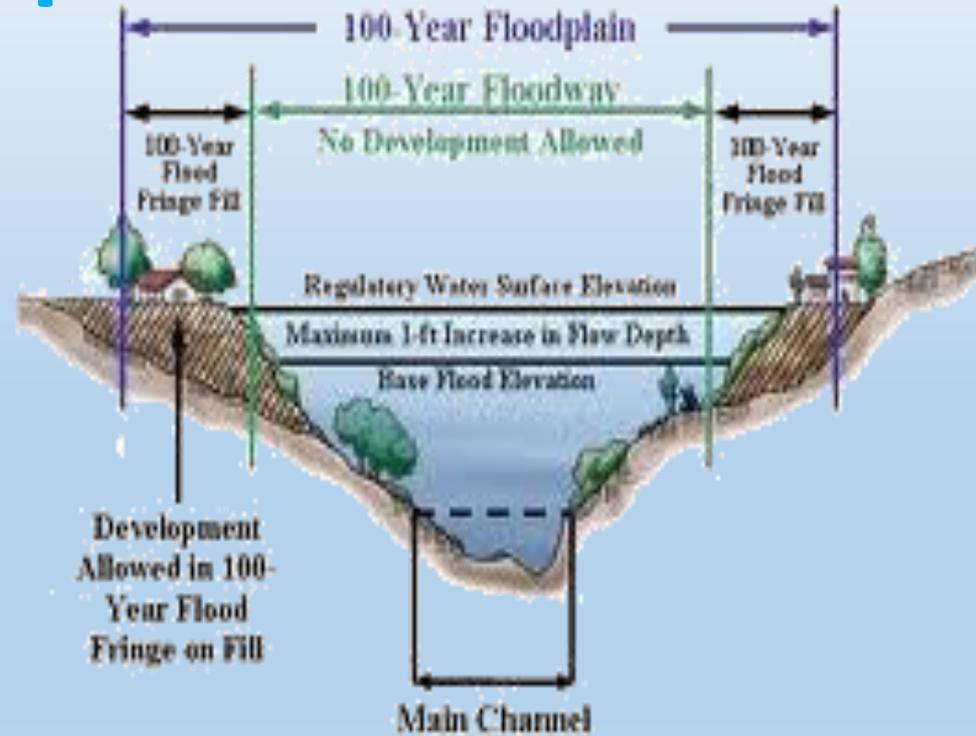
A **wetland** is a land area that is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. Primarily, the factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation that is adapted to its unique soil conditions: Wetlands consist primarily of hydric soil, which supports aquatic plants.





Floodplains

A **floodplain** or **flood plain** is a flat or nearly flat land adjacent a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high discharge. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the **flood fringe**, which are areas covered by the flood, but which do not experience a strong current. In other words, a floodplain is an area near a river or a stream which floods when the water level reaches flood stage.





Federal Emergency Management Agency (FEMA) and Floodplains

To obtain information regarding a property's relationship to floodplains visit the FEMA website at the address on the upper left.

The lower web address will bring you directly to the online flight Map Viewer. Visitors to this area of the site can insert an address and prompted geo coder to zoom in and produce the appropriate FEMA floodplain map.

For information regarding all of the services offered by FEMA visit the FEMA home page at

<https://fema.gov>

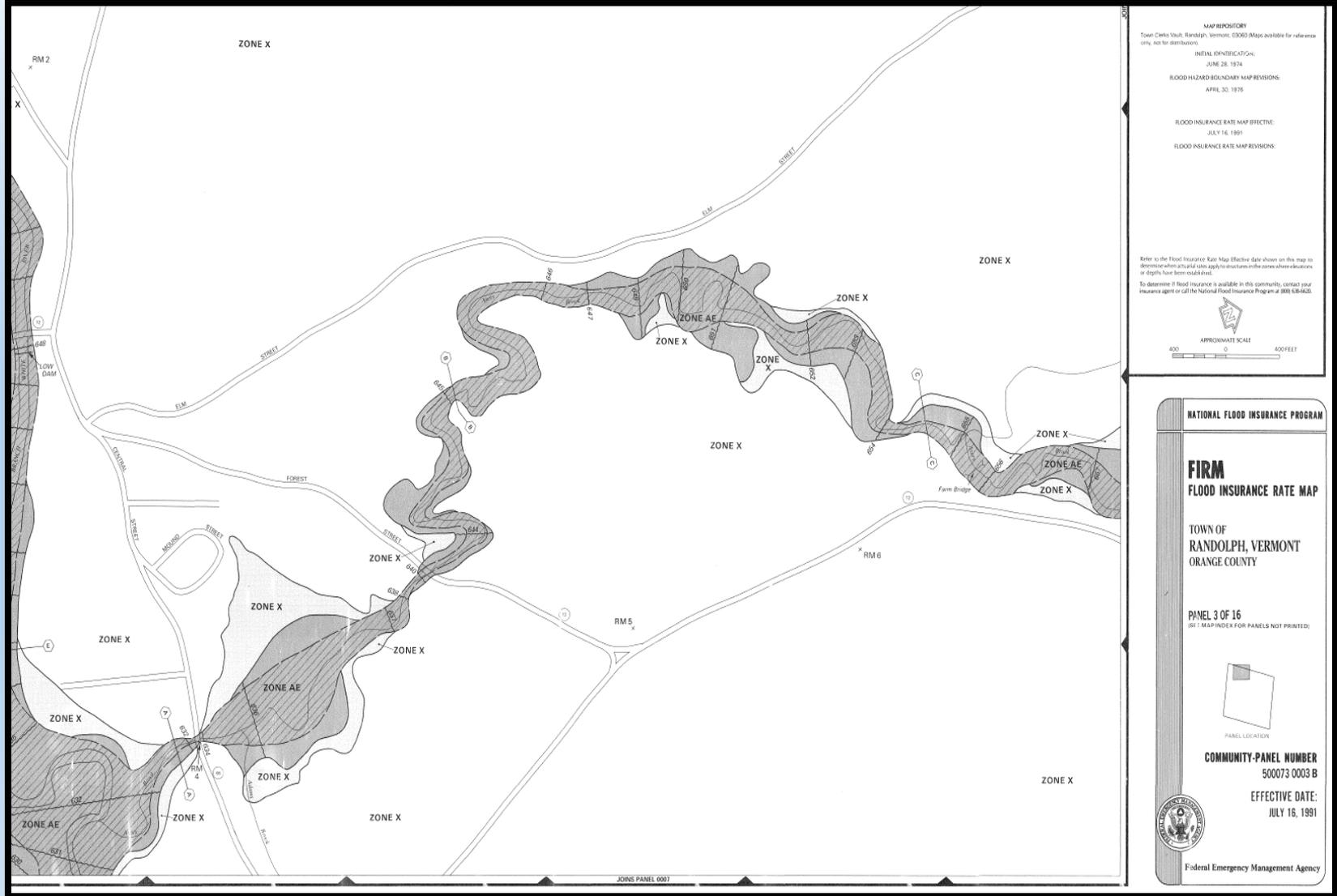
To access maps depicting floodplains visit the address below.

<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>

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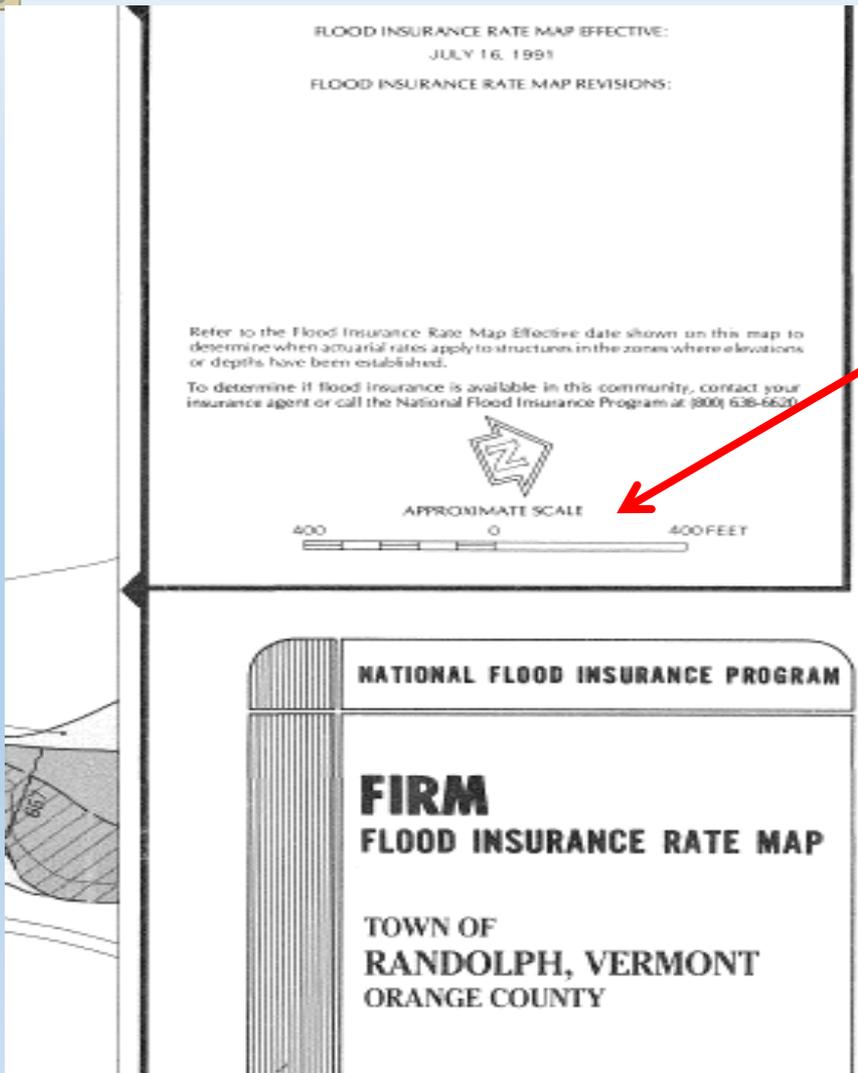


Sample Floodplain Map





Wetlands and Floodplains



- Notice the scale of the maps.
- Approximate scale 1 inch equals 1000 feet, or
- 1/10 of an inch equals 100 feet
- The width of some urban lots are 50' x 100'. A lot that size would be represented on the map as 1/20" X 1/10".
- It would be prudent for the real estate appraiser to clearly identify limitations of their observations by commenting on the approximate map scale.
- This would be especially important if the subject property were on the edge of a flood zone .
- Be sure to Identify the map panel and zone of the property located in your appraisal report.
- A value of a property located in the flood zone may be negatively impacted.



Wetlands and Floodplains FEMA Map Information exchange (FMIX)

New Live Chat Service

FEMA Map Information exchange (FMIX) Map Specialists are available for online chat; Monday through Friday, 9:00 am to 5:00 pm Eastern Standard Time (Eastern Daylight Time). When Live Chat is available select the button on the right to chat with a Map Specialist.

Contact a Map Specialist - FMAC + MSC = FMIX

The Contact Centers of the Map Service Center (MSC) and the FEMA Map Assistance Center (FMAC) have been consolidated into the FEMA Map Information eXchange, or FMIX.

The consolidation is designed increase efficiency as it will provide a one-stop shop for a variety of information, products, services, and tools that support the [National Flood Insurance Program](#) (NFIP).

The toll-free number for the FMIX is the same as before, 1-877-FEMA MAP (1-877-336-2627) and should be used instead of the MSC number.



Wetlands and Floodplains FEMA Map Information eXchange (FMIX)

The FMIX, looks forward to helping you with any FEMA map related questions or orders. For more information or to contact a FEMA Map Specialist, please call 1-877-FEMA-MAP (1-877-336-2627) or e-mail FEMAMapSpecialist@riskmapcads.com.

Hours of Operation

The FMIX hours of operation are Monday through Friday, 8:00 am through 6:30 pm Eastern Standard Time (Eastern Daylight Time). Self-service options are available 24 hours a day, seven days a week.

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping>



Wetlands (source EPA)

Section 404 of the Clean Water Act: How Wetlands are Defined and Identified

"Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

-Definition of wetlands as used by the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) since the 1970s for regulatory purposes.

In more common language, wetlands are areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system meaning the kind of soils that form, the plants that grow, and the fish and/or wildlife communities that use the habitat. Swamps, marshes, and bogs are well-recognized types of wetlands. However, many important specific wetland types have drier or more variable water systems than those familiar to the general public. Some examples of these are vernal pools (pools that form in the spring rains but are dry at other times of the year), playas (areas at the bottom of undrained desert basins that are sometimes covered with water), and prairie potholes.



Wetlands: View information online regarding Wetlands Regulations and considerations at the web addresses below

According to Mary E. Kentula, *U.S. Environmental Protection Agency*

The benefits of restoration of degraded or destroyed wetlands and creation of new wetlands has only recently been recognized. As the population has expanded across the Nation during the past few centuries, wetlands have been drained and altered to accommodate human needs. These changes to wetlands have directly, or indirectly, brought about changes in the migratory patterns of birds, local climate, and the makeup of plant and animal populations. In the past, people used wetland plants and animals for shelter and food. More recently, people have become more aware of other benefits that wetlands provide **such as** water-quality improvement, flood attenuation, esthetics, and recreational opportunities.

Now, it is recognized that numerous losses are incurred when a wetland is damaged or destroyed. Restoration and creation can help maintain the benefits of wetlands and their surrounding ecosystems, and at the same time accommodate the human need for development.

<http://water.usgs.gov/nwsum/WSP2425/legislation.html>

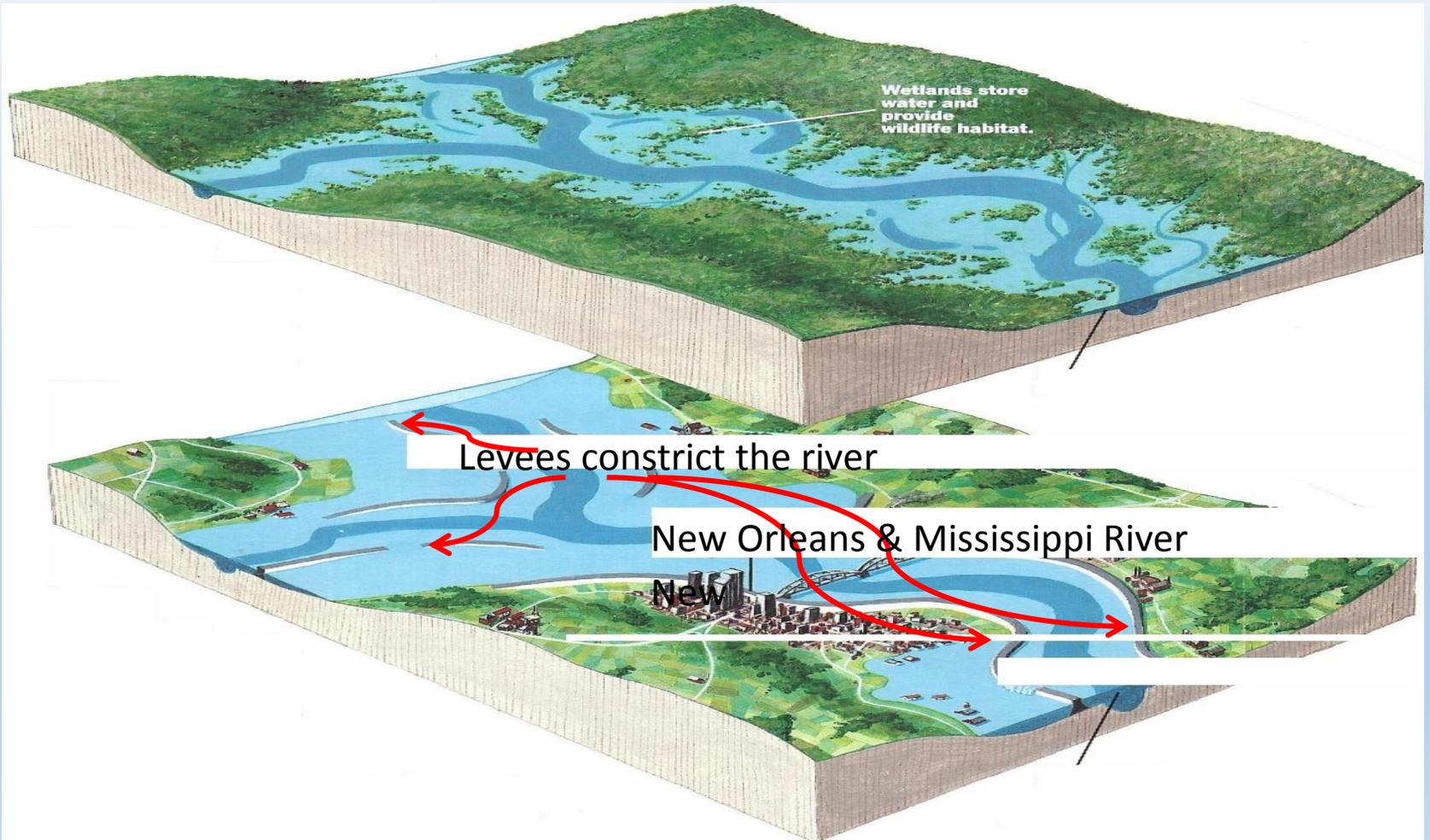
<http://water.usgs.gov/nwsum/WSP2425/restoration.html>

<http://www.epa.gov/owow/wetlands/facts/fact11.html>





New Orleans Geographic Area Before and After Levees



New Orleans and the Mississippi River delta region before and after the Army Corps of Engineers constructed the levees. The levees constrict the volume creating smaller surface area. This elevates the river. The development adjacent to the levees has vastly reduced the wet lands and flood plains.



When the levees broke



All too familiar is the sad story of Hurricane Katrina causing rivers to overflow into the surrounding heavily settled areas. These areas were once comprised of wetlands and floodplains. At the upper left corner you'll notice the Chrysler Dealership sign.



The Wetlands Were Temporarily Re-established



The devastation has cost thousands of lives and billions of dollars. When appraising a commercial property, the ever-escalating flood insurance may have an impact on the value of the property when considering the income approach.



Chapter 4

Summary

Now you know how to:

- Identify where information regarding floodplains can be obtained, at the FEMA website and/or EDR Neighborhood Environmental Reports NER.
- Identify some of the challenges associated with locating a property in a floodplain, like the approximate scale and how it may impact one's ability to locate a small lot especially on the fringe of the flood zone. Also, how to clearly identify the limitations of your observations, as they relate to such maps.
- Determine whether or not a property may be in a floodplain or wetland by recognizing its proximity to a river, stream, lake, pond, ocean, marsh, all wetlands vegetation, etc. presented in this chapter.
- Define the difference between a floodplain and wetland . A **wetland** is a land area that is saturated with water, either permanently or seasonally; it is distinguished by its characteristic hydric soil and aquatic vegetation. Whereas a **flood plain** is a flat or nearly flat land adjacent a stream or river that stretches from the banks which floods when the water level reaches flood stage.



Chapter 5

Radon



Chapter 5

Learning Objectives

The appraiser will be able to define what radon is.

The appraiser will be able to identify the element that produces radon.

The appraiser will be able to identify the equipment used to do radon testing.



Radon

What is Radon?

How was EPA's action level 4 picocuries per liter of air (4.0 pCi/L) reached?

Excerpt from an article by Francis X. Finigan

“There’s gold in them there hills”, or something more valuable... uranium, and lots of it. Vermont history took an interesting turn back in the early 1980’s when a couple hiking up Bald Mountain in southern Vermont discovered test borings, radioactive tailings from uranium and discarded work gloves.

The couple did some research and discovered that land and numerous other sites around the state had been leased by uranium mining companies. A group called SUM (Stop Uranium Mining in VT) was formed. They succeeded in having Act 250 (Vermont’s land use act) amended to prevent the mining of fissionable materials in the state of Vermont.

Radon is a naturally occurring odorless, colorless, radioactive gas that is developed as uranium breaks down below the earth’s surface. High concentrations of radon are typically found in soils where granite and shale are present. As radon gas rises from the earth virtually everywhere, it mixes with the vast volumes of atmosphere (outdoor air) and is diluted resulting in very low concentrations. However, in an enclosed space such as inside a home, it can accumulate to levels which according to EPA may be hazardous to your health.



Radon

How Does Radon Become a Hazard? Radon enters a building through cracks, dirt floors, drains and porous concrete foundations. It is drawn into the home as air is sucked in by the furnace for combustion and then sent up the chimney. Air exits the chimney creating a partial vacuum. This is especially true during winter months when the ground is frozen and furnaces are flaring. The resulting pressure difference draws air and radon from beneath the home through any available openings. Concentrations of radon will vary depending on the building's construction style and the amount of radon present in the soil underneath it.

When Is Radon Considered a Hazard? EPA guidelines state that radon levels in indoor air should be kept below 4 picocuries per liter of air (4 pCi/l). EPA has established careful guidelines for action at 4 pCi/l i.e. mitigate within 11 months. At 19 pCi/l EPA recommends mitigating within 30 days. In the uranium industry uranium miners are allowed to be exposed to no more than 16 pCi/l over an 8- hour period. Typically expressed as “working level” (WL) measurements, this is known as the PEL (permissible exposure limit) as established by OSHA (Occupational Safety and Health Administration).

In most regions a cost-effective means of controlling radon levels is to install an active, semi active or passive ventilation system. This system overcomes the vacuum effect and prevents the radon gas from entering the home or building.

EPA has est. regulations for residual radioactive materials in buildings in 40 CFR - CHAPTER I –Part 19 § 192.20 Guidance for implementation states: “Residual radioactive materials should be removed from buildings exceeding 0.03 WL”

The 4 pCi per liter of air action level is based on a formula associated with the health-based standards established by EPA and is not in and of itself a health standard.



Radon

It's easy to solve! An active ventilation system draws air from beneath the building and vents it above the roofline. Inexpensive PVC pipes installed through the basement floor are connected by a manifold. The air is then directed to the roof vent via a single vertical pipe. A small radon removal fan may be installed to facilitate the air flow or at some concentrations the radon can be dissipated passively. If the fan runs continually, costs vary depending upon where you purchase your electrical supplies.

In a basement or crawl space with a dirt floor the exposed soil can be covered with a polyethylene membrane (plastic) to create a barrier, similar to that created by a concrete floor. The radon control system is then installed in the same manner. Once installed, the system collects air from beneath the membrane. Radon mitigation systems range in cost from \$2000-\$4800, subject to the size of the property, concentration of radon and level of finish work required.



Radon

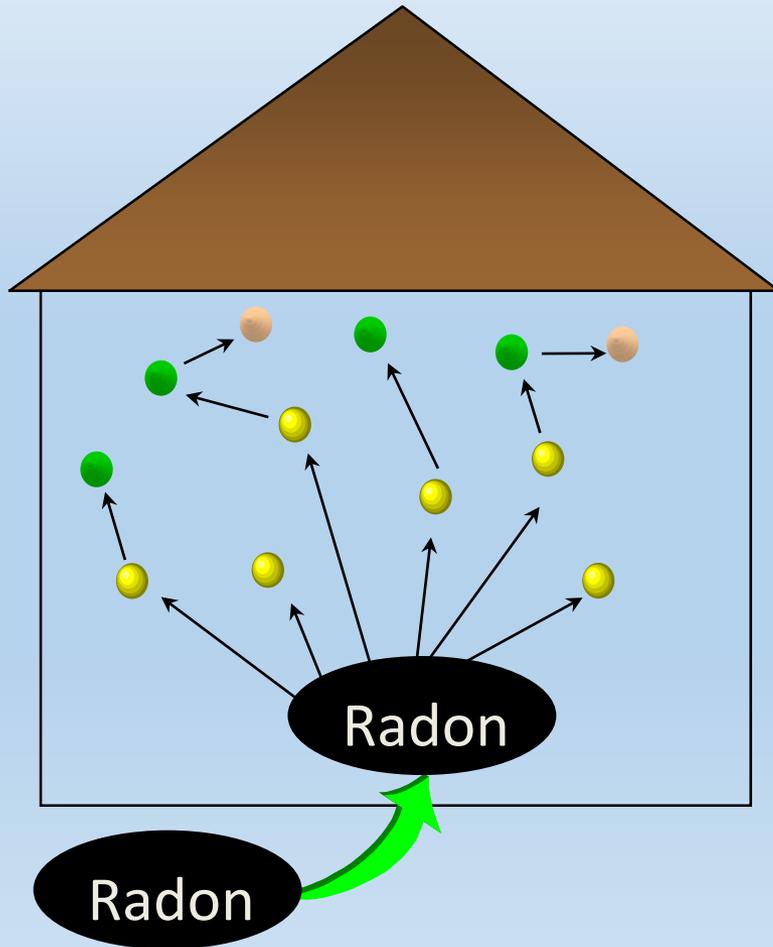
The installation- Any home can be retrofitted with a Radon Control System. Various installation options are used according to the structural design of the building and any limitations it may present. We recommend accommodations to facilitate radon reduction in new homes while under construction. You can only test for radon after the property is completely enclosed.-

How is radon in air tested? Radon is collected in short-term charcoal canisters or other devices which are sent to a lab for review. This method is frequently conducted at the same time as the home inspection and costs between \$100 & \$175. If you have testing conducted, be sure that the consultant utilizes 2 passive devices. Electronic testing may be conducted with one Continuous Radon Monitor. An electronic device left on premise completes CRM testing. This method costs between \$225 & \$275. Long-term testing is conducted with an Alpha Track device.

Radon is everywhere but it's easy to get rid of. Remember what EPA says, "It's easier to live without than with!"



Why Radon is a Concern



Radon as a gas can enter indoor environments

Radon decay products are created from radon

Electrostatically charged

Attach to lung tissue

Quickly attach to surfaces or particles

Source of health effects of radon exposure

Measured in Working Levels (WL)

Can be expressed in terms of equilibrium equivalent radon (pCi/L) for easy comparison.



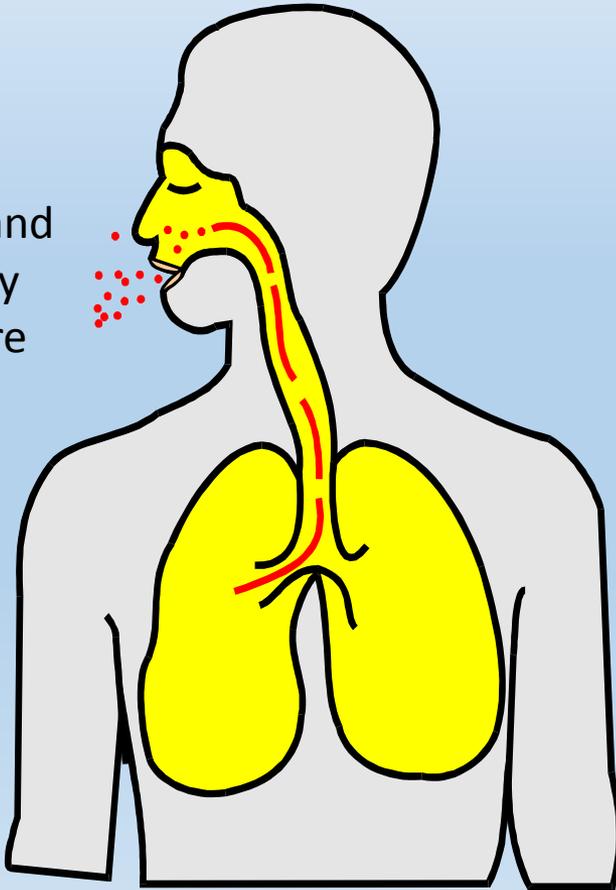
Why Radon is a Concern

Soil laden with radon gas can encourage entry through a building's foundation. Radon is unstable and will radioactively decay into a series of elements called "radon decay products." Polonium, Bismuth, and Lead are radon decay elements. Because radon decay products are formed from radon in the air, they are initially suspended in the air space. However, their strong electrostatic charge will cause them to attach to other particles (still respirable) or to fixed surfaces (non-respirable). The radon decay products that remain suspended can enter the lungs and cause the health effects associated with indoor radon.



Radon and Radon Decay Products Represent a Mixture of Gas and Particulates in the Air

Mixture of radon gas and radon decay products are inhaled.



If Radon is inhaled and then exhaled

No accumulation

Little health risk

If Radon decay products are inhaled

Adhere to lung tissue

Can cause damage to lungs before particles are expelled.

Primary health risk



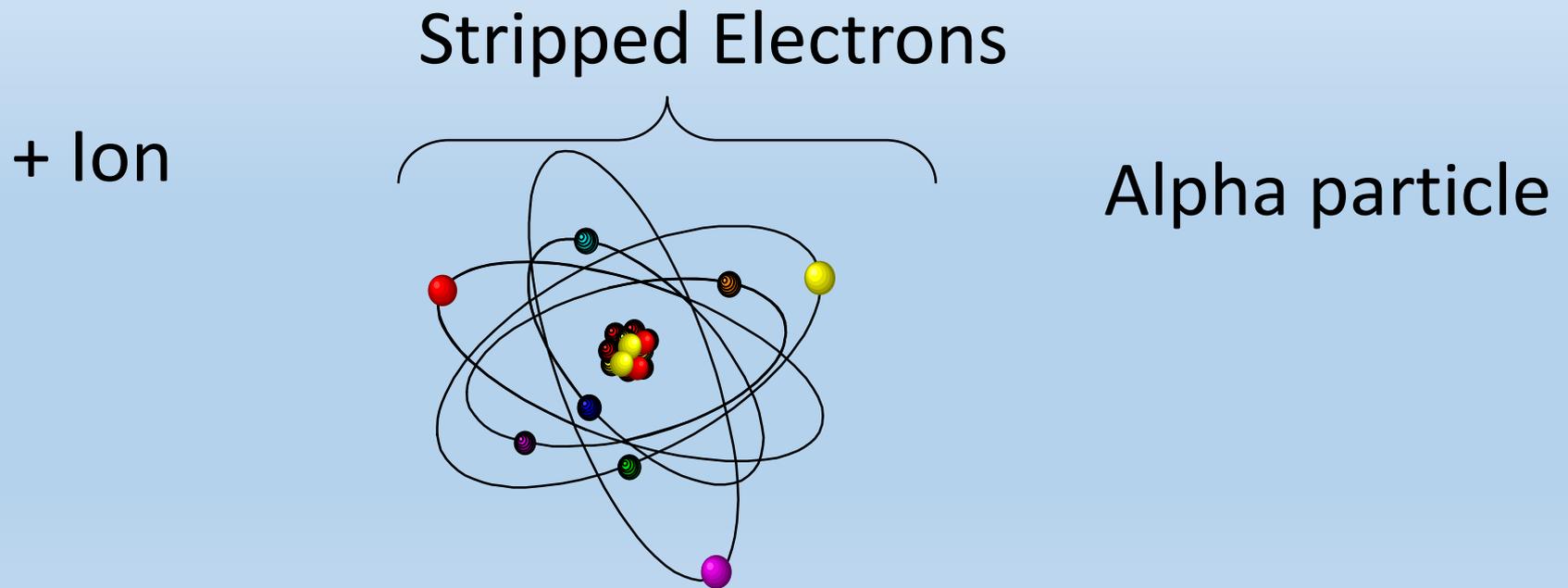
Radon

Radon has a half life of about 3.8 days. During that period of time, before it breaks down, to other elements known as Radon progeny, including polonium, breathing Radon poses very little health risk to individuals.

Polonium on the other hand is a known carcinogen.



Recoil from Alpha Release Strips Electrons Causing Resultant Decay Product to be Charged





Radon

Radon is a chemically inert element with a neutral charge.

However, since its nucleus is unstable, it will radioactively decay, releasing an alpha particle at a very high rate of speed.

The release of this decay product is like firing a bullet from a gun, causing the radon atom to recoil and move through the air that surrounds it.

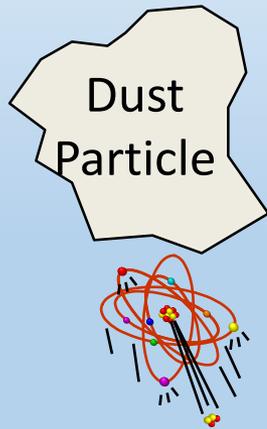
As the atom recoils and moves through air, the electrons orbiting around the atom collide with other atoms and are stripped off, causing the resultant atom to be positively charged.

This stripping of electrons causes the resultant radon decay product to be highly reactive and prone to attach to other objects in order to satisfy or reduce this resultant charge.

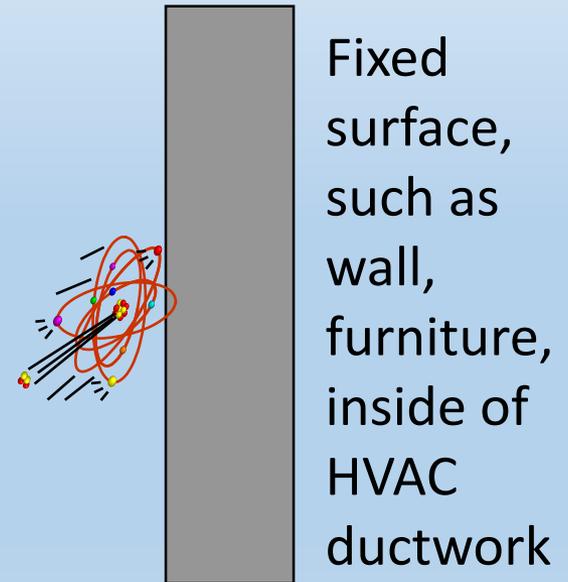
The act of sticking to things like; cigarette smoke, fabrics (curtains, etc.), filters, or the cilia in your lungs is known as plating out.



Charged Radon Decay Products Readily Attach to Airborne Particles and Surfaces



Radon decay products that attach to suspended particles can remain airborne and, if host particle can pass through nasal passages, can lodge in the lungs.



Radon decay products that attach to fixed objects, strongly adhere to those objects and are no longer breathable.



Radon

When a radon atom radioactively decays, it ejects an alpha particle from its nucleus. This “firing” of an alpha particle disrupts the electron field around the atom that results in the former radon atom (now polonium 218) to become ionized. The high static charge causes the radon decay product to attach to other objects. If it attaches to a fixed object (like a wall or air duct) the decay product is no longer available for inhalation (i.e. no risk). If it attaches to a suspended dust particle, it will remain in the breathing space, where it does present a hazard.



Radon Gas Measurement Used as Surrogate Estimate of Risk

RDP (radon decay products) guidance is 0.02 WL (Working Levels) of radon decay products

Historical guidance

40 CFR - CHAPTER I –Part 19 § 192.20 cites 0.02WL

If one assumes an equilibrium factor (50%) one can estimate RDP exposure from less expensive gas measurement

Allows for less expensive consumer measurements

$$\text{Rn(pCi/L)} = \frac{\text{RDPs(WL)} \times 100}{\text{Equilibrium Factor}} = \frac{0.02 \text{ WL} \times 100}{0.50} = 4.0 \text{ pCi/L}$$

Alternate guidance



Radon Gas Measurement Used as Surrogate Estimate of Risk

The primary guidance, which can be cited within federal statutes, is 0.02 working levels of radon decay products. The desire for less expensive measurements for consumers led to the use of radon gas measurements to estimate exposure, requiring an assumption of the EF. EPA conservatively assumed 50%. This led to the alternate, and now widely used surrogate guidance of 4.0 pCi/L of radon gas.

0.02 Working Levels Established as Standard for Uranium Mill Tailings Clean-up (UMTRCA)

(3) Compliance with § 192.12(b) may be demonstrated by methods that the Department of Energy has approved for use under Pub. L. 92-314 (10 CFR part 712), or by other methods that the implementing agencies determine are adequate. Residual radioactive materials should be removed from buildings exceeding 0.03 WL so that future replacement buildings will not pose a hazard [unless removal is not practical -- see § 192.21(c)]. However, sealants, filtration, and ventilation devices may provide reasonable assurance of reductions from 0.03 WL to below 0.02 WL. In unusual cases, indoor radiation may exceed the levels specified in § 192.12(b) due to sources other than residual radioactive materials. Remedial actions are not required in order to comply with the standard when there is reasonable assurance that residual radioactive materials are not the cause of such an excess.

40 CFR - CHAPTER I –Part 19 § 192.20 Guidance for implementation



Is Radon Decay Product Measurements an Acceptable Procedure?



Milt Lammering, US EPA (ret)
US EPA Region 8
Radiation Manager 1980-2001

Yes, EPA recognizes 2 testing procedures;

- Radon decay products
- Radon gas

“If all factors are equal, the direct measurement of radon decay products is the preferable approach”....provides the most accurate assessment of health risk.



Radon testing devices

Passive detectors, the two commonly used types are charcoal detectors and Electret ion detectors (E-PERMs).



Charcoal Detectors



E-PERMs (electret ion chambers)



E-PERMs

Charcoal detectors and Electret Ion Chambers (E-PERMs) detect the average radon concentration for the entire exposure period. The long-term E-Perm method provides a more accurate result than the charcoal detectors.

Passive testing devices, like the ones depicted in the previous slide, are typically used for short-term tests. The cost of testing with passive short-term devices ranges between \$100 and \$175.

EPA requires short-term testing be conducted in a “closed house” (doors and windows closed normal entrance and egress excepted) condition for a minimum of 12 hours. Testing devices are deployed a minimum of 18 inches off the floor. The duration of the test must be at least 48 hours.

EPA does not recommend conducting remedial action based on the results from one short-term test, but recommends averaging the results of two short-term tests, or long-term testing.



Continuous Radon Monitor (CRM)



A radon professional will place and retrieve an electronic radon monitor and mail or e-mail the consumer a full report.

The typical cost for radon testing conducted with a CRM is \$150 - \$250.

The electronic continuous radon monitor (CRM) gives hour by hour measurements of the radon concentrations in a home. The picture above depicts 2 continuous radon monitoring devices from differing manufacturers. Some equipment processes the capability to report if it is moved. Devices may also measure temperature, humidity and barometric pressure. Information of this sort can provide an indication of tampering by opening windows in the test area or otherwise skewing the results. Based on studies conducted by EPA, CRM's are more accurate than charcoal detection devices, but less accurate than electret ion chambers (E-Perms).



Radon Decay Product and Radon Instruments Used



Continuous Monitors

Femto-Tech 510 passive CRM

Thompson Nielson active CWLM



Integrating Devices

Co-located radon and radon decay products

Rad-Elec Electret Radon progeny integrating Sampling Unit with S chamber for radon



Radon Decay Product and Radon Instruments Used

Devices currently available, allow a radon professional to simultaneously measure radon and radon decay products. This technique provides a means to identify both potential and actual health risks. The instruments shown in the previous slide are EPA/NEHA approved devices and were used in determining radon equilibrium factors (EF) in studies in Guam, Mainland Japan, and Colorado.



Inexpensive Electronic Radon Monitors



Inexpensive Electronic Radon Monitors can be purchased by consumers for use in their homes or businesses. These inexpensive (\$150+/-) electronic monitors can be reused in different locations. The unit depicted does not have the sensitivity to measure radon levels every hour, but it will provide average radon levels for a **seven-day** period. Data can be cleared allowing the unit to be moved to an alternate location.



Long -Term Radon Measurements

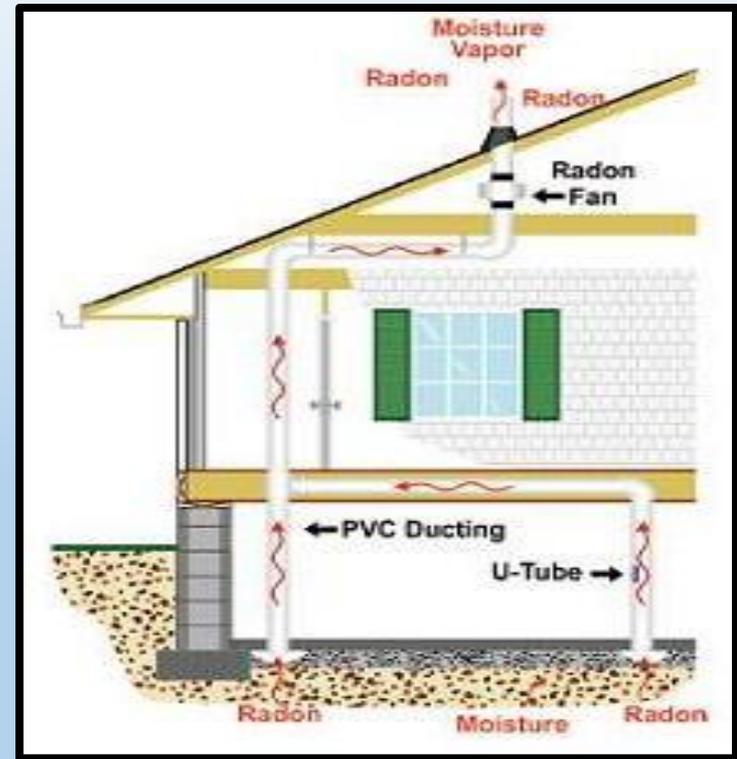
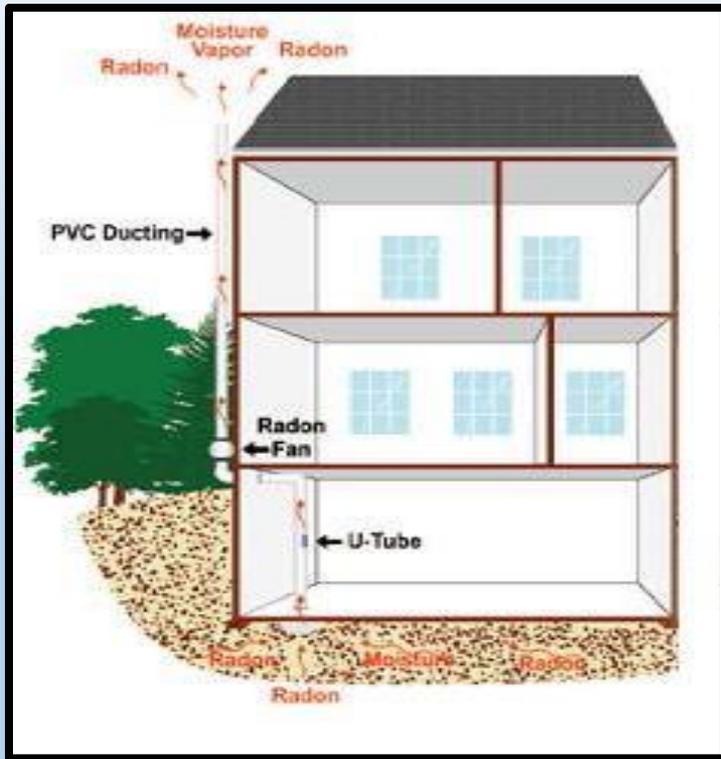


Long- Term Radon Measurements a.k.a. Alpha Track Testing devices test the ambient air for one month to one year. A Professional Certified Radon tester will frequently install and retrieve these devices from the subject property for about \$175, but they can be purchased by virtually anyone for about \$30-\$50.

As a comparison, **short -term** radon measurements are typically 2 to 4 days in length. They most frequently utilize passive or active testing devices.



Radon Mitigation

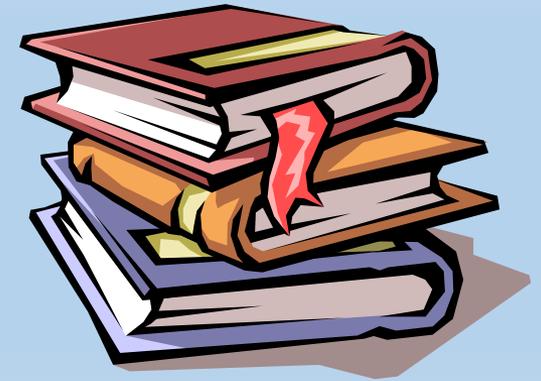


Most methods of lowering the levels of radon in a home will require added ventilation. This ventilation can be either passive or active. A passive vent could be a pvc pipe that runs from below the concrete slab or basement floor, up through the house, and out through the roof. An active system may use a similar design, but with the aid of a motorized fan. The fan is installed on the pipe to draw a greater volume of air from beneath the house. This causes a vacuum, of sorts, below the slab. Such systems are called sub-slab depressurization and are the most common of techniques for removing radon before it enters the improvements. Radon mitigation systems will typically cost \$2000 to \$4800, when professionally installed.



Is there a regulated action level for Radon in water?

The U.S. EPA has not established a Maximum Contaminant Level (MCL) for radon in drinking water. The Agency proposed an MCL of 300 pCi/L, but withdrew it on July 30, 1997. Levels of radon in household water at the concentrations of 10,000 (pCi/L) in water have a tendency to increase Radon in air by about 1 pCi/L of air. Radon concentrations in water greater than 2,000 pCi/L is considered by some state health departments to be significant; at this level or greater a consumer should consider taking some action. A real estate appraiser will also want to review the marketplace to determine if radon in water has a negative impact on value in his or her marketplace. Also, contact your state health department to determine what their recommended action level is.

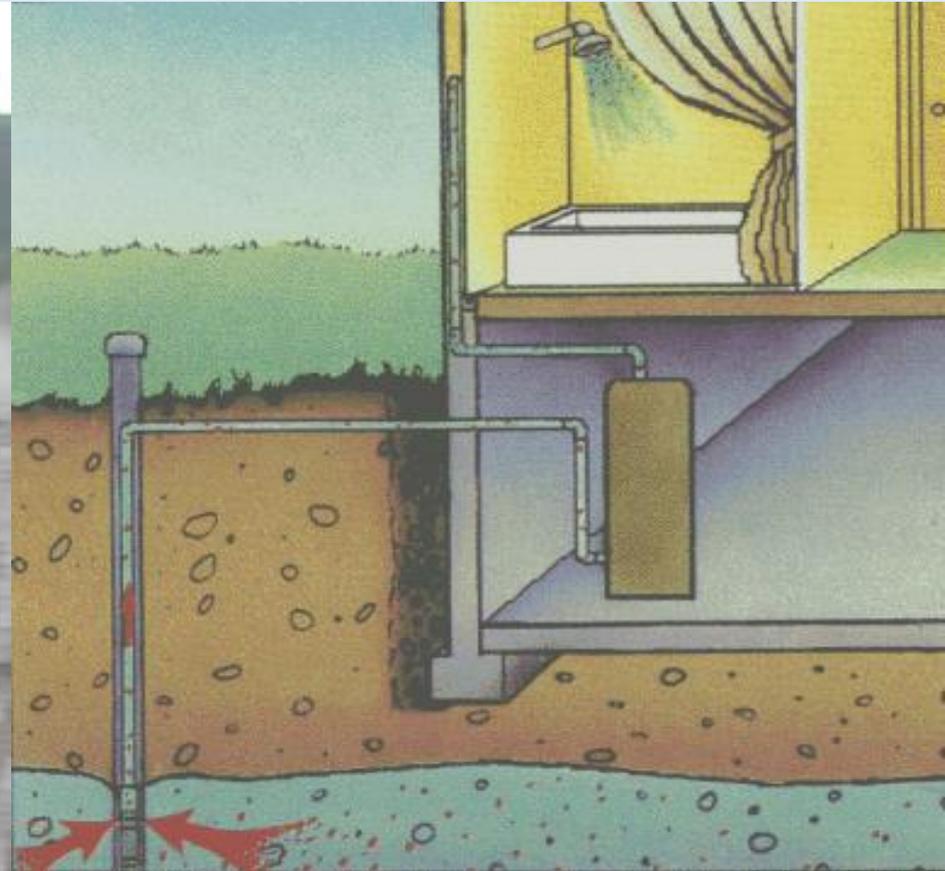


Where can I get more information?

For more information about radon or radium in water contact; the U.S. EPA Safe Drinking Water Hotline at (800) 426-4791, and/or the National Radon Hotline is (800) 767-7236, and/ or the National Ground Water Information Center at (800) 551-7379.



Health Effects of Radon in Water



When chemicals from fertilizers seep into an aquifer, they help move radium deposits into the water (radon is a decay product of radium).



Health Effects of Radon in Water

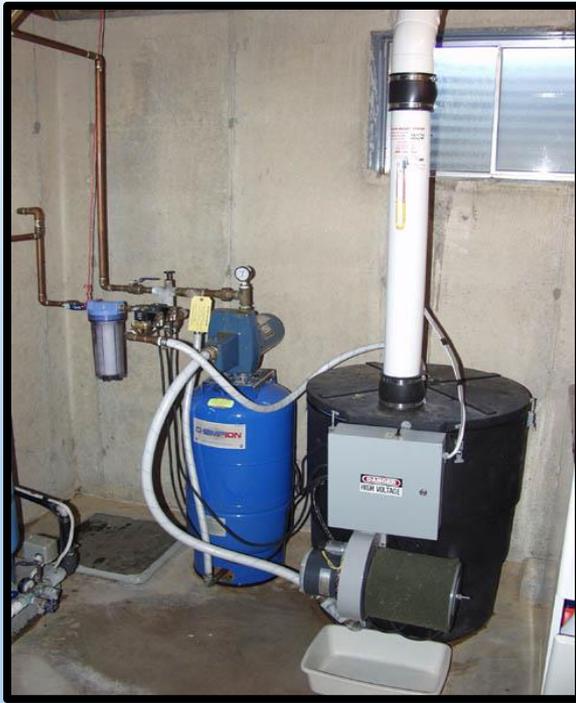
While radon can enter a home through well water, the risk of radon entering homes through water is small compared with that of radon entering through the soil. It is uncommon for water in a house to have extremely high levels of radon. Radon can be released into residences when the water is used for household purposes, such as washing dishes and showering. On average, radon in water contributes about five percent of the total indoor air concentration in homes served by wells.

One way radium (radon is a decay product of radium) gets into the water is from fertilizer and lime used on residential and agricultural land. When chemicals from fertilizers seep into an aquifer, they help move radium deposits into the water.

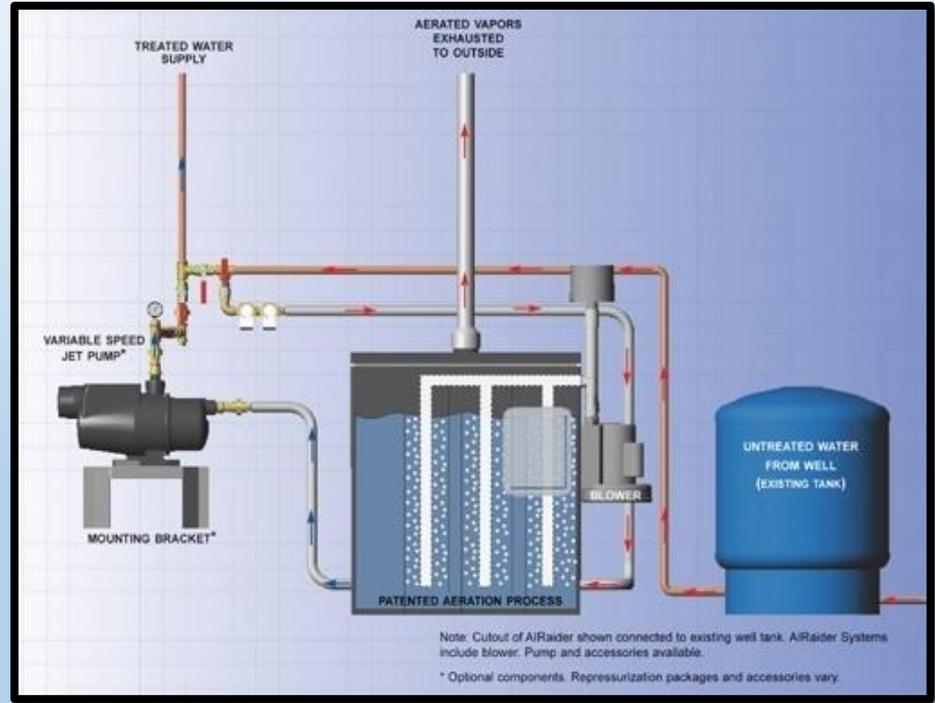
Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. Radium is a known cause of bone and nasal cancers. It is especially dangerous to children who have developing bone tissue. When a person ingests radium, the body interprets the radioactive element as calcium and deposits it in bones. Because it accumulates in the body, radium is considered to pose a greater cancer risk than most other radioactive elements.



Radon in Water



Aeration radon mitigation



Schematic of aeration radon mitigation

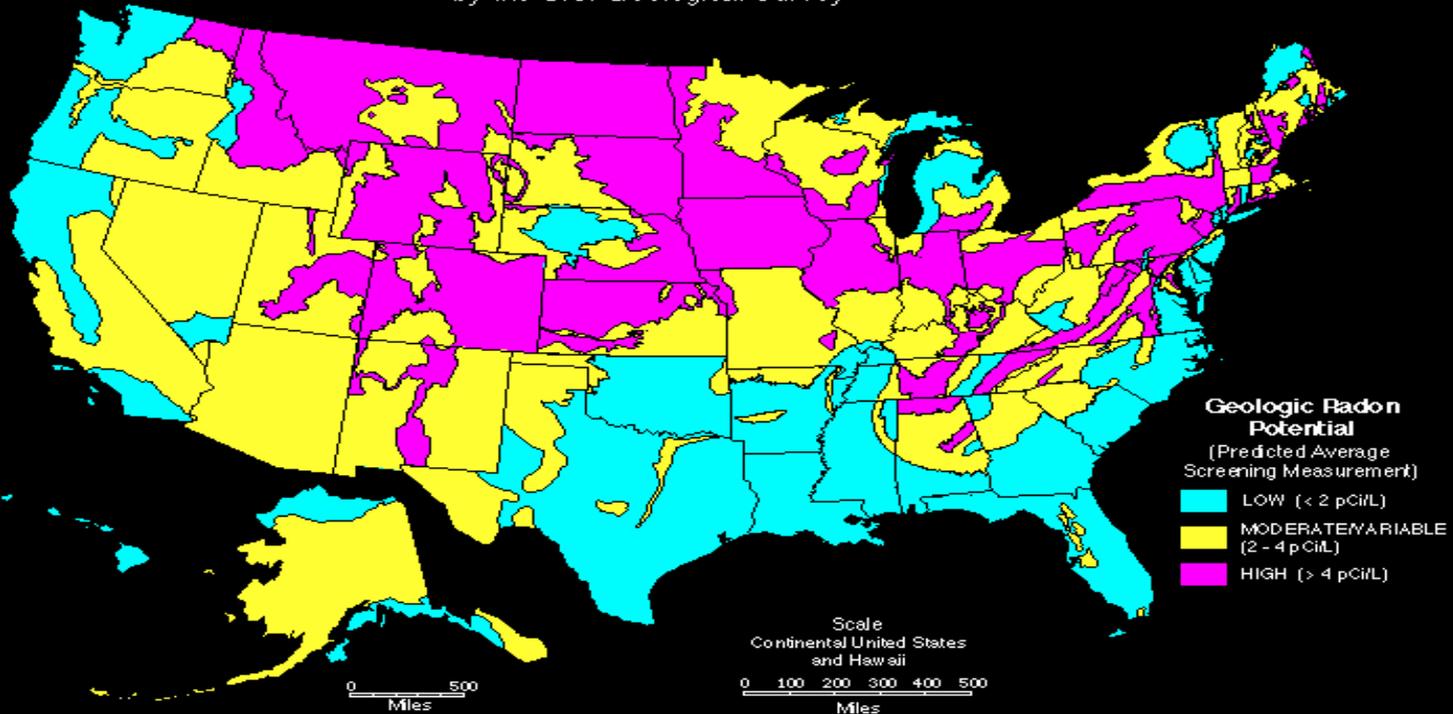
Above are depicted a photograph and a schematic of a bubbling system or aeration system. It is also known as a Shallow Tray Aeration system. The water is bubbled in a shallow tray before falling into the bottom of the tank. Radon in the water moves into the air bubbles created by the aeration system. The radon gas laden exhaust is then vented above the roof.

Systems of this sort have been known to reduce the radon in water from 58,000 pCi/L to 508 pCi/L .



GENERALIZED GEOLOGIC RADON POTENTIAL OF THE UNITED STATES

by the U.S. Geological Survey



Blue/ Turquoise areas represent low potential for elevated concentrations of Radon. These areas typically exhibit concentrations less than 2 picocuries per liter of air.

Yellow areas represent a moderate potential for elevated concentrations of Radon. These areas typically exhibit concentrations from 2 to 4 picocuries per liter of air.

Fuchsia areas represent a high potential for elevated concentrations of Radon. These areas typically exhibit concentrations greater than 4 picocuries per liter of air.



Chapter 5

Summary

Uranium decays and eventually becomes Radium. As Radium decays it gives off Radon gas.

Radon is an inert gas that bears little health risk to individuals. Radon has a half-life of 3.8 hours and breaks down to Polonium.

Polonium is a radioactive gas that can adhere to lung tissue and cause lung cancer. Radon testing is an inexpensive surrogate measurement to gauge the presence of Polonium.

There are many ways to test for radon gas and many different instruments that can detect it.



Chapter 6

Asbestos

**(Overview of Hazards, Regulations,
Responsibilities and the Impact on Value)**



Chapter 6

Learning Objectives

The appraiser will be able to identify products that have asbestos in them.

The appraiser will be able to describe the health risks of asbestos.

The appraiser will be able to describe asbestos abatement techniques.



Chapter 6 Topics Covered

- Properties of asbestos
- Uses of asbestos
- Health hazards of asbestos
- Asbestos regulations
- Impact on Value

Asbestos is a known carcinogen. It is the name given to a group of six different fibrous minerals (amosite, chrysotile, crocidolite, and the fibrous varieties of tremolite, actinolite, and anthophyllite) that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings. Some vermiculite or talc products may contain asbestos.



Asbestos Exposure - General Overview

How common do you think asbestos use is throughout the USA?

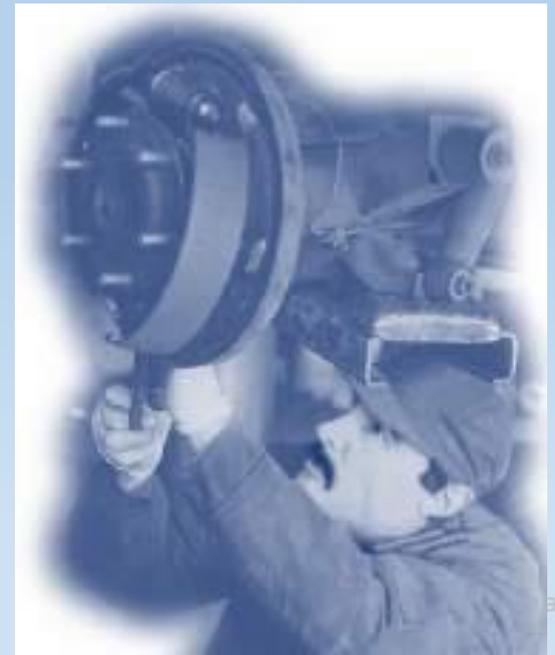


1.3 million workers are exposed in the U.S. – primarily in the construction industry.

Asbestos removal and building renovation & demolition have the greatest exposures.

Exposure in general industry:

- manufacture of asbestos products
- automotive brake and clutch repair
- Housekeeping and custodial work





Properties of Asbestos



Asbestos ore



Asbestos fibers

- Naturally occurring fibrous minerals
- Good tensile strength
- Flexible
- Heat resistant
- Electrical resistance
- Good insulation
- Chemical resistant

Because of these unique properties, asbestos was used extensively in variety of products.



Types of Asbestos

Most commonly used:

Chrysotile - “White asbestos”

Amosite - “Brown asbestos”

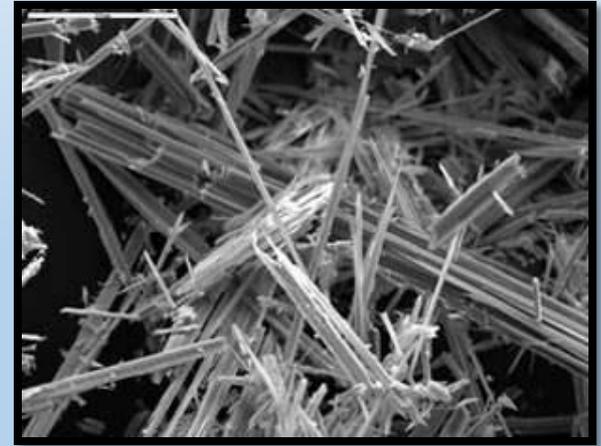
Crocidolite - “Blue asbestos”

Others:

Tremolite (sometimes found in vermiculite)

Actinolite

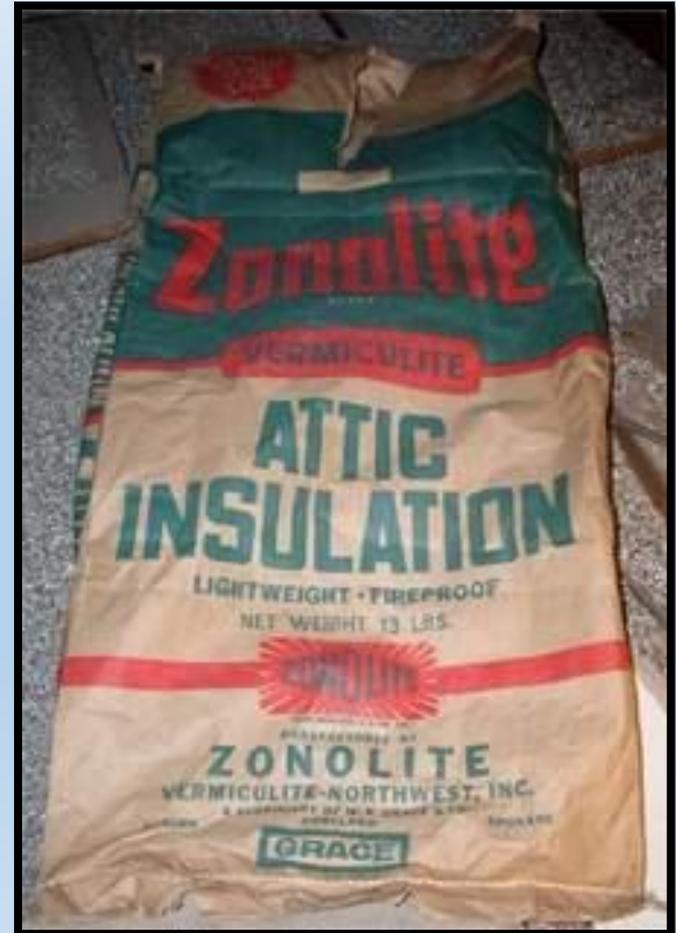
Anthophyllite



Asbestos fibers,
high magnification



Vermiculite – some products contained asbestos



Vermiculite insulation in attics



Vermiculite-assume it is asbestos according to EPA

Vermiculite mining in and near the town of Libby, Montana began in 1919 and was continued by the W.R. Grace Company from 1963 until 1990. The vermiculite ore mined in Libby was contaminated with tremolite asbestos.

In 1999, The Agency for Toxic Substances and Disease Registry (ATSDR) was asked by the Department of Health and Human Services (DHHS) to evaluate human health concerns in Libby that were related to asbestos exposure. DHHS was acting on requests received from the U.S. Environmental Protection Agency (EPA) and the Montana Congressional delegation.

Testing vermiculite can be expensive and yield mixed results. EPA recommends that if you have vermiculite insulation, you assume it contains asbestos and do not disturb it. Asbestos fibers in vermiculite are too small to be seen by the naked eye and can only be seen by a trained technician using a microscope. For additional information regarding vermiculite visit the Web address below. http://www.epa.gov/asbestos/pubs/verm_questions2.html#1



Vermiculite-assume it is asbestos according to EPA

If you disturb or remove vermiculite insulation, it is probable that you may inhale some asbestos fibers - the degree of health risk depends on how much and how often this occurred. If you do not go into your attic, handle, or disturb the insulation, it is likely that you will not be exposed to asbestos fibers from vermiculite insulation. Also, you need to consider if any disturbance of the insulation - possibly by a contractor doing work in your attic - may result in the fibers being deposited into other areas of your house where an exposure might be possible.

If you are concerned about possible exposure, talk to your doctor and consider consulting a physician who specializes in lung diseases, also known as a pulmonologist. For more information on asbestos-related diseases, see the [Agency for Toxic Substances & Disease Registry Web site \(http://www.atsdr.cdc.gov/ \)](http://www.atsdr.cdc.gov/).

It is estimated that the Libby mine was the source of over 70 percent of all vermiculite sold in the U.S. from 1919 to 1990. While no precise statistics exist, vermiculite insulation produced from Libby vermiculite was widely distributed throughout the U.S. and it is possible that it is present in millions of homes.



Vermiculite-assume it is asbestos according to EPA

Appraisers: According to EPA YOU SHOULD ASSUME THE VERMICULITE CONTAINS ASBESTOS AND DO NOT DISTURB IT!

Any disturbance could potentially release asbestos fibers into the air. If you absolutely have to go into an attic and it contains vermiculite insulation, you should limit the number of trips you make and shorten the length of those trips in order to help limit your potential exposure.

Consider wearing appropriate respiratory protection.

For guidance on appropriate respiratory protection see 29 CFR 1910.134.

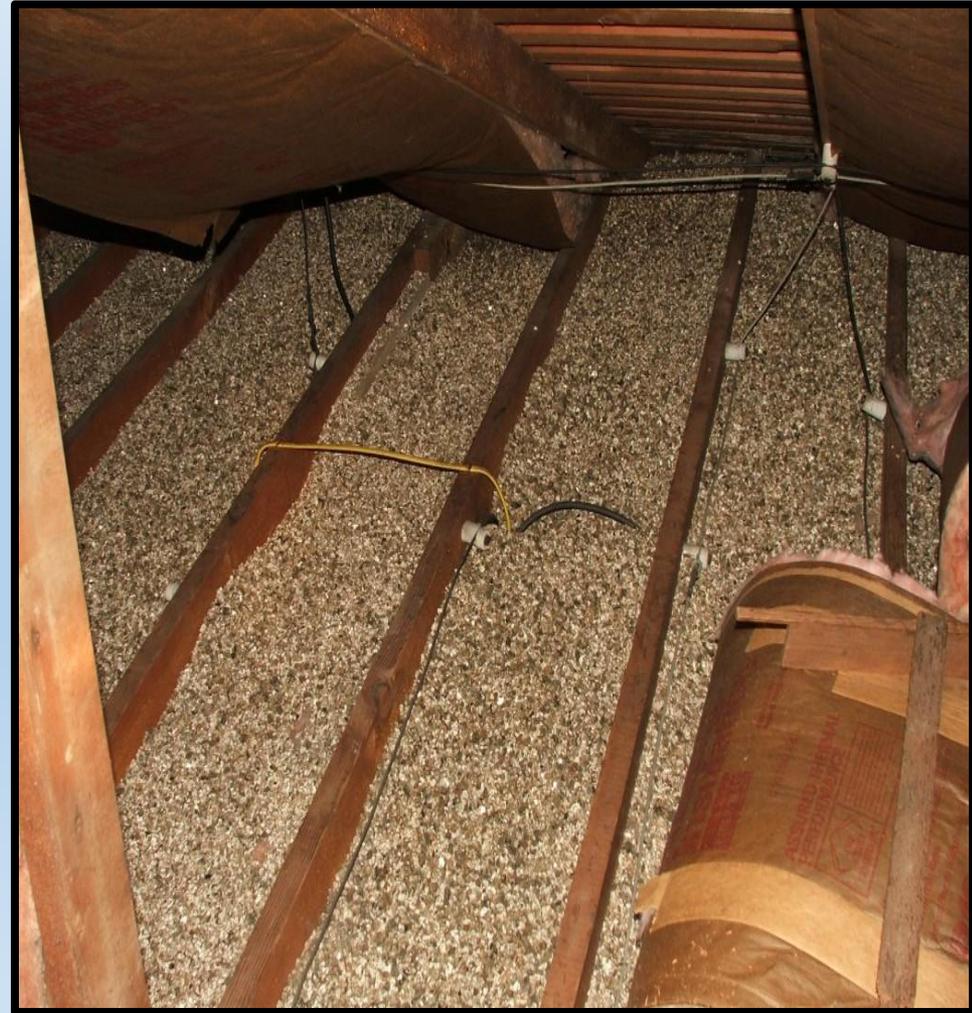




Vermiculite-assume it is asbestos according to EPA

If you discover vermiculite insulation during your site inspection I recommend you do the following:

- Take great care not to disturb it
- Take photographs of it
- Last, but not least, be sure to identify its presence in your appraisal report





Vermiculite-assume it is asbestos according to EPA

When reporting vermiculite that you have observed you may consider using a statement like the following:

This appraiser observed a material believed to be vermiculite insulation in the attic. The area that was observed containing vermiculite insulation was approximately (identify the number of square feet).

All observations and representations made herein, are based on casual visual observations of readily accessible areas. It should be noted that this appraiser did not conduct any manner of destructive inspection and makes no representations regarding latent conditions behind walls, or above ceilings, etc.

According to EPA vermiculite insulation should be considered asbestos containing material.

Note to the appraiser: in 2012 the cost range to remove vermiculite insulation from an attic in a 24' x 40' ranch ranges between \$8500-\$13,000. It is an asbestos abatement job subject to EPA and state regulations. In querying hundreds of appraisers at live environmental hazards impact on value classes there seems to be a consensus that when asbestos is encountered it's an issue that is cost to cure with no stigma associated with the product after it is removed.



Uses of Asbestos



Asbestos insulated pipe



Asbestos insulated boiler

Asbestos has been used for centuries, but greatly increased during and after World War II in ship insulation and the following:

- Pipe insulation
- Surfacing insulating materials
- Reinforcement of materials
- Fireproofing
- Acoustic and decorative plaster
- Textiles

Use has greatly declined since the late 1970's



Examples of Uses of Asbestos



Sprayed-on fireproofing material



Sheet vinyl containing asbestos

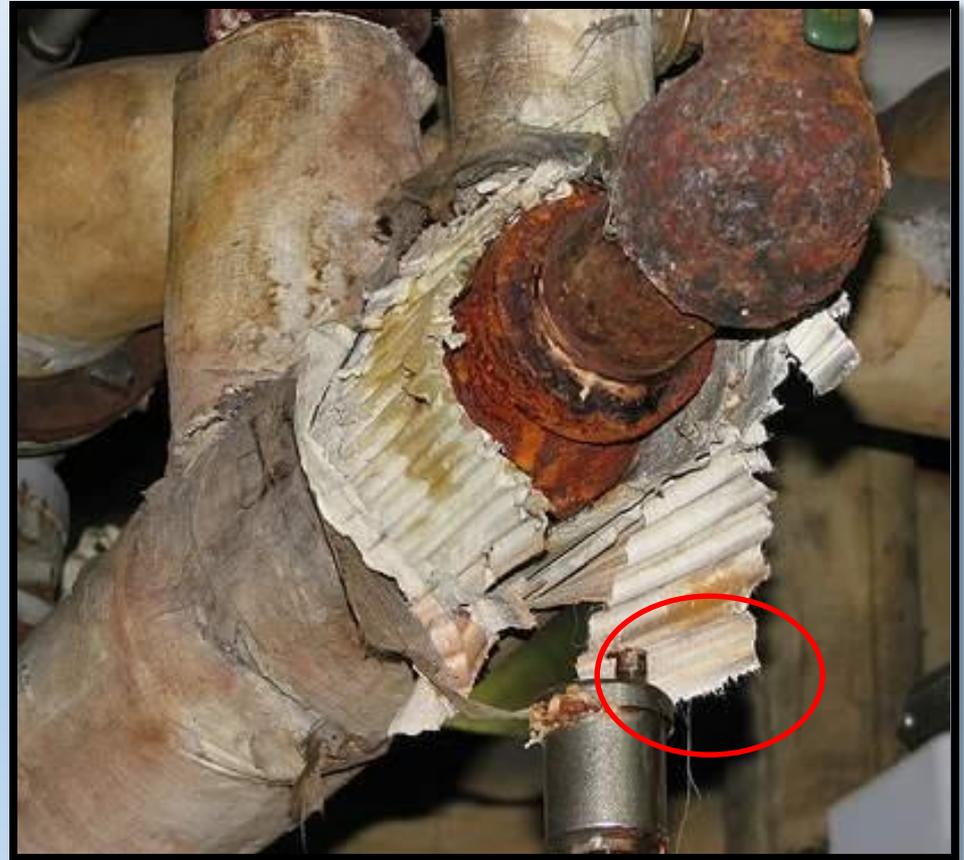
These products may be found in homes and buildings constructed before 1981.



Vinyl asbestos flooring



Damaged Asbestos Pipe Insulation



This damaged pipe insulation is a health hazard to persons working around it, handling it, or removing it. Asbestos fibers are visible on the torn edges.



Asbestos Millboard



Asbestos millboard was used in the construction of walls and ceilings, especially around furnaces and wood-burning stoves, where insulation and fire protection was required. Most varieties of asbestos millboard contained between 80% and 85% asbestos.



Asbestos in Gaskets and Fabric



Asbestos fabric in HVAC system



Asbestos gaskets– may be round, flat or impregnated with waterproof sealant



Damaged asbestos gasket



Asbestos Roofing Material — used from 1920's to 1970's



Asbestos cement roof shingles and felt (tar paper)





Cement-Asbestos Pipe (Transite)



Asbestos Cement
(AC) Pipe



Asbestos
Cement Lab
Fume Hood
Exhaust Duct



Cement-asbestos pipe, sometimes called Transite, was used underground and above ground in years past and may show up in pipe replacement jobs, building demolition jobs or excavations.



Asbestos Ceiling Tile - used until about 1980



Tile close-up

Usually white and in 1' by 1' or 2' by 4' sizes



Asbestos Shingles and Siding



Removal done correctly



Found in older houses – not to be confused with newer asbestos-free cement siding. There is little hazard unless disturbed. The top right hand picture shows a siding replacement job with broken green asbestos shingles which would have released dust and fibers into the air if done incorrectly.



Asbestos “Popcorn” Ceiling Material

Popcorn ceilings (also known as acoustic ceilings) were popular in many homes built from the late 1950s through the early 80s.



Damaged ceiling material



Uncontrolled popcorn ceiling removal job

Not all popcorn ceiling material contained asbestos, but some did. Many types were more easily dislodged than others.

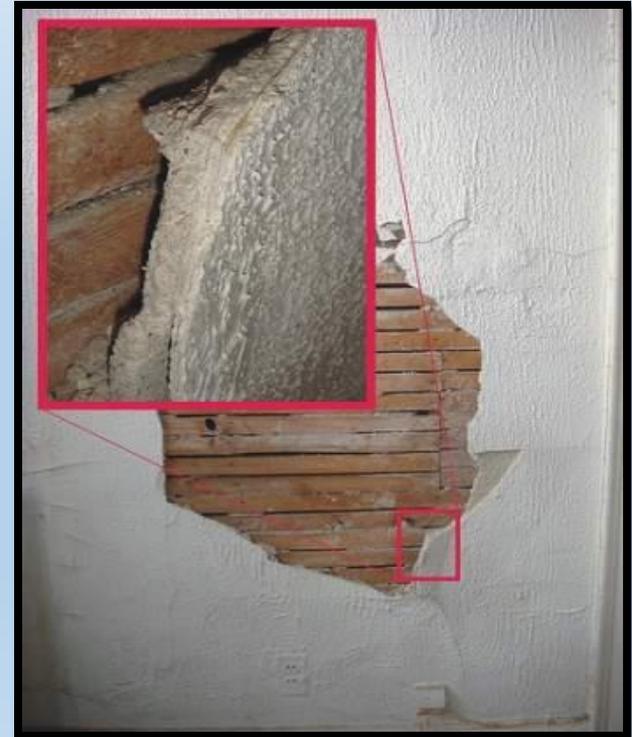


Asbestos in Joint Compound and Plaster

Some joint compound contained up to 5% asbestos. Older plasters in lath and plaster construction also sometimes contained asbestos.



Joint compound



Plaster with asbestos

See [WRD 23.30](#) for guidance on employee exposure to joint compounds



Some Asbestos-Containing Materials*

- Cement Pipes
- Cement Wallboard
- Cement Siding
- Asphalt Floor Tile
- Vinyl Floor Tile
- Vinyl Sheet Flooring
- Flooring Backing
- Construction Mastics (floor tile, carpet, ceiling tile, etc.)
- Acoustical Plaster
- Decorative Plaster
- Textured Paints/Coatings
- Ceiling Tiles and Lay-in Panels
- Spray-Applied Insulation
- Blown-in Insulation
- Fireproofing Materials
- Taping Compounds (thermal)
- Packing Materials (for wall/floor penetrations)
- High Temperature Gaskets
- Laboratory Hoods/Table Tops
- Laboratory Gloves
- Fire Blankets
- Fire Curtains

(This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.)



Some Asbestos-Containing Materials*

(Continued)

- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breaching Insulation
- Ductwork Flexible Fabric Connections
- Cooling Towers
- Pipe Insulation (corrugated air-cell, block, etc.)
- Heating and Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roofing Shingles
- Roofing Felt
- Base Flashing
- Thermal Paper Products
- Fire Doors
- Caulking/Putties
- Adhesives
- Wallboard
- Joint Compounds
- Vinyl Wall Coverings
- Spackling Compounds

(This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.)



Some Terms: “ACM” and “PACM”

Asbestos Containing Material

Any material containing more than 1% asbestos by weight.

Presumed Asbestos Containing Material

Installed prior to 1981 {

- Surfacing materials
- Thermal System Insulation
- Flooring

Must be handled as ACM unless proved otherwise

Many uses of asbestos have been banned under EPA and Consumer Product Safety Commission regulations. However, some materials where asbestos fibers are generally well bound in the materials were not banned.

Previously installed products still pose a hazard to workers. Asbestos fibers can be released during repair work, demolition, and renovation of older buildings and structures containing ACM.



Asbestos Health Effects

Asbestos is an Inhalation Hazard

The primary asbestos exposure route that EPA is concerned about is through inhalation. Asbestos fibers must be airborne to cause a health risk through inhalation. Asbestos exposure can cause cancer and other diseases, and there is no known safe level of asbestos exposure. The risk of disease increases as the level, duration, and frequency of exposure increases. That risk is made worse by smoking. Disease may not occur until decades after exposure.



Asbestos is an Inhalation Hazard

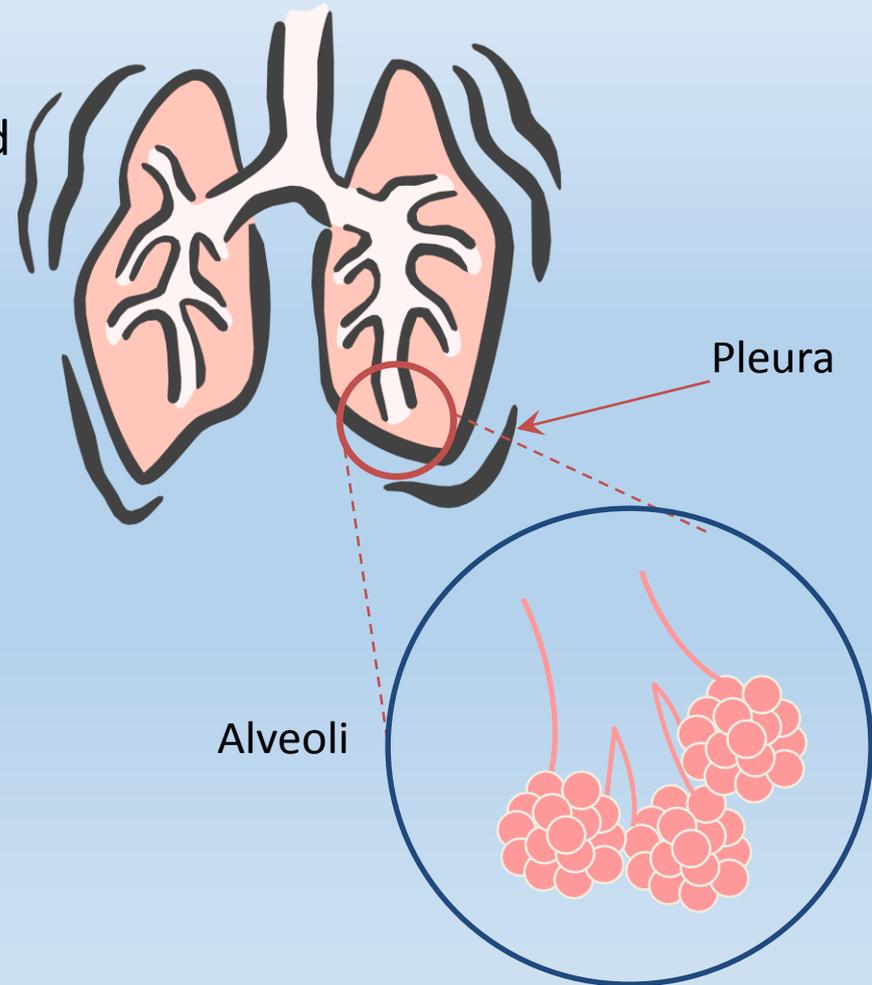
Airborne asbestos fibers inhaled deep into the lung can cause damage.

Tiny breathable asbestos fibers are deposited in the alveoli, the ending small air sacs in the lungs.

The body's defense mechanisms cannot break down the fibers.

Asbestos fibers cause damage to the lungs.

The fibers may also travel to the pleura, the membrane lining the outside of the lungs.





Asbestos-Related Diseases

Asbestosis

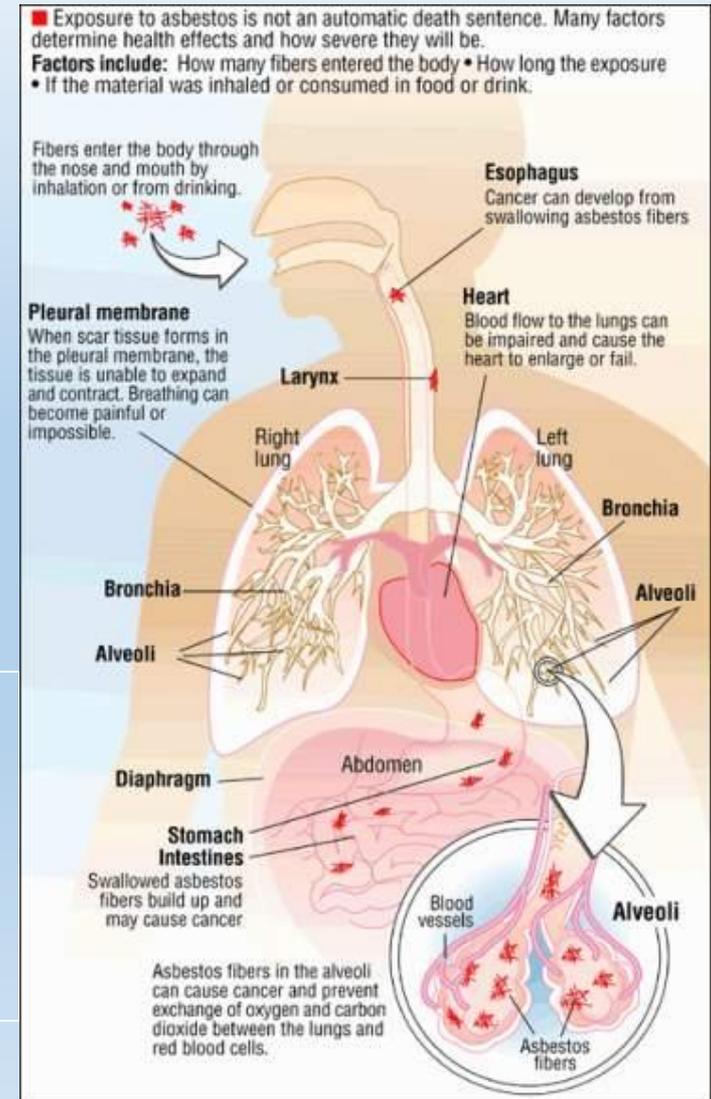
Mesothelioma

Lung Cancer

Other cancers

Usually symptoms take 15 to 30 years or more to develop.

Health effects from asbestos exposure may continue to progress even after exposure is stopped.





Asbestosis Example

Photos © RAVANESI@2000



Joe Darabant, 1949, covered with chrysotile asbestos fibers. Worked for 30+ years at the Johns-Manville Plant in New Jersey, cutting asbestos shingles and making asbestos block and pipe-covering materials.



Joe, 1989. Forced to retire in 1974 at age 50 from poor health; he died from asbestosis in 1990 at age 66.

Asbestosis is a serious chronic, progressive disease that can eventually lead to disability or death in people exposed to high amounts of asbestos over a long period. Asbestos fibers cause the lung tissues to scar; when the scarring spreads, it becomes harder and harder to breathe. Symptoms include shortness of breath, a dry crackling sound in the lungs while inhaling, coughing, and chest pain. This condition is permanent and there is no effective treatment.

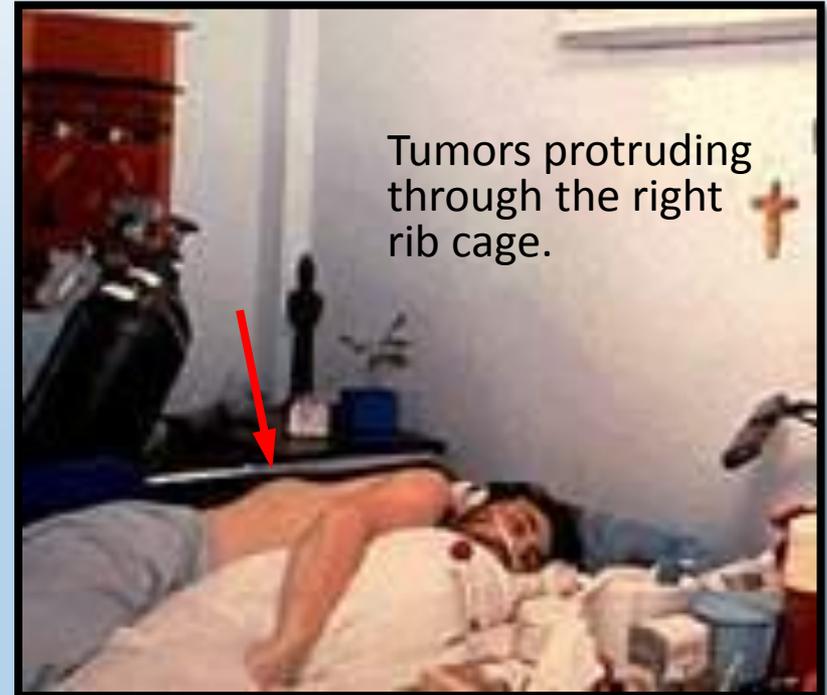


Mesothelioma

The individual in the photo to the right was diagnosed in 1985 with pleural mesothelioma; he died 5 months later at age 36. In college, he worked for less than a year at the Manville Plant in N.J. His father also worked at the plant 30+ years and died from asbestosis. This individual's exposure may have begun when he was a child.

Mesothelioma is a rare form of cancer of the pleura, the thin membrane lining the lungs. About 200 cases are diagnosed each year in the U.S. Virtually all cases are linked with asbestos exposure.

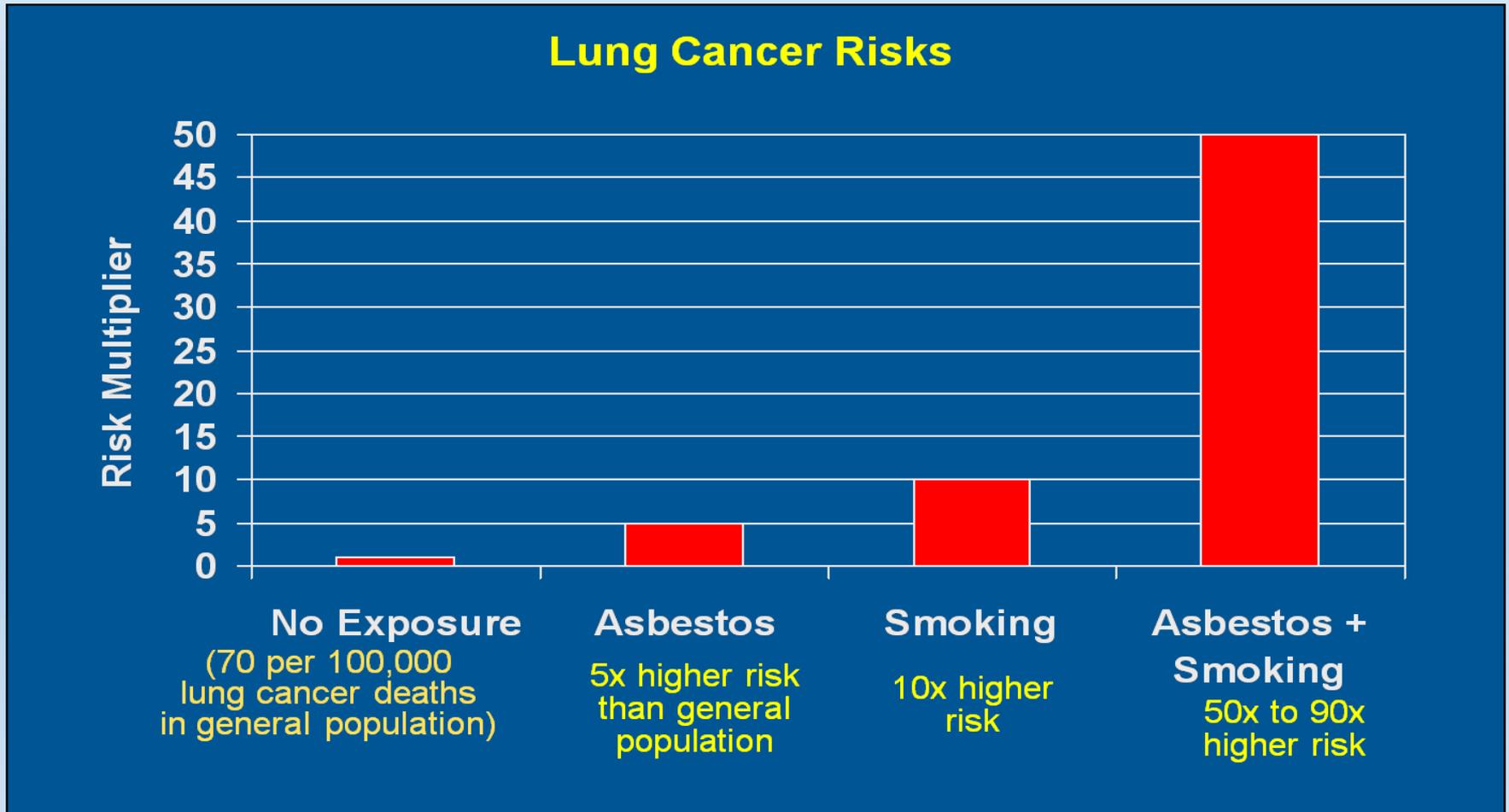
The cancer is very invasive and spreads quickly, eventually crushing the lungs so that the patient cannot breathe. It is painful and always fatal. It can be caused by very low exposure and is not directly related to the amount inhaled. This cancer may take 30-40 years to develop.





Lung Cancer; the chart below was developed by EPA to indicate the relationship between asbestos exposure and how the risk of cancer is dramatically increased for those who also smoke cigarettes

Lung cancer, one of several respiratory diseases caused by asbestos, is responsible for the largest number of deaths from asbestos exposure.



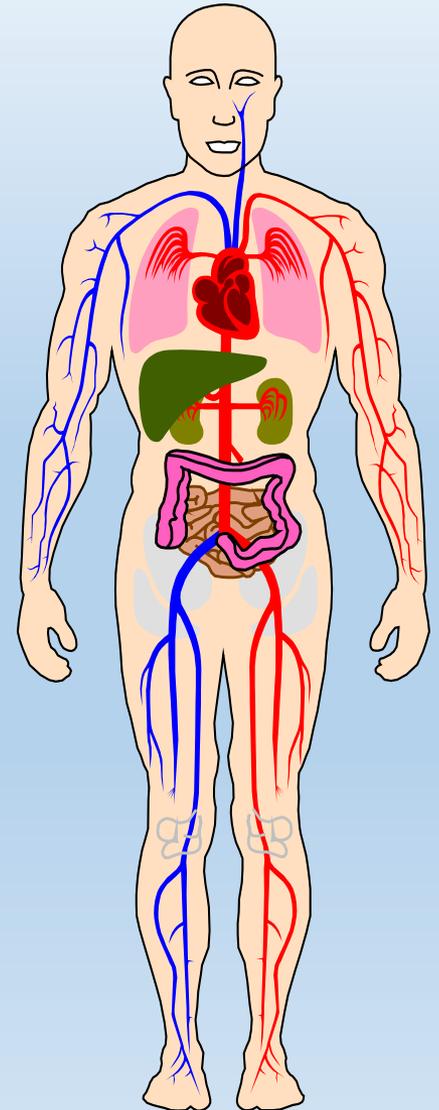


Other Cancers

Evidence suggests that ingesting asbestos can also cause cancers in the:

- Esophagus
- Larynx
- Oral cavity
- Stomach
- Colon
- Kidney

Fibers can enter the mouth and be swallowed. Poor hygiene, leaving food/drinks out in contaminated areas, and carelessness can result in the ingestion of asbestos.





Asbestos-Related Diseases



The potential for asbestos related disease depends on:

- Amount of fibers inhaled
- Length of exposure
- Whether exposed worker smokes
- Age – because of delayed effects

Don't smoke! An asbestos worker is at much greater risk of developing lung cancer if he/she smokes.



How Do Asbestos Fibers Get in the Air?

Physical disturbance of asbestos-containing materials can suspend fibers in the air.

Asbestos is most hazardous when it is “FRIABLE”.

- The term Friable means it can be easily crumbled or crushed by hand, releasing fibers into the air.
- Very small fibers stay in the air for long periods.
- Damaged or deteriorated ACM increases friability.



Photo of friable asbestos

Non-friable ACM (asbestos-containing materials)(floor and ceiling tiles, house siding, fire doors, etc.) won't release fibers unless disturbed or damaged in some way.



Evaluating Asbestos Hazards

Type of Material

- What is the asbestos content (greater than 1%)?
- Is it friable or non-friable?
- What is the location – is it isolated or accessible to workers?

Condition of Material

- Is it intact with no damage?
- Is it in poor condition – damaged, disturbed or no longer intact?



Activity

- Are employees working in the area where asbestos is found?
- Will the material be cut, sawed, ground, sanded, drilled, broken, removed, replaced or otherwise disturbed?



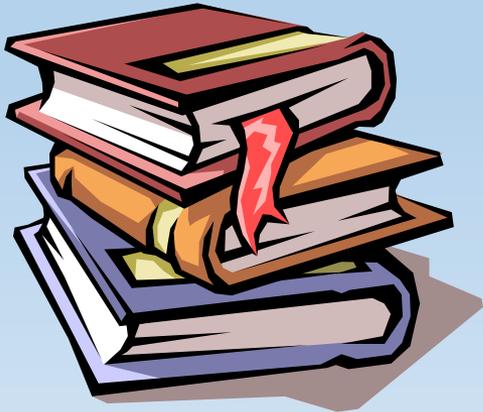
Asbestos Regulations

NESHAP

- National Admissions Standards for Hazardous Air Pollutants (NESHAP)
- Regulates asbestos in all commercial buildings.

AHERA

- The Asbestos Hazard Emergency Response Act (AHERA) regulates asbestos in schools.





Construction/Maintenance Activities

To avoid a situation illustrated in the photo below, regulations cover any construction or maintenance activity releasing or likely to release asbestos fibers into the air including:

- Renovation
- Remodeling
- Demolition
- Asbestos removal and disposal

Covers work done in:

- Buildings
- Structures
- Mechanical piping equipment and systems
- Ships
- Other facilities



Loose asbestos debris from demolition project



“NESHAP Pre-Renovation Or Demolition” Inspection/Survey

NESHAP (National Emission Standards for Hazardous Air Pollutants) regulations 40 CFR Part 61, Subpart M

Demolition

At least ten (10) working days prior to the demolition start date, an Applications/Notification must be submitted to the appropriate state regulatory body overseeing NESHAP (frequently State Departments of Health). This form is required if the structure contains NO ASBESTOS MATERIAL or any amount of asbestos materials. A copy of the Asbestos Survey performed by an ~~an~~ Inspector accredited by the State of N.C. is to be included with the Application/ Notification Form. After review of the application and inspection of the facility, a permit to demolish the structure will be issued. The permit must be obtained BEFORE beginning any demolition activities.

Renovation

At least ten (10) working days prior to commencing any renovation operations, an Applications/Notification must be submitted to the appropriate state regulatory body overseeing NESHAP. After review of the application and a determination that the operation will comply with all applicable regulations, a permit will be issued. The permit must be obtained BEFORE beginning any renovation activities.



"NESHAP Pre-Renovation Or Demolition" Inspection/Survey

If greater than 160 square feet, 260 linear feet, or 35 cubic feet of friable asbestos material is being removed, stripped, or disturbed, the operation is subject to these regulations. If a facility has several small-scale, unexpected or emergency renovation operations, the amount of RACM (regulated asbestos containing material) removed is combined for each calendar year. Once the 160/260/35 totals are achieved for the calendar year, any further renovation operations in that year are subject to these regulations. The 160/260/35 determination is based on the total amount of asbestos involved in the project. If there are multiple structures being renovated or demolished as one project or at one facility, then all of the asbestos in all of the structures must be totaled.



“NESHAP Pre-Renovation Or Demolition” Inspection/Survey

The owner of the structure, contractors, and sub-contractors involved in any demolition / renovation operation are subject to these regulations regardless of their involvement in the operation. If you are contracted to demolish a structure or remove asbestos and are told that all notifications and permits have been taken care of, call appropriate state regulatory authority for verification. This information does not relate in any way to other regulations governing asbestos activities such as OSHA, AHERA (Asbestos Hazardous Emergency Response Act), or permits issued by municipalities.

The regulations covering asbestos are very stringent and often mis-interpreted. If you have any questions concerning asbestos or the asbestos NESHAP regulations, visit the following web address <http://www.epa.gov/asbestos/pubs/neshap.html> at the EPA web site (<http://www.epa.gov/asbestos/>).

Failure to comply with these federal regulations can result in substantial penalties - up to \$25,000 per day per violation.



“NESHAP Pre-Renovation Or Demolition” Inspection/Survey

NESHAP has been in effect since 1988. It requires that any renovation or demolition of or in a commercial building, regardless of the building’s age, must have an asbestos survey conducted if more than 160 linear feet or 260 ft.² of potential asbestos-containing material is being disturbed.

For many years this regulation was only enforced for large building projects. More and more states have begun enforcing this regulation vigorously for all commercial holdings regardless of size.

The fines associated with noncompliance can be very significant in the tens or even hundreds of thousands of dollars.



Environmental Regulations (EPA)

- AHERA (Asbestos Hazard Emergency Response Act)
- NESHAPS (National Emission Standards for Hazardous Air Pollutants)



State environmental agencies:

Each state enforces the AHERA and NESHAP regulations through their individual state agencies. Most frequently it is the state's department of health.

- department



Asbestos Abatement

- Asbestos abatement is highly regulated
- Must be conducted by licensed professionals in a contained environment
- Is very expensive



Asbestos Abatement

Depending upon the type of asbestos to be removed in the building, components that comprise the cost vary dramatically.

In a residential setting asbestos removal is not required and typically does not have a negative impact on value, unless the surfaces of the suspected asbestos-containing material are significantly deteriorated. In most cases there is no stigma associated with the presence of asbestos.

In both residential and commercial settings, if calculations are employed to determine the impact on value, they typically are presented as a cost to cure.

After the asbestos is professionally abated there is usually no stigma associated with the property.

The cost of abatement could have a profound impact on the value of a property, especially one requiring substantial renovation. Given the fact that asbestos is still present in some joint compounds, drywall, adhesives, and other building materials, it would be prudent for appraisers to make an extraordinary assumption regarding the presence of asbestos.



Asbestos Abatement





Asbestos Abatement

If removal is to be performed when users are still present in the building, it may be necessary to relocate some users temporarily. Typically, the part of the building from which asbestos is being removed has to be sealed off in order to prevent contamination of the other areas. Sealing off with barriers is known as containment. Methods of sealing off an area often include the use of Polyethylene film, duct tape and negative air pressure machines which are fitted with HEPA (high efficiency particulate air) filters. The idea is that the contained area is pulling fresh air in as to not allow asbestos fibers into the surrounding environment.

Only a special vacuum cleaner that's designed for asbestos containment (HEPA vacuum) can be safely used when cleaning up during and after asbestos removal. Ordinary vacuum cleaners cannot be used, even those fitted with a HEPA filter (HEPA filters filter down to .3 microns 99.97%) efficiently. An ordinary vacuum cleaner will expel the asbestos fibers into the room air.



Asbestos Abatement

If the building is closed to normal users, it may be necessary to seal it off from outside atmosphere so that no accessible air is contaminated. Examples of asbestos removal enterprises include the Jussieu Campus (begun circa 1996 and still going on as of 2005^[update]) and the *Tour Montparnasse* (in 2005, projected duration was three years if the tower was emptied of its users, and ten years if it were not).

Removal is not the only means of asbestos abatement. Asbestos and asbestos-bearing materials may be "enclosed" or "encapsulated" to prevent building occupants from being exposed to the fibers.

An asbestos-containing building that is to be torn down may have to be sealed, and to have its asbestos safely removed before ordinary demolition can be performed. The asbestos removal may take longer and cost more than the actual demolition. For example, commercial buildings scheduled for demolition containing potentially friable asbestos, will be stripped of most of their asbestos before the final demolition occurs.

Communication of Hazards

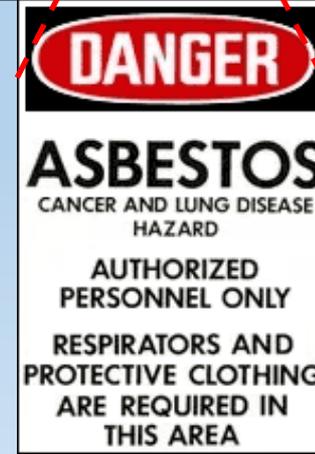


Warning Signs

- for regulated areas
- visible before entering

Warning Labels

- attached to all products and their containers





Basic Information About Asbestos

This page is intended to provide the public with general information concerning asbestos and where and how to get more information.

- What is asbestos?
- What are asbestos health effects?
- Where can asbestos be found?
- What if I have asbestos in my home?
- Where can I find an accredited laboratory to test for asbestos?
- EPA's role in asbestos.
- Other federal asbestos efforts.



Basic Information About Asbestos

What is asbestos?

Asbestos is the name given to a number of naturally occurring fibrous minerals with high tensile strength, the ability to be woven, and resistance to heat and most chemicals. Because of these properties, asbestos fibers have been used in a wide range of manufactured goods, including roofing shingles, ceiling and floor tiles, paper and cement products, textiles, coatings, and friction products such as an automobile clutch, brake and transmission parts. The Toxic Substances Control Act defines asbestos as the asbestiform varieties of: chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite/grunerite); anthophyllite; tremolite; and actinolite.



Basic Information About Asbestos

Asbestos health effects

Exposure to asbestos increases your risk of developing lung disease. That risk is made worse by smoking. In general, the greater the exposure to asbestos, the greater the chance of developing harmful health effects. Disease symptoms may take several years to develop following exposure. If you are concerned about possible exposure, consult a physician who specializes in lung diseases (pulmonologist).

Exposure to airborne friable asbestos may result in a potential health risk because persons breathing the air may breathe in asbestos fibers. Continued exposure can increase the amount of fibers that remain in the lung. Fibers embedded in lung tissue over time may cause serious lung diseases including asbestosis, lung cancer, or mesothelioma. Smoking increases the risk of developing illness from asbestos exposure.



Basic Information About Asbestos

Three of the major health effects associated with asbestos exposure include:

Asbestosis -- Asbestosis is a serious, progressive, long-term non-cancer disease of the lungs. It is caused by inhaling asbestos fibers that irritate lung tissues and cause the tissues to scar. The scarring makes it hard for oxygen to get into the blood. Symptoms of asbestosis include shortness of breath and a dry, crackling sound in the lungs while inhaling. There is no effective treatment for asbestosis.

Lung Cancer -- Lung cancer causes the largest number of deaths related to asbestos exposure. People who work in the mining, milling, manufacturing of asbestos, and those who use asbestos and its products are more likely to develop lung cancer than the general population. The most common symptoms of lung cancer are coughing and a change in breathing. Other symptoms include shortness of breath, persistent chest pains, hoarseness, and anemia.

Mesothelioma -- Mesothelioma is a rare form of cancer that is found in the thin lining (membrane) of the lung, chest, abdomen, and heart and almost all cases are linked to exposure to asbestos. This disease may not show up until many years after asbestos exposure. This is why great efforts are being made to prevent school children from being exposed.

For more information on these and other health effects of asbestos exposure see the [Agency for Toxic Substances and Disease Registry's Web site](#).



Basic Information About Asbestos

Where can asbestos be found?

Asbestos fibers are incredibly strong and have properties that make them resistant to heat. Many products are in use today that contain asbestos. Most of these are materials used in heat and acoustic insulation, fire proofing, and roofing and flooring. In 1989, EPA identified the following asbestos product categories. Many of these materials may still be in use:

- Asbestos-cement corrugated sheet
- Asbestos-cement flat sheet
- Asbestos-cement pipe
- Asbestos-cement shingle
- Roof coatings
- Flooring felt
- Pipeline wrap
- Roofing felt
- Asbestos clothing
- Non-roof coatings
- Vinyl/asbestos floor tile
- Automatic transmission components
- Clutch facings
- Disc brake pads
- Drum brake linings
- Brake blocks
- Commercial and industrial asbestos friction products
- Sheet and beater-add gaskets (except specialty industrial)
- Commercial, corrugated and specialty paper
- Millboard
- Rollboard



Basic Information About Asbestos

What if I have asbestos in my home?

The best thing to do is to leave asbestos-containing material that is in good condition alone. If unsure whether or not the material contains asbestos, you may consider hiring a professional asbestos inspector to sample and test the material for you. Before you have your house remodeled, you should find out whether asbestos-containing materials are present. If asbestos-containing material is becoming damaged (i.e., unraveling, frayed, breaking apart) you should immediately isolate the area (keep pets and children away from the area) and refrain from disturbing the material (either by touching it or walking on it). You should then immediately contact an asbestos professional for consultation. It is best to receive an assessment from one firm and any needed abatement from another firm to avoid any conflict of interest. In such a scenario as described above, asbestos-containing material does not necessarily need to be removed, but may rather be repaired by an asbestos professional via encapsulation or enclosure. Removal is often unnecessary.



Basic Information About Asbestos

Laboratory to test for asbestos?

The National Institute for Standards and Technology (NIST) maintains a listing of accredited asbestos laboratories under the National Voluntary Laboratory Accreditation Program (NVLAP). You may call NIST at (301) 975-4016.

[NVLAP Accredited Laboratories for the Polarized Light Microscopy \(PLM\) Test Method](#)

[NVLAP Accredited Laboratories for the Transmission Electron Microscopy \(TEM\) Test Method](#)



Basic Information About Asbestos

EPA's role in asbestos

Office of Air and Radiation/Office of Air Quality Planning Standards (OAQPS)

The Office of Air Quality Planning and Standards is part of EPA's Office of Air and Radiation. Its primary mission is to preserve and improve air quality in the United States. OAQPS is the EPA Office responsible for implementing the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) found at 40 CFR Part 61, Subpart M.

EPA Region 4 asbestos NESHAP documents

Asbestos NESHAP Adequately Wet Guidance

A Guide to Normal Demolition Practices Under the Asbestos NESHAP

Reporting and Record keeping Requirements for Waste Disposal

For other documents not listed here, go to the Region 4 Asbestos Web page.

Office of Enforcement and Compliance Assurance

The Office of Enforcement and Compliance Assurance (OECA), working in partnership with EPA Regional Offices, state governments, tribal governments and other federal agencies, ensures compliance with the nation's environmental laws. Employing an integrated approach of compliance assistance, compliance incentives and innovative civil and criminal enforcement, OECA and its partners seek to maximize compliance and reduce threats to public health and the environment. NESHAP Applicability Determination Index is a database of interpretations of the asbestos NESHAP regulations.

<http://www.epa.gov/asbestos/pubs/help.html>

End of Page



Basic Information About Asbestos

Other federal asbestos efforts

Agency for Toxic Substances and Disease Registry (ATSDR) - ATSDR conducts health-related activities around asbestos exposure and provides informational materials and resources for individuals and health care providers who are concerned about exposure. This Web site provides the following information resources to assist concerned individuals:

- ATSDR Public Health Statement
- ATSDR Asbestos Health Effects
- TOX FAQs™ (September 2001)

Consumer Product Safety Commission (CPSC) - The Consumer Product Safety Commission (CPSC) is an independent federal regulatory agency that was created in 1972 by Congress in the Consumer Product Safety Act. In that law, Congress directed the Commission to "protect the public against unreasonable risks of injuries and deaths associated with consumer products."

National Institute for Occupational Safety and Health (NIOSH) - The National Institute for Occupational Safety and Health (NIOSH) is the Federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and injury. The Institute is part of the Centers for Disease Control and Prevention (CDC). NIOSH maintains a listing of Asbestos publications. NIOSH's publications may be of interest to the general public but are targeted specifically to occupational safety and health issues.



Basic Information About Asbestos

Visit the EPA webpage below for more information and access to active links and other resources.

<http://www.epa.gov/asbestos/pubs/help.html>



Chapter 6

Summary

Types of asbestos that are most commonly used are chrysotile, amosite, and crocidolite.

It can be found in many types of insulation, roof tiles, fireproofing materials, fabric, cement pipes, ceiling tiles, etc.

Exposure can cause asbestosis, mesothelioma, lung cancer, and other cancers.

Asbestos abatement is highly regulated and can only be done by a licensed professional.



Chapter 7

Electromagnetic Fields



Chapter 7

Learning Objectives

The appraiser will be able to define electromagnetic fields and radiofrequency electromagnetic fields.

The appraiser will be able to describe the health risks of electromagnetic fields .

The appraiser will be able to identify the health risks of radiofrequency electromagnetic fields.



Electromagnetic Fields (EMFs) and Radiofrequency Electromagnetic Fields (RF)



- Electromagnetic Fields (EMFs)
- Radiofrequency Electromagnetic Fields (RFs)
- Cost to Cure or Stigma?
- What would the cost to cure be?
- What would the basis of the stigma be?



Electromagnetic Fields

Electromagnetic Fields (EMFs) are areas of energy that surround electrical devices. Power lines, electrical wiring, and appliances produce EMFs. Some people worry about EMF exposure and cancer. A few studies found a link between EMF exposure and a higher risk of childhood leukemia, but the link is weak. Other studies didn't find a link between EMF exposure and other childhood cancers.

For adults, some studies of EMF exposure from power lines and electric blankets show little evidence of a link to cancer. In adults, EMFs may reduce heart rate and interfere with brain electrical activity during sleep. This may or may not affect your health.

Some people worry that wireless and cellular phones cause cancer. They give off radio-frequency energy (RF), a form of electromagnetic radiation. Scientists need to do more research on this before they can say for sure.





Most recently the Electric Power Research Institute categorized health risks associated with EMFs in the following fashion

EPRI Electric and Magnetic Fields Research

Electric and magnetic fields (EMF) exist wherever electricity is present. Electric power lines and substations, electrical wiring, household appliances, and electrical equipment all produce EMF. EMF also occur naturally in the environment. During the last 35 years, research at the **Electric Power Research Institute (EPRI)** and elsewhere has investigated whether EMF associated with electricity can cause biologic changes or affect health. Hundreds of studies have been reviewed in [health risk evaluations](#) by the World Health Organization and other national and international organizations concerned with public health.

Recent evaluations concluded that in epidemiologic studies, exposure to magnetic fields measuring 0.3–0.4 microtesla (3–4 milligauss) or more is weakly associated with childhood leukemia risk. However, the evaluations concluded that other factors could account for the association and that the overall scientific evidence does not support a cause-and-effect relationship. Health risk evaluation panels found weaker evidence for an association between EMF and several other health outcomes, including adult leukemia, adult brain cancer, miscarriage, and the neurodegenerative diseases amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease) and Alzheimer disease.



Most recently the Electric Power Research Institute categorized health risks associated with EMFs in the following fashion

EPRI EMF Health Assessment and RF Safety Program research is addressing childhood leukemia and other high-priority health issues identified in EMF health risk evaluations. The program's research includes:

- Investigating hypotheses that could plausibly explain the magnetic field–childhood leukemia association
- Investigating EMF and other electrical factors in relation to neurodegenerative diseases
- Investigating the scientific basis for occupational EMF exposure guidelines
- Monitoring studies of EMF interference with cardiac pacemakers and other implanted medical devices
- Investigating EMF exposure levels that are present in electric motor vehicles

A few years ago, the program expanded to include research and information on safety issues for workers exposed to radio-frequency (RF) fields near telecommunications facilities and equipment. EPRI is the only organization in North America funding long-term, multidisciplinary EMF research. To ensure objective results, EPRI carries out much of this research through sponsorship of independent scientists affiliated with major universities, laboratories, and consulting organizations. In addition, an external, blue-ribbon scientific advisory committee provides guidance for the EMF program's research activities. Research findings are published in peer-reviewed journals.

In keeping with its mandate to conduct scientific research for the benefit of societies throughout the world, EPRI is continuing the search for answers to questions about EMF and health.



According to: *Science News*(November 30, 1991), 357 "Fickle fields: EMFs and epidemiology,"

Schmidt, *Science News*(November 30, 1991), 357.

The inexact science of epidemiology once again has tangled with the fickle phenomenon of electromagnetic fields (EMFs) as researchers try to gain a clearer picture of whether living near power lines and using electric appliances may increase the risk of cancer. A new EMF study--involving more people than any such effort in the past--indicates that the risk of childhood leukemia correlates with the location of power lines, but not with the measured strength of electric and magnetic fields.

Researchers at the University of Southern California in Log Angeles examined the arrangement of power lines near residences and used this information to [estimate](#) children's EMF exposures. They based their exposure estimates on a controversial model developed for a study conducted in Denver in 1979 (SN:4/21/79, p.263). In the Denver wiring model, underground power lines receive the lowest exposure rating, while certain aboveground configurations receive the highest rating.

Of the four studies that have used the Denver model so far, this is the third to suggest a link between childhood leukemia and power lines.



According to: Science News(November 30, 1991), 357 "Fickle fields: EMFs and epidemiology,"

The new study is the first, however, to take 24-hour measurements of EMFs inside children's bedrooms, in addition to EMF measurements around the home. The investigators were surprised to “find “no consistent association¹ between leukemia risk and these direct measurements”, says principal author Stephanie J. London. This finding hints at the potential importance of other EMF factors, such as the field's direction, frequency and degree of fluctuation, she suggests.

Focusing solely on EMF magnitude, she says, is “sort of like going to the symphony and grading it just on how loud the music was.”

London's team directly measured EMF strength in and around the Los Angeles County homes of 164 children with leukemia and 144 healthy children, finding no correlation with leukemia risk. But when they used the Denver wiring model to assess EMF exposures in an expanded sample of 219 children with leukemia and 207 healthy children, they found that the children with the highest estimated exposures had doubled the leukemia incidence seen in children with the lowest estimated exposures, the group reports in the Nov. 1 AMERICAN JOURNAL OF EPIDEMIOLOGY.



According to: *Science News*(November 30, 1991), 357 "Fickle fields: EMFs and epidemiology,"

A number of epidemiologic studies have turned up statistical links between EMF exposure and various cancers, although scientists have yet to establish whether EMFs actually have any [health effects](#) (SN:9/28/91,p.202). David Savitz of the University of North Carolina in Chapel Hill says the new finding adds to the evidence suggesting that EMFs cause cancer.

They also dovetail with a Denver study he led in 1986, he notes. London's study "remedied some of the deficiencies that were in our study and found a surprisingly similar pattern of results." Savitz says. "The inherent association with wiring configurations seems to remain."

London emphasizes that her study--funded by the Electric Power Research Institute, the research arm of the electric industry--is far from conclusive. The observed association could stem from unidentified leukemia risk factors, possibly related to the lifestyle or educational level, she points out. In general, families living in neighborhoods with underground power lines are more affluent than those living near above-ground power lines, she says.

London also notes that the Denver model may not reflect the wiring configurations used in Los Angeles. She hopes to develop a southern California wiring model to use in further investigations. If such investigations show a weaker association between power lines and leukemia, she says, they will cast doubt on the validity of the recent findings.



According to: *Science News*(November 30, 1991), 357 "Fickle fields: EMFs and epidemiology,"

Her team also analyzed data from questionnaires asking parents if their child had routinely come in contact with any of 15 household appliances. For two of these items--electric hair dryers and black-and-white televisions--the researchers found a statistically significant association with leukemia incidence. Hair dryers produce substantial EMFs, and thus could be an important contributor to EMF exposure in the home, London says.

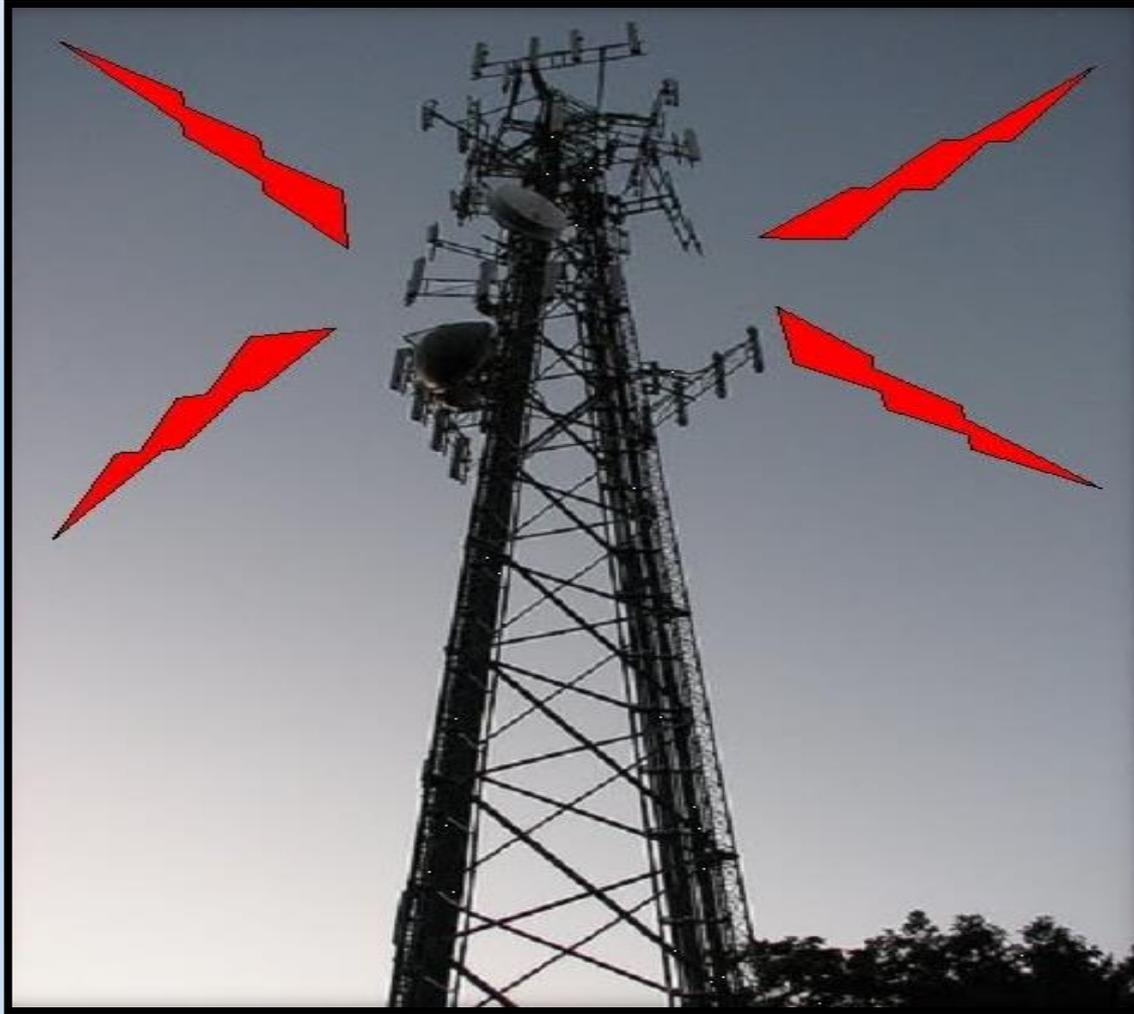
Last year, however, in the only other EMF study to investigate that appliance, Savitz found no association between hair dryers and childhood leukemia. His study did not include televisions.

London notes that parents of seriously ill children, compared with parents of healthy children, may recall more details about potentially risky exposures in the child's past--a tendency that could skew research findings.

Without any solid evidence that EMFs contribute to cancer risk, London discourages people from tossing out their hair dryers just yet. "There are so many public health messages that people get that can change every week because they're not based on solid science," she says, "I think this [appliance-leukemia correlation] is one of those."



Radiofrequency Electromagnetic Fields from cell phone and radio towers





Radiofrequency Electromagnetic Fields from cell phone and radio towers

According to some researchers, cell towers are considered more harmful to people living within the radius of 500 meters, because they continuously emit electromagnetic radiation (EMR) 24-hours a day, 7-days a week, and 365-days a year. Towers emit radiofrequencies (RF), a form of EMR, for a distance as large as two miles and essentially the same frequency radiation as microwaves and microwave ovens. Low levels of radiation emitted by mobile phone towers are harmful. Scientists at the **School of Public Health of Harvard University** say that the radiation from cell phone towers is a serious health hazard. Studies have shown that low levels of radiation can cause brain tumors, cancer, depression, miscarriage, insomnia and Alzheimer's disease, apart from damaging cell tissues and the DNA. People will have disturbed sleep and headache. Immune system could be affected. The nearby apartments could become very hot. Television displays could show flickering images. Massive increase in radiation in the environment due to these towers has also been linked to increase in the incidence of diseases such as asthma, learning disabilities, anxiety disorders, attention deficit disorder, autism, multiple sclerosis, amyotrophic lateral sclerosis (ALS), Alzheimer's disease, epilepsy, fibromyalgia, chronic fatigue syndrome, cataracts, hypothyroidism, diabetes, malignant melanoma, testicular cancer, heart attacks and strokes. According to **Dr. Howard Fischer, a Toronto-based researcher and clinician**, "though the radiation one is exposed to during a mobile phone call is 10 times higher than exposure from a cell tower, just standing in a wi-fi enabled area is equal to talking on your mobile for 20 minutes."



Harvard School of Public Health and Radiofrequency Electromagnetic Fields

July 1999



Peter Valberg, adjunct professor in the Department of Environmental Health, measures levels of radio waves on a Cambridge street with a radio frequency survey meter.

"Two things have become apparent," he says. "One, intense radio waves do produce an effect on biological organisms. These effects arise from changing the temperature of the cells." These findings led to the formulation of existing federal and state standards, which reduced the allowable level of exposure by a factor of 10 for occupational exposures and by a level of 50 for public exposure. These and similar international standards have been endorsed by scientific panels from the American National Standards Institute, the World Health Organization, the National Radiation Protection Board of Great Britain, and the Royal Society of Canada.

<http://www.hsph.harvard.edu/ats/Jul16/>

End of Page



World Health Organization (WHO) and Radiofrequency Electromagnetic Fields May 2011 press release

World Health Organization (WHO)

The WHO's International Agency for Research on Cancer published a review of the evidence on health risks of electromagnetic fields (EMFs), and concluded that there was limited evidence that cell phone users might be at increased risk of glioma (a type of brain cancer). Further, that there was inadequate data or research at this time to provide definitive evidence of any other health risks posed by EMF.

The WHO classified radiofrequency electromagnetic fields as "possibly carcinogenic".



World Health Organization (WHO) and Radiofrequency Electromagnetic Fields May 2011 press release

Conclusions rendered by a Dr. Jonathan Samet of the University of Southern California, the overall chairman of the working group involved in the study wrote, “the evidence, while still accumulating, is strong enough to support a conclusion and A. to B. classification. The conclusion means that there could be some risk, and therefore we do need to keep a close watch for a link between cell phones and cancer risk.”

Your reading assignment is to download the above described press release from the learning extras and read it in its entirety before continuing to the next slide.



Summary

For over 19 years I have provided Environmental Hazards Impact on Value seminars to thousands of real estate appraisers and real estate sales professionals across the United States.

During each live classroom seminar I would ask the same question, “based on your experience as real estate professionals, do you have data and or belief that the proximity of electric transmission lines can have an impact on value?”



Summary

The overwhelming majority would respond that the proximity of electric transmission lines usually had a negative impact on value.

An example is provided by both real estate appraisers and real estate sales professionals in the Burlington, Vermont, area.

They described a new subdivision that was constructed during a strong housing market.

The development contained several newly constructed streets. One of the streets was adjacent to a electrical transmission lines.

The consensus from both appraisers and real estate sales professionals was; that the houses on the street adjacent to the electrical transmission lines took longer to sell, and sold for slightly less than the properties on the other streets in the same subdivision.



Summary

Another question I have routinely asked the real estate appraisers at the seminar is, “if there are trees blocking the view of the electrical transmission lines, do they still have a negative impact on value?”

The consensus was routinely no. In other words, out of sight and out of mind.



Summary

With the jury still being out till more recent studies leaning more toward negative health effects than not, I make the following recommendations.

List the proximity of radio towers, cell phone towers, radar towers, electrical transfer stations, or electrical transmission lines accurately in your appraisal report (i.e. electrical transmission lines exist within 500 feet of the improvements at the subject property, etc.)(Please do not confuse 500 feet as being some magic number. Whatever the distance from the improvements at the subject property, be sure to identify in the report.)

I would list the proximity of EMF or RF producing structures and / or equipment when discussing the view in the site portion in the appraisal report.



Chapter 7

Summary

Electromagnetic Fields (EMFs) are areas of energy that surround electrical devices (power lines, electrical wiring, and appliances).

Radiofrequency Electromagnetic Fields are produced by radio and cell phone towers.



Chapter 8

Lead-Based Paint





Chapter 8

Learning Objectives

The appraiser will be able to describe the effects of lead poisoning.

The appraiser will be able to identify the year in which lead paint was banned in the United States.

The appraiser will be able to define their due diligence in regards to lead-based paint.



Lead Overview

Lead is a toxic metal that was used for many years in products found in and around our homes. Lead also can be emitted into the air from industrial sources and leaded aviation gasoline, and lead can enter drinking water from plumbing materials. Lead may cause a range of health effects, from behavioral problems and learning disabilities, to seizures and death.



Historians agree that the fall of the Roman Empire was brought about by lead poisoning





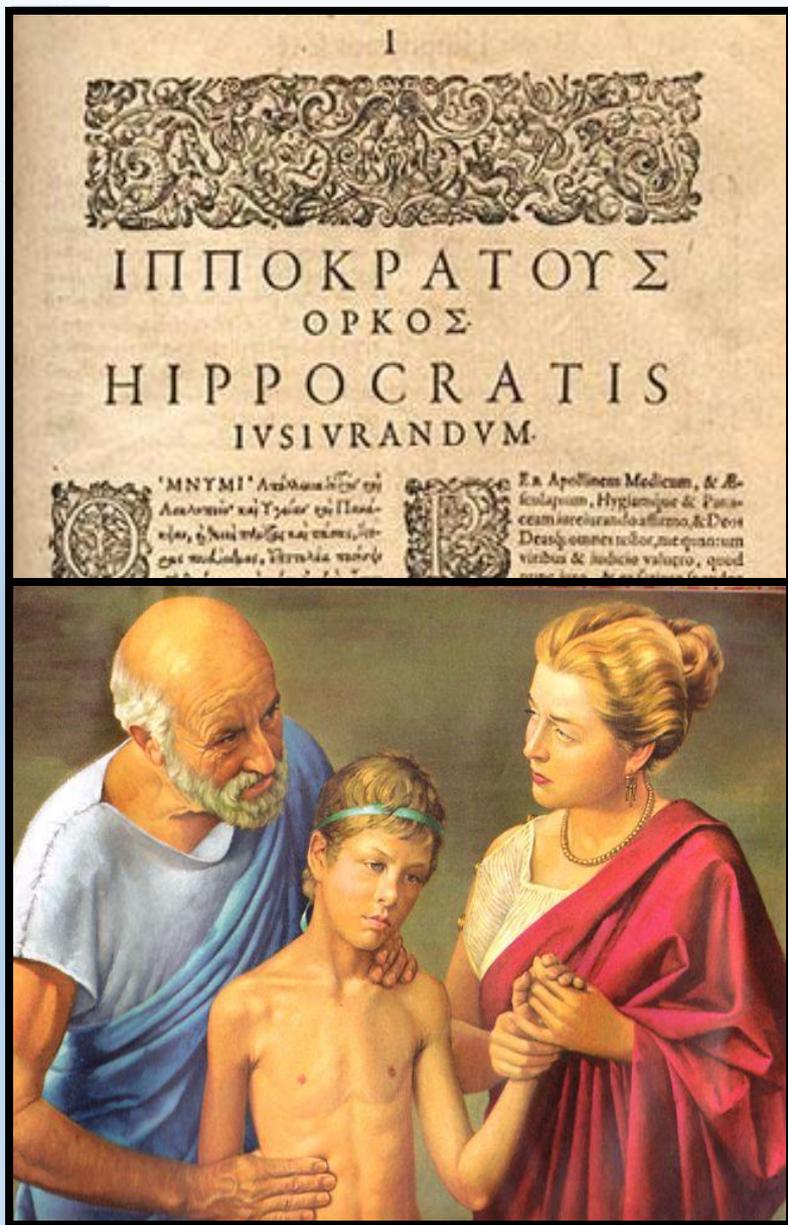
Lead

Humans have used lead for thousands of years.

Lead was first used by humans around 6700 BC when it was mined and molded into statues.

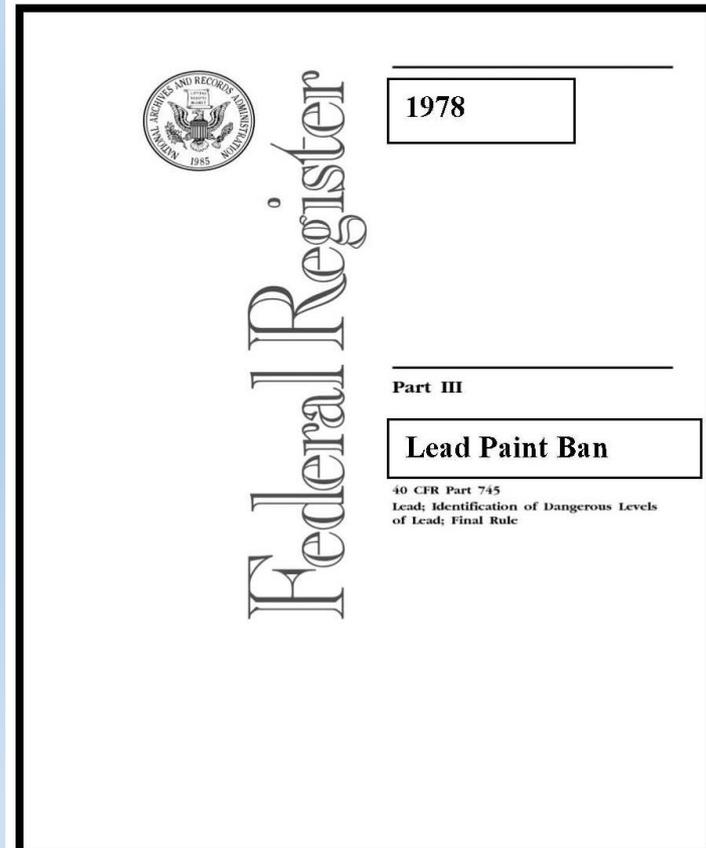
Many historians agree that the fall of the Roman Empire was, at least in part, brought about by lead poisoning.

The Romans used it extensively to line their aqueducts and eating utensils. Romans even used a powdered form to flavor their wine and cider.



Hippocrates First Documented Lead Poisoning in 370 BC

1978 USA Bans Lead Paint for Residential Use





Lead Poisoning

Lead has been known to be poisonous for over two thousand years. Countless documents reference its hazards since Hippocrates diagnosed and documented a case of lead poisoning in 370 BC.

The United States Congress banned the use of lead paint in homes in 1978.



1978 USA Bans Lead Paint for Residential Use





Lead Paint

How common is lead paint in homes?

Even though Congress banned the use of lead paint for residential properties in 1978, there are still 36 million homes in America that contain lead-based paint. Lead dust, generated from lead-based paint, is the primary cause of lead poisoning in young children.

Every year in the United States, there are hundreds of thousands of children under the age of six who become lead poisoned.



Congress Banned The Use Of Lead Paint For Residential Properties In 1978

16 C.F.R. PART 1303—BAN OF LEAD-CONTAINING PAINT AND CERTAIN CONSUMER PRODUCTS BEARING LEAD-CONTAINING PAINT

§ 1303.1 Scope and application.

(a) In this part 1303, the Consumer Product Safety Commission declares that paint and similar surface-coating materials for consumer use that contain lead or lead compounds and in which the lead content (calculated as lead metal) is in excess of 0.06 percent of the weight of the total nonvolatile content of the paint or the weight of the dried paint film (which paint and similar surface-coating materials are referred to hereafter as “lead-containing paint”) are banned hazardous products under sections 8 and 9 of the Consumer Product Safety Act (CPSA), 15 U.S.C. 2057, 2058. (See parts 1145.1 and 1145.2 for the Commission's finding under section 30(d) of the Consumer Product Safety Act (CPSA) that it is in the public interest to regulate lead-containing paint and certain consumer products bearing such paint under the CPSA.) The following consumer products are also declared to be banned hazardous products:

- (1) Toys and other articles intended for use by children that bear “lead-containing paint”.
- (2) Furniture articles for consumer use that bear “lead-containing paint”.



Congress Banned The Use Of Lead Paint For Residential Properties In 1978

16 C.F.R. PART 1303—BAN OF LEAD-CONTAINING PAINT AND CERTAIN CONSUMER PRODUCTS BEARING LEAD-CONTAINING PAINT

(b) This ban applies to the products in the categories described in paragraph (a) of this section that are manufactured after February 27, 1978, and which are “consumer products” as that term is defined in section 3(a)(1) of the Consumer Product Safety Act. Accordingly, those of the products described above that are customarily produced or distributed for sale to or for use, consumption, or enjoyment of consumers in or around a household, in schools, in recreation, or otherwise are covered by the regulation. Paints and coatings for motor vehicles or boats are not included within the scope of the ban because they are outside the statutory definition of “consumer product”. In addition to those products which are sold directly to consumers, the ban applies to products which are used or enjoyed by consumers after sale, such as paints used in residences, schools, hospitals, parks, playgrounds, and public buildings or other areas where consumers will have direct access to the painted surface.



Congress Banned The Use Of Lead Paint For Residential Properties In 1978

16 C.F.R. PART 1303—BAN OF LEAD-CONTAINING PAINT AND CERTAIN CONSUMER PRODUCTS BEARING LEAD-CONTAINING PAINT

(c) The Commission has issued the ban because it has found (1) that there is an unreasonable risk of lead poisoning in children associated with lead content of over 0.06 percent in paints and coatings to which children have access and (2) that no feasible consumer product safety standard under the CPSA would adequately protect the public from this risk.

§ 1303.2 Definitions.

(a) The definitions in section 3 of the Consumer Product Safety Act (15 U.S.C. 2052) shall apply to this part 1303.

(b) For purposes of this part:

(1) *Paint and other similar surface-coating materials* means a fluid, semi-fluid, or other material, with or without a suspension of finely divided coloring matter, which changes to a solid film when a thin layer is applied to a metal, wood, stone, paper, leather, cloth, plastic, or other surface. This term does not include printing inks or those materials which actually become a part of the substrate, such as the pigment in a plastic article, or those materials which are actually bonded to the substrate, such as by electroplating or ceramic glazing.



1992 Lead Hazard Reduction Act

Residential Lead-Based Paint Hazard Reduction Act of 1992--Title X

SEC. 1002. FINDINGS. The Congress finds that -- (1) low-level lead poisoning is widespread among American children, afflicting as many as 3,000,000 children under age 6, with minority and low-income communities disproportionately affected.

<http://www.epa.gov/lead/pubs/titleten.html>



1992 Lead Hazard Reduction Act

EC. 1003. PURPOSES. The purposes of this Act are -- (1) to develop a national strategy to build the infrastructure necessary to eliminate lead-based paint hazards in all housing as expeditiously as possible; (2) to reorient the national approach to the presence of lead-based paint in housing to implement, on a priority basis, a broad program to evaluate and reduce lead-based paint hazards in the Nation's housing stock; (3) to encourage effective action to prevent childhood lead poisoning by establishing a workable framework for lead-based paint hazard evaluation and reduction and by ending the current confusion over reasonable standards of care; (4) to ensure that the existence of lead-based paint hazards is taken into account in the development of Government housing policies and in the sale, rental, and renovation of homes and apartments; (5) to mobilize national resources expeditiously, through a partnership among all levels of government and the private sector, to develop the most promising, cost-effective methods for evaluating and reducing lead-based paint hazards; (6) to reduce the threat of childhood lead poisoning in housing owned, assisted, or transferred by the Federal Government; and (7) to educate the public concerning the hazards and sources of lead-based paint poisoning and steps to reduce and eliminate such hazards.



1992 Lead Hazard Reduction Act

In 1996, the Lead-Based Paint Disclosure Regulation was enacted. It requires owners of pre-1978 "target housing" to disclose to potential buyers or renters all known information about the presence of lead-based paint and/or lead-based paint hazards in the property. It requires that the potential buyer or tenant be given the lead information pamphlet, "Protect Your Family From Lead In Your Home," or other United States environmental protection agency United States Environmental Protection Agency approved pamphlet as well as a specific disclosure statement. The option of whether to test for the presence of lead-based paint is left to the owner.

Commencing in January 1, 1997 the contract is required to make similar disclosure to families prior to conducting work in pre-1978 properties that contain lead based paint, or were assumed to contain lead based paint. By and large, this requirement was not adhered to and no enforcement mechanism was in place.

Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards

Lead Warning Statement

Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. Lead poisoning also poses a particular risk to pregnant women. The seller of any interest in residential real property is required to provide the buyer with any information on lead-based paint hazards from risk assessments or inspections in the seller's possession and notify the buyer of any known lead-based paint hazards. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to purchase.

Seller's Disclosure

(a) Presence of lead-based paint and/or lead-based paint hazards (check (i) or (ii) below):

(i) _____ Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

(ii) _____ Seller has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

(b) Records and reports available to the seller (check (i) or (ii) below):

(i) _____ Seller has provided the purchaser with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

(ii) _____ Seller has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Purchaser's Acknowledgment (initial)

(c) _____ Purchaser has received copies of all information listed above.

(d) _____ Purchaser has received the pamphlet *Protect Your Family from Lead in Your Home*.

(e) Purchaser has (check (i) or (ii) below):

(i) _____ received a 10-day opportunity (or mutually agreed upon period) to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards; or

(ii) _____ waived the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards.

Agent's Acknowledgment (initial)

(f) _____ Agent has informed the seller of the seller's obligations under 42 U.S.C. 4852(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information they have provided is true and accurate.

_____ Seller	_____ Date	_____ Seller	_____ Date
_____ Purchaser	_____ Date	_____ Purchaser	_____ Date
_____ Agent	_____ Date	_____ Agent	_____ Date

**Uniform
Lead
Disclosure
Statement**

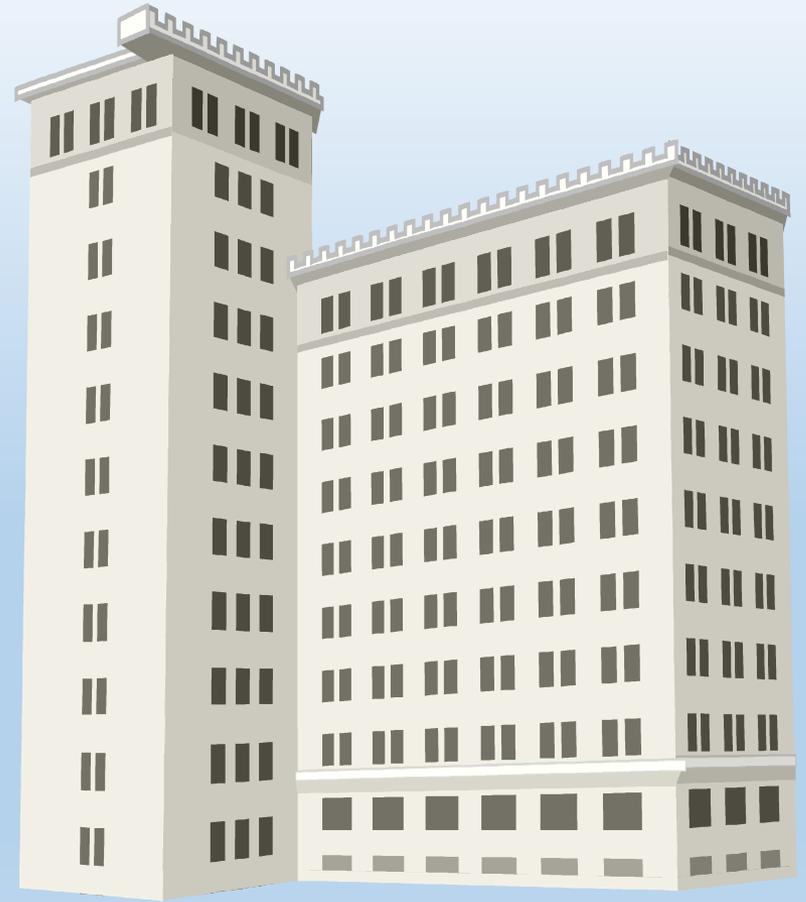


40 CFR part 745 ETA's Renovation, Repair, Painting Rule

EPA signed a new regulation (Renovation, Repair and Painting (RRP), 40 CFR part 745, regarding the renovation of child-occupied buildings built before 1978 on April 22, 2008. The rule (Federal Register: July 15, 2009 (Volume 74, Number 134)) became effective April 22, 2010. Under the rule, contractors performing renovation, repair and painting projects that disturb lead-based coatings (including lead paint, shellac or varnish) in child-occupied facilities built before 1978 must be certified and must follow specific work practices to prevent lead contamination. EPA's RRP rule impacts many construction trades, including general contractors and special trade contractors, painters, plumbers, carpenters, window installers, wood floor refinishers and electricians. Activities performed by all of these trades can disturb lead-based paint and have the potential to create dangerous lead dust.



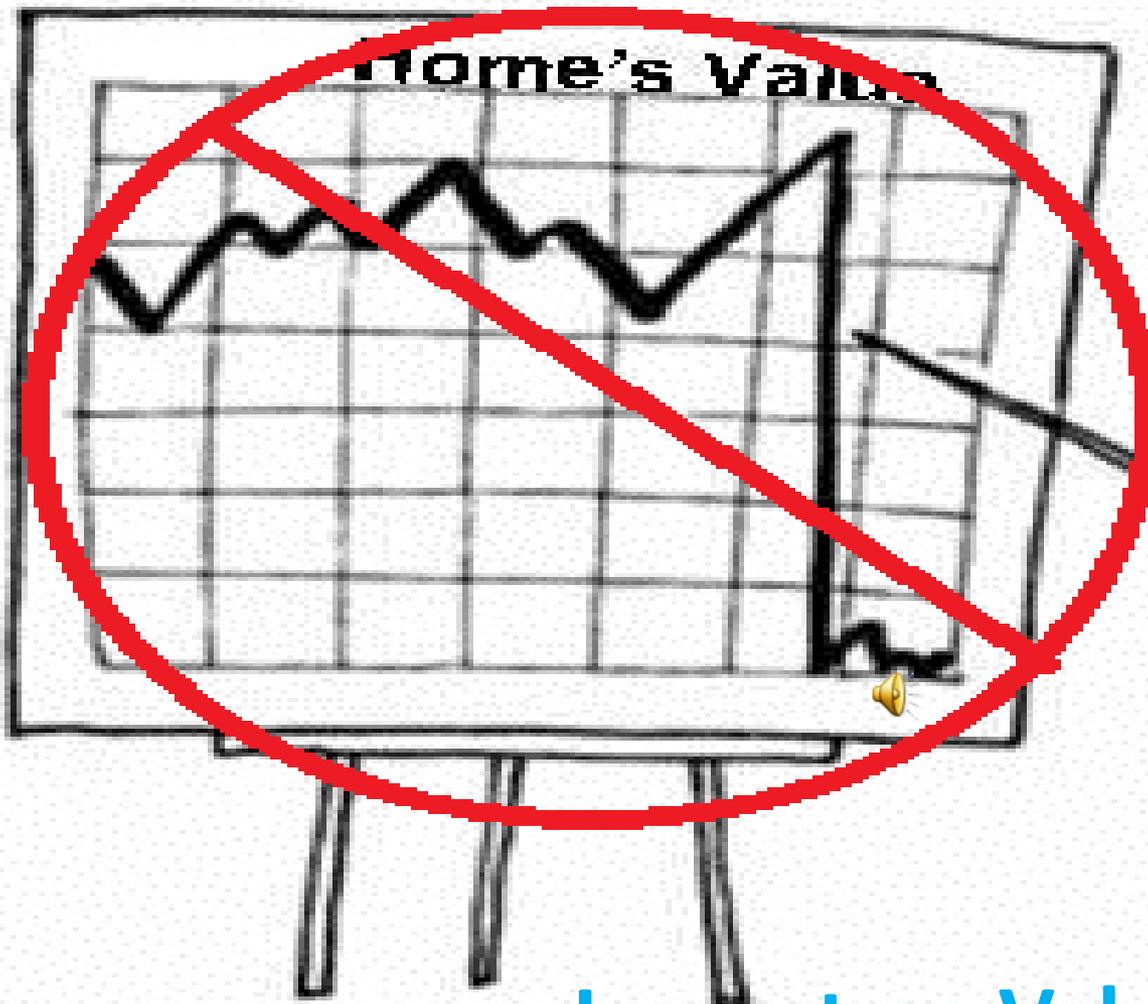
Does Lead Paint Impact Value?



Residential vs. Commercial

Unless deteriorated, lead paint will not typically have a negative impact on the value of a single-family home.

It can sometimes have an impact on multi-family properties.



Impact on Value

“Cost to Cure”

No stigma associated with lead.

Professional Due Diligence



Pre 1978 Homes

Disclose that they may contain lead paint

FHA- identify paint condition

Real estate sales or rentals always disclose





Professional Due Diligence

Real estate appraisers: If the subject property was constructed prior to 1978, disclose that it may contain lead-based paint. For FHA and VA loans you must also identify the condition of the paint.

Real estate sales professionals must always disclose the potential for lead hazards in pre-1978 properties whether they're selling them or renting them. **If selling or renting pre-1978 residential properties, utilize the federal disclosure form in accordance with federal regulations.**



Uniform Lead Disclosure Statement

Since 1996 realtors or anyone selling a pre-1978 property and landlords have been required to supply buyers or renters of properties constructed prior to 1978, that may contain lead-based paint, with a federally- approved disclosure form and the protect your family from lead pamphlet.

Since 1999 renovation contractors in America have been required to make similar disclosure and supply their customers in pre-1978 homes where they disturbed surfaces that may contain lead-based paint with the protect your family from lead pamphlet. Because contractors failed to do this over the years, in 2010 every renovation contractor in America, including plumbers, electricians, carpenters, renovators, etc. were required to become certified at an eight-hour training program known as RRP (Renovation, Repair, and Painting)in accordance with 40 CFR part 749.

Under HUD regulations real estate appraisers must disclose that a house constructed prior to 1978 may contain lead-based paint and identify whether or not the painted surfaces are deteriorated.

My strong recommendation is that all appraisers whether it is the appraisal or a conventional appraisal ??? provide the same disclosure in order to help protect the end user from dangerous environmental conditions and themselves from liability.



Chapter 8

Summary

Lead poisoning can cause behavioral problems, learning disabilities, seizures and even death.

The U.S. banned lead-based paint for residential use in 1978.

If a building was built before 1978, the real estate agent must disclose that there could be lead-based paint present.