

Real Property Valuation Issues in Environmental Class Actions

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The appraisal profession is being increasingly called upon to assist in the analysis and valuation of claims of property value diminution (proposed or being litigated) as environmental class actions. In this context, the appraiser's task may be to evaluate the impacts of environmental contamination on a large number of properties. This type of assignment gives rise to many issues concerning

- proper methodology and appropriate basis for valuation;
- reliability of inferences concerning the effects of contamination that may differ from one property to the next; and
- considerations involved in the development of a scope of work necessary to produce meaningful conclusions.

These issues are complex and such assignments should be undertaken only after careful consideration of the proposed or certified class of real property interests in relation to the generally accepted valuation framework¹ and the appropriate methods and techniques² for estimating the impacts of environmental contamination on property values.

Requirements for Class Certification

The requirements for certification of class actions by courts of law are within the purview of the legal profession and not the appraisal profession. Whether or not a class involving real properties or real property interests is certified is determined by the court

based on specific legal tests or criteria. However, appraisers can assist in assembling certain real property data and information that can assist the courts in this determination. As such, appraisers should be generally aware of the criteria used in determining the appropriateness of the real property interests in the proposed class for treatment and analysis as a class.

Federal Rule 23(a) lists four requirements or prerequisites for class certification:

- (1) the proposed class must be so numerous that joinder of all members is impractical (numerosity);
- (2) questions of law or fact common to the entire class (commonality);
- (3) the claims or defenses of the class representatives must be typical of the claims and defenses of the absentee class members (typicality); and
- (4) the class representatives must fairly and adequately protect the interests of the class (class representation).⁵

If the proposed class meets each of these four criteria, a fifth requirement must be met, that "the questions of law or fact common to the members of the class predominate over any questions affecting only individual members, and that a class action is superior to other available methods for the fair and efficient adjudication of the controversy."⁴ This latter is known as the superiority or predominance requirement.

1. Thomas O. Jackson, "Appraisal Standards and Contaminated Property Valuation," *The Appraisal Journal* (April 2003): 127-133.

2. Thomas O. Jackson, "Methods and Techniques for Contaminated Property Valuation," *The Appraisal Journal* (October 2003): 311-320.

3. D. Alan Rudlin, "Strategies in Litigating Multiple-Party Toxic Tort Suits," in *Environmental Litigation*, 2nd ed., ed. Janet S. Kole, Stephen Spitz, and Stephanie Nye (American Bar Association, Section of Litigation, 1999), 179.

4. *Ibid.*, Rudlin, citing Federal Rule 23(b)(c).

The certification of a class of plaintiffs where the alleged damages are related to diminution in property value would focus these requirements on the real property interests of the putative class members that are alleged to have been impacted as the result of certain, specified environmental contamination generated, created, or emanating from facilities or sources for which the defendants were or had been responsible. As such, issues in estimating the diminution in value of these interests by appraisers would be most directly related to the commonality, typicality and predominance requirements.

Commonality

Issues of commonality with respect to a proposed class could involve similarities in the properties of the putative class members. If the proposed class contains a wide range of property types and interests, then valuing them or estimating impacts on them on a common, class-wide basis would be difficult or perhaps impossible. For example, commercial and residential property types (houses and retail centers, for instance) could not be valued together. They have different markets and value influences. Single-family homes are typically acquired by homebuyers seeking to occupy them as a place of residence. Their pricing decisions are based upon this. Retail centers are bought by investors who seek the income stream they generate and price is typically determined by the capitalized value of this income stream. The valuation approaches for these property types differ. For the single-family residence, greatest reliance would typically be placed upon the sales comparison approach using recently sold and similar single-family residences as comparables. For the retail center, greatest reliance would typically be placed on the income capitalization approach to value. If a sales comparison approach is used, comparables would obviously not be single-family house sales but similar retail properties. Oddly enough, there have been proposed classes that combined all property types into a single category with the assumption that they could all be valued together in a common framework and any impacts on value could be estimated on a common basis with similar methods and techniques.

