Controversy concerning the gasoline additive methyl tertiary butyl ether (MTBE) may mark the beginning of yet another mass tort explosion as increasing numbers of toxic tort and environmental cleanup cases are filed alleging MTBE contamination.

This article provides background information on the emerging issues, examining (i) the administrative, legislative, and litigation history of MTBE in the context of the state and federal environmental statutes, (ii) the importance of applicable Resource Conservation and Recovery Act deadlines for compliance with underground storage tank regulations, (iii) the question of MTBE toxicity for personal injury claims, and (iv) the scope of damages available in property damage cases filed by plaintiffs not physically affected by contamination.

**MTBE: CAN THE CONTROVERSY BE CONTAINED?**

**An Evaluation of the Emerging Underground Storage Tank Litigation**

By Richard O. Faulk and John S. Gray *

A firestorm has engulfed the gasoline manufacturing and marketing industries, with the incendiary being the additive methyl tertiary butyl ether (MTBE). Fueled in part by an Environmental Protection Agency report, considerable momentum is building in Congress and the various states to restrict, or even ban, this widely used additive.

In that report, EPA’s Blue Ribbon Panel on Oxygenates in Gasoline concluded that when gasoline leaks and spills occur from sources such as underground storage tanks (USTs) and gas cans, MTBE poses a risk to water supplies. The panel recommended that the use of MTBE be substantially reduced (with some members supporting its complete phase out).

These governmental efforts have coincided with the emergence of information about contamination from leaking USTs to spark private litigation across the United States seeking damages for groundwater pollution and possible health effects. As a result of the recently expired RCRA deadlines for UST upgrades and closings, a tremendous amount of public data have been generated in leak reports to state regulating agencies. The public records alone provide a ready source of potential defendants for plaintiffs claiming injury from...
leaking USTs. The records may also provide important information regarding leak aging, containment systems, and the timing and efficacy of remedial action.

Does this controversy mark the beginning of yet another mass tort explosion? Perhaps. Or perhaps not. At this point, however, personal injury claims are not viable. Serious health problems, such as cancer, have not been associated with exposure to MTBE and, indeed, may never be linked in a scientifically reliable way.

Property and natural resource damages claims involving tainted or unusable water resources present different concerns. Such claims deal less with toxicity and more with the utility of real properties and contaminated public resources. As with many environmental torts, the scope of damages recoverable in these property damage cases is uncertain.

Plaintiffs are currently pushing the “hedonic” model of property damages, seeking to expand the availability of “stigma” damages to tracts that are not physically impacted by the pollution. With such arguments, plaintiffs seek damages for diminution of property values based solely upon their proximity to a contaminated site. Thus, the claims in a typical leaking UST case may seek damages on behalf of a wide radius of property owners who are merely concerned about the “stigma” of nearby contamination.

The following article provides historical, legal, and scientific information regarding this emerging controversy.

I. History and Recent Developments

A. MTBE Characteristics and Concerns.

MTBE is an organic chemical—an oxygenate manufactured by the chemical reaction of methanol and isobutylene. At room temperature, it is a volatile, flammable, and colorless liquid that is highly soluble in water. MTBE belongs to a group of organic chemicals known as ethers and is the most widely used oxygenate in gasoline today. Approximately 30 percent of all gasoline in the United States contains oxygenates. An additional 4 percent is used for compliance with federal oxygen fuel requirements, which will be discussed more fully below. MTBE is used in more than 80 percent of oxygenated fuels. Since 1993, it has been the second most produced organic chemical manufactured in the United States. In addition to use as a fuel oxygenate, MTBE is widely used for octane enhancement in mid- and high-octane blended gasoline, typically at concentrations ranging from 2 percent to 8 percent by volume. It may also be found in regular grade gasoline at low concentrations.

A seemingly innocent feature of the modern American landscape, corner gasoline stations are everywhere. But buried beneath every station there is an environmental disaster waiting to happen: the underground storage tank. ¹

Three concerns, namely, (i) toxicity, (ii) exacerbation of contamination, and (iii) increasing difficulty in remediation, are the most immediate practical issues raised in the current controversy. MTBE is a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act (the “superfund” law). Although it is known to be less toxic than many other gasoline constituents, concerns have been raised about the potential for acute inhalation effects at service stations and chronic effects from contaminated drinking water. Some researchers and regulatory agencies are concerned that MTBE may be a human carcinogen. To date, scientific research has not substantiated these concerns.

Secondly, many opponents contend that MTBE is more soluble in water than most other petroleum constituents and capable of traveling through the subsurface at the same speed as groundwater. They argue that, as a result, MTBE may travel farther than other gasoline constituents, and may impact water resources, such as public and private wells, that other gasoline components do not reach. The actual progress of MTBE through groundwater is a complex process that does not necessarily result in lengthy plume migrations in particular cases. Nevertheless, MTBE’s comparatively greater affinity for water is a problem that merits careful examination in individual cases. Moreover, even low concentrations of MTBE allegedly produce bad-tasting water, and most lawsuits assert that, even if the water is not toxic, it is undrinkable.

Finally, opponents claim that, because of MTBE’s affinity for water, releases of petroleum containing MTBE may be more difficult to remediate than other petroleum releases, making cleanups more time-consuming, exacting, and costly. Again, depending on the circumstances at a particular site, the water solubility and enhanced migration of MTBE may (or may not) be a problem. New technology and procedures are being developed to deal specifically with MTBE plumes where traditional methods of remediation prove inadequate. The cost-effectiveness and efficiency of these

methods—as well as the necessity of their use—can be evaluated conclusively only by empirical data generated under field conditions.

B. The Development of MTBE to Combat Air Pollution.

MTBE was developed as a gasoline octane enhancer to replace tetraethyl lead and to reduce the concentration of ozone-forming compounds in automobile tailpipe emissions. As an oxygenate, MTBE adds oxygen to gasoline which, in turn, promotes enhanced combustion. More efficient burning of gasoline produces less carbon monoxide (CO) and, hence, decreases tailpipe pollutants. In this way, oxygenated fuels are an important means of combating air pollution and providing “considerable air quality improvements and benefits for millions of US citizens.” Since persons with coronary artery disease are particularly sensitive to CO, oxygenated fuels may reduce these health risks.

Oxygenates, including both alcohols and ethers, have a long history of use in motor fuels—going back to the beginning of this century when ethanol was first promoted for gasoline blending. At various times, alcohols such as methanol, isopropanol, and tertiary butyl alcohol (TBA), along with ethers such as di-isopropyl ether (DIE), ethyl tertiary butyl ether (ETBE), and tert-butyl amyl methyl ether (TAME) have been blended into gasoline. Oxygenates have been used as octane enhancers in gasoline since lead was phased out in the late 1970s. Industry standards for material compatibility with oxygenated fuels have been in place since 1986. By the time EPA began formulating the 1998 UST regulations, the use of oxygenates in conventional gasoline was well established. When the regulations were promulgated, EPA noted that the standard specifications for steel and fiberglass tank system materials provided for compatibility with gasoline/oxygenate mixtures containing up to 15 percent by volume MTBE, 10 percent by volume ethanol and 5 percent by volume methanol.

MTBE was developed in response to the energy and fuel disruptions of the 1970s, which showed the need for alternative programs promoting the use of new fuel resources. The National Energy Act of 1978 suspended the motor excise tax for gasoline blended with alcohol derived from biomass (surplus grain supplies). This suspension spurred renewed commercial interest in oxygenates for transportation fuel.

The 1975 and 1977 Clean Air Act Amendments brought the intensive phase-down of lead-based octane enhancers. The use of lead in gasoline was reduced and ultimately banned in 1996. In order to maintain octane levels, manufacturers faced two options: (i) increasing the concentration of aromatic constituents, or (ii) utilizing alternative products, such as oxygenates, with favorable blending and performance properties. Increasing aromatic usage would require more severe refining processes with lower yields per barrel of crude oil and higher costs for the finished gasoline. Moreover, speculations about aromatic health effects and the effect on ozone formation limited the levels of aromatics blendable into fuel.

During the 1980s, some states implemented oxygenated gasoline programs to combat CO pollution in cold weather. There is a significant relationship between ambient temperature and tailpipe emissions of CO. Essentially, CO emissions increase when temperatures decrease. The first winter oxygenated fuel program in the United States was implemented in Denver in 1988. In 1990, the Clean Air Act Amendments required the use of oxygenated gasoline in certain areas of the country that failed to attain the National Ambient Air Quality Standard (NAAQS) for CO. During the winter of 1992-1993, a number of new oxygenated fuel programs were implemented to increase combustion efficiency and reduce CO emissions in cold weather.

C. The Oxyfuel and RFG Programs.

The Oxygenated Fuel (Oxyfuel) and Reformulated Gasoline (RFG) programs were initiated by the U.S. EPA in 1992 and 1995, respectively, to meet requirements of the 1990 Clean Air Act Amendments. The oxyfuel program requires 2.7 percent oxygen (by weight) in gasoline during fall and winter months to reduce carbon monoxide emissions. To meet this requirement, gasoline manufacturers must use oxygen-containing compounds called “fuel oxygenates.” (e.g., MTBE, ethanol). When MTBE is used to meet the oxyfuel requirements, it is added at a concentration of approximately 15 percent (by volume) to gasoline. As of November 1997, 28 metropolitan areas were governed by the oxyfuel program. Of these 28 areas, only Minneapolis-St. Paul uses oxyfuel year-round.

