

# Defining the "Environmentally Impaired Market Value" of Real Property

This article provides an operational definition of "environmentally impaired market value" and a discussion of each of the elements of the definition along with supporting definitions and concepts. The article also provides information on some of the available methodology and techniques for developing an impaired value estimate including the relationship of the impaired value definitions to pertinent laws, rules, regulations, judicial decisions, agency policies, and seminal articles on the subject.

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Since its introduction to the valuation of environmentally impaired real property in Peter J. Patchin's 1988<sup>1</sup> article, the term "stigma" has become pervasive, significantly misunderstood, and abused. Despite numerous efforts to provide a precise and quantitative definition by Patchin and others, such a definition has yet to be published. This article defines the general concept of "environmentally impaired market value" of real property, and its subsidiary concepts—unimpaired market value, direct costs, and market factors—a term intended to replace "stigma."

### PROPOSED DEFINITIONS

Impaired market value is defined by the following general relationship:

$$\text{impaired market value} = \text{unimpaired market value} - \text{direct costs and market factors}$$

Each of the elements of impaired market value may be defined as follows.

#### Unimpaired Market Value

The unimpaired market value of property refers to the market value with no environmental condition present. Unimpaired market value is established through application of the three approaches to value; it is important that the data employed be carefully screened to eliminate biases resulting from the presence of an environmental condition.

#### Direct Costs

Direct costs mean the most likely (probable) net cost incurred because of the presence or remediation of the environmental condition.

Direct costs include—but are not limited to—the following factors, which depend in part on the

"state of knowledge" regarding the environmental condition as of the date of valuation:

- **Remediation Costs.** Remediation costs mean the expense of investigation and engineering dictated by the appropriate or relevant and applicable requirements<sup>2</sup> to fully characterize the environmental condition, develop a remedial action plan, and the costs to implement and manage that plan.
- **Restriction-on-Use Costs.** Restrictions-on-use costs mean those costs associated with a (1) loss of use of the property, and/or (2) a change in the property's highest and best use resulting from the environmental condition and/or the remedial action plan.
- **Incremental Financing Costs.** Incremental Financing Costs mean the costs (1) of financing the remediation of the property, and/or (2) resulting from a

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difference between the cost of financing the purchase of the property as impaired and the costs of financing the purchase as if it were unimpaired.

- **Net Recoveries.** Net recoveries mean the positive impacts of the probable value of net recoveries available to the purchaser from other available sources, such as the seller, third parties, insurance proceeds, or publicly funded programs for reimbursement.

**Market Factors**

The term "market factors" refers to the change in the market value of the property resulting from the increased risks associated with the environmental condition. Market factors result from the following elements, all of which are partially dependent on the "state of knowledge" regarding the environmental condition as of the date of valuation:

- The risk that the following occur:
  - Estimates of probable remediation costs understate the actual remediation costs.
  - After remediation has been completed to the satisfaction of the governing environmental authorities, (1) the highest and best use will be less advantageous than the unimpaired highest and best use, and/or (2) the property may continue to suffer a diminution in value in the marketplace resulting from such factors as mortgage discrimination.
  - Purchasing the property would potentially expose a buyer to liability under federal or state laws such as the Comprehensive Envi-

ronmental Response, Compensation and Liability Act (CERCLA).

- Purchasing the property may expose the buyer to public liability.
  - The probable net recoveries from such sources as a seller, third party, insurance proceeds, or a remediation cost reimbursement program may be less than the actual costs incurred by the purchaser, including such costs as attorney's fees.
  - Other factors, such as fear, may negatively affect the market value of the subject property.
- Certain market forces may offset some of the elements noted above. The positive factors include strong demand, lack of available substitutes, degree of marketplace familiarity with the environmental condition, level of comfort in the marketplace with the remediation technology or the source of recovery funding, and similar positive factors.
  - All of the foregoing are limited to include only those impacts on market value that have not been accounted for in the development of the direct costs.
- "Stigma," generally included within the market factors, is a particularly inappropriate term. The market factors may have a positive resultant, as opposed to the normal negative connotation associated with the term "stigma." This positive resultant may be sufficiently strong to offset not only those elements normally associated with the term stigma, but also may in fact be sufficient to offset some or all of the direct costs resulting in an impaired property being traded in the marketplace at

**The owner of the nonsource property generally is not liable for the costs of remediation.**

a near-unimpaired value. The author suggests that the phrase "market factors" be used in place of the term "stigma."

**Source Vs. Nonsource Properties**

Though this article is directed toward the effects of an environmental condition on source property, the definitions will work equally well for nonsource property so long as the distinction between the two types is clearly understood and considered in the analysis.

**Source Property.** Source property means the property where the release of an environmental risk source<sup>3</sup> occurred.

Source property is generally liable for the remediation costs of the facility<sup>4</sup> created by the release without regard to legal parcel boundaries.

**Nonsource Property.** Nonsource property may contain a part of the facility created by the release of the environmental risk source, but is not the property where the release occurred. The owner of the nonsource property generally is not liable for the costs of remediation.

Obviously, a critical difference exists between a source property and a nonsource property. The source property may have or share the remediation costs on a strict, joint, and several liability basis under CERCLA, for example, while the nonsource property does not have such liability. The distinction between a source property and a nonsource property has been significantly reinforced by

**Timing relates to the need to identify the present value of a future expenditure.**

the action of the U.S. Environmental Protection Agency (USEPA) in a recent policy statement. In its "Final Policy Toward Owners of Property Containing Contaminated Aquifers," the USEPA states that it will not only not pursue a nonsource property owner for contribution to remediation costs if the contamination migrated to the owner's property through an aquifer, but will also act to help the nonsource property owner defend itself against third-party contribution actions by entering into a *de minimis* settlement with that owner.<sup>5</sup>

The direct costs and market factor impacts tend more readily toward zero for nonsource properties. However, if a nonsource property exists, the direct costs and market factor elements of the impaired market value for the source property may increase.

In the literature and reported comparable property data, many observers fail to distinguish between the subject property as a source property or nonsource property. Because of the very large difference in liability and consequent impact on market value, this failure to distinguish can lead to very large errors in the impaired market value opinion.

#### **UNIMPAIRED MARKET VALUE**

Nearly all credible observers agree that the analysis of impacts on a property's market value must begin with the benchmark unimpaired market value (UMV). As noted in the definition, the UMV is the value of the proper-

ty with no environmental condition impacting its value.

The analyst must exercise care to ensure that data used in the development of the UMV conclusion is free of environmental biases. The sales comparison approach may be particularly vulnerable to this concern, as "comparable" property sales may include a hidden discount for an environmental condition. Property operating costs and income are also vulnerable, although generally to a lesser extent.