Typicality

Proposed class actions can utilize “the test or bellwether case approach in that the claims of a few representative plaintiffs are tried and the results of that trial will operate to conclude the claims of a larger number of similarly situated persons.”⁵ Again, the issue of property types and interests are important. Using the preceding example, if the “representative plaintiffs” are owners of single-family homes, their real property interests would not be typical of the owners of retail shopping centers. Real property damages in an environmental class action decided on the basis of the interests of the owners of single-family homes would likely not reflect damages to commercial properties. Research suggests that these two property types are impacted differently even from the same contamination source.⁶

Thus, any attempt to resolve damages impacts on one property type based on impacts estimated on the basis of another would not be accurate and likely would result in an inequitable solution for one of the two categories of property interests. In addition, and as will be explained in more detail below, properties that are source sites will likely experience different impacts than non-source properties, as will properties that have no contamination (proximate or adjacent properties). Thus, impacts to the properties of “representative plaintiffs” in one of these categories will not be typical of the properties of class members in another of the categories. Other issues such as the date at which the property interests were acquired and the potential effects of multiple sources of contamination will also create typicality issues (see the following discussion on predominance).

Predominance

As noted, the predominance requirement stipulates that questions of law or fact common to the members of the proposed class must predominate over any questions affecting only individual members. This requirement could relate to the uniqueness of the real property interests of the putative class members as well as differences in the way in which they may be impacted by environmental contamination. One way in which these property interests may be unique is related to their date of acquisition. Since all real

5. Ibid, Rudlin, 178.

6. Mark G. Dotzour, “Groundwater Contamination and Residential Property Values,” *The Appraisal Journal* (July 1997): 279–285; G. William Page and Harvey Rabinowitz, “Groundwater Contamination: Its Effects on Property Values and Cities,” *Journal of the American Planning Association* 59, no. 4 (1993): 473–481.

property is valued as of a certain date, sometimes referred to as the effective date or date of value, the real property interests of the proposed class members could be expected to vary depending on which date they acquired their properties or property interests. Property interests acquired before the date at which information about the contamination was known would be different and likely impacted differently than interests acquired after discovery of the contamination. In addition, as the effects of contamination tend to dissipate over time,⁷ interests acquired well after discovery are likely to be impacted differently and in a different way, if at all. Further, as these interests are transferred, presumably without some sort of assignment, the interests of future class members would become more diverse from the interests of those whose interests had encompassed a past ownership period. Adding to the complications are varying market conditions under which the property interests were acquired. Strong and weak market conditions can tend to mitigate or exacerbate the effects of environmental contamination on property values.

Another complicating factor involves the presence of multiple sources of environmental contamination. Multiple sources at varying locations can result in a relatively unique set of impacts to properties at different locations across a broad class area. Properties in one location that are impacted by a different set of contamination sources will differ not by degree, but in the type and kind of property value impacts from otherwise similar properties located elsewhere. The issue of multiple sources and impacts is not uncommon, especially in older industrial areas with antiquated or obsolete facilities interspersed with housing that may have once provided shelter for workers at the very same facilities. In such situations, the mix of impacts is likely to vary by location and the analysis of the impacts of any single source is greatly complicated.⁸

Lastly, all of the foregoing issues, property types, ownership issues, market knowledge, market conditions, changing effects over time, multiple sources and effects, and others tend to have a multiplicative effect on the number of categories of properties and property interests that must be analyzed by the

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appraiser in determining the extent of any diminution in value on a class wide basis. At some point, common interests may not predominate and it simply becomes untenable to evaluate impacts on a class-wide basis.

Merits Issues

In environmental class actions, the determination of the appropriateness of the interests of the putative class members for treatment as a class (class certification) is usually based on issues related to but different than whether or not these interests have actually been damaged. The latter is sometimes referred to as *the merits* of the class allegations. As the U.S. Supreme Court has noted, “the basic rule on merits issues at class certification seems simple and well settled: When deciding a class certification motion, courts may not ‘inquire into the merits’ of the plaintiff’s claims”⁹ independent of the requirements for class certification. Yet, as suggested in the discussion of the requirements for class certification, the analysis of merits in an environmental class action involving alleged reductions in property values must consider whether such analysis is possible or reasonable on a common, class-wide basis and whether class-wide treatment is appropriate given the construction of the proposed class of real property interests. Thus, even without actually evaluating the merits (typically diminution in property value) that question may overshadow considerations related to certification. Indeed, some definitions refer to a *class* as those “who have suffered economic harm, including tangible damage or injury to property interests, destruction or diminution of property value.”¹⁰ This

7. Thomas O. Jackson, “The Effects of Environmental Contamination on Real Estate: A Literature Review,” *Journal of Real Estate Literature* 9, no. 2 (2001): 93–116.

8. Thomas O. Jackson, “Evaluating Proximity Impacts from Multiple Sources of Environmental Contamination” (paper presented at the 23rd Annual Meeting of the American Real Estate Society, San Francisco, CA, April 2007).

9. Craig C. Martin, “Balancing Act: Weighing Merits Issues at the Class Certification Stage,” *Class Actions Today* (American Bar Association, Section of Litigation, 2008), citing *Eisen v. Carlisle & Jacquelin*, 417 U.S. 156 (1974).

10. *Cathy Pitts, et al. v. North Sanitary Landfill Company, et al.*, in the Court of Common Pleas, Montgomery County, Ohio, Case No. 99 CV 5231 (2004).

seemingly invites an analysis of merits at the class certification stage.

An issue for the appraiser, though, is that prior to certification, the court has not established the composition and definition of the class, and so it is unclear what properties and property interests are to be analyzed. This type of undefined appraisal problem is fraught with issues for the appraiser and his or her client. Without a clear class definition and statement of the problem to be addressed, the appraiser may be left to define the valuation problem, which may or may not comport with the class as subsequently certified. However, despite these issues the appraiser may be asked to address merits issues as defined by his or her client in order to address damages on some pre-class certification basis. Great care should be taken on such assignments so the assignment results are not misleading and are not communicated in a misleading manner.¹¹

Valuation Framework

The generally accepted framework for the analysis of the impacts of environmental contamination on property values is set forth in Advisory Opinion 9 (AO-9), “The Appraisal of Real Property That May Be Impacted by Environmental Contamination,” as well as in *The Appraisal of Real Estate*, 13th edition.¹² As explained in AO-9, the effects of environmental contamination on the value of real property can be categorized as cost effects, use effects, or risk effects.

Cost effects are deductions for costs to remediate a contaminated property to appropriate regulatory standards, recognizing that not all costs are recognized by the market as having an effect on value. *Use effects* are limitations on the highest and best use of properties that may be impacted by environmental contamination, recognizing that these effects would be meaningful only if they limited the use of the site or property that would be the highest and best use without the effect of the contamination, and would otherwise meet the four highest and best use criteria (physically possible, legally permissible, financially feasible and maximally productive). *Risk effects* are the effects on value due to increased perceptions of environmental risk by relevant market participants. These three factors influence the

value of a potentially impacted site according to the following formula:

$$\begin{aligned} \text{Impaired value} = & \text{Unimpaired value} - \text{Cost effects} \\ & (\text{remediation and related costs}) - \\ & \text{Use effects (effects on site usability)} \\ & - \text{Risk effects (environmental risk/} \\ & \text{stigma)} \end{aligned}$$

Further, since property value diminution is the difference between the impaired and unimpaired values, the following formula can be derived:

$$\begin{aligned} \text{Property value diminution} = & \text{Cost effects (remediation} \\ & \text{and related costs)} + \text{Use} \\ & \text{effects (effects on site} \\ & \text{usability)} + \text{Risk effects} \\ & (\text{environmental risk/} \\ & \text{stigma)} \end{aligned}$$

These formulas are consistent with existing guidance with respect to the application of USPAP standards in the valuation and analysis of contaminated properties, as presented in AO-9.

In the impaired value formula, the unimpaired value of a contaminated property can usually be estimated using a traditional sales comparison approach, income capitalization approach, and/or a cost approach to value. The appraiser estimating this unimpaired value must be careful to qualify it as hypothetical and as necessary for the intended use of the assignment results. On the other hand, the impaired value of a contaminated property—or property that may be impacted by environmental contamination—can rarely be estimated through one of the three traditional approaches to value due to data limitations and other factors. Thus, alternative methods must be utilized. However, these methods must be based on relevant market data and must be consistent with the applicable requirements of USPAP for appraisal development.

In measuring the three potential effects on value (cost, use, and risk, as explained), cost effects are derived from remediation costs usually estimated by environmental specialists. Assuming the market recognizes these costs, the appraiser can usually deduct them as a lump sum from the unimpaired value in a similar manner to a capital expenditure

11. See Standards Rule 2-1(a) of the Uniform Standards of Professional Appraisal Practice (USPAP), in Appraisal Standards Board, *Uniform Standards of Professional Appraisal Practice*, 2010–2011 ed. (Washington, DC: the Appraisal Foundation, 2010).

12. *Ibid.*, AO-9; and Appraisal Institute, *The Appraisal of Real Estate*, 13th ed. (Chicago: Appraisal Institute, 2008), 226.

for deferred maintenance. When a discounted cash flow analysis is used, the anticipated costs can be deducted from the projected cash flows in the periods in which they are projected to occur. Uncertainty regarding cost estimates, projection, and timing would be reflected in the environmental risk premium added to the unimpaired property or equity yield rate (risk effect). Use effects can be analyzed by estimating the highest and best use of the subject contaminated property in an impaired and unimpaired condition. If the conclusions of the two highest and best use analyses are the same, then there are no use effects on value. If they differ, then the unimpaired and impaired values would be estimated for different uses and compared. Risk effects, on the other hand, are derived from the perceived environmental risk and uncertainty related to the property's environmental condition. Measuring this element usually requires more sophisticated and less direct techniques.

Further, AO-9 states that "estimating the effects of environmental contamination on real property value usually involves the application of one or more specialized valuation methods." Like all methods for valuing real property, these methods and techniques must be derived from, or based on, one or more of the three approaches to value. These specialized methods and techniques can generally be described as the analysis of environmental case studies; paired sales analysis of potentially impacted properties; multiple regression analysis of potentially impacted neighborhood areas or properties in proximity to a contamination source; the use of market interviews to collect data and information used in other approaches or to support and supplement the results of other analyses; and the adjustment of income and yield capitalization rates to reflect environmental risk premiums in an income capitalization analysis. Other methods may emerge over time, but as yet have not achieved general acceptance in the appraisal profession and/or do not have the required linkage to one of the three traditional approaches to value.¹³

Lastly, AO-9 lists a number of important elements and individual property characteristics that should be considered by appraisers when estimating

the impacts of contamination on property values. These include

- (1) whether the contamination discharge was accidental or permitted;
- (2) status of the property with respect to regulatory compliance requirements;
- (3) remediation lifecycle stage (before, during or after cleanup) of the property as of the date of value;
- (4) contamination constituents (petroleum hydrocarbons, chlorinated solvents, etc.);
- (5) contamination conveyance (air, groundwater, soil, etc.);
- (6) whether the property is a source, non-source, adjacent or proximate site;
- (7) cost and timing of any site remediation plans;
- (8) liabilities and potential liabilities for site cleanup;
- (9) potential limitations on the use of the property due to the contamination and its remediation; and
- (10) potential or actual off-site impacts due to contaminant migration (for source sites).

Also important are certain specialized terms and key definitions in AO-9 that are used in appraisal assignments that involve property impacted by environmental contamination; these terms and definitions are shown in Table 1.

Note that the definition of *environmental contamination* in AO-9 specifically references "regulatory limits established by the appropriate federal, state and/or local agencies," and that concentrations of potentially hazardous substances must exceed these limits in order to be considered environmental contamination, as that term is defined for the appraisal profession. Thus, not all concentrations of hazardous or potentially hazardous substances would be considered environmental contamination, but only those whose concentrations exceed regulatory standards. The mere presence of these substances at background or barely detectable levels that do not exceed regulatory standards would not be considered contamination within this

13. For example, see recent articles in *The Appraisal Journal* on the controversial technique known as contingent valuation: Albert R. Wilson, "Contingent Valuation: Not an Appropriate Valuation Tool," *The Appraisal Journal* (Winter 2006): 53–61; Richard J. Roddewig and James D. Frey, "Testing the Reliability of Contingent Valuation in the Real Estate Marketplace," *The Appraisal Journal* (Summer 2006): 267–280; and Kristy E. Mathews, "Under the Microscope: Dissection of a Contingent Valuation Survey," *The Appraisal Journal* (Summer 2008): 259–273.

Table 1 Specialized Terms and Definitions in Environmental Contamination Assignments

Diminution in Value (Property Value Diminution): The difference between the unimpaired and impaired values of the property being appraised. This difference can be due to the increased risk and/or costs attributable to the property's environmental condition.

Environmental Contamination: Adverse environmental conditions resulting from the release of hazardous substances into the air, surface water, groundwater or soil. Generally, the concentrations of these substances would exceed regulatory limits established by the appropriate federal, state and/or local agencies.

Environmental Risk: The additional or incremental risk of investing in, financing, buying and/or owning property attributable to its environmental condition. This risk is derived from perceived uncertainties concerning (1) the nature and extent of the contamination; (2) estimates of future remediation costs and their timing; (3) potential for changes in regulatory requirements; (4) liabilities for cleanup (buyer, seller, third party); (5) potential for off-site impacts; and (6) other environmental risk factors, as may be relevant.

Environmental Stigma: An adverse effect on property value produced by the market's perception of increased environmental risk due to contamination.(See Environmental Risk)

Impaired Value: The market value of the property being appraised with full consideration of the effects of its environmental condition and the presence of environmental contamination on, adjacent to, or proximate to the property. Conceptually, this could be considered the "as-is" value of a contaminated property.

Remediation Cost: The cost to cleanup (or remediate) a contaminated property to the appropriate regulatory standards. These costs can be for the cleanup of on-site contamination as well as mitigation of off-site impacts due to migrating contamination.

Remediation Lifecycle: A cycle consisting of three stages of cleanup of a contaminated site: before remediation or cleanup; during remediation; and after remediation. A contaminated property's remediation lifecycle stage is an important determinant of the risk associated with environmental contamination. Environmental risk can be expected to vary with the remediation lifecycle stage of the property.

Source, Non-source, Adjacent, and Proximate Sites: Source sites are the sites on which contamination is, or has been, generated. Non-source sites are sites onto which contamination, generated from a source site, has migrated. An adjacent site is not contaminated, but shares a common property line with a source site. Proximate sites are not contaminated and not adjacent to a source site, but are in close proximity to the source site.

Unimpaired Value: The market value of a contaminated property developed under the hypothetical condition that the property is not contaminated.

Source: Advisory Opinion 9, Uniform Standards of Professional Appraisal Practice

framework, and should not be considered as such by appraisers.

As mentioned, this general framework and these definitions are also found in *The Appraisal of Real Estate*, 13th edition, and in *The Dictionary of Real Estate Appraisal*, 5th edition.¹⁴

Methodology Issues

As suggested in the valuation framework, the analysis of the effects of environmental contamination on real property values has several components: the estimation of the unimpaired value or values; the analysis of property value diminution, including cost, risk and use effects; and the estimation of the impaired value or values. The analysis and estimation of these values would fit within the merits inquiry phase of a class action, and typically occur after a class has been certified and the specific real property interests, including locations, dates of value and other parameters have

been defined. For class actions potentially involving hundreds or even thousands of individual properties, the estimation of the unimpaired values, diminution, and impaired values of the properties of the class members presents several special and difficult methodological issues for the appraiser.

Unimpaired Value

The estimation of the unimpaired values of properties involved in a class action has several complications depending on how the class is defined. If the properties of the class members consist of a variety of property types, then these properties will have to be appraised separately. For most appraisers, it would seem obvious that houses and stores, for example, cannot be valued together since they have different comparables, markets, etc. Most importantly, and consistent with USPAP and the nature of value expressed in the profession's reliance

14. See *The Appraisal of Real Estate*, 13th ed., 224–227; and "Environmental Contamination Glossary," *Dictionary of Real Estate Appraisal*, 5th ed. (Chicago: Appraisal Institute, 2010), 323–332.

on the highest and best use determination in the valuation process, these properties would likely have a different highest and best use.¹⁵ Even within a single property category, though, it may not be possible to meaningfully analyze some properties together. For example, it may not be appropriate to analyze larger, estate-type, single-family homes together with smaller, less-expensive housing as these are likely to reflect different market segments.

USPAP Standards Rule 6-2 (e) requires appraisers when valuing a group of properties to identify and consider:

- (i) the group with which a property is identified according to similar market influence;
- (ii) the appropriate market area and time frame relative to the property being valued; and
- (iii) their location and physical, legal and economic characteristics.

In addition, USPAP Standards Rule 6-2 (f) cites the following considerations:

- (i) location of the market area;
- (ii) physical, legal, and economic attributes;
- (iii) time frame of market activity; and
- (iv) property interests reflected in the market.

Accordingly, market areas and influences, dates of value, legal ownership interests and other factors must be considered when developing an analysis leading to unimpaired market value estimates for the group of properties in a class. Even properties of the same type could have significant differences relative to each of these factors. In any statistical analysis of such properties, there is an issue termed *aggregation error* that results from the over inclusion of properties with dissimilar characteristics in the same valuation analysis.¹⁶ This error can result in biased and unreliable estimates.

In the development of the unimpaired value estimates in a class action context, there are also issues associated with the use of mass appraisal techniques developed for intended uses associated with ad valorem taxation when applied to individual properties. Mass appraisal techniques are appropriate for what they are typically used for, i.e., the development of jurisdiction-wide assessments, as their individual property estimation errors tend to average out over a

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large number of properties. In estimating the value of individual properties, though, errors can be large. This creates problems in a class action context where damages and compensation may ultimately be paid to property owners based on the characteristics of their individual properties.

Another approach that may be used, at least in the early stages of a class action, involves the use of the representative or bellwether plaintiffs. In this approach, the properties of the representative plaintiffs could be simply appraised individually consistent with USPAP Standard Rule 1. Of course, as previously discussed, there is still the issue of typicality associated with the interests of the representative plaintiffs compared with the rest of the class.

Property Value Diminution

A second general step or task involves estimating the extent of any diminution in value to the properties of the class members. This task should be accomplished in light of the valuation framework outlined in AO-9 and elsewhere, and it should consider cost, risk, and use effects. Most attention has been focused on the estimation of the risk effects, sometimes referred to as *environmental stigma* (as previously defined). As stated in AO-9, “the analysis of the effects of increased environmental risk and uncertainty on property value (environmental stigma) must be based on market data, rather than unsupported opinion or judgment.” Accordingly, it is unacceptable practice to assume that environmental contamination will reduce the value of a property without adequate support derived from information obtained in the relevant real estate market. Relevant market information in this context would consist of actual real estate transactions

15. *The Appraisal of Real Estate*, 13th ed., 139.

16. Max Kummerow and H. Galfalvy, “Error Trade-Offs in Regression Appraisal Models,” chap. 6 in *Real Estate Valuation Theory*, ed. Ko-Kang Wang and Marvin L. Wolverton (Boston: Kluwer Academic Publishing, 2002).

(sales) involving properties with similar property and environmental characteristics to the properties of the class members.

One technique that has been increasingly employed to estimate risk effects is multiple regression analysis.¹⁷ This technique can be properly employed to estimate average impacts to groups of properties that share similar characteristics and are similarly situated. The use of multiple regression analysis for this purpose is not the same as its use in estimating individual property values with the issues and potential errors as previously mentioned. In an analysis of property value diminution, the regression analysis is used to estimate average or mean impacts for a group of properties. This is usually measured through one or more independent variables that identify the environmental characteristic of the properties for which the impacts are being estimated. Important in this regard are the structural characteristics of the regression model due to issues associated with correlations between independent variables and other issues.

Estimating the mean or average impacts to the value of a group of properties is a different assignment and use of the regression technique than using it to estimate the market value of individual properties. The errors associated with the estimation of individual property values can be large, while the errors associated with the estimation of mean or average impacts to a group of properties with a properly constructed regression model usually fall within acceptable limits. Since a regression analysis of environmental impacts produces only estimates of average effects for a group of properties, it is likely to overestimate impacts for some properties and underestimate impacts for others.¹⁸ This could potentially result in an inequitable allocation of damages in class actions involving the impacts of environmental contamination on property values. This issue is also present in even properly structured environmental case studies¹⁹ if the characteristics of the case study subjects (impaired properties) are estimated on an average basis and then applied to individual class properties that have differing environmental conditions and characteristics.

Allocation of Damages/Impaired Value

Because the analysis of property value diminution through regression analyses (or through environmental case studies) produces an estimate of average effects, an additional step is necessary: the allocation of estimated damages to properties within the class. In this step, more-specific property characteristics should be considered. Such property characteristics include status of the property with respect to regulatory compliance requirements; remediation lifecycle stage (before, during, or after cleanup) of the property as of the date of value; and whether the property is a source, non-source, adjacent, or proximate site. Even within a relatively homogenous group of properties for which regression estimates of diminution may be reliably produced, the properties' individual environmental characteristics will produce impacts that are greater or less than the mean or average impacts. For example, a group of properties in the class may contain some with detections of hazardous substances above regulatory thresholds (contaminated properties) and some with such substances at non-detect or background levels (not contaminated). It is likely that impacts will differ for properties in these two categories. Other characteristics such as remediation status (remediated compared to unremediated) should be considered as well. The result of this step will produce more reliable, and for the class more equitable, impaired value and damages estimates.

Conclusion

The foregoing presents a number of issues related to the certification and analysis of class actions involving diminution in value resulting from environmental contamination. These issues should be considered by the appraiser when called on to evaluate properties and the impacts on their value in this context. The analysis of diminution in value becomes more difficult where proposed and certified classes are made more inclusive, with varying property types, characteristics, and environmental issues. In some cases, it may not be possible to analyze effects on a class-wide basis without significantly disaggregating the properties. As

17. Thomas O. Jackson, "Evaluating Environmental Stigma with Multiple Regression Analysis," *The Appraisal Journal* (Fall 2005): 363–369.

18. The one exception to this issue is in situations where there is no discernable impacts (cannot reject the null hypothesis of no effect) since zero or near zero impacts average out to no effect.

19. Thomas Jackson and Randall Bell, "The Analysis of Environmental Case Studies," *The Appraisal Journal* (January 2002): 86–95.

such, disaggregation becomes necessary for a credible analysis (a USPAP term and requirement), and the class-action vehicle becomes less useful. At some point, the class may break down and becomes inappropriate for valuation analysis. Nevertheless, with reasonable similarities in property, market, and environmental characteristics, property interests defined in a class action can be meaningfully analyzed.

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