The RFG program requires 2 percent oxygen (by weight) in gasoline year-round in the most heavily polluted metropolitan areas to reduce ozone and smog. When MTBE is used to meet the RFG requirements, its concentration in gasoline is approximately 11 percent by volume. Ten metropolitan areas are required to use RFG: Baltimore, Chicago, Hartford, Houston, Los Angeles, Milwaukee, New York, Philadelphia, Sacramento, and San Diego. Another 22 areas in 13 states and the District of Columbia voluntarily participate in the RFG program: Arizona, Connecticut, Delaware, Kentucky, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Texas, and Virginia. California has a separate statewide program with more stringent standards than the federal RFG program. Since these programs were promulgated, MTBE has become the oxygenate of choice for most petroleum manufacturers. These developments, in confluence with related federal and state programs regarding USTs, set the stage for the current MTBE debate.

D. Recent Regulatory Developments.

Although initiatives against MTBE are either underway or completed in several states (most notably in corn-producing Iowa, which furnishes much of the biomass for ethanol), California’s activities have attracted the most attention. In 1986, Santa Monica, Calif., closed down a substantial amount of its municipal water supply, claiming that its wells were contaminated with gasoline constituents, including MTBE, which leaked from USTs. Since that time, Santa Monica has been buying alternative water supplies for a large number of its citizens. The problem attracted the attention of Senator Barbara Boxer, who wrote a letter to EPA Ad-
ministrator Carol Browner. In the letter, Senator Boxer stated that “[t]he city of Santa Monica is faced with a critical public health hazard—contaminated drinking water.” Senator Boxer asserted that high levels of MTBE had been detected in the city’s wells and advised that “[t]he chemical is thought to be getting into reservoirs from boat exhaust and possibly windblown emissions, and is leaching into wells from leaking underground storage tanks.” She stated that Santa Monica was “forced to shut down half of its usual water supply” because of the contamination threat, and urged EPA to establish standards for allowable levels of MTBE in drinking water to address this “problem of national significance.” Additional MTBE concerns arose after contamination was discovered in the Lake Tahoe area.

In 1997, in response to complaints that MTBE was contaminating many California lakes, reservoirs and groundwater, federal and state initiatives commenced aim at easing requirements to add oxygenates to gasoline. In California, the legislature passed the “MTBE Public Health and Environmental Protection Act of 1997,” which required regulators to study MTBE and its potential health impacts. The bill also gave the governor authority to ban MTBE if the substance was deemed “significantly harmful.” Thereafter, University of California researchers reported widespread MTBE contamination throughout the state, primarily due to leaking USTs, and that cleanup of the pollution would be costly and technically challenging. The researchers also concluded that MTBE poses a health threat to the public because some studies linked MTBE to cancer in animals.4

On March 25, acting pursuant to his statutory authority, Gov. Gray Davis of California ordered the phase out of MTBE in gasoline. He ordered the regulatory agencies to devise a plan to remove MTBE from California’s gasoline by Dec. 31, 2002. The governor recognized the benefits that oxygenates may confer in reducing air pollution, but insisted that clean air would not come at the expense of clean water. The governor’s actions, however, cannot take immediate effect because enforcement would require a waiver of the federal Clean Air Act’s oxygenate mandate for fuels sold in California’s most polluted areas. Additionally, the viability of ethanol as an alternative to MTBE must be thoroughly explored, and the California Air Resources Board must adopt its next phase of reformulated fuel requirements. Nevertheless, on July 2, the California Energy Commission approved a staff report affirming the Dec. 31, 2002, deadline for removing MTBE from gasoline. Some dissatisfied environmental groups have argued that the three-year phase out period is too long. They also want the governor to list MTBE under California’s Safe Drinking Water and Toxic Enforcement Act of 1986, commonly known as “Proposition 65.” Chemicals so listed are labeled as “known by the State of California to cause cancer or birth defects.”

On the federal front, on Nov. 30, 1998, the U.S. EPA administrator appointed a Blue Ribbon Panel to examine the issues surrounding the use of oxygenates in gasoline—primarily MTBE—because of concerns raised by the discovery of MTBE in some water supplies. The panel was commissioned to investigate the air quality benefits and water quality concerns associated with oxygenates in gasoline, and to recommend ways to maintain air quality while protecting water quality. The panel met several times and heard testimony on the University of California study and other reports on MTBE. Subsequently, it released its own report July 27, finding (1) that “MTBE is currently an integral component of the U.S. gasoline supply both in terms of volume and octane,” and (2) that reformulated gasoline “provides considerable air quality improvements and benefits.”5 Additionally, the panel stated that it “was not constituted to perform an independent comprehensive health assessment” and, instead, chose to rely on reports from various health agencies.6 Nonetheless, it called on U.S. EPA to work with Congress and the states to implement a four-part package of reforms because, in the panel’s opinion, it was clear “that MTBE is more likely to contaminate ground and surface water than the other components of gasoline because of its persistence and mobility in water.”7 Based on its findings, the panel:

- Recommended a comprehensive set of improvements to the nation’s water protection programs, including a number of specific actions to enhance underground storage tank, safe drinking water, and private well protection programs;
- Agreed broadly that use of MTBE should be reduced substantially (with some members supporting its complete phase out), and that Congress should act to provide clear federal and state authority to regulate and/or eliminate the use of MTBE and other gasoline additives that threaten drinking water supplies;
- Recommended that Congress act to remove the current Clean Air Act requirement—that 2 percent of RFG, by weight, consist of oxygen—to ensure that adequate fuel supplies can be blended in a cost-effective manner while reducing usage of MTBE; and,
- Recommended that the EPA seek mechanisms to ensure that there is no loss of current air quality benefits. Efforts are also underway to pass federal legislation banning or restricting the use of MTBE, but none of those bills has been reported from the committee.8

E. Recent Litigation Developments.

The first major volley in national UST litigation commenced when an Alabama state court “conditionally certified” a nationwide class action of property owners against numerous oil companies and other defendants in 1996. As permitted by Alabama state court procedure, the “conditional” certification order was issued as an ex parte order before any of the defendants were served with process. The order certified a class comprising all individuals and businesses owning property within 250 feet of a site that contains a leaking underground petroleum pipe or storage tank. Although the case was removed to federal court, the certification order remains in effect, thereby including most property owners participating in the class action.

5 See The Blue Ribbon Panel on Oxygenates in Gasoline, Executive Summary and Recommendations, 2-3 EPA (July 27, 1999).
6 Id. at 3.
7 Id. at 3-7. Although several members of the EPA Panel said the use of MTBE should be phased out completely, others disagreed. Some members said EPA should not rush to limit the use of MTBE because (1) environmental risk to drinking water from leaking underground storage tanks will be reduced to manageable levels as the RCRA UST regulations become fully implemented and enforced, and (2) no public health risk associated with MTBE has been identified.

damage claims of potential UST plaintiffs within its ambit. After a delay partially resulting from attempts to mediate a settlement, discovery is now proceeding.

Hot on the heels of the University of California report, a California environmental group sued several major oil companies on Aug. 6, 1998, claiming that the companies’ negligent distribution of MTBE was “recklessly contaminating California’s drinking water.” The plaintiff accused the companies of placing profits above the health of residents by failing to ensure that gasoline storage and distribution systems were secure from leaks, and of failing to warn residents that exposure to MTBE was harmful. The suit asserted claims under California’s Unfair Competition Act, the California Fish and Wildlife code, and the California Water Code. Plaintiff argued that the companies should be held accountable as responsible parties and “be forced to disgorge all profits made from this illegal business venture.” This action has recently been expanded by joining additional defendants and remains pending in California state court.

Shortly thereafter, another California lawsuit was filed, this time claiming damages from MTBE contamination in the Lake Tahoe area. The plaintiff is a public utility district that supplies water to the area. The suit contends that MTBE has contaminated the drinking water sources in the area and seeks damages from the companies allegedly responsible for the contamination.

Another MTBE action was filed in Maine last year. This suit seeks to certify a class action against certain defendants which supplied gasoline or MTBE to locations in Maine. The suit claims damages on behalf of a class of persons whose health and properties allegedly have been adversely impacted by water polluted with MTBE. The case was initially removed to federal court but has now been remanded to state court for proceedings on the merits.

On Aug. 5, yet another lawsuit was filed in California. In this lawsuit, the plaintiff is the City of Dinuba, which is responsible for purveying drinking water for the homes of residents in and around Dinuba, Calif. This suit seeks to recover funds needed to secure alternative water supplies, to treat MTBE contaminated water and to assure that the companies allegedly responsible for the contamination—and not the city’s customers—bear the expense.

Finally, on Sept. 22, EPA issued a unilateral administrative order to Shell Oil Co., Shell Oil Products Co., and Equilon Enterprises L.L.C. to provide replacement drinking water to Santa Monica and the Southern California Water Co. for a period of five years beginning Jan. 7, 2000. This enforcement action was taken as a result of releases of MTBE and other gasoline constituents from a few gasoline stations, in one of which Shell Oil, Shell Oil Products, and Equilon had a leasehold interest. This latest action was taken in response to Santa Monica’s shutting down half its water supply because of MTBE contamination, as related by Sen. Boxer in her letter to Browner at EPA.

**F. International Law Developments.**

Last but not least, the MTBE controversy recently migrated to the international arena when a Canadian company, Methanex Corp., which manufactures and exports MTBE to California, filed a Notice of Intention with the United States seeking damages of $970 million under the North American Free Trade Agreement (NAFTA). Under NAFTA, the United States is responsible for state actions. Methanex seeks damages under NAFTA’s expropriation provisions based upon California Governor’s decision to phase out MTBE. Methanex believes that the California decision to ban MTBE is a breach of Article 1110 under Chapter 11 of NAFTA, which governs expropriation and compensation. According to Methanex, the California action amounts to an expropriation of its business when there are more appropriate alternatives short of an outright ban. The company contends that improved UST management, more stringent boat-engine emission standards, and managed recreational use of lakes and reservoirs “would address the root cause of the issue by substantially reducing gasoline releases to the environment.” The claim for damages includes losses resulting from $150 million in stock value declines since California’s announcement, and loss of profits based on reduced sales volumes, reduced pricing, and increased costs due to the ban. Under the NAFTA settlement process, Methanex and U.S. representatives may negotiate a settlement. If no settlement is reached before Sept. 25, the matter will go to arbitration.