There are two major reasons to ensure that the UMV is free of environmental bias. First, the entire theory behind the development of an impaired market value (IMV) opinion relies on the UMV being free of such bias. If it is not, the possibility of adjusting the value twice for an environmental condition becomes probable, resulting in an IMV that overstates the impact of the impairment. Second, the UMV is a benchmark value; it is the highest value attainable by the property without regard to how much is spent on remediation. Given the complex disclosure laws concerning the financial condition of the owner and the tax consequences associated with a remediation effort as well as for the purposes of valuation, the benchmark UMV opinion can significantly influence owner decision-making.

#### **"State of knowledge" on the Date of Valuation**

An understanding of this phrase and its implications is critical to establishing the IMV. There are at least three broad categories of knowledge to be analyzed on the date of valuation regarding environmental condition: (1) scientific knowledge, (2) engineering

knowledge concerning remediation, and (3) market behavior.

#### **Scientific State of Knowledge**

The scientific state of knowledge forms the basis on which the engineering solutions to the environmental condition are founded. Scientific knowledge includes such issues as follow:

- Our understanding of the physical world and the processes taking place within it that influence the environmental condition;
- How the environmental condition may be altered by specific activities such as a particular remediation approach,
- How the risk source may damage a target.

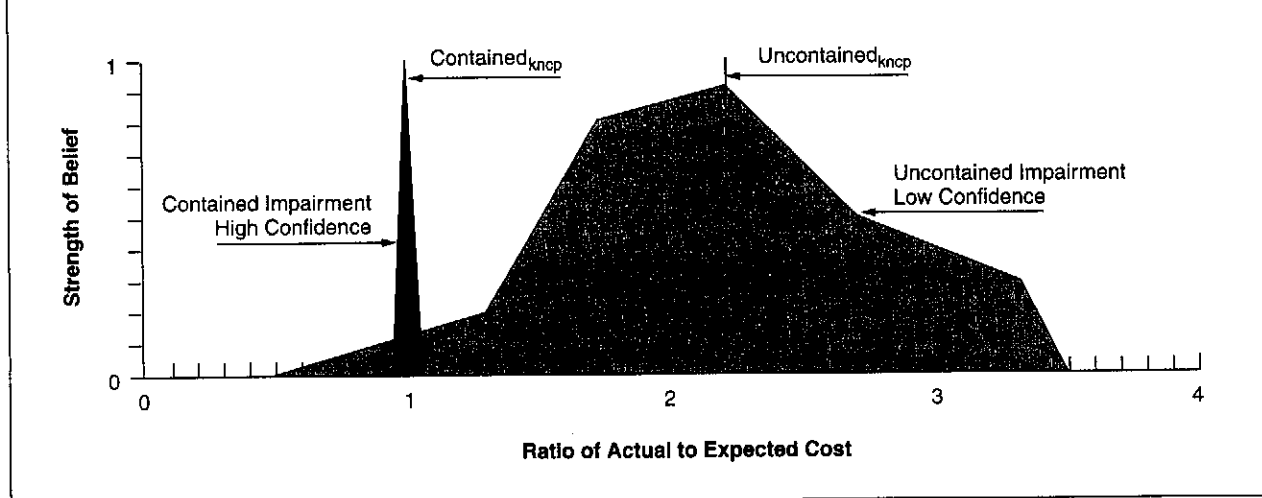
The scientific state of knowledge is more advanced in some areas than others. And, in those areas where knowledge is most advanced, the degree of uncertainty associated with a condition tends to lessen.

#### **Engineering State of Knowledge**

The engineering state of knowledge is particularly important with respect to remediation cost estimates. If the environmental condition has a well-known, efficient, and proven remediation technology available, the impact of the environmental condition on value may be significantly lessened by a reduction in the uncertainty concerning the costs and timing of remedial activities. If, on the other hand, the technology is unproved or possibly even nonexistent, the impact on value may be increased.

In a similar vein, if the engineering state of knowledge regarding the specific environmental condition is well grounded in analytical information, the risk

**EXHIBIT 1**  
**State of Knowledge Vs. Actual Cost of Remediation**



of error in cost estimates will tend to be less. Author studies indicate that after only an American Society of Testing and Materials (ASTM) Phase I Environmental Site Assessment, the actual cost of remediation may range from 0.50 to more than 3.5 times the estimated cost. This is illustrated in Exhibit 1 as the "Uncontained Impairment, Low Confidence" case based on the survey results.

As engineering knowledge concerning the extent and character of the environmental condition increases, the range of the actual cost compared to the estimated cost tends to decrease significantly. As an example, in the case of asbestos in a building (a contained impairment with proven remediation technology) formed after a careful engineering survey, the range of the ratio between the estimated cost and the actual cost may be from 0.95 to 1.05 times the estimate (labeled the "Contained Impairment, High Confidence" case in Exhibit 1). The  $k_{ncp}$  factors are the central tendency of the ratio of actual to expected cost based on the survey data.

**Probable or Most Likely Present Value of Costs**

"Probable" means the most likely or the most mathematically representative value within a range of possible values given the state of knowledge on the date of valuation. At any given state of knowledge prior to the completion of all work, the cost and timing of specific remedial activities can only be estimated. The probable or most likely cost is the cost that all the available information and experience indicate will best represent the actual cost—the total cost identified after all work has been completed. In the case of the author's survey data, the probable or most likely cost is the estimated cost times the appropriate central tendency of the ratio from the survey data—the  $k_{ncp}$  value.

**Development of Probable Cost**

There are two issues associated with the development of the probable cost: (1) the most likely cost of the individual activities composing the remedial action plan, and (2) the timing of the occurrence of each of those activities.

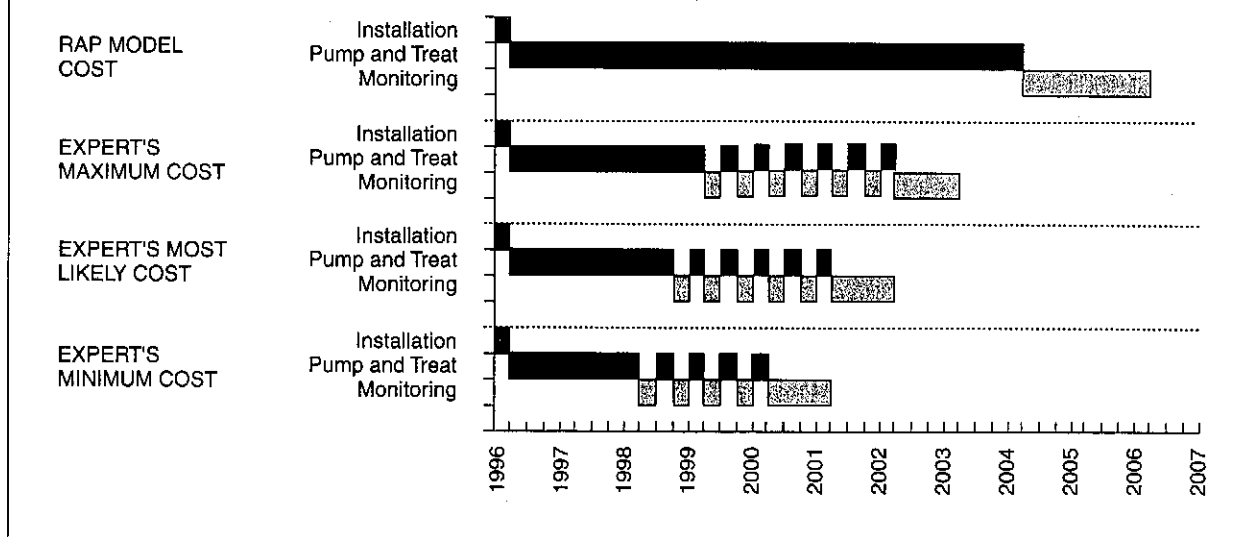
Timing relates to the need to identify the present value of a

future expenditure. In the case of an event (e.g., cost of a remedial activity) spread over a future period of time or scheduled to occur at some future date, the present value of the probable cost will be the basis for decision-making. This interpretation is consistent with both valuation theory<sup>6</sup> and specific guidance offered by the Securities and Exchange Commission (SEC) in its Staff Accounting Bulletin 92 (SAB 92).<sup>7</sup>

SAB 92 states:

The measurements of the [environmental] liability should be based on currently available facts, existing technology, and presently enacted laws and regulations, and should take into consideration the likely effects of inflation and other societal and economic factors. Notwithstanding significant uncertainties, management may not delay recognition of a contingent liability until only a single amount can be reasonably estimated. If management is able to determine that the amount of the liability is likely to fall within a range and no amount within that range can be determined to be the better estimate, the registrant should recognize the minimum amount of the range....

**EXHIBIT 2**  
**Alternative Remediation Timing Scenarios**



As with the development of any probable cost, there will be associated minimum and maximum likely costs. The difference between the probable cost and the maximum likely cost has a direct influence on market factors because it is a measure of the risk of error in the estimate.

Consider the development of the minimum, most likely, and maximum costs for an individual remedial activity. Exhibit 1 illustrates how these three elements are related for two specific situations. In one situation, the technology for remediation is well known and the environmental condition is a contained impairment that can be accurately measured. Therefore, the expert expressed a high level of confidence that the estimate will accurately reflect the actual cost. In the other case, the impairment is uncontained, and therefore cannot be accurately measured. In addition, the amount of investigative work performed prior to the estimate is small. While the impairment is known to exist, its extent and exact character are not well known. The expert therefore

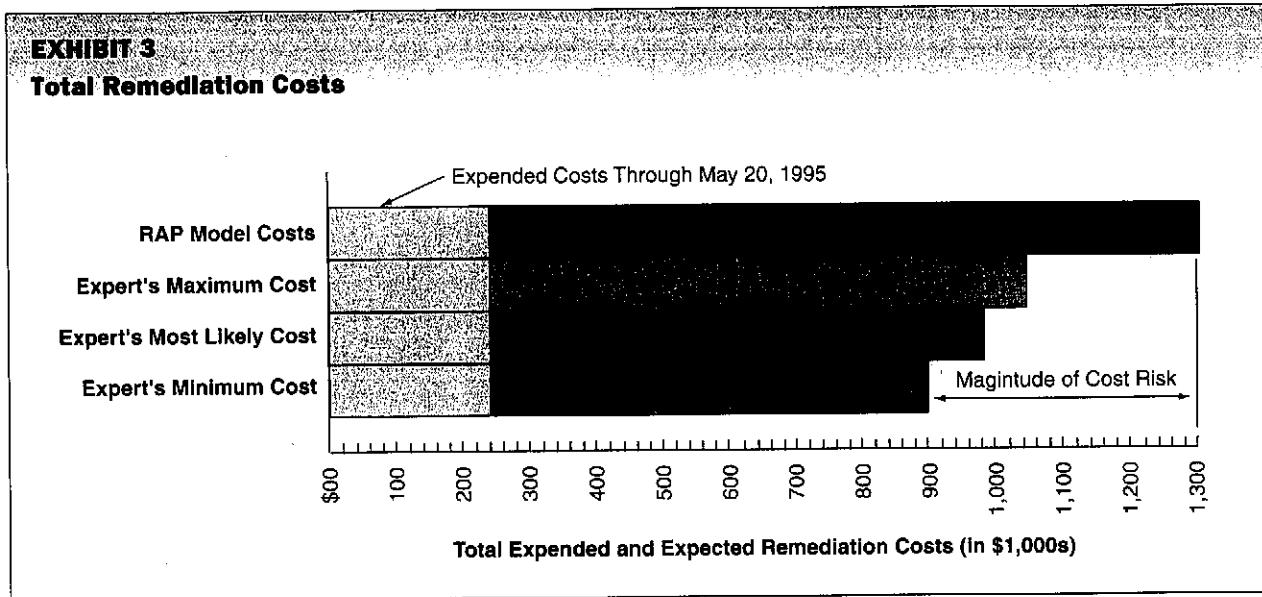
can express only a low level of confidence in the estimate accurately representing the actual cost.

Using the data from Exhibit 1, assume the estimated cost of the remedial activity is \$100,000. For the contained impairment, high confidence case, the survey data indicates that the actual cost of the remedial activity will probably lie between the minimum likely cost of \$95,000 ( $0.95 \times \$100,000$ ) and the maximum likely cost of \$105,000 ( $1.05 \times \$100,000$ ). The most likely cost will be \$100,000 ( $k_{ncp} = 1.00 \times \$100,000$ ). For the uncontained impairment, low confidence case, the survey data indicates that the actual cost of remedial activity will probably lie between the minimum likely cost of \$50,000 ( $0.50 \times \$100,000$ ) and the maximum likely cost of \$350,000 ( $3.5 \times \$100,000$ ). The most likely cost is \$220,000 ( $k_{ncp} = 2.2 \times \$100,000$ ).

It must be emphasized that the probable or most likely cost of remediation in each case reflects the best available data and experience at a given state of knowledge. The risk of error in the use

of the most likely cost as an estimator of the actual cost may be measured by the difference between the most likely cost and the minimum/maximum likely costs. Stigma usually refers to the possibility that the error lies in underestimating the actual cost when using the most likely cost as the estimator. For the contained impairment, high confidence case, a measure of stigma would be \$5,000 ( $\$105,000 - \$100,000$ ). For the uncontained impairment, the measure of stigma would be \$130,000 ( $\$350,000 - \$220,000$ ).

The second part of the probable remediation cost is the impact of the timing of remedial activities. A recent case involved a Remedial Action Plan (RAP) calling for eight years of active groundwater pumping and treatment followed by two years of monitoring to complete remediation based on a standard groundwater model that the governing agency required be used to form the estimating basis for the RAP. Professional experience indicates, however, that a pulsed pumping strategy (as opposed to the continuous pump-



ing strategy used in the required model) would probably be more efficient with three possible timing scenarios forming part of the range of likely scenarios. The expert indicated that 2, 2.5, or 3 years of continuous pumping and treatment followed by periods of quarterly pumping and treatment and aquifer resting followed by one year of confirmation monitoring would provide adequate remediation. These timing alternatives are represented in Exhibit 2.

When the most likely cost of each activity, inflation, timing and after discounting by a safe rate of return are considered, the total cost of remediation is represented in Exhibit 3.

The most likely cost of remediation is the Expert's Most Likely Cost in Exhibit 3. This is the cost of remediation that the expert feels will most accurately represent the actual cost for the work necessary to satisfy the governing agency. The costs are summarized in Exhibit 4.

In Exhibit 4, the Expert's Most Likely Cost of \$985,490 forms one element of the remediation cost. The impact of the Difference to Most Likely Cost will be discussed

**EXHIBIT 4**  
**Remediation Cost Estimates (Present Value at Safe Rate of Return)**

Timing Alternative	Example	
	Most Likely Cost for Alternative	Difference to Most Likely Cost
RAP Model	\$1,290,864	\$305,374
Expert's Maximum Likely Cost	\$1,052,618	\$67,128
<b>Expert's Most Likely Cost</b>	<b>\$985,490</b>	<b>\$0</b>
Expert's Minimum Likely Cost	\$914,882	\$(70,608)

in the section on market factors. Exhibit 5 summarizes all of these factors and illustrates the areas of buyer and seller risk if an offset to the UMV is less than (buyer risk) or greater than (seller risk) the most likely cost.

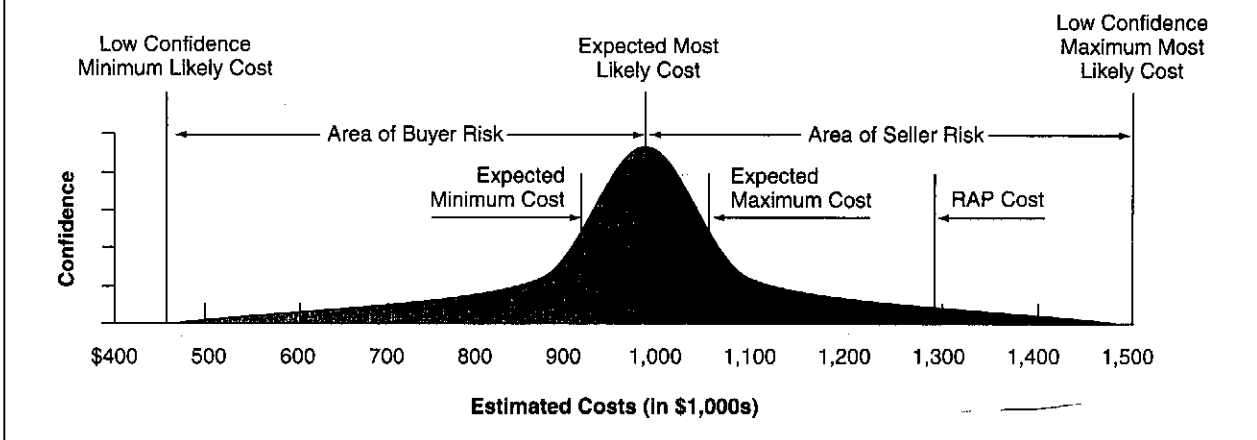
**Market Behavior**

The market behavior state of knowledge can be illustrated using the example of asbestos in a commercial office building. In 1987, the presence of asbestos was generally considered to be a "deal killer." Today, while the presence of asbestos will almost certainly influence the property's market value, debt financing for a purchase is generally available at nor-

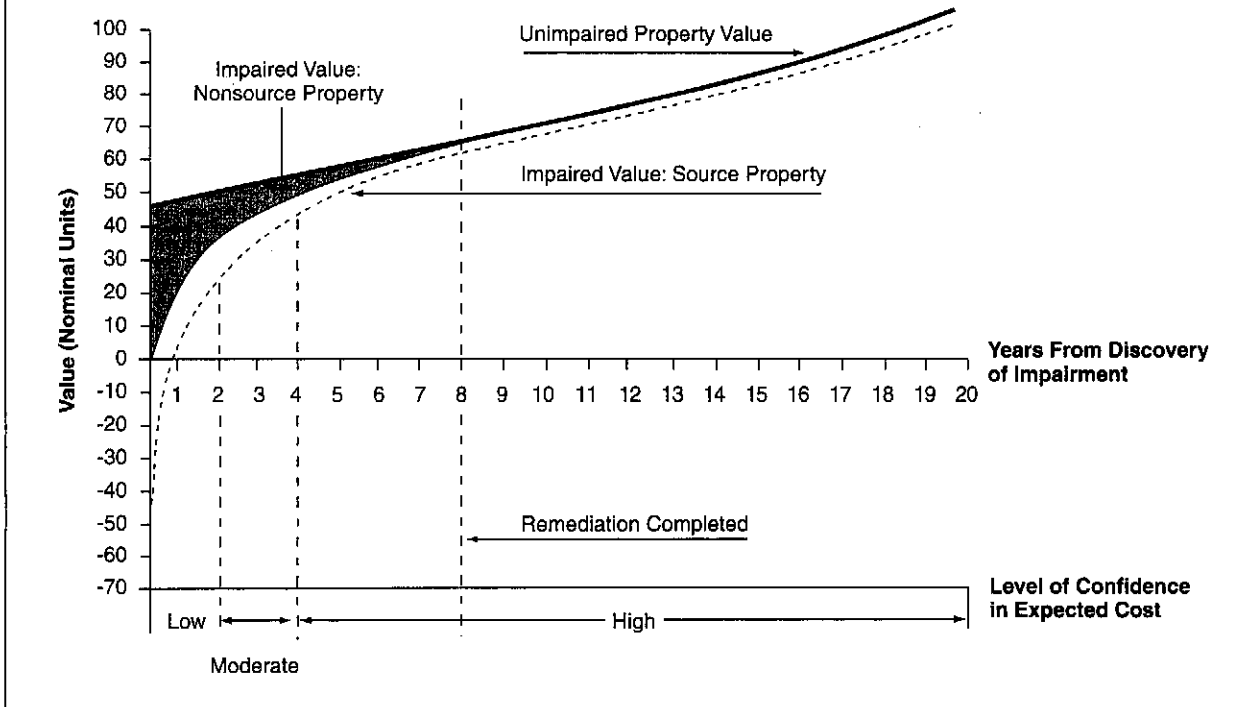
mal terms and conditions, and buyers are ready, willing, and able to purchase pre-abatement. The price paid generally reflects an adjustment for the present value of the costs of managing and eventually removing the asbestos. Remediation of underground storage tanks containing refined petroleum products appear to follow a similar market behavior pattern.

This pattern of market behavior does not necessarily apply to all environmental conditions, nor does it appear to follow a rigid time frame. Soils and groundwater remediation of particularly unusual or difficult-to-remediate substances may have stronger and longer-lasting impacts.

**EXHIBIT 5**  
**Summary of Probable Remediation Cost**



**EXHIBIT 6**  
**Impact on Value of a "Permanent" Impairment (For Illustration Only)**



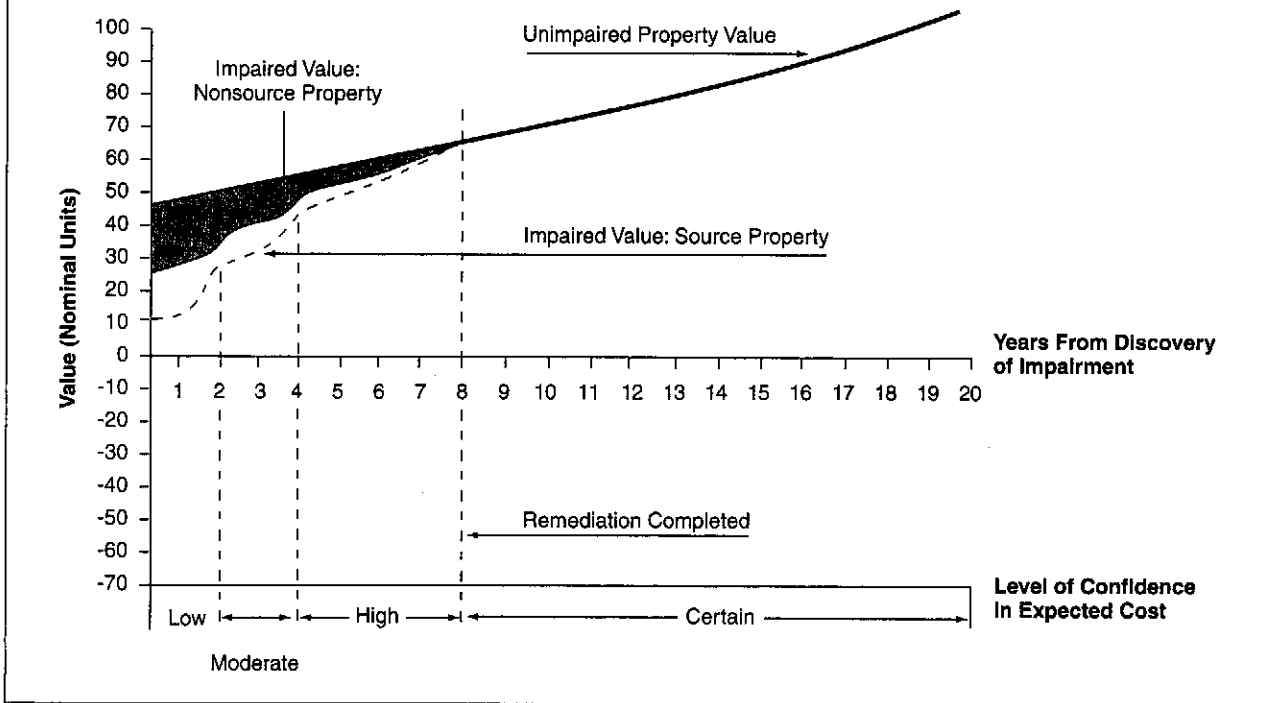
The accumulated market impact may be illustrated using Exhibits 6 and 7. Exhibit 6 indicates the hypothetical impact of a "permanent" impairment. A "permanent impairment" is arbitrarily defined for illustration purposes as an impairment that will not be resolved for a period of at least 20

years. Note that information is provided in Exhibits 6 and 7 for the impacts on market value to both source property and non-source property and at four levels of confidence in the reliability of the estimates accurately reflecting the actual cost of remediation labeled Low, Moderate, High, and

Certain. The levels of confidence are a result of the state of knowledge concerning the specific situation on the part of the engineering, scientific and market participant communities.

Exhibit 7 is similar to Exhibit 6, except that it deals with a "temporary" impairment—one that

**EXHIBIT 7**  
**Impact on Value of a "Temporary" Impairment (For Illustration Only)**



marketplace participants believe will be fully resolved within a short period.

The state of knowledge may also have a political element—one that may be highly correlated to a specific locality. In some localities, there may be a strong bias against nuclear facilities or mining, for example, while in another locality, there may be an opposing bias due to the economic advantages such as employment or taxes.

**DIRECT COSTS**

Direct costs may be prescribed by environmental laws and associated regulations and judicial decisions or administrative orders. Direct costs also include real costs to the owner/buyer that are not always included in those prescribed costs. Some of these real costs are financing of the remediation effort, the cost of loss of use during remediation, and the cost of recovery, including profession-

al fees. The property model to be used to illustrate the following discussion is that of a source property having an uncontained impairment; that is, "an environmental risk not contained within distinct, well defined, and easily identifiable physical boundaries."<sup>8</sup>

**Remediation Costs**

One may not simply guess as to what will constitute an appropriate remedial action plan any more than one may guess what construction will satisfy local building codes, although a "best" guess on the part of an experienced individual in either case may be quite accurate. As with the construction of a building where the codes define many of the elements of cost, so with an environmental condition the appropriate or relevant and applicable requirements (ARARs) define the cost of the remedial action plan under CERCLA. While CERCLA may not

apply to a specific environmental condition, other federal or state laws will, and appropriate remedial activities are frequently provided by the implementing regulations associated with these laws. Judicial decisions indicate that in order to recover remediation expenditures from a third party under CERCLA, the expenditures must be in substantial conformance with the ARARs.

In effect, the ARARs or their equivalent in a specific situation, define the "typical" cost of remediation as "typical" is understood by a valuer in the context of a normal property improvement. While one may install gold-plated bathroom fixtures in a commercial office building, the marketplace is highly unlikely to provide dollar-for-dollar compensation for this nontypical expense. Similarly, with environmental remediation activities, groundwater remediation to below the applicable maximum

**The cost of remediation to meet a stated highest and best use may negatively influence that highest and best use.**

contaminant levels (MCLs) is unlikely to be compensable on a dollar-for-dollar basis. The existence of the National Contingency Plan (NCP)<sup>9</sup> and the associated ARARs and their equivalents in other situations provide the valuer with a key element in the identification of remediation costs, an environmental "building code."

The first step in developing the cost of remediation is to perform the necessary scientific and engineering work required to develop a RAP in substantial conformance with the ARARs, or the equivalent of the RAP if there are other governing requirements. Developing the RAP requires that certain expenditures be made to locate, identify, and characterize the environmental condition. This would include identifying the amount of contaminant present at specific physical locations and the physical (e.g., hydrologic and geologic) circumstances that govern the distribution of the contaminants and the remediation technology. It will also be necessary to identify and evaluate the potential risks associated with the contamination, develop an engineering solution, and carry through the applicable administrative functions required to obtain the approval of the governing agency.

The costs of obtaining an approved RAP may, however, be significantly higher than the cost of developing an approved building plan because of the much more complex circumstances surrounding an environmental condition. The costs may also vary significantly from jurisdiction to jurisdiction. For example, Broward

and Dade counties in Florida reportedly require twice the investigation and planning expenditures to obtain an approved RAP compared to those costs in a number of other counties in Florida. While a formal RAP may not be required in all circumstances, an environmental remediation "building plan" of some sort will almost always be present and the probable or actual costs to develop such a plan are the first costs experienced by an owner.

Given the existence of an approved or likely to be approved RAP, the costs of implementing and managing the RAP over a period possibly extending decades into the future must be evaluated and the probable present value calculated. The need for a probable present value cost of the execution of the RAP gives rise to a serious analytical question: What is the appropriate discount rate for use in calculating the present value?

The issue of a choice of an appropriate discount rate may be resolved by referring to the guidance offered by SAB 92. The SEC Staff clearly state that one of two possible discount rates are appropriate: (1) a "safe rate of return" with specific mention of the Treasury bill (T-bill) rate for a T-bill of maturity equivalent to the projected expenditure timing, or (2) a rate of return based on similar experience. The purpose of the discount rate selection is to develop a present value that conservatively reflects the uncertainties and risks associated with the prediction of a future environmental expenditure.

#### **Cost of Restrictions on Use**

The remediation cost is not the only source of cost to an owner or buyer. For example, if, as a result of remedial activities, a floor of a commercial office building must

be dedicated to the removal of asbestos for a period of time, the loss of rental income constitutes a loss to the owner and carries a corresponding economic penalty. The present value of the probable cost of a loss of use due to the remedial activities is a contributor to the impact of the direct cost on value.

Inherent in the governing rules and regulations is the fact that the remediation costs may be directly influenced by the highest and best use to which the property will be put. In some states, a clear distinction in remedial requirements is based on whether the highest and best use is for residential, commercial, or industrial use. In turn, the cost of remediation to meet a stated highest and best use may negatively influence that highest and best use. Consider, for example, a former municipal landfill. If the landfill—with its subsidence and methane-generating conditions—were not present, the unimpaired highest and best use would be for development of light industrial facilities indicating a land value of \$1.75 per square foot. However, given the presence of these conditions, the incremental cost to develop the property to this highest and best use would have been \$1.92 per square foot, which is not in keeping with the definition of highest and best use given that there is an alternative highest and best use yielding a greater return to the owner. An alternative impaired highest and best use of outdoor storage at an indicated land value of \$0.75 per square foot would generate the greatest net benefit to the owner because the cost of dealing with the subsidence and methane can be totally avoided. The difference in value between the unimpaired and impaired highest and best uses—\$1.00 (\$1.75 - \$0.75)—is also a part of the direct cost.

### Incremental Cost of Financing

An incremental cost is the difference between a cost experienced under one set of conditions and a cost for the same activity experienced under a different set of conditions. In this case, the baseline condition is the cost of financing the purchase/ownership of a property as unimpaired. The alternative condition is the cost of financing the purchase/ownership of that same property given the presence of the environmental condition.

The cost of financing the purchase of an impaired property may be significantly different from the cost of financing the same property without the impairment. Equity may demand higher rates of return in compensation for the additional risks taken by investing in such a property. Debt financing may require lower loan-to-value ratios, higher closing costs, greater debt maintenance costs, and occasionally higher interest rates. Debt financing may not be available at all under certain circumstances, particularly those associated with uncontained impairments on a source property. The incremental difference in financing costs—the difference in financing the purchase of the subject as impaired less the cost of financing as unimpaired—generates a component of the direct costs.

In general, commercial financing sources are not available for remediation financing and alternative sources including noninvestment grade or junk bond financing may be required. The cost of financing the direct remedial activities must be considered an additional component of direct costs.

The minimum cost of financing remedial activities will be at a rate equivalent to the weighted average cost of capital (WACC) for the organization.<sup>10</sup> This will, however,

be an unrealistically low estimate of the cost of financing in most cases because the fundamental assumption of any business enterprise is that the organization makes a profit on its capital investments. Therefore, the cost of financing will range upward from the WACC to a rate equivalent to high risk or junk bond financing costs.

With respect to the term (length of time) of financing, under unusual circumstances, it may be reasonable to deal with terms approximating long-term mortgage debt. Such financing would be most appropriate for such remediation activities as asbestos abatement or similar activities where the underlying asset being remediated will directly benefit. Normally, remediation financing terms will approximate the term of the remediation project plus a few years. From the point of view of the owner, this financing term will most accurately represent the cost of diverting owner financial resources to remediation.

### Probable Net Recoveries

Similar analytical arguments are applied in SAB 92 to recoveries, with the explicit statement that recoveries must not be netted against liabilities in disclosure but may be separately identified. The reasoning is straightforward and compelling—if a court judgment is rendered in favor of the property owner, collection may be problematic and is subject to collection costs that may not be recoverable. Even in cases of state-funded remediation programs, recovery may be problematic, as these are classically underfunded and funding in several instances has been terminated by the legislatures.

To the extent that a recovery of costs may be available, the present

**The risk of underestimating the actual cost of remediation can sometimes be measured.**

value of the probable net amount of that recovery may act to offset the impacts of the other elements of direct cost. However, such recoveries may be so highly speculative that the risk of the recovery would more logically be borne by the seller than by the buyer and the market value would not contain a credit for such a recovery.<sup>11</sup>

### MARKET FACTORS

Market factors means the collective result of market forces acting in a positive or negative sense to increase or decrease the impact of the direct costs on the market value. Stigma means the decrease in market value of the property resulting from the increased risks associated with the environmental condition.<sup>12</sup> Under certain circumstances (e.g., very high demand and limited supply of the subject property type), it is entirely possible for the market factors as a whole to reduce the impact of the direct costs. Consider in this light the following list of risks that determine market factors.

□ *Estimates of probable remediation costs understate the actual remediation costs.* As explained in the discussion of remediation costs, the risk of underestimating the actual cost of remediation given an estimate at a particular state of knowledge can sometimes be measured. In the uncontained impairment, low confidence case, the example indicated that the difference between the maximum and most likely costs was in the neighborhood of \$130,000 (\$350,000 – \$220,000).

**Exposure to public liability has been a point of some concern to prospective purchasers.**

To the extent that buyer and seller agree to reduce the unimpaired value by an amount equal to the most likely cost, both parties are taking equal risks that the actual cost will be different from the most likely cost. To the extent the buyer negotiates an offset greater than the most likely cost, the seller is taking an increasingly greater risk that the actual cost will be less than the amount of the offset. To the extent the buyer is unable to negotiate an offset as great as the most likely cost, the buyer is accepting the risk that the actual cost will be greater than the offset. It is for this reason that while the offset associated with the market factors should be an amount approximating some portion of the difference between the most likely and the maximum likely costs, the strength of demand, for example, may act to reduce the net impact of this element or to increase its impact in a weak market.

□ *After remediation has been completed, the highest and best use will be less advantageous than the unimpaired highest and best use.* In rare circumstances, it may not be possible to state with a high degree of certainty the outcome of remediation relative to the highest and best use of a property or possibly the time in the future when an unimpaired highest and best use might be achieved.

The landfill example cited earlier is a case in point. Eventually, all of the garbage in the landfill will be converted to water, gases, and solid materials and the process for all practical purposes will be at an end. At that point, the highest and

best use of light industrial development will again be achievable. But, that point in time is dependent on such factors as the exact composition of the landfill, the amount of moisture available, the amount of oxygen available within the landfill, and other factors that can only be approximated; hence, the date when the process will be complete can only be estimated, not stated with certainty. This risk may result in a market factor offset to reflect the buyer's assumed risk of when the light industrial highest and best use will be attained.

□ *After remediation has been completed, the property may continue to suffer a diminution in value.* Again, using the landfill example, very extensive environmental investigations allowed the composition of the landfill to be stated with a relatively high level of confidence. But, a high level of confidence is not the same as certainty, and some room for doubt remains that not all of the constituents are known. Possibly at a later date, a hazardous condition might be discovered that could result in extensive and very expensive remediation not currently believed necessary. This possibility—as opposed to probability—may influence the buyer's decisions and result in a market factor offset to compensate for this particular risk.

□ *Purchasing the property would risk exposure to strict joint and several liability.* Consider the following citation:

The Broward County Department of Natural Resource Protection (DNRP) has received and reviewed the (type of report) \_\_\_\_\_ dated \_\_\_\_\_ for the above-referenced site. The (type of report) \_\_\_\_\_ is accepted. This case has been reclassified to inactive based solely on the information submitted

by your consultant . . . "Should additional information become available which indicates that the site status has changed, DNRP reserves the right to reclassify the site to active and to require further investigation and/or remediation as appropriate." Broward County (FL) DNRP reclassification form letter as of July 1, 1995.

Obviously, the reclassification of a site to an inactive status, allowing the termination of active remediation work and the removal of equipment, is a qualified event. The governing agencies specifically state that they have the unequivocal right to require additional work at a later date. In many cases, the right to reopen the site and require additional work is not as clearly stated as in the preceding citation, but only in very rare circumstances will the governing agency explicitly give up that right. In New Jersey, for example, the governing agency will only guarantee that a site will not be reopened at owner expense to the current and an immediate successor owner. Any succeeding owner is exposed to a possible reclassification and additional work at owner's expense.

Recently, "brownfields" legislation has been enacted in several states that may protect an owner and sometimes subsequent owners, from the reopening of remedial activities. For example, the state of Illinois recently passed into law "brownfields" legislation that, providing certain criteria are met, requires the Illinois Environmental Protection Agency to issue a certificate that is attached to the land title precluding any additional remediation work so long as the property's use remains unchanged. However, these statutes generally have not been tested in the courts and they all contain caveats.

□ *Purchasing the property may expose the buyer to public liability.* Exposure to public liability has been a point of some concern to prospective purchasers. Litigation against an owner of a property, possibly years after the event, is at least a theoretical possibility. While this uncertainty can rarely be evaluated or completely discounted, it probably acts in a subtle manner during the purchase negotiation process. It may result, for example, in a stiffened resistance to a higher price. To the best of the author's knowledge, there has not yet been a successful attempt to quantify this element of market factors. For the present, it simply remains a market force that must be judged subjectively in light of the specific situation, if it can be reasonably evaluated at all.

□ *The probable net recoveries may be less than the actual costs incurred.* This is a risk that will almost always be evaluated prior to closing. An indemnification from "Joe's Midnight Auto Parts" would not be likely to receive the same credence as one extended from a *Fortune 100* firm. This discounting of a potential recovery is a normal part of any transaction, but generally receives special attention when an environmental condition is involved because of the inherent uncertainties and risks associated with the estimation of future environmental expenditures.

In addition to the problem of discounted indemnifications are the issues of recovery for such soft costs as diversion of management attention and transactional costs, such as attorney and collection fees, carrying costs, and the like that may not be recoverable from certain sources. Loss of profits can be a particularly difficult issue, as it deals with the legitimate concern that a profit might have been

made had there been nothing wrong. Additional issues are that a buyer at least implicitly accepted the risk of a lost profit and the estimation of the value of the amount of the loss. This does not mean that the risk of such losses or that the losses themselves are any less real; it simply means that they are not usually subject to exact quantification and tend to be reflected in the general market factors.

□ *Other factors may negatively impact the market value.* There may be other factors not explicitly identified above that result in an offset to value attributed to the environmental condition. These might include the general belief that buyers try to avoid a property with an environmental condition in favor of properties that do not have such a condition.

#### **Certain Marketplace Factors May Offset Some Elements**

There have been a number of recorded sales of properties with known environmental problems that have sold at or near full unimpaired market value. The properties involved have had environmental conditions ranging from being source properties for underground storage tank leaks to adjacent nonsource properties having refined petroleum products in the groundwater underlying the improvements to office and industrial properties with asbestos-containing building materials.

While some of this lack of impact on market price may be explained by such factors as the extension of meaningful indemnifications from the responsible party to the market participants, this is not true in all cases. Some properties with significant environmental conditions, but without indemnifications, have still sold at full unimpaired market value.

**The probable net recoveries may be less than the actual costs incurred.**

In those cases where properties have transferred at full market value despite the presence of significant environmental conditions, there appear to have been several common market factors at work. These have included a strong demand and lack of available substitutes in the market, a high degree of awareness and familiarity in the marketplace with respect to the kind of environmental condition, and a knowledge or belief that the condition will not affect the use of the property or its revenue stream.

#### **Include Only Those Impacts Not Accounted For**

It is very important that care be taken in analyzing the market factor impacts to ensure that none of the direct costs be included in the market factor analysis. Such double counting is particularly easy to do when considering the incremental costs of financing and the impact of restrictions on use. In these cases, the use of a market-derived impaired capitalization rate or using a reduction in the income growth rate to reflect a direct cost offset may be inadvertently duplicated in the market factor analysis through the application of an offset representing a reduced demand for the subject or mortgage discrimination by lenders. Both may have already been included in the market-derived data used in the direct cost analysis.

This fact is often overlooked, particularly by those who insist on using a percentage of unimpaired value approach to analyzing the impaired value. A statement in the

literature that a property having such-and-such a problem suffered a 90 percent diminution in market value is a resultant, not a quantitative, factor representing the market factors. It includes both the impact of direct costs and market factors and indicates that in the presence of both, the result was that the property sold at 10 percent of its unimpaired value. In a study of impaired property valuation methodology conducted by Dr. Timothy Dixon directed toward identifying appropriate techniques for application in the United Kingdom, Dr. Dixon indicated that the use of a gross percentage offset technique could lead to very misleading results. Dr. Dixon also concluded that the use of the Sales Comparison Approach to establish the IMV was subject to considerable possibilities for error.<sup>13</sup> ■

**Notes**

<sup>1</sup> Peter J. Patchin, "Valuation of Contaminated Properties," *Appraisal J.* (Jan. 1988).  
<sup>2</sup> The language "appropriate or relevant and applicable requirements" originates with 40 CFR Part 300, the National Contingency Plan. The U.S. Environmental Protection Agency defines "applicable requirements" as "cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site." Relevant and Appropriate Requirements are defined as "substantive environmental protection requirements . . . promulgated

under Federal or State law that, while not 'applicable' . . . address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site."

<sup>3</sup> An environmental risk source is a hazardous substance, hazardous waste, or other source of threat to human health and/or the environment.

<sup>4</sup> A "facility" may be defined for practical valuation purposes as that volume of air, soils, or groundwater contaminated by the release of a risk source. More formal legal definitions are available as evidenced by the following: "Facility" is defined broadly to include, inter alia, "any site or area where a hazardous substance has . . . come to be located." 42 USC § 9601(9)(B). In construing the term "facility," courts have emphasized repeatedly that Congress intended this term to be interpreted broadly. See, e.g., *United States v. Northeastern Pharmaceutical & Chem. Co. (NEPACCO)*, 810 F2d 726, 743; 25 ERC 1385 (CA 8, 1986), cert. denied, 484 US 848, 26 ERC 1856 (1987). The cases concerning this issue uniformly state that, as long as a hazardous substance is present at a site in question, the site will be considered a facility. EDDG §101.3(a)

<sup>5</sup> BNA's Environmental Due Diligence Guide, EDDG app. 501:1401 (June 1995).

<sup>6</sup> Value is defined as: "The present worth of future benefits accruing to real property ownership." *The Dictionary of Real Estate Appraisal*, The American Institute of Real Estate Appraisers, 2d. ed.

<sup>7</sup> Staff Accounting Bull. 92 (relating to SAB 92), 17 CFR pt. 211, 58 Fed. Reg. 32, 843 (daily ed. June 14, 1993).

<sup>8</sup> Albert R. Wilson, "Emerging Approaches to Impaired Property Valuation," *Appraisal J.* (Apr. 1996).

<sup>9</sup> National Contingency Plan, 40 CFR pt. 300.

<sup>10</sup> "Weighted average cost of capital" is defined as the weight average of the cost of debt and equity financing for the organization. Formulas and citations may be found in any textbook on financial management.

<sup>11</sup> See, e.g., *Hennepin County Regional Railroad Authority v. CMC Real Estate Corp.* (Minn. Dist. Ct., County of Hennepin, 4th Judicial Dist., CD 2139, Nov. 25, 1992), wherein the court effectively held that any recovery from the state's underground storage tank fund should accrue to the seller, and the price paid by the buyer should not consider any such recovery.

<sup>12</sup> In 1995, the Florida Supreme Court rendered a signal decision in *Finkelstein* (*Ida Finkelstein, Alice Fox & TENNECO Oil Co. a/k/a TOC Retail, Inc., Petitioners, v. Department of Transportation, Respondent*, No. 83.308 (Fla. May 18, 1995)) that at least partially attempted to define the measurement of environmental impacts on value using the stigma concept. A careful reading of the source materials cited by the court will reveal that the basic definition of "stigma" set forth in *Finkelstein* originated with an article by Chalmers and Roeher. Chalmers & Roeher, "Issues in the Valuation of Contaminated Property," *Appraisal J.* (Jan. 1993). In turn, a careful examination of the approach set forth by Chalmers and Roeher will reveal that their approach is simply a special analytical case of the definitions set forth in this article. Unfortunately, the *Finkelstein* decision, if the background materials are not read and understood, tends to perpetuate the problems associated with the use of the term "stigma."

Chalmers and Roeher suggest that the IMV is the UMV less the direct costs (excepting incremental financing costs) and with the market factors (including the incremental financing costs) evaluated through the income capitalization technique using a capitalization rate that is incrementally increased over the unimpaired capitalization rate to reflect the increased risks as outlined in the "market factors" discussion. This may be a very useful analytical technique and is wholly consistent with the broader definition set forth here.

<sup>13</sup> *Lessons from America: Appraisal and Lender Liability Issues in Contaminated Real Estate* (Whiteknights, Reading, Berkshire, England: The College of Estate Management, 1995).