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Environmental Due Diligence

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Environmental Due Diligence

***Overview of Phase Is, IIs, Transaction
Screenings, Asbestos and More***

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Section 1

Introduction

Many engineers and consultants may find themselves overwhelmed after their first encounter with State and Federal environmental laws and regulations. This is a perfectly normal reaction. The body of environmental legislation and corresponding regulations is complex, technical and often confusing. State and Federal programs can differ, and sometimes appear to be at odds with one another. You may have asked yourself one or more of the following questions. Weren't these laws enacted, after all, to regulate industrial operations? Shouldn't they pertain only to manufacturing entities? And how did the real estate and financial communities find themselves caught up in this process in the first place?

Prior to 1970, effective environmental regulatory programs simply did not exist in the United States in any real or meaningful form. Individual states, counties, and communities had developed and implemented localized programs to begin to address the most glaring pollution problems. Some of these programs, such as the construction of municipal sewage treatment plants, were relatively successful. But a uniform, organized, national approach was needed.

In 1970, the United States Environmental Protection Agency (EPA) was formed to act as a national environmental watch dog agency. As Congress passed laws to address water pollution, air pollution and solid and hazardous wastes, the EPA developed the regulations which were used to implement each law. Failure to comply with the new laws could bring substantial fines and penalties.

The essence all environmental law is the generator of any given waste is responsible for that material from its generation to its disposal (so-called cradle to grave). For many materials, this is a relatively straight forward process. Waste oil, for example, may be burned as a fuel. The generator's liability literally goes up the chimney at this point.

But other wastes, particularly heavy solvents, sludges, and other inorganic materials, are not disposed of so easily. The generator's liability for such material may go on for many, many years. If such materials were spilled or buried on-site, the property owner could be held liable for the cost of cleaning up his property and remedying the damages his wastes caused if they migrated off-site and impacted an adjoining piece of property.

Many gas stations, for example, had tanks on site that were discovered to be leaking only after gasoline turned up in a neighbor's well. The station operator could then be faced with the cost of replacing tanks, cleaning up the effects of the spill, both on and off of his property, and attempting to provide his neighbor with a new supply of water. Regulatory fines and penalties would also probably be added for good measure.

At this point it is easy to see how the real estate and financial communities could be impacted by environmental law. The costs associated with cleaning up even a relatively small environmental problem can easily stretch the resources of a small or medium sized company to the breaking point. Properties used by the banking community as collateral for loan obligations may be rendered valueless by contamination. If such properties are taken over by foreclosure prior to the discovery of contamination, the lending institution, as the owner of record, can be ordered to perform the clean-up.

Ironically, a well run company which acted responsibly in the past management of its wastes can also be affected by these laws. If, for example, it had shipped materials in the past to a perfectly legal, licensed waste disposal facility which had subsequent problems, that well run company, along with any of the others who shipped waste there, could be ordered to pay for the ensuing clean-up.

Given some of the aforementioned examples, it behooves engineers and consultants to learn as much as they can about the environmental laws which pertain to the transfer of commercial and industrial properties. Compliance with these laws will add some cost, both in time and money, to the transfer process. But when one considers the potential consequences of failing to consider these issues, the cost becomes time and money well spent.

This booklet contains an overview of information which is designed to assist engineers and consultants in understanding the applicable environmental laws and concerns which are associated with property transfers.

Section 2

Laws Which May Affect Property Transfer

Environmental contamination and its associated liabilities may have a significant adverse impact upon the value of real estate. In addition, a facility's ability to operate profitably can be impacted by contamination clean-up costs, fines due to violations of environmental laws or costly requirements to install pollution control equipment.

The potential for environmental liability may arise from a number of federal and state environmental laws. Lenders and real estate agents can not be expected to understand the complicated in and outs of these laws, this is left for specialized attorneys and environmental experts. However, lenders and real estate agents' primary responsibility in the area of environmental liability is to:

- A. recognize potential environmental liability in residential, commercial and industrial properties;
- B. recommend that potential environmental liabilities be evaluated by an expert; and
- C. identify the environmental liability's potential impact under a facility's ability to operate and the real estate value.

In this section, major laws which require the clean-up of contamination or impact a facility's ability to operate profitably are discussed briefly below.

A. Environmental Responsibilities Under CERCLA (Superfund) and SARA

The most significant environmental laws establishing liability for the cost of contaminant clean-up is the Comprehensive Environmental Response, Compensation and Liability Act (known as CERCLA or Superfund). CERCLA

establishes a broad legal framework that creates potential liability for the clean-up cost of hazardous wastes.

Under CERCLA environmental liability extends to those who violate environmental quality laws (soil and/or ground water quality standards) and to those who somehow become responsible for the clean-up of contaminated property. Keep in mind that the issue is not fairness. It is a question of who has "deep pockets" and might be able to afford to pay for the clean-up of contaminated soils and/or ground water. The government will seek clean-up costs from innocent purchasers of real estate if the original wrongdoer is insolvent or cannot be found. In other words, this legislation is based on "strict liability." It doesn't matter if the contamination was not the owner's fault.

Who can become liable for cleaning up contaminated property? Property owners, lenders who foreclose on contaminated property, parties who have the equivalency of ownership through a sale-leaseback, and others can become responsible for clean-up costs. Superfund Section 107(a) imposes liability on persons known as "potentially responsible parties" (PRPs) which includes:

1. Those who have operations and processes that generated and improperly disposed regulated wastes must pay to clean-up the contaminated property or property where the wastes were improperly (illegally) disposed. This could include problems such as leaking tanks, improper storage of hazardous materials, on-site dumping which affects the site's soil or ground water. This also means that sellers may have continuing liability for clean-up costs resulting from improper discharge of hazardous waste onto the property after the sale.
2. The current owner or purchaser may have to pay for clean-up of contamination from previous owners even if the current owner had nothing to do with past contamination.

3. The current owner may have to pay for disposal of illegally disposed wastes without the consent of the owner by an unknown third party.
4. An owner of land may be responsible to pay for the clean-up of wastes that have leached in from an adjoining property.
5. Landlords may be liable for actions of their tenants whenever a tenant improperly disposes of hazardous waste onto a property.
6. Tenants may assume liability for property conditions or may be required to correct a condition.

B. Small Business Liability Relief and Brownfields Revitalization Act (the Brownfields Amendments)

On January 11, 2002, President Bush signed into law the Small Business Liability Relief and Brownfields Revitalization Act (the Brownfields Amendments), which amended CERCLA. The Brownfields Amendments clarifies CERCLA liability provisions for certain landowners and potential property owners and also provide liability protections for certain property owners, if the property owners comply with specific provisions outlined in the statute, including conducting all appropriate inquiries into present and past uses of the property and the potential presence of environmental contamination on the property. The Brownfields Amendments amend Section 101(35)(B) of CERCLA and require EPA to promulgate regulations that establish federal standards and practices for conducting all appropriate inquiries.

The all appropriate inquiries standards and practices are relevant to:

- the innocent landowner defense to CERCLA liability (§101 (35));
- the contiguous property exemption to CERCLA liability (§107 (q));
- the bona fide prospective purchaser exemption to CERCLA liability (§107 (r)(1) and (§101 (40)); and
- the brownfields site characterization and assessment grant programs (§104 (k)(2)).

For the first time since the enactment of CERCLA in 1980, a person may purchase property with the knowledge that the property is contaminated without being held potentially liable for the cleanup of the contamination.

C. The Resource Conservation and Recovery Act of 1976 (RCRA)

This law provides for the "cradle to grave" management of hazardous waste. Hazardous wastes are strictly defined under the law and include solid wastes which exceed any of the criteria noted below:

- Ignitability (flash point <140°F)
- Corrosivity (pH <2.0, ≥12.5)
- Reactivity (reactive or explosive)
- Toxicity (contains specific contaminations above certain thresholds)
- Listed Wastes [waste generated from specific processes (i.e., F006-waste water treatment sludges generated from treatment of electroplating wastewaters)]

Facilities which generate hazardous waste are subject to registration, reporting, permitting, handling, storage, transportation and disposal requirements. Improper disposal of hazardous waste lack of compliance with training, operating, storage or recordkeeping requirements can subject a facility to substantial times as well as clean-up costs.

Substantial fines may be issued against a facility for violating standards of RCRA.

D. Other Environmental Laws

In addition to the laws noted above, a number of other environmental laws impact a facility's operation. Violations of these laws may subject a facility to significant fines. In addition, these laws may require facilities to install

costly controls. Either way the laws listed below, if not properly addressed, may affect a facility's ability to operate profitably.

Clean Water Act (CWA) - requires permitting and sampling of wastewater discharges. In addition, depending upon a facility's operations, treatment of wastewater discharges may be required.

Clean Air Act (CAA) - the New York State Department of Environmental Conservation (NYS DEC) requires permits for all sources of air contamination (except discharges which meet noted exemptions). Also, various facilities (i.e., graphic arts, surface coating, etc.) are subjected to operating, recordkeeping, monitoring and control requirements.

Toxic Substance Control Act (TSCA) - address the use, storage, labeling, inspection and disposal of PCB containing materials.

Superfund Amendments and Reauthorization Act (SARA) - subjects facilities which store or emit certain hazardous materials above state thresholds to reporting requirements.

We should point out that some of these laws enacted over the years had led to unintended, negative results, such as:

The clean water act prohibited unlawful discharges to surface waters in the US. However, this led to some industries constructing on-site water treatment facilities, such as surface impoundments and lagoons. Unfortunately, some of these facilities resulted in groundwater contamination.

The Clean Air Act (CAA) mandated that reformulated gasoline (RFG) be sold in the 10 largest metropolitan areas with the most severe summertime ozone levels. A negative result of this mandate was that MTBE, a common and widely used additive in gasoline to boost the octane since the 1970s, contaminated groundwater. Studies by the U.S. Geological Survey have found that water supplies are more likely to be contaminated with MTBE in areas where RFG or Oxyfuel is required than in other areas.

Section 3

The Environmental Site Assessment

Environmental Site Assessments are conducted to identify a site's potential liability as well as any conditions which will adversely impact a site's value. The most current standard for environmental site assessments is ASTM E 1527-05: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. In general, environmental site assessments are conducted for these reasons:

- A. Protection for innocent landowners, bona fide purchasers, contingent landowners against CERCLA Liability;

The general rule is: To avoid liability for clean-up costs, an innocent landowner, a purchaser, or contingent landowner must make all appropriate and customary inquiries into past ownership and use of the property. By doing so, potential owners can prove they are not responsible for contamination. The "innocent landowner" defense may not stop the purchaser from losing the contaminated assets, it merely protects other income and assets from being attached.

- B. To evaluate the potential for on-site soil, ground water or surface water contamination due to on-site or off-site operations prior to purchase or use of a property as collateral; and
- C. To establish a baseline or exit condition when operations begin or end on a property.

A. When is an Environmental Site Assessment Required?

An Environmental Site Assessment or commonly referred to as a Phase I, is required to satisfy All Appropriate Inquiry requirements for protection for innocent landowners, bona fide purchasers, contingent landowners against CERCLA Liability.

Many lenders may have internal credit risk policies requiring Phase Is depending on loan value.

B. What is ASTM's Purpose for Publishing an Environmental Site Assessment Standard?

ASTM states that the purpose of this requirement is define commercial and customary practice for conducting an environmental site assessment of a commercial parcel of real estate in the United States. ASTM defined commercial real estate as:

"any real property except a dwelling or property with no more than four dwelling units exclusively for residential use (except that a dwelling or property with no more than four dwelling units exclusively for residential use is included in this term when it has a commercial function, as in the building of such dwellings for profit). This term includes but is not limited to undeveloped real property and real property used for industrial, retail, office, agricultural, other commercial, medical, or educational purposes; property used for residential dwelling units; and property with no more than four dwelling units for residential use when it has a commercial function, as in the building of such dwellings for profit."

C. Who can complete an Environmental Site Assessment

An environmental site assessment must be completed by an environmental professional (EP) which is defined as someone who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors of 40 CFR 312.10(b). EPs must also have: (1) a Professional Engineer or Professional Geologist license and three years of relevant full-time work experience; or (2) a state or tribal issued certification or license and three years of relevant full-time work experience; or (2) a Baccalaureate degree or higher in science or engineering and five years of relevant full-time work experience; or (3) ten years of relevant full-time work experience.

It should be noted that a person who does not qualify as an environmental professional under the regulatory definition may assist in the conduct of all appropriate inquiries if he or she is under the supervision or responsible charge of a person who meets the qualifications of an environmental professional.

D. The Objective of an Environmental Site Assessment

The objective of an Environmental Site Assessment is to identify, to the extent feasible pursuant to the process, recognized environmental conditions associated with the property. A recognized environmental condition is defined as:

“The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.”

E. ASTM Site Assessment Process

A Phase I Environmental Site Assessment, according to the ASTM standard, is comprised of four components:

1. Records Review

Records that are considered from standard sources and that are reasonably ascertainable must be reviewed. Reasonable ascertainable is defined as “(1) information that is publicly available, (2) information that is obtainable from its source within reasonable time and cost constraints, and (3) information that is practically reviewable.”

Review of Available Government Records - the goal is to obtain and review government records which will help identify potential sources of on-site contamination as well as off-site contamination which may adversely impact the site. Available records include:

- Federal NPL within 1.0 mile of site
- Federal Delisted NPL within 0.5 mile of site
- Federal CERCLIS and CERCLIS NFRAP within 0.5 mile of the site
- Federal RCRA CORRACTS within 1.0 mile of site
- Federal RCRA non-CORRACTS Treatment, Storage and Disposal facilities within 0.5 mile of the site
- Federal RCRA generators on the property and adjoining properties
- Federal institutional control / engineering control registries on the property only
- Federal ERNS Emergency Response Notification for the property only
- State and tribal equivalent NPL within 1.0 mile of the site
- State and tribal equivalent CERCLIS within 0.5 mile of the site
- State or tribal landfill and/or solid waste disposal site lists
- State or tribal Leaking Underground Storage Tanks within 0.5 mile of the site
- State or tribal Registered Storage Tanks on the property and adjoining properties
- State or tribal institutional control / engineering control registries on the property only
- State or tribal voluntary cleanup sites
- State or tribal brownfield sites

Review of Additional Environmental Record Sources – if reasonable ascertainable and are sufficiently useful, accurate and complete local records shall be checked.

- Assessor's Office
- Health Department/Environmental Division
- Fire Marshal
- Building Department
- County Health Department
- Planning Department
- Engineering Department
- Local Sewer/Water Authority
- Historical Society
- Code Enforcement

The types of records that may be useful, includes but is not limited to: local brownfield lists, local underground storage tank records, records of contaminated wells.

Historical Review – All obvious uses of the property must be identified from the present, back to the property's first developed use or back to 1940, whichever is earlier. Standard historical sources include:

- aerial photographs

- city directories
- Sanborn Fire Insurance maps
- property tax and assessor records
- recorded land title records
- topographic maps
- building department records
- zoning / land use records
- local historians / historical society

2. Site Reconnaissance - a detailed inspection of the site must be performed with an appropriate site contact, if available, to evaluate the potential for contamination and document features that may have currently or historically contributed to contamination from on-site or off-site sources. The site inspection must include the review / identification of:

- current site operations
- past uses of the property
- hazardous substances and petroleum products that are stored, used, treated, generated or disposed of on-site
- underground/above-ground tanks
- evidence of odors, pools of liquid or spills
- hazardous substance and petroleum product containers and drums
- unidentified substance containers
- any electrical or other equipment likely to contain PCBs
- heating and cooling systems
- stains or corrosion
- drains and sumps
- pits, ponds or lagoons
- stained soil or pavement
- evidence of stressed vegetation
- evidence of solid waste fill
- wastewater discharges
- septic systems
- wells

The goal is to be able to evaluate the likelihood past uses and surrounding area having led recognized environmental conditions.

3. Interviews – Interviews with past and present owners and occupants, as well as local governmental officials must be completed in order to obtain information indicating recognized environmental conditions associated with the property.
4. Written Report - At the completion of the environmental Site Assessment, a report containing findings and conclusions must be prepared. An opinion

must be rendered as to the potential likelihood of a recognized environmental condition associated with the property.

F. Other Considerations

Under the ASTM E 1527-05 standard there are other considerations:

- (1) Data gaps must be identified that are significant enough to affect the potential to have the recognized environmental conditions associated with the property
- (2) An environmental lien search must be completed by the user or preparer id contracted to do so.
- (3) Specific conclusion statements must be made with exact language offered by ASTM
- (4) The user must provide specialized knowledge, reasonable ascertainable or commonly known information on the site, activity and use limitations in place at the site, environmental cleanup liens filed / recorded against the site and reasons for a significantly lower purchaser price.
- (5) A User Questionnaire is typically completed.
- (6) The Environmental Professional must certify the Environmental Site Assessment
- (7) An evaluation of business environmental risk is commonly added to the scope of an environmental site assessment. These non-scope considerations include asbestos, radon, lead-based paint, wetlands, etc.

Section 4

The Transaction Screening

Transaction Screenings are also conducted to identify a site's potential liability as well as any conditions which will adversely impact a site's value. The most current standard for transaction screenings is ASTM E 1528-06: Standard Practice for Limited Environmental Due Diligence: Transaction Screening Process.

A. When are Transaction Screenings Completed?

In general, transaction screenings are conducted for these reasons:

- To evaluate the potential for soil and groundwater contamination due to on-site or off-site operations when the property's use is not considered "high risk", such as office buildings, vacant land, etc. and a full historical review is not anticipated as necessary;
- To evaluate the potential for on-site soil, ground water or surface water contamination when the property's use is not considered "high risk" and CERCLA liability protection is not needed; and
- To update site conditions after a previous environmental site assessment was completed.

B. What is ASTM's Purpose for Publishing a Transaction Screening Standard?

ASTM states that the purpose of this requirement is define commercial and customary practice for conducting a transaction screening of a commercial parcel of real estate in the United States. ASTM defined commercial real estate as:

"any real property except a dwelling or property with no more than four dwelling units exclusively for residential use (except that a dwelling or property with no more than four dwelling units exclusively for residential use is included in this term when it has a commercial function, as in the building of such dwellings for profit). This term includes but is not limited to undeveloped real property and real property used for industrial, retail, office, agricultural, other commercial, medical, or educational purposes; property used for residential dwelling units; and property with no more than four

dwelling units for residential use when it has a commercial function, as in the building of such dwellings for profit.”

C. Who can complete a Transaction Screening

According to ASTM, the transaction screen process may be conducted by the user, or some other person, including environmental consultants, lenders, brokers, appraisers, corporations, lawyers, government agencies or any other party looking to screen environmental property risk. The transaction screen process can be performed by, but does not require the judgment of an environmental professional.

D. The Objective of a Transaction Screening

The objective of a Transaction Screening is to identify, to the extent feasible pursuant to the process, potential environmental conditions associated with the property. A potential environmental condition is defined as:

“the possible presence of any hazardous substances or petroleum products on a property under conditions that indicate the possibility of an existing release, a past release, or a threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The includes buildings and other fixtures and improvements located on the property and affixed to the land. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. (Note that “threat of release” is generally understood to be present when hazardous substances or petroleum products are poorly managed (for example in corroded tanks or damaged containers) but the release of the contaminants has not yet occurred, and there is an opportunity to take response action to prevent a release of the contaminants.”

E. ASTM Transaction Screening Process

The transaction screen process consists of asking questions contained within the transaction screen questionnaire of owners and occupants of the property, observing site conditions at the property with direction provided by the transaction

screen questionnaire, and, to the extent reasonably ascertainable, conducting limited research regarding certain government records and certain standard historical sources.

The questionnaire is comprised of 22 questions with some questions with multiple subparts. The questionnaire is designed to detect potential environmental conditions from current or past uses by asking questions about site uses, container and drum storage, on-site spills, and potentially relevant site features.

Example questions include:

“Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?”

“Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?”

“Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?”

The answer to each question will be: Yes, No, or Unknown. If Yes is answered to the question then an explanation must be offered.

Specifically, according to the ASTM standard, a Transaction Screening is comprised of four components:

1. Interviews of Owners and Occupants

The series of 22 questions that comprise the Transaction Screening Questionnaire and should be asked of:

- (1) the current owner of the property;
- (2) Any major occupant of the property, and

(3) in addition to the current owner and the occupants identified in (2), any occupant likely to be using, treating, generating, storing, or disposing of hazardous substances or petroleum products on or from the property.

It should be noted that ASTM defines a major occupant as any occupant using at least 40 % of the leasable area of the property or any anchor tenant when the property is a shopping center. In a multifamily property containing both residential and commercial uses, the preparer does not need to ask questions of the residential occupants.

The preparer should ask each person to answer all questions to the best of the respondent's actual knowledge and in good faith.

2. Records Review

Review of Available Government Records - the goal is to obtain and review government records which will help identify potential sources of on-site contamination as well as off-site contamination which may adversely impact the site. Available records include:

- Federal NPL within 1.0 mile of site
- Federal Delisted NPL within 0.5 mile of site
- Federal CERCLIS and CERCLIS NFRAP within 0.5 mile of the site
- Federal RCRA CORRACTS within 1.0 mile of site
- Federal RCRA non-CORRACTS Treatment, Storage and Disposal facilities within 0.5 mile of the site
- Federal RCRA generators on the property and adjoining properties
- Federal institutional control / engineering control registries on the property only
- Federal ERNS Emergency Response Notification for the property only
- State and tribal equivalent NPL within 1.0 mile of the site
- State and tribal equivalent CERCLIS within 0.5 mile of the site
- State or tribal landfill and/or solid waste disposal site lists
- State or tribal Leaking Underground Storage Tanks within 0.5 mile of the site
- State or tribal Registered Storage Tanks on the property and adjoining properties
- State or tribal institutional control / engineering control registries on the property only
- State or tribal voluntary cleanup sites
- State or tribal brownfield sites

Review of Additional Environmental Record Sources – if reasonable ascertainable and are sufficiently useful, accurate and complete local records shall be checked.

- city directories

- Sanborn Fire Insurance maps
3. Site Reconnaissance - a detailed inspection of the site must be performed with an appropriate site contact, if available, to evaluate the potential for contamination and document features that may have currently or historically contributed to contamination from on-site or off-site sources. The site inspection will:
- current site operations
 - past uses of the property
 - hazardous substances and petroleum products that are stored, used, treated, generated or disposed of on-site
 - underground/above-ground tanks
 - evidence of odors, pools of liquid or spills
 - hazardous substance and petroleum product containers and drums
 - unidentified substance containers
 - any electrical or other equipment likely to contain PCBs
 - heating and cooling systems
 - stains or corrosion
 - drains and sumps
 - pits, ponds or lagoons
 - stained soil or pavement
 - evidence of stressed vegetation
 - evidence of solid waste fill
 - wastewater discharges
 - septic systems
 - wells

The goal is to be able to evaluate the likelihood past uses and surrounding area having led potential environmental conditions. The documentation of these inspected items are also contained in the series of 22 questions within the questionnaire. Answers are either Yes, No or Unknown. Again, If the answer is Yes to any question then an explaining must be offered.

The user and the preparer of the transaction screen questionnaire must complete and sign the questionnaire as provided at the end of the questionnaire.

4. Completion of the Transaction Screening Questionnaire

The Transaction Screening Questionnaire must be completed by the Owner, Occupant(s) and Site Inspector. The name, title, address, years at site, relationship to user, and date must be Provided.

In addition, ASTM states that upon completing the transaction screen questionnaire, if the user concludes that further inquiry or action is needed (for example, consult with an environmental consultant, contractor, governmental authority, or perform additional governmental and/or historical records review), the user should proceed with such inquiry. (Note that if the user determines to proceed with a Phase I Environment Site Assessment, the user may apply the current Practice E 1527 or alternatively the provisions of EPA's regulation "Standards and Practices for All Appropriate Inquiries," 40 C.F.R. Part 312.)

Section 5

Phase IIs and Beyond

A. Phase II Subsurface Investigations

If potential sources of contamination are identified after a Phase I Environmental Site Assessment or Transaction Screening then a Phase II Subsurface Investigation may be warranted. Depending on goals and budgetary consideration, the Phase II investigation can be designed to evaluate the noted potential sources of contamination and if necessary, determine the degree and extent of the contamination. Typical Phase II activities could include:

- surface soil sample collection;
- installation of borings, using a drill rig, direct push unit (e.g., geoprobe®), or hand augers to collect and analyze soil samples;
- installation of permanent or temporary monitoring wells to collect and analyze ground water samples;
- soil gas survey; and
- Sediment soil sample collection

Based upon field review, selected soil and/or ground water samples are submitted to a state certified laboratory for analysis of the contaminants of concern. The laboratory results are compared to applicable State or Federal cleanup levels or standards. If any of the standards are exceeded then based upon the type of contaminants detected, degree and extent of contaminants, the site's use, status of area ground water, presence of potential pathway, the necessity for remediation is determined.

D. Phase III Remediation

If it is determined that remediation of the site soils and/or ground water is required, initially the clean-up standards must be determined based upon risk assessment and negotiating with the State or Federal environmental official.

In order to remediate a site, a number of different remediation techniques or available, including but not limited to:

- soil excavation and off-site treatment or disposal;
- soil vapor extraction (SVE);
- air sparging;
- biosparging;
- bioremediation (landfarming, biopiles, and bioventing);
- low-temperature thermal desorption;
- groundwater pump and treat;
- chemical oxidation; and
- natural attenuation.

Based upon an economic and technical feasibility analysis, and the negotiations with the State or Federal environmental officials, a technique is selected.

Section 6

Business Environmental Risks

Spills and historical releases of hazardous substances and petroleum products are not the only potential environmental risks which may have adverse affects upon real estate value. ASTM defines a business environmental risk is “a risk which may have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate..”. The following observations regarding business environmental risk considerations may be addressed as part of a Phase I ESA:

- Asbestos
- Radon
- Lead Based Paint
- Indoor Air Quality & Mold
- Lead in Drinking Water
- Environmental Regulatory Compliance
- High Voltage Powerlines
- Cultural, Historical, and Archeological Resources
- Wetlands and Surface Waters
- Threatened, Endangered, and Other Protected Species

Information on several business environmental risks is provided below.

A. Asbestos

Asbestos is generally a concern in residential, commercial and industrial facilities constructed prior to 1979.

1. What is Asbestos?

Asbestos is a naturally occurring silica mineral that has many commercial uses due to its useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The main uses of asbestos are in building materials, paper products, asbestos-cement products, friction products, textiles, packings and gaskets, and asbestos-reinforced plastics. Asbestos has been used in the construction industry due to its excellent fire retardant and insulation properties. Common products that might have contained asbestos in the past, and conditions which may release fibers, include:

- Steam pipes, boilers, and furnace ducts insulated with an asbestos blanket or asbestos paper tape. These materials may release asbestos fibers if damaged, repaired, or removed improperly.
- Resilient floor tiles (vinyl asbestos, asphalt, and rubber), the backing on vinyl sheet flooring, and adhesives used for installing floor tile. Sanding tiles can release fibers. so may scraping or sanding the backing of sheet flooring during removal.
- Cement sheet, millboard, and paper used as insulation around furnaces and woodburning stoves. repairing or removing appliances may release asbestos fibers. so may cutting, tearing, sanding, drilling, or sawing insulation.
- Door gaskets in furnaces, wood stoves, and coal stoves. Worn seals can release asbestos fibers during use.
- Soundproofing or decorative material sprayed on walls and ceilings. Loose, crumbly, or water-damaged material may release fibers. So will sanding, drilling, or scraping the material.
- Patching and joint compounds for walls and ceilings, and textured paints. Sanding, scraping, or drilling these surfaces may release asbestos.
- Asbestos cement roofing, shingles, and siding. These products are not likely to release asbestos fibers unless sawed, drilled, or cut.

- Artificial ashes and embers sold for use in gas-fired fireplaces. Also, other older household products such as fireproof gloves, stove-top pads, ironing board covers, and certain hairdryers.
- Automobile brake pads and linings, clutch facings, and gaskets.

EPA has indicated that over 3,000 asbestos products have been manufactured. Asbestos or asbestos carrying material (ACM) can be classified into two general categories: "friable" and "non-friable."

Friable products are materials that can easily crumble, usually with little mechanical activity. This is considered the most dangerous because when this asbestos becomes airborne, asbestos fibers can be easily inhaled. Activities that can cause friable products to become airborne include routine cleaning, repair and maintenance, renovation, operation of air-conditioning, and general deterioration over time.

Non-friable products typically contain bonding agents like cements, plastics, etc., which prevent the asbestos from being released into the air. However, problems can occur if the material is physically altered (cut, ground, etc.).

2. Asbestos Health Effects

When inhaled, asbestos can cause asbestosis (a fibrotic scarring in the lungs), lung cancer and mesothelioma (cancer of the chest). Basically, the EPA has stated that there is no safe level of asbestos exposure.

3. Testing of Asbestos

The sampling and removal of asbestos are generally regulated at either the State level or using EPA certified individuals. Generally, samples of potential asbestos containing material may only be collected by trained and state certified personnel. You should check your State for specific requirements. In addition, asbestos abatement plans and asbestos removal projects may only be completed by state certified personnel.

In order to properly conduct an asbestos survey, initially the site must be inspected for suspect asbestos containing materials. Generally, three or more samples must be collected from homogenous suspect materials and the samples must be submitted to a state certified laboratory for analysis via polarized light microscopy (PLM) and/or transmission electron microscopy (TEM). Materials which contain greater than 1% asbestos are considered asbestos containing material (ACMs) and submit to regulation.

4. When is Asbestos a Problem?

Intact and undisturbed asbestos materials do not pose a health risk. However, asbestos material can become hazardous when due to damage, disturbance or deterioration overtime, they release asbestos fibers into building area. Therefore, the EPA and local agencies generally require that:

- any asbestos materials be maintained in good condition;
- all friable material be removed prior to building demolition or renovation.

In addition, new additional regulation promulgated by OSHA requires that building owners and employers must presume the thermal system insulation; sprayed or troweled surfacing material and asphalt and vinyl flooring installed in the building prior to 1980 are asbestos unless the materials have been properly sampled.

4. General Comments

The use of asbestos in buildings has generally been prohibited since 1978, with some restrictions as early as 1973. Therefore, a building constructed prior to 1979 is a concern and should be evaluated for the presence of asbestos.

An EPA random survey in 1988 found asbestos in approximately 20% of the buildings surveyed.

In the real estate and financial community, it is common for at least a visual assessment of suspect asbestos containing materials or the collection and analysis of damaged, friable suspect materials be completed as a part of a Phase I Environmental Site Assessment. During these transactions, one of the concerns for these entities is the abatement costs of these materials. Also, it is common for an Operation and Maintenance Plan be developed and implemented as part of the real estate transaction.

B. Radon

Radon is more commonly a concern in the lowest living units of residential units.

1. What is Radon?

Radon is a naturally occurring, odorless, tasteless radioactive gas. Generally it occurs in areas that contain uranium. It also has been discovered in soils with phosphate, granite, and certain types of shales.

Problems occur when radon passes through cracks and spaces in the foundation and becomes concentrated in tight buildings that do not allow the gas to escape and dissipate to the outside. Radon can also seep into well water, but the likelihood is reduced for homes supplied with municipal wells

2. Health Effects

Radon is considered a carcinogen and is reported to be the second largest cause of lung cancer after cigarette smoking.

3. How to Test for Radon

Special equipment or devices are needed to measure radon levels. The most common and easiest to use are the do-it-yourself activated charcoal detector and the alpha track detector.

The activated charcoal (AC) detector is appropriate for short-term screening tests of two to seven days. You can purchase an AC testing device for \$10.00 to \$25.00 (including analysis). Since this device is sensitive to moisture, it should be placed away from sources of water and humidity.

The alpha track (AT) device is used for long-term tests of three months to one year. It provides a measurement of the average radon exposure over time. Therefore, decisions on whether to reduce radon can be based on these results. You can purchase an AT testing device for \$20.00 to \$50.00 (including analysis).

It should be noted that 14 states now require a licensed radon sampler to deploy and retrieve radon sampling devices.

4. What do the Radon Test Results Mean?

The EPA recommends that a home be remediated if radon values are 4.0 pCi/l or higher, or at a minimum additional tests be conducted. For comparison purposes the average indoor radon level is estimated to be about 1.3 pCi/L, and about 0.4 pCi/L of radon is normally found in the outside air.

5. How to Lower the Radon Level in Homes

A variety of methods are used to reduce radon in the home. In some cases, sealing cracks in floors and walls may help to reduce radon. In other cases, simple systems using pipes and fans may be used to reduce radon. Such systems are called "sub-slab depressurization," and do not require major changes to your home. These systems remove radon gas from below the concrete floor and the foundation before it can enter the home. Similar systems can also be installed in houses with crawl spaces. Radon contractors use other methods that may also work in your home. The right system depends on the design of your home and other factors.

The cost of making repairs to reduce radon depends on how the home was built and the extent of the radon problem. Most homes can be fixed for about the same cost as other common home repairs like painting or having a new hot water heater installed. The average house costs to remediate radon can range from about \$1,000 to about \$4,000.00.

6. Comments

The EPA and many State Departments of Health have conducted extensive radon testing. General radon level are provided by area of the country and in some case, the results are reported by county as well as by town, city or village. This information provides a general indication of an area radon concentration, however, only site specific testing can provide site specific information.

C. Lead Based Paint

Lead paint is generally a concern in residential properties.

1. What is Lead Based Paint?

Lead was added to paint to increase paint's durability. From a historical perspective, the allowable level of lead in new paint was lowered to 0.06% on a federal level in 1978. Therefore, the probability that lead-based paints were utilized on residences built from 1978 to the present is low. Prior to 1978, however, the percentage of lead-based paint generally increased with each decade, such that prior to 1950, lead-based paints were typically used in applications throughout the home especially on window sills, door jams and in kitchen and bathrooms.

2. Health Effects

The presence of lead paint is very dangerous especially to children under six years of age. Lead excretes from the body very slowly and accumulates in bone and tissues. It can cause brain damage, convulsions, paralysis, and impaired learning.

3. Lead Based Paint Testing

Generally, any residence constructed prior to 1978 should be surveyed for lead paint. It should be noted that lead-based paint inspections, risk assessments and abatements conducted after August 29, 1999 on structures receiving federal funding must be performed by individuals certified to perform such activities by EPA or an EPA-authorized State or tribal program. For other types of projects, engineers and consultants need to check with their state environmental agency to determine if specific state licensure is required.

During the survey, all accessible interior and exterior surfaces should be tested. Lead paint testing is completed by either collection or mass analysis of paint chips for lead or x-ray fluorescence (XRF) testing. USEPA and HUD consider any surfaces which exhibit 0.5% lead via mass analysis, or 1.0 mg/cm².

In addition, lead is considered a hazard when equal to or exceeding: 40 micrograms of lead in dust per square foot on floors; 250 micrograms of lead in dust per square foot on interior window sills and 400 parts per million (ppm) of lead in bare soil in children's play areas or 1200 ppm average for bare soil in the rest of the yard. Lead dust is completed by collecting wipe samples. Both dust and soil samples require analysis of lead by a state certified laboratory.

4. Lead Paint Disclosure

Section 1018 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 directs EPA and HUD to jointly issue regulations requiring

disclosure of known lead-based paint and/or lead based paint hazards by persons selling or leasing housing constructed before the phase-out of residential lead-based paint use in 1978. Under that authority, EPA and HUD are establishing the following requirements:

- (1) Sellers and lessors of most residential housing built before 1978 must disclose the presence of known lead-based paint and/or lead based paint hazards in the housing;
- (2) sellers and lessors must provide purchasers and lessees with any available records or reports pertaining to the presence of lead-based paint and/or lead-based paint hazards;
- (3) sellers and lessors must provide purchasers and lessees with a federally approved lead hazard information pamphlet;
- (4) sellers must provide purchasers with a 10-day opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards before the purchaser is obligated under any purchase contract;
- (5) sales and leasing contracts must include disclosure and acknowledgment language; and
- (6) agents must ensure compliance with these requirements.

5. Comments

The likelihood of lead paint is directly related to the age of a home. In particular:

- approximately 2/3 of home built prior to 1940 have lead paint;
- approximately 1/3 of homes built between 1940 and 1960 have lead paint;
- indeterminate (but smaller) portions of homes built after 1960 have lead paint.

In the real estate and financial community, it is common for at least a visual assessment of painted surfaces or the collection and analysis of damaged, suspect lead based paints be completed as a part of a Phase I Environmental Site Assessment. During these transactions, one of the concerns for these entities is the abatement costs of these materials. Also, it is common for an Operation and Maintenance Plan be developed and implemented as part of the real estate transaction.

D. Lead in Drinking Water

Drinking water can become contaminated because it passes through lead pipes. These pipes were in common usage as late as the 1930s. Lead solder was used for copper pipes into the 1980s. Not until 1986 did the Safe Drinking Water Act require the use of "lead-free" solder, pipes and flux for any facility connected to a public water system. In 1988, Congress banned the use of lead-based solder in plumbing applications within homes and buildings.

E. Mold

Many types of molds exist and all molds reportedly can cause adverse health effects. Concern about indoor exposure to mold has been increasing as the public becomes aware that exposure to mold can cause a variety of health effects and symptoms, including allergic reactions. According to EPA, 10 things you should know about mold includes:

1. Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints.
2. There is no practical way to eliminate all mold and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.

3. If mold is a problem in your home or school, you must clean up the mold and eliminate sources of moisture.
4. Fix the source of the water problem or leak to prevent mold growth.
5. Reduce indoor humidity (to 30-60%) to decrease mold growth by: venting bathrooms, dryers, and other moisture-generating sources to the outside; using air conditioners and de-humidifiers; increasing ventilation; and using exhaust fans whenever cooking, dishwashing, and cleaning.
6. Clean and dry any damp or wet building materials and furnishings within 24-48 hours to prevent mold growth.
7. Clean mold off hard surfaces with water and detergent, and dry completely. Absorbent materials such as ceiling tiles, that are moldy, may need to be replaced.
8. Prevent condensation: Reduce the potential for condensation on cold surfaces (i.e., windows, piping, exterior walls, roof, or floors) by adding insulation.
9. In areas where there is a perpetual moisture problem, do not install carpeting (i.e., by drinking fountains, by classroom sinks, or on concrete floors with leaks or frequent condensation).
10. Molds can be found almost anywhere; they can grow on virtually any substance, providing moisture is present. There are molds that can grow on wood, paper, carpet, and foods.

In the real estate and financial community, it is common for at least a visual assessment for water intrusion or obvious microbial growth be completed as part of a Phase I Environmental Site Assessment. During these transactions, one of the concerns for these entities is the abatement costs of these materials. Generally, mold surveys should be completed by trained and certified personnel. In addition, mold abatement plans and removal projects should only be completed by competent and trained personnel. It is important to note that exposure standards for airborne concentrations of mold, or mold spores, have not been set. Currently, there are no EPA regulations or standards for airborne mold contaminants.