**II. Importance of the RCRA UST Deadlines**

These developments regarding MTBE occur in the shadow of thousands of USTs that have not complied with EPA’s Dec. 22, 1998 deadline to comply with all RCRA regulations designed to prevent, detect, and clean up releases from USTs containing petroleum products or certain listed hazardous substances. Last year, December 22nd held more significance than being just “three days before Christmas.” The regulations, which were issued in 1988, provided a 10-year compliance window—a window that, according to the EPA, abruptly slammed shut on Dec. 22, 1998. Through the EPA’s enforcement strategy, it may seek to shut down non-complying UST operations or impose fines and other penalties available under RCRA. States also are developing their own enforcement strategies.

Even more important, however, is the likelihood that the number of leaking UST sites requiring corrective action will increase substantially. Through 1997, states reported more than 300,000 confirmed UST releases and that number is increasing as owners and operators discover additional contamination during compliance activities. Since all such releases will be (or should be) reported publicly, the scope of the UST problem in the United States may expand exponentially and a new wave of civil litigation is almost certain to follow—litigation that will seek damages for remediation, property value diminution, and adverse health effects. MTBE contamination stands at the center of many of these cases. Counsel who represent persons allegedly damaged by UST releases, as well as those who repre-
sent UST owners and operators, have a vested interest in understanding these regulatory requirements.

This section discusses the EPA regulations with which UST owners and operators were required to comply by the December 1998 deadline. The origins, provisions and requirements are reviewed and analyzed, and the impact of the regulations on pending and future civil litigation is discussed. Concepts such as Risk-Based Corrective Action (RBCA) and “brownfields” are also evaluated with a view toward their relevance in litigating claims filed by plaintiffs damaged by UST releases.


“Out of sight, out of mind” is a philosophy that may prove disastrous when it is applied to USTs. Under certain circumstances, leaking tanks can cause fires, explosions, and adversely affect people’s health. In addition, UST leaks can contaminate nearby soils, surface waters, and groundwater. Public water supply wells have been shut down in some areas to protect water supplies.

To address these problems, Congress directed the EPA in 1984 to establish regulatory programs to prevent, detect, and clean up releases from UST systems containing petroleum or hazardous substances. Consequently, the EPA developed UST regulations which it promulgated in 1988. Although the EPA’s regulations authorize states to take the lead role in implementing and enforcing these regulations (most states have developed their own administrative procedures and set statewide cleanup levels), the EPA set a national deadline of Dec. 22, 1998 for upgrading, replacing, or closing all substandard UST systems. That deadline passed about ten months ago. The EPA’s administrator, Carol Browner, announced in May 1997 that the EPA would not extend the deadline because such an extension would not be fair to tank owners who already complied with the rules. Tom Fields, then-acting assistant administrator for the EPA’s Office of Solid Waste and Emergency Response, echoed Carol Browner’s statement at a Dec. 22, 1997 press conference. True to their word, on Dec. 22, 1998, the deadline expired after UST owners and operators had a full 10 years to comply with the regulations. Thus, beginning on Dec. 23, 1998, UST owners and operators who are out of compliance are subject to fines of $10,000 per day for every day their UST systems are not in compliance.

Currently, it is estimated that there are about 2 million USTs scattered among 750,000 locations. Of these 2 million USTs, 892,000 are currently in operation. On Dec. 9, 1998, the EPA estimated that only about 500,000 or 56 percent of the operational UST systems had been upgraded by the deadline. As of Sept. 15, the EPA estimates that about 80 percent of the regulated universe of UST systems have been upgraded. Thus, about 178,000 UST systems still need to be upgraded, replaced or closed, a number that EPA expects to increase.

Since the deadline passed last year, the EPA has undertaken a number of non-enforcement-related efforts to address the many USTs that were not, and are not, in compliance. However, the EPA retains the authority to take judicial enforcement action in situations involving recalcitrant parties. It is the EPA’s position that stations not in compliance with these regulations should be temporarily closed until the work necessary to upgrade, replace, or permanently close them is completed. Alternatively, the EPA may refer the matter to the state UST implementing agency where the state has the authority to shut down non-compliant UST systems without initiating administrative or judicial proceedings. Nonetheless, the EPA has taken a number of steps (other than enforcement) to address the many USTs not in compliance. The EPA is continuing its compliance assistance efforts by providing information and identifying sources of financing for upgrading, closing or replacement. During the first half of 1999, the EPA has focused its resources on:

- federal facilities;
- owners and operators of multiple UST facilities;
- owners and operators of large facilities with multiple USTs; and
- facilities that are endangering sensitive ecosystems or sources of drinking water by failing to upgrade, repair or close USTs.

Conversely, the EPA did not focus its resources on the following types of facilities:

- facilities that are not in operation;
- owners and operators of UST facilities with only one tank;
- facilities that are not endangering sensitive ecosystems or sources of drinking water.

References:

17 40 C.F.R. § 280.21(a).
18 Memorandum from Carol M. Browner, EPA Administrator, to Regional Administrators 1 (May 14, 1997) (on file with author).
19 EPA Assistant Administrator Tim Fields, Remarks at a Press Conference (Dec. 22, 1997).
20 RCRA § 9006(d), 42 U.S.C. § 6991e(d).
21 See Memorandum from Steven A. Harman, EPA Assistant Administrator, to Regional Administrators 3 (Dec. 9, 1998) (on file with author) (discussing EPA’s strategy for enforcing the regulatory requirements applicable to underground storage tanks as of December 1998).
22 Achieving Clean Air and Clean Water: The Report of the Blue Ribbon Panel on Oxygenates in Gasoline, 46 EPA (Sept. 15, 1999) (citing unpublished data submitted by states on Feb. 28, 1999 and April 30, 1999). By the end of 2000, EPA estimates that only 90 percent of regulated tanks will be upgraded. Id. Thus 10 percent of regulated USTs are not expected to be upgraded.
23 The UST Corrective Action Program, EPA Fact Sheet (Sept. 23, 1997). As of the end of 1997, there had been 321,773 confirmed releases. At these sites, 292,446 cleanups have been initiated but only 178,297 cleanups completed. What has EPA’s Office of Underground Storage Tanks (OUST) accomplished?, EPA Fact Sheet (Sept. 30, 1998).
24 EPA’s Strategy for Enforcement of Regulatory Requirements Applicable to Underground Storage Tanks (UST) Facilities, 3 (Aug. 10, 1998) (declaring the willingness to use all the enforcement tools available for dealing with UST violations, including; (1) judicial enforcement actions with recalcitrant owners; (2) filed citations for a limited time after the deadline passed; or (3) administrative orders under RCRA §§ 7903, 9003(b), or 9006, where the inspection indicates a release has occurred and EPA decides to order a cleanup or seeks temporary or permanent injunctive relief).
25 Id.
26 See Harman Memorandum, supra note 21, at 1-2. Some states have developed assistance programs for UST owners with many programs targeted at small businesses. These programs include grants, direct loans, and loan guarantee programs. In addition, the federal government has several programs that may provide assistance to UST owners. These programs are run by the Small Business Administration, Rural Development Administration, Economic Development Administration, and Administration for Native Americans. Id.
small UST facilities (c tanks) owned and operated by one person who does not own or operate other regulated UST facilities; and

USTs owned and operated by local government and state agencies (i.e., school districts, fire departments and police departments).  

B. Origins of the UST Regulations.

Unlike President Jimmy Carter, when Congress originally enacted RCRA in 1976, it did not have LUST in its heart. However, this changed in 1984 when Congress passed the Hazardous and Solid Waste Amendments (HSWA) to RCRA and President Reagan signed them into law. In Title IV of the Amendments, Congress established a new program, Subtitle I, specifically devoted to the regulation of LUST, or leaking USTs. This program encompasses the majority of USTs (and the piping connected to them) that store petroleum and hazardous substances that are not also regulated as a hazardous waste. Under Subtitle I, all federally regulated USTs must:

- be registered;
- meet leak detection requirements;
- meet upgrade requirements (i.e., spill, overfill, and corrosion protection) by Dec. 22, 1998;
- meet financial responsibility requirements;
- perform a site check and corrective action in response to leaks, spills and overfills;
- replace or close USTs that did not meet the upgrade requirements by Dec. 22, 1998;
- follow the regulatory rules during installation of new tanks and closure of existing tanks;
- maintain records as required; and
- have periodic checks performed on their corrosion protection and leak detection systems.

However, RCRA’s regulation of USTs is not unlimited. It does not include heating oil tanks or other specifically exempted underground tanks. With that said, state law may nonetheless regulate some types or uses of tanks that RCRA exempts; therefore, care must be taken to look at both state and federal laws. These regulations also only apply to “owners” and “operators” of USTs, as defined by RCRA. Finally, private parties, such as neighboring land owners affected by the off-site migration of petroleum from tank leaks, are now able to seek enforcement of RCRA, injunctive relief, and other damages that arise out of a release of petroleum from a UST by using the citizen suit provision of RCRA. However, the damages that can be recovered using RCRA citizen suits are limited. It does not provide for recovery of past remediation costs, property damages, or other damages arising from the operation of USTs. Accordingly, RCRA citizen suits are available only to impose liability on owners or operators of USTs to (1) pay for future costs of cleaning up leaking USTs, or (2) force them to conduct remediation of leaking USTs themselves.

C. UST Regulations—Provisions and Requirements.

1. Requirements for New UST Systems

To prevent releases due to structural failure, corrosion or spills and overfills, the EPA requires new tanks and connected piping to be designed and manufactured to meet specific standards. For example, any portion of a new tank that is underground which routinely contains a product must be protected from corrosion according to standards of a nationally recognized organization or an independent testing laboratory. Specifically, new tanks and piping must be constructed of fiberglass-reinforced plastic or, if constructed in steel, then the tank must be coated and cathodically protected or clad with fiberglass. New UST systems must also be installed according to the standards of a nationally recognized organization or an independent testing laboratory. Upon installation, tank owners and operators must be able to demonstrate that the system was properly installed by showing that

- the tank was installed by a person certified by tank and piping manufacturers or certified by the implementing agency;
- the installation was inspected by a registered professional engineer with education and experience in UST systems or installation;
- the installation was inspected and approved by the implementing agency;
- all work listed in the manufacturer’s installation checklist has been completed; or

27 Id. at 2-3
28 Referring to President Jimmy Carter’s statement that he had “looked on a lot of women with lust . . . [and he had] committed adultery in my heart many times.” Robert Scheer, Jimmy Carter: A Candid Conversation with the Democratic Candidate for the Presidency, Playboy, Nov. 1976.
29 RCRA § 9001(1) & (2), 42 U.S.C. § 6991 (1) & (2) (defining the terms “underground storage tank” and “regulated substance”); 40 C.F.R. § 280.12 (defining the terms “hazardous substance UST system” and “regulated substance”).
30 40 C.F.R. § 280.22(a).
31 40 C.F.R. § 280.43 - 280.44.
32 40 C.F.R. § 280.21 & 280.30.
33 RCRA § 9003(c)(6), 42 U.S.C. § 6991b(c)(6); 40 C.F.R. § 280.93 (demonstrating that they are able to clean up a site if a release occurs, correct environmental damage, and compensate third parties for injury to their property or themselves).
34 RCRA § 9003(c)(4), 42 U.S.C. § 6991b(c)(4); 40 C.F.R. § 280.71.
35 RCRA § 9003(c)(5), 42 U.S.C. § 6991b(c)(5); 40 C.F.R. § 280.71.
36 40 C.F.R. § 280.20(d).
37 RCRA § 9003(c)(2), 42 U.S.C. § 6991b(c)(2); 40 C.F.R. § 280.34.
38 40 C.F.R. § 280.31(b) & 280.43 - 280.44.
39 RCRA § 9001(1), 42 U.S.C. § 6991(1); 40 C.F.R. § 280.10.
40 See e.g., Ill. Admin. Code tit. 35, § 107.103 (defining the term “underground storage tank” to include tanks [except for those on farms or residential units] that are used exclusively to store heating oil for use on the premises).
41 See RCRA § 9001(3) & (4), 42 U.S.C. § 6991(3) & (4).
42 See RCRA § 7002(a), 42 U.S.C. § 6972(a) (setting forth citizen standing to enforce regulatory obligations or to address threats to environmental health and safety); See also Maher and Harvey, “Liability Issues in Private RCRA Suits Over Leaking Underground Storage Tanks,” Chemical Waste Litigation Reporter, Vol. 30, No. 4, (Sept. 1995).
43 See Meghrig v. KFC Western Inc., 116 S.Ct. 1251 (1996) (holding that RCRA does not provide for the recovery of cleanup costs when the cleanup is completed before suit is filed).
■ the installation complied with another method approved by the implementing agency to insure regulatory compliance.47

New tanks must also be able to prevent spilling and overfilling during the transfer of products to and from the tanks. This is done by installing spill and overfill prevention equipment. To contain spills, USTs must have “catchment basins.”48 Catchment basins are also called “spill containment manholes” or “spill buckets.” Basically, these are buckets that are sealed around the fill pipe. They should be large enough to contain a spill that may occur when a delivery hose is uncoupled from the fill pipe. The larger the bucket, the more spill protection it provides. The UST system must also have overfill protection.49 The three main types of overfill protection are automatic shutoff devices, overfill alarms and ball float valves. If, however, the UST never receives more than 25 gallons at a time, then it does not have to meet the overfill protection requirements.50

2. Upgrading Existing UST Systems

UST system upgrading consists of adding corrosion protection and installing devices to protect against spills and overfills. Federal rules require corrosion protection to be installed on existing UST systems because corrosion of unprotected steel and piping results in products being released through the resulting holes.51 When upgrading existing steel USTs, owners and operators have three options; the tanks can be (1) interior lined, (2) cathodically protected or (3) have an internal lining combined with cathodic protection.52 However, before a steel tank is cathodically protected, the integrity of the UST must be ensured using one of the following methods:

■ an internal inspection to ensure the tank is structurally sound and free of corrosion or holes;
■ a determination that the tank has been installed for less than 10 years and has been monitored monthly for releases in accordance with 40 C.F.R. §§ 280.43(d) - 280.22(b);
■ a determination that the tank has been installed for less than 10 years and is assessed for corrosion holes by conducting two tightness tests in accordance with 40 C.F.R. § 280.43(c)—the first occurring before cathodic protection is added and the second occurring three to six months after the cathodic protection begins operating; or
■ an assessment for corrosion holes is conducted using a method determined by the implementing agency to prevent releases in a manner that is no less protective of human health and the environment than those listed above.53

With respect to spill protection, existing tanks can be retrofitted with catchment basins, and overfill protection devices. Table 1 summarizes various upgrading options.

Leak detection is also required on all new or upgraded tanks and piping. The leak detection system used must allow a leak to be detected from any portion of the tank or its piping that routinely contains petroleum. It must also be installed, calibrated and maintained in accordance with the manufacturer’s instructions and meet the performance requirements set forth in 40 C.F.R. §§ 240.43 and 240.44.54 Table 2 summarizes the leak detection requirements.

### Table 1: UST System Upgrading Requirements

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Corrosion Protection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Tanks</td>
<td>1. Coated and Cathodically Protected Steel</td>
</tr>
<tr>
<td>3 Choices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Fiberglass</td>
</tr>
<tr>
<td></td>
<td>3. Steel Tank Clad with Fiberglass</td>
</tr>
<tr>
<td>Existing Tanks</td>
<td>1. Same Options as for New Tanks</td>
</tr>
<tr>
<td>4 Choices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Add Cathodic Protection System</td>
</tr>
<tr>
<td></td>
<td>3. Interior Lining</td>
</tr>
<tr>
<td></td>
<td>4. Interior Lining and Cathodic Protection</td>
</tr>
<tr>
<td>New Piping</td>
<td>1. Coated and Cathodically Protected Steel</td>
</tr>
<tr>
<td>3 Choices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Fiberglass</td>
</tr>
<tr>
<td></td>
<td>3. Another Approved Material</td>
</tr>
<tr>
<td>Existing Piping</td>
<td>1. Same Options as for New Piping</td>
</tr>
<tr>
<td>2 Choices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Cathodically Protected Steel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Spill/Overfill Prevention Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Tanks</td>
<td>■ Catchment basins</td>
</tr>
<tr>
<td></td>
<td>-and-</td>
</tr>
<tr>
<td></td>
<td>■ Automatic Shutoff Devices, or</td>
</tr>
<tr>
<td></td>
<td>■ Overfill Alarms, or</td>
</tr>
<tr>
<td></td>
<td>■ Ball Float Valves</td>
</tr>
</tbody>
</table>

47 40 C.F.R. § 280.20(e).
48 40 C.F.R. § 280.20(c).
49 Id.
50 40 C.F.R. § 280.20(c)(2)(ii) (many small used oil tanks fall into this category).
52 Id.
53 40 C.F.R. § 280.21(b)(2).
54 40 C.F.R. § 280.40(a).
55 See 40 C.F.R. § 280.20; see also, Upgrading UST Systems, EPA Fact Sheet (May 27, 1998).
TABLE 2: UST System Leak Detection Requirements

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Leak Detection Method</th>
</tr>
</thead>
</table>
This option can only be used for 10 years after installation then Monthly Monitoring is required. |
This option can only be used until Dec. 22, 1998; or 3. Monthly Inventory Control and Tank Tightness Testing Every 5 Years.  
This option can only be used for 10 years after adding corrosion protection or until Dec. 22, 1998, whichever is the later date. |
| New and Existing Pressurized Piping | A. 1. Automatic Shutoff Device, or 2. Flow Restrictor, or 3. Continuous Alarm System and  
B. 1. Annual Line Testing, or 2. Monthly Monitoring (except automatic tank gauging) |
| New and Existing Suction Piping | 1. Monthly Monitoring (except automatic tank gauging); or 2. Line Testing Every 3 Years; or 3. No Requirements |

Notes
- Monthly monitoring includes secondary containment with interstitial monitoring,
- automatic tank gauging,
- monitoring for vapors in the soil,
- monitoring for liquids on the groundwater,
- statistical inventory reconciliation (SIR), or other methods approved by the implementing agency

*56 Tanks 2,000 gallons and smaller may be able to use manual tank gauging.*

*57 Suction piping that does not require leak detection has two main characteristics, which must be readily determinable: 1. Below-grade piping is sloped so that its contents will drain back into the storage tank if the suction is released. 2. Each suction line has only one check valve which is located directly below the suction pump.*

3. Closing Existing UST Systems

Substandard UST systems must be closed in accordance with federal and state requirements if they store a regulated substance and were not upgraded by the Dec. 22, 1998 deadline. Moreover, for non-compliant UST systems, the EPA’s Blue Ribbon Panel on Oxygenates in Gasoline recently recommended that the EPA accelerate its enforcement activities. Specifically, the panel recommended having all states prohibit fuel deliveries to non-upgraded tanks, and adding enforcement and compliance resources to ensure prompt enforcement action, especially in area using MTBE.57

According to the regulations, substandard USTs may be closed temporarily or permanently.58 Owners and operators who decide to temporarily close a UST may do so for up to twelve months provided they:
- continue to monitor for leaks by maintaining the UST’s leak detection system (if the UST is empty, the leak detection system does not need to be maintained);
- continue to monitor and maintain any corrosion protection systems;
- quickly stop any detected releases, notify the implementing agency, and take appropriate action to clean up the site; and
- cap and secure all lines, pumps, manways, and ancillary equipment, except vent lines, if the UST remains open longer than three months.59

After 12 months, owners or operators have three options. They can:
- close the UST if it still does not comply with applicable requirements for new or upgraded USTs;
- seek a temporary closure extension from the implementing agency (this requires an assessment to be made to determine whether contamination is present at the site); or
- remain temporarily closed without an extension if the UST meets all applicable requirements for new or upgraded USTs, except for spill prevention and overfill.60

If the owner and operator decide to permanently close the UST, they must:
- notify the implementing agency at least 30 days before closing the UST;
- determine if contamination from the UST is present in the surrounding environment, and if it is present, take corrective action;
- empty the tank of all liquids, dangerous vapor levels and accumulated sludge, and clean the tank; and
- either remove the UST from the ground or leave it in place after filling it with a harmless, chemically inactive solid, like sand.61

If the owner or operator does not want to upgrade or close the tank, they can still use the UST to store non-regulated substances. If this option is chosen, they must empty and clean the tank and notify the implementing agency at least 30 days before making the change.62

4. Financial Responsibility

If the owner and operator of the UST are different persons, only one of them is required to demonstrate financial responsibility; nonetheless, both parties remain liable in the event of non-compliance.63 Regardless of which party complies, the amount of coverage required is determined by the characteristics of the owner.64 In demonstrating financial responsibility, owners and op-

---

56 See 40 C.F.R. § 280.41 - 280.44; see also, Leak Detection, EPA Fact Sheet (Nov. 23, 1997). EPA’s Blue Ribbon Panel on Oxygenates in Gasoline has recommended strengthening these requirements to enhance early detection of releases. See supra note 2, at 4.

57 See The Blue Ribbon Panel on Oxygenates in Gasoline, supra note 2, at 3.


59 40 C.F.R. § 280.70(a) - 280.70(b).

60 40 C.F.R. § 280.70(c).

61 40 C.F.R. § 280.70(a) - 280.70(b).

62 40 C.F.R. § 280.71(a) - 280.71(c).

63 40 C.F.R. § 280.90(e).

64 See 40 C.F.R. § 280.91.
operators may (1) obtain commercial environmental impairment liability insurance, (2) show that they are self-insured, (3) obtain guarantees, surety bonds, or letters of credit, or (4) place the required amount into a trust fund administrated by a third party, or rely on coverage provided by a state financial assurance fund. Table 3 shows the amounts of coverage required to demonstrate financial responsibility.

### 5. Reporting and Recordkeeping Requirements

Generally, the implementing agency must be notified:

- within 30 days after installing a UST;
- when there is a spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons or that causes a sheen on nearby surface water;
- within 24 hours of suspecting a release;
- within 24 hours of confirming a release;
- within seven days, 20 days, 45 days, or as soon as practical after certain corrective action activities; and
- 30 days before a UST is permanently closed or changes service.

It is prudent, however, to check the implementing agency’s regulations because of its authority to make additional reporting requirements or more stringent requirements than those noted above. Additionally, owners and operators must keep records and make them available to inspectors which prove that the UST system is in compliance with certain requirements. For example, leak detection performance and maintenance records must be kept, including the last year’s monitoring results, the most recent tightness test, copies of performace claims provided by leak detection manufacturers, and records of recent maintenance, repair, and calibrations of on-site leak detection equipment. Other records that must be kept include those showing

- required studies, inspections and tests of the corrosion protection system;
- repairs and upgrades to UST systems were done properly;
- compliance with release detection requirements;
- results of the site assessment required for permanent closure; and
- financial responsibility.

For operating UST systems, these records must be kept either at the UST site or at a readily available site. For UST systems that have been closed, the records can also be mailed to the implementing agency if they cannot be kept at the site, or an alternative site, as indicated above.

### 6. Responding to Possible Releases

When the results of a leak detection program indicate the possibility of a leak, the implementing agency must be notified within 24 hours. Then, within seven days, the owner or operator must determine whether the suspected leak is an actual leak. This is done by conducting a tightness test on the entire UST system and by checking the site for additional signs of contamination and the possible source of the contamination. If a leak is confirmed, the owner or operator must repair, replace or upgrade the UST system and begin corrective action. Corrective action taken in response to confirmed releases comes in two stages: short-term and long-term.

---

66 40 C.F.R. § 280.94.
67 RCRA § 9002(a)(3), 42 U.S.C. § 6991a(a)(3); 40 C.F.R. § 280.22 (requiring owners and operators on their notification forms to certify within 30 days of installation that the new UST system is in compliance with installation, cathodic protection, financial responsibility, and leak detection requirements).
68 See 40 C.F.R. § 280.50 (describing the circumstances under which a suspected release must be reported).
69 See 40 C.F.R. §§ 280.91 & 280.93; see also, Financial Responsibility, EPA Fact Sheet (Oct. 6, 1997).
Short-term actions may include (1) taking immediate steps to stop and contain the release, (2) reporting the release to the implementing agency, (3) ensuring that the release does not pose an immediate hazard to people, (4) removing petroleum from the UST to prevent further release, (5) investigating the extent of soil and groundwater contamination, and (6) removing free-product floating on the water table.88

Long-term actions are based on information provided to the implementing agency. Based on this information, the implementing agency will decide if additional action is required at the site. Additional action may include developing and submitting a Corrective Action Plan that shows how the implementing agency’s site requirements will be met and then implementing a corrective action plan approved by the implementing agency.86

F. Innovative Approaches to Corrective Action.

1. Using Risk-Based Decision Making

Risk-based decision-making is a process some implementing agencies allow. When it is used in a corrective action, it is known as RBCA (pronounced Rebecca), an acronym for risk-based corrective-action. RBCA refers specifically to the standard titled “Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites,” [E-1739-95]. This standard was published by the American Society for Testing and Materials (ASTM) Subcommittee on Storage Tanks. RBCA is a streamlined approach in which exposure and risk assessment practices are integrated with traditional components of the corrective action process to ensure that appropriate and cost-effective remedies are selected, and that limited resources are properly allocated.87 Its goals are to (1) protect human health and the environment, (2) apply practical and cost-effective risk-based decision-making, and (3) develop a consistent and technically-defensible administrative process.88 Currently, several states are already using risk-based approaches in their corrective action program and have issued guidance documents. Most of the other states are developing their RBCA programs and developing guidance documents.

Risk-based decision-making takes into account the relative risks a UST release may pose to human health and the environment. It uses site exposure assessment and risk assessments to assess a site’s current and potential risk and then applies this knowledge to develop a sound and appropriate corrective action plan for the site.89 For example, based on known or anticipated risks, an appropriate action for a site might include site closure, monitoring and data collection, active or passive remediation, containment, or institutional controls.90

2. Brownfields and Voluntary Cleanup Programs

There are literally tens of thousands of properties throughout the United States that have recently been labeled “brownfields.” Brownfields are abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.91 They are typically developed, abandoned and/or in a state of inactivity or disrepair, and they are generally located in otherwise properly developed areas. Abandoned or inactive gas stations are one type of property often considered to be brownfields. Because of the perceived or real contamination associated with these properties, prospective developers, lenders and owners are fearful they will be held liable for the cost to clean up the site. However, recent initiatives on both the state and federal levels have focused on remediating and redeveloping these areas, as well as addressing the liability issues associated with brownfields.

“USTfields” is an EPA initiative that is an offshoot of the brownfields initiative that is designed to clean up existing USTfields and to prevent future USTfields. Focus of the initiative is on abandoned or idled industrial and commercial UST facilities (including gasoline service stations and automobile and rental car lots) where expansion or redevelopment has been complicated by real or perceived contamination.92 It is believed that many brownfields sites involve USTs. In fact, Illinois estimates that half of that state’s brownfields sites are former UST sites.93 Moreover, the EPA believes that this number will increase as a result of the 1998 regulatory deadline.

To help clean up these site, EPA has promulgated a lender liability rule clarifying when a lender may be exempt from UST liability.94 The agency is working with states and municipalities to develop guidance that will provide some assurance that, under specified circumstances, prospective purchasers, lenders, and property owners do not need to fear cleanup liability.95 The state initiatives in this area have taken the form of “voluntary cleanup programs.” These programs are designed to provide limited liability protection to private parties that clean up brownfields sites.96 The EPA is also taking steps to diminish the fear of federal liability by modifying existing agreements with states that have voluntary cleanup programs. Through these modified agreements, the EPA is supporting state cleanup programs and essentially pledges that the successful cleanup of a site under the state’s program will also satisfy the EPA.97

Unlike the UST regulations, which require owners and operators of active UST systems to diligently discover and remediate contamination caused by tank and line leaks, RBCA and voluntary cleanup programs give property owners and developers an incentive to voluntarily assess a brownfield property and undertake to remediate any contamination found on the site. Both approaches, however, ultimately lead to the discovery of…
contamination caused by leaking USTs. While the EPA may agree to not sue the brownfield property owner who cleans up the site, it cannot stop persons allegedly damaged by the UST release from seeking damages for property value diminution and adverse health impacts. Consequently, a wave of litigation is almost certain to follow the cleanup of brownfields, just as it will the discovery of contamination as owners and operators comply with the UST regulations.

III. The Toxicity Problem

Immediately after the federal oxygenated fuel program commenced in 1992, there were reports, primarily from Alaska, but also from other states, such as Montana, New Jersey, and Wisconsin, that MTBE caused headaches, coughs, and nausea. Reduced fuel economy in some areas and concerns about engine performance were also reported. Further concerns were then raised about the detection of low levels of MTBE in groundwater samples. Finally, spurred by public health concerns, the EPA spent more than $12 million to investigate the alleged health effects. Unfortunately, the National Research Council (NRC) has concluded that “all of these studies have deficiencies, such as inadequate exposure assessment, insufficient sample size, objective outcome assessment, and the possibility of selection bias.”

After considering, the matter, an interagency task force was assembled to report on the issues. The purpose of the report was to “provide a review of the scientific information on oxygenated fuels and to assess effects of winter oxygenated fuels programs on air quality, fuel economy, engine performance, water quality, and public health.” Working groups were comprised of technical and scientific experts from across several federal agencies, as well as representatives from industry, state government, and environmental groups. The draft interagency report ultimately concluded that:

(A) Human exposure data to MTBE are too limited for a quantitative estimate of the full range and distribution of exposures to MTBE among the general population;

(B) Chronic non-cancer health effects (neurologic, developmental, or reproductive) would not likely occur at environmental or occupational exposures to MTBE;

(C) Experimental studies in rodents indicate that MTBE is carcinogenic in rats and mice at multiple organ sites after oral or inhalation exposure. The mechanisms by which MTBE causes cancer in animals are not well understood; and,

(D) While there are no studies on the carcinogenicity of MTBE in humans, based upon the animal data there is sufficient evidence to conclude that MTBE is either possibly or probably a human carcinogen. Estimates of human risk from MTBE contain large uncertainties in both human exposure and cancer potency.

In view of the interagency report’s conclusions regarding carcinogenicity, as well as for other reasons, EPA asked the NRC to assemble a committee to independently review the draft interagency report from the federal government. On March 15, 1996, the committee presented its report to the NRC. The report disagreed with the interagency task force on a number of matters, including the question of carcinogenicity, concluding, that:

(A) The interagency report did not use the standard “weight of evidence” methodology and reached its conclusions without discussing the long-term animal studies completely and comprehensively.

(B) Because of the inconsistencies and unresolved questions regarding animal carcinogenesis studies, the interagency report’s estimates of MTBE “cancer potency” should be considered cautiously.

(C) Regarding each category of animal studies where positive carcinogenic effects were found, the conclusions probably should not be used to infer that MTBE causes cancer in humans.

For example, although the committee recognized that data showed an increase in kidney tumors in male rats exposed to MTBE, the committee found that new information that the probable cause of this tumor was by a particular male sex hormone unique to rats. The tumors were not found in female rats or even in another subspecies of rat. Although animal studies also found increases of lymphomas and leukemias (combined) in one strain of female rats exposed 1000 mg/kg of MTBE, no such results were found for either male or female rats at exposures of 250 mg/kg. Neither sex showed an increase when exposed to air levels as high as 8,000 ppm of MTBE—even though the strain of rats used in the test (F344) is particularly susceptible to leukemia. Finally, similar patterns were not observed in mice, a species that is presumably more closely related to rats than humans. Because of these inconsistencies, which are rare in rodent studies, the committee concluded that in-depth investigations, including a review of the pathology slides themselves, were necessary before the rodent data should be used in risk assessment.

On Sept. 15, 1999, the EPA’s Blue Ribbon Panel on Oxygenates in Gasoline reported that although there is some evidence that fuels containing MTBE could irritate the eyes, cause headaches and rashes, there is no proof that any of these effects are attributed to MTBE alone. To quantify MTBE’s health effects, the EPA’s Health Effects Institute and at the Chemical Industry Institute of Toxicology are conducting human and animal health effect studies. It is known, however, that once MTBE in water reaches 20 to 40 micrograms per liter, the water begins to taste and smell like turpentine and can make the drinking water unacceptable to consumers, however, this level of MTBE in drinking water is not expected to cause adverse health concerns for the majority of the population.

Information currently available from MTBE studies show that possible adverse health effects, such as cancer, have not been detected in animal ingestion studies below 250,000 micrograms per kilogram animal body weight and height; a level much higher than the MTBE taste and odor threshold. Likewise, TBA, a major metabolite of MTBE regardless of the route of exposure, did not produce carcinogenic effects in animal testing except at high levels of exposure—1,250,000 micrograms per liter and

99 Id., at 2.
100 Id., at 158-160.
103 Id.
higher. Nonetheless, it is uncertain whether these health effects can be extrapolated to humans, and currently both the International Agency for Research on Cancer (IRAC) and the National Institute of Environmental Health Sciences (NIEHS) indicate that there is not enough information at this time to consider MTBE a probable or known carcinogen.

As can be seen above, the issue of MTBE carcinogenicity, clearly raises one of the primary concerns in toxic tort litigation, namely, the relevance of animal studies to determine causation in civil litigation. Even among mammalian species, there are many biologic and biochemical differences. Indeed, there are substantial differences in responses, even among apparently similar species of rodents, such as rats and mice, and even within subspecies of the same species.

These variations are not uncommon, but if extrapolation between animal species is a delicate exercise, extrapolations from animals to humans raise even greater questions. For example, the following results are obviously bewildering:

(A) differing findings regarding carcinogenicity between rats and mice similarly exposed to 1,3-butadiene, and variations between sexes among the same species;

(B) production of nasal carcinomas uniquely in rats after inhalation exposure to formaldehyde;

(C) the development of kidney tumors associated with exposure to 2,3,5-trimethylpentane and d-limonene uniquely in male rats;

(D) liver tumors production in some rodent species from “peroxisomal pro-liberators” such as the antilipemic drug clofibrate and the common solvent trichloroethylene; and

(E) the high resistance of mice to the carcinogenic effects of the fungal toxin aflatoxin B1 in the liver, while low doses produced significant excesses of liver tumors in rats.

It is now generally recognized that the introduction of a chemical agent into a living system results in bio-transformation products when the substance is absorbed and metabolized. However, adverse or toxic effects in the living system are not produced by a chemical agent unless that agent or its biotransformation products reach appropriate sites in the body at a concentration and for a length of time sufficient to produce the toxic manifestation. Whether or not a toxic response occurs is dependent on (1) the chemical and its physical properties; (2) the exposure situation; (3) how the chemical agent is metabolized by the living system; and (4) the overall susceptibility of the living system.

Different species also have different metabolic processes and products, and absorption and metabolism may differ radically from species to species. Consequently, chemical agents are toxicologically selective. Selective toxicity means that a chemical can produce an injury to one living system without harming another even though the two living systems may co-exist. Therefore, we need to know if a substance produces the same metabolite in animals and humans because only through a thorough understanding of these differences can the relevant of animal data to human response be verified. If the response is not the same in both the animal and man, then a toxic finding in the animal bioassay may have little relevance to what might occur in a human. Under such circumstances, the bioassay would have been conducted in what is now termed an “inappropriate animal model.” For example, we know that butadiene metabolizes differently in rodents, monkeys, and humans. Thus, reliance on butadiene studies of monkeys and rodents are based on inappropriate animal models and the data is unhelpful for understanding toxicity to humans. “In other words, Man is not a big mouse.”

If researchers cannot reliably predict carcinogenic effects within a species, between genders of the same species, or between similar species, the utility of animal studies to show causation in toxic tort litigation is doubtful.

Another example of gender differentiation arose when mice were studied after exposure to unleaded gasoline. In the male mice, but not in the female mice, researchers found kidney lesions suggesting a precancerous condition. After considerable investigation to verify and clarify the result, researchers finally concluded that, like MTBE, some components of gasoline interacted with the sex pheremones of male mice. Of course, the sex pheremones of male humans and male mice are (thankfully) dissimilar. Hence, the finding of precancerous conditions in mice cannot reasonably be used to infer causation in humans.

Additionally, animal studies may find a connection to cancer—but find the connection in organs that are unique to rodents. One of the more famous examples arose in a study of female rats exposed to benzene. In that study, female rats which ingested benzene daily for a year developed “zymbal gland” tumors. Zymbal glands are found only in rats. Neither mice, an apparently similar species, nor man, a more remote mammal, have zymbal glands. Even more curiously, the zymbal gland tumors were observed only in the female rats—male rats were inexplicably spared. If researchers cannot reliably predict carcinogenic effects within a species, between genders of the same species, or between similar species, the utility of animal studies to show causation in toxic tort litigation is doubtful.

Lastly, animal studies usually involve higher exposures than humans will ever encounter. To reach con-

---

104 Id.
105 Id. at 76-77. Nonetheless, the Northeast States for Coordinated Air Use Management (NESCAUM) have decided to consider MTBE as a carcinogen for comparative risk purposes because of the “documented animal carcinogenicity and equivocal evidence of human carcinogenicity.” RFG/MTBE: Findings and Recommendations, 19 NESCAUM (August 1999).
107 Id. at 15.
108 Id. at 25 (noting that large differences in carcinogenic response between experimental animal species are not unusual).
conclusions about human carcinogenicity, researchers “extrapolate” data from the higher doses given to the ani-
mals to lower doses encountered by humans. Extrapolation is an inherently unreliable process for de-
termining causation in civil litigation. There are hun-
dreds (some would say thousands) of substances that
are known to cause cancer in animals—but less than 30
are known to cause cancer in humans. This disparity is
conclusive proof that animal studies are insufficiently
accurate predictors of human carcinogenicity for pur-
poses of general scientific forecasts as well as civil li-
gation. Researchers tend to expose animals to the “Maxi-
mum Tolerated Dose” (MTD)—exposures slightly be-
low levels that produce significant acute effects, but low
enough that most animals survive the full exposure pe-
riod.110 In some of the MTBE studies, the MTD was
many, many times higher than any human will probably
ever experience occupationally or environmentally. As
one author has noted:

While the MTD may not produce any overt adverse effects
of consequence, the test animal is clearly stressed and deals
with this biological stress by attempting to replace dam-
aged cells at a much increased rate. Cell division is termed
“mitosis.” The induction of mitosis is called “mitogenesis.”
More rapid mitosis increases the probability of a genetic de-
fect in a cell that could progress to a tumor or cancer. Thus
the phrase “Mitogenesis Begets Carcinogenesis.””111

This concept has been the subject of considerable pub-
lication in the toxicologic literature, and has figured
strongly in the Texas Supreme Court’s decision in Mer-
rell Dow Pharmaceuticals Inc. v. Havner.112 In that
case, the Texas Supreme Court questioned studies
which found an association between Bendectin and
birth defects in rats where the rats were dosed with 100
milligrams per kilogram daily—the equivalent of a daily
dose of 1200 tablets for a woman weighing 132 pounds.

The assumption of proponents of the use of animal
studies to show causation in tort cases that, in the ab-
sence of proof to the contrary, “there is no safe level of
exposure” to a carcinogen, is a regulatory policy, not
scientific proof. The policy of protecting public health
with which regulatory agencies are charged and the sci-
entific inconclusiveness regarding exposure to many
substances necessarily results in more conservative ex-
posure standards and the use of the no-threshold
model. The rationale for such conservatism is “above
all, do no harm.” 113 The regulatory policies, however,
are notably different from tort policies that require a de-
termination of the level of exposure at which actual risk
or causation occurs in order to ensure compensation is
afforded only where harm more probably than not was
done.114 Certainly, given the unreliability of animal
studies regarding MTBE carcinogenicity, there is no
evidentiary basis for concluding that MTBE causes can-
cer in humans.

110 The National Toxicology Program’s (NTP) Bioassay Pro-
gram currently defines the MTD as the dose that suppresses body
weight gain slightly (about 10 percent) in a 90-day subchronic
study.
111 Scott, supra at F-14.
112 553 S.W.2d 706 (Tex. 1997).
113 See Reference Manual on Scientific Evidence, at 193, n.32.
114 See Allen v. Pennsylvania Engineering Corp., 102 F.3d 194,
198 (5th Cir. 1996).

IV. Recoverability of ‘Stigma’ Damages

To be sure, environmental contamination can have
real consequences—damages to property surfaces, sub-
soil, and groundwater—not to mention injuries and ill-
nesses under certain circumstances. When the damage
results from a true impact of a contaminant, such as
MTBE, on an otherwise pristine and healthy environ-
ment, few persons argue that, as a general rule, liability
should not be imposed on the person responsible for
causing the impact. Environmental law is written in
black and white for those cases.

But what happens when there is no physical impact
between the contaminant and the property? What if you
represent the owners of neighboring property—owners
that are upset because, according to their perspectives,
their property values have diminished just because of
their proximity to an environmentally contaminated
site? Of course, none of the owners plan to sell their
properties. They only want to recover damages for the
“stigma” raised by the presence of a nearby contami-
nated site. Even if the site has been remediated, the
owners may still be concerned because, in their minds,
the “stigma” persists long after the cleanup is finished.
There are two fundamental questions raised by this sce-
nario. First, as a matter of fact, have these owners sus-
tained an injury? Secondly, as a matter of law, is this
type of injury one for which the law allows the recovery
of damages?

Factually, as a general marketplace rule, a property
owners’ mere concern about the reaction of a specula-
tive future purchaser is not compensable. This is simply
a ‘paper loss’ that, like fluctuations in stock prices, has
no real economic consequences. The real estate market
is a dynamic market, like the stock market, and this
year’s “paper losses,” whether caused by the “stigma”
of nearby environmental contamination or some other
event, may be erased by next year’s “paper gains.” True
losses occur only when actual sales take place. Only
then is there a measurable economic impact. In this
sense, there is really no empirical “injury” that results
from pre-sale environmental stigma.

Legally, in the absence of such an empirically demon-
strated “injury,” property value diminution from the
stigma of nearby environmental contamination should
not be compensated in damages. In the absence of mar-
ketplace experience shown by the results of a real
transaction—not a fictional future deal—advocates of
stigma damages ask the system to speculate about what
might or might not occur when, if ever, the “injured”
owners decide to sell their properties. They ask for a
present award of damages that may never be realized if,
for example, property values rebound over time after
remediation. Viewed in this perspective, the concept of
pre-sale stigma damages is dangerously speculative and
fraught with the potential for abuse and confusion.

This section surveys the problem of stigma damages
by (i) examining the underpinnings of the concept from
economic and legal perspectives, (ii) reviewing the au-
thorities, including those arising from “related” areas,
such as eminent domain and tax valuation, and (iii) tak-
ing a realistic look at how and why courts have failed to
reconcile “stigma” damage claims with conventional
tort damages, and (iii) proposing a solution based upon
proof of empirically demonstrated economic loss, as op-
posed to the vagaries of a fluctuating real estate market.
A. The Trap of Terminology.

Almost everyone will tell you that they know the meaning of “stigma.” But like other problematic legal concepts, such as obscenity, useful definitions are elusive. In classical Greek, a “stigma” is an identifying “mark” that singles out a person or thing, or class of persons or things, in a distinctly individual manner. In the classical sense, “stigma” did not necessarily have a derogatory connotation. That remains true in some modern contexts, but in environmental law, the term is invariably demeaning. Aside from that commonality, authorities vary widely regarding the true meaning of the term in an environmental context. For example, “stigma” has been variously described by real estate experts as: (i) “[t]he value impact of uncertainties . . . resulting from the presence or assumed presence of an environmental risk,”115 (ii) “[a]ll of the risk, hazard and uncertain consequences of contamination, which increase the costs of attracting capital to a contaminated or previously contaminated property,”116 (iii) “[t]he result of an undesirable event that disrupts the balance of an environmental system . . . [defined by criteria such as] disruption, concealability, aesthetic effect, responsibility, prognosis, degree of peril, level of fear,”117 (iv) “[a] variety of intangible factors from possibly public liability and fear of additional health hazards to the simple fear of the unknown.”118

When experts resort to such vagaries, it is not surprising that courts and juries are perplexed. In litigation, problems with the principles underlying the expert’s opinions are compounded by a number of other, almost unanswerable questions. For example, when does contamination rise to such a level, at such a close proximity, that it affects the property values other than the impacted site? How long does the stigma persist in the area, and at what rate does it decline or advance? By what standards and by whose judgment is the existence, extent and persistence of stigma determined? These are serious questions that must be answered by some reliable methodology before stigma damages can be legally awarded in American courtrooms. To date, however, as we shall see below, the answers remain elusive.

B. Impacted and Non-Impacted Properties: The Presence or Absence of Physical Contamination.

Most experts agree that the presence or absence of contamination on a particular property is an important factor in evaluating the effect, if any, of “stigma” value diminution. Beyond that agreement, however, consensus is rare. Many inquiries initially focus on whether the property is the “source” of the contamination. Owners of such tracts are legally obligated to remediate the contamination on the source property as well as other properties physically affected by the problem. On the other hand, owners of properties that are not “sources” may not have the same exacting duties. Although some writers have observed that such “non-source” owners do not suffer devaluation when the source property has been located and remediation is underway, owners of “source” properties may face substantial devaluation when burdened with cleanup costs. The degree of devaluation and its impact on marketability may vary widely.

For example, if a property is so severely contaminated that it cannot reasonably be cleaned up, the presence of such serious contamination will certainly impact its marketability. Years ago, such contamination might have effectively condemned the property, but with today’s “brownfields” programs, properties once abandoned are now in the process of redevelopment. This example illustrates the fallacy of projecting future conditions on the assumption of a marketplace status quo. Emerging concepts such as risk-based corrective action also play a role in determining marketability. Many properties that were formerly thought to be unmarketable because of the excessive cost of an acceptable cleanup are now remediable under RBCA at substantially less cost than projected less than a decade ago. Here again, RBCA illustrates that omniscience is an unrealistic attitude insofar as the real estate market is concerned.

Non-contaminated property which is merely in proximity to a contaminated site presents even more serious economic issues. Of course, the remediable or non-remediable character of the contaminated site is an issue here, too, as is the contaminated site’s possible future utility. On top of those factors, however, lie other variables, such as (i) the real or, in some cases, perceived threat of migrating contamination from the contaminated site, (ii) the reasonableness of such a concern, (iii) the distance within which such a concern operates, (iv) the time within which the threat will persist, and (v) the extent to which the concern will reasonably increase or decrease over time.

The published literature regarding appraisal techniques has discussed a concept known as the “impact and recovery cycle.” This concept estimates that there is a calculable time period within which the impact of contamination impacts property values. According to the literature, the cycle commences with some sort of initiating event, such as the discovery of contamination or, with respect to non-contaminated tracts, publicity regarding nearby contamination. Some experts have suggested that “fear and uncertainty” regarding the effect of contamination on marketability may be sufficient to precipitate the cycle.

After the initiating event occurs, there is a period of “maximum uncertainty” about property values, during which the highest impact of contamination on property values occurs. Curiously, the highest impact occurs at a time when the least information is available about the contamination. The unresolved concerns typically include (i) the degree and nature of contamination; (ii) the cost and scope of remediation and the time period necessary for it to be accomplished; and the (iii) identity and financial responsibility of potentially responsible parties. According to the “impact-recovery” model, the greatest diminution of property values occurs within this period of high uncertainty.

The level of uncertainty declines as the situation is investigated and persons responsible for the problem are isolated. As this occurs, the rate of property value diminution decreases. Values ultimately stabilize and recover, but the recovery rate varies according to certain


117 W. Mundy, Stigma and Value, 60 APPRAISAL J. 175 (1992).

circumstances. For example, if long-term health risks are rapidly publicized and cleanup is delayed or attenuated because of lack of resources or litigation, property values may be depressed for a significant period of time. On the other hand, if the responsible persons are capable of remediating the problem, and if they are financially responsible, property values may recover at a relatively quick pace. Additionally, if remediation occurs before human health dangers are presented, or even before the health risks are publicized, the duration and degree of diminution may be lessened.

In real life, property values may react somewhat differently than predicted by this model. Although the model generally recognizes that diminution will inevitably continue for some period of time after remediation plans are in place, the “rebound” period is necessarily variable because it is based upon subjective estimates of human perceptions in the marketplace. As we shall see in later sections, the evaluating and defining “perception” is itself a vexing problem. Indeed, giving “perception” too much weight in any appraisal analysis, in the absence of empirical data, especially regarding sales, encapsulates the entire issue of whether such subjective criteria can ever show that a true “injury” has occurred. For this reason, given these conclusions, as well as the lack of substantial and published empirical data to substantiate specific effects in the “impact-recovery” cycle, it seems that the model may not be sufficiently reliable for estimating the existence, extent and duration of property value diminution.

C. Problems of Perception.

In some cases, the term stigma is used to “indicate a decrease in, or loss of, property value due to a perception that the property poses health and safety risks.” Others refer to “a decrease in, or loss of, property value caused by fear that a property owner may face future cleanup liability.” Irrespective of how the term is applied, some commentators recognize that actual contamination is not required, or even the potential for contamination—rather, the “fear of contamination” is used to justify stigma damages, “even when no actual or potential contamination threat exists.”

To such experts, “stigma” is a matter of “perception” in the real estate market. Stigma is sometimes the result of simple fear of the unknown, even when the fear is irrational. “As the complexity of contamination rises, the level of uncertainty and perceived risk rises.” Fear, ambiguities, and uncertainty regarding the character of a tract are undeniably subjective factors, yet they, like others discussed above, are used to reach an objective result, namely, an appraised value. The problem becomes even more complex when one tries to identify just whose perspective is relevant. Is the projected (and hypothetical) future buyer’s view conclusive? Such a person might believe that contaminated property is worth less and would insist on a lower purchase price. Is the seller’s view important because of his belief that an informed buyer will certainly pay less for contaminated property? Does the perspective extend to encompass some vague “real estate market” perceptions by an appraiser who believes that values in the entire market are depressed because of contamination in certain areas? Do mortgage companies, taxing authorities and agencies with the power of eminent domain have a voice?

The Appraisal Institute offers only general guidance on this problem. For example, the market value of real estate is:

The most probable price . . . for which the property should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress.

But how can a buyer and seller act “knowledgeably” when they probably have no idea about the true extent of contamination, or how that contamination may, or may not, affect property values in the future? And how can a “competitive market” for such properties be determined? In reality, the value of real property lies within the minds of the persons who comprise the marketplace—as an extrinsic process, the appraisal procedures and definitions provide guidelines for predicting human behavior, not hard rules for calculating with mathematical precision. As a result of this extremely subjective approach, it is not surprising that the courts have not only struggled with ascertaining the existence of stigma damages, but also with calculating and quantifying the appropriate amounts.

D. Stigma Damages: Ascertainable and Calculable?

From the foregoing discussion, it seems that, at best, stigma damages are based on a number of subjective criteria—at worst, they are exercises in speculation. Whichever perspective is accepted, few could disagree that speculative elements form a major part of any formula for determining their existence and calculating their extent. There is, in fact, very little evidence showing how and to what extent stigma affects property values. Stigma does not invariably exist, and even when it arises, it dissipates with time. Certain types of properties, such as commercial properties, are less likely to suffer from stigma because their value depends more upon objective income production than subjective desirability. As we will see below, the uncertainties contained in any attempt to ascertain and calculate stigma damages suggest that, at least in the pre-sale context, they are not a true injury.

---

120 Id.
121 Id.
123 Id., quoting Mundy, Stigma and Value, 7 APPRAISAL J. 7, 10 (1992) (emphasis added).
In cases involving stigma damages, the goal in damage estimation is to determine what would have happened “but for” the alleged contamination.129 Appraisers generally follow one of three possible methods to calculate the value of property:

(A) the sales comparison approach, which compares data from recent sales of similar properties to determine the sales price for a particular tract, with adjustments for differences in physical characteristics;

(B) the cost approach, which values the property by comparing sale prices of comparable properties, and then adds the costs of reproducing the subject property’s improvements, and deducts a factor for obsolescence and depreciation;

(C) the income approach, which applies a capitalization rate to a property’s income and its residual value, commonly used for commercial properties.130

Serious problems arise when any of these methods is used to evaluate properties.131

The sales comparison approach is problematic because there is very little information on contaminated properties; as a result, there is no comparable market to use for appraisal purposes. “[I]t is difficult to apply the three traditional methods to contaminated properties because of the lack of precedent.”132 Moreover, “[i]t is rare to find sufficient actual sales of comparable contaminated and remediated properties.” Even when a number of contaminated properties exist for comparison purposes, the comparative sales approach may be frustrated “because the nature of contamination and the method of remediation are unique to each property.”133

Since the cost approach focuses on improvements and the value of structures and buildings on the property, it does not address contamination of the underlying tracts. As a result, its utility is questionable when dealing with allegedly stigmatized tracts.134 Similarly, the income approach does not concern itself with contamination, but rather focuses on the property’s productivity—and property that is contaminated may continue to be highly productive. For example, a shopping mall impacted by an underground plume of contamination may still churn out millions of dollars annually for its owners. One suspects the applicability of the income approach is limited to tracts that have been so severely contaminated that they “have no present use.”135 For this reason, the concept of stigma damages has questionable relevance to income-producing properties.

Faced with these problems, appraisers, like other inventive professionals, have resorted to increasingly creative solutions. When there is a lack of data for comparable properties, data must be created, commonly through public surveys, using a “contingent valuation method.”136 The contingent evaluation method “involves formal surveys of market participants by using hypothetical questions.”137 As with any other expert methodology, the trustworthiness of these surveys depends upon whether the appraiser follows recognized practices of survey methodology, reporting, and analysis. For example, the standard methodology for securing survey evidence requires the appraiser to ensure that:

(A) the survey participants are “appropriate and knowledgeable”;

(B) a statistically significant number of respondents is chosen;

(C) the selection is not biased;

(D) the questions be appropriate and unbiased;

(E) neither the survey participants nor the interviewers know the purpose of the survey or who sponsored it; and

(F) data is accurately reported, appropriately analyzed and fairly summarized in any report or testimony.138

Given this methodology, it would, of course, be fatal if a survey suggested that stigma actually exists, or that it is constant, or that it is permanent.139 Indeed, it would be grossly inappropriate if the survey participants knew that the survey was being done for purposes of evaluating stigma, or that a law firm or a party known to be involved in litigation was revealed as the sponsor. Like any other statistical study, a survey must follow a standard statistical methodology and be governed by statistical principles. Hence, the survey group must be sufficiently large to permit a meaningful analysis—samples that are too small yield statistically unreliable results. Moreover, care must be taken to ensure that the participants are actually representative of the marketplace population. Without such attention to details, survey results may be rendered unreliable both as scientific analysis and as evidence in legal proceedings.

Moreover, opinions based on surveys reflect only possibilities—they do not reflect probable stigma regarding any particular tract, because findings regarding a percentage of the public who fear the contamination “neither conclusively demonstrates an impact has occurred, nor permits quantifying the effect of any impact.”140 In addition to the participants’ possible self-interest in certain outcomes, surveys increase the already substantial opportunities for appraisers to exercise subjective judgments.141 Because the “seemingly sophisticated analysis” of statistical surveys lends a mystical credibility to an otherwise subjective opinion, there is “significant potential” that property value diminution may be found in the absence of empirical proof.142

If traditional appraisal methods are of limited utility in evaluating the impact of direct and neighboring contamination of real estate, and if statistical evidence collected through surveys is suspect, the probability of ascertaining and calculating the impact of stigma is, at

---


131 See generally, Comment, Stigma Damages, supra note 126 at 1149-1151.

132 Davis and Longo, supra note 119 at 10,348; Cabot, supra note 128 at 29.

133 Cox and Bachrach, supra note 130 at 21.

134 Id.

135 Id.

136 Id.

137 Id.

138 Wise and Guthrie, supra note 129.

139 See Cabot, supra note 128 at 29.

140 Id.

141 Wise and Guthrie, supra note 129.

142 Id. at 3.

143 See id. at 1.
best, remote. Some authors have suggested that any correct and reliable methodology must consider at least the following factors: (i) when the effect occurred; (ii) which properties are affected; (iii) how the effect varies over time; (iv) how the effect varies with distance from the contaminated site. Unfortunately, each of these issues raises vexing problems—problems that are once again compounded by the vague variable of perception.

For example, since stigma typically arises only after publicity creates a public perception that a problem exists, it is impossible to assess timing without evaluating public knowledge and reaction. Moreover, in determining which tracts are affected, the appraiser must analyze the entire area, including natural barriers, highways, water bodies, parks, and underdeveloped areas, because those features may limit the perception of risk. In evaluating the persistence of stigma effects over time, appraisers must acknowledge that the effect varies over time as publicity and other information can shape the public’s perception of the problem. Lastly, in studying the effect of proximity to a contaminated site, “perception of risk is likely to vary” according to the subject tract’s distance from the contamination.

These issues, which are critical to both the ascertainment and calculation of stigma effects, cannot be evaluated without empirical data, such as would support appraisals under more traditional appraisal techniques. The empirical data—the “missing link”—needed for a reliable analysis consists of nothing more or less than sales information. In the absence of a demonstrated market experience, opinions regarding the impact of stigma are truly speculative. Indeed, as we will see below, an injury from stigma, if it arises at all, arises only when owners/sellers realize lower prices than they would have realized “but for” the contamination.

E. The Windfall of Pre-Sale Stigma Damages.

All legal scholars presumably agree that, without reliable indicia of injury, a party is not entitled to damages. As can be seen from the foregoing discussion, the speculative nature of pre-sale stigma damages precludes a court from calculating their amount. Although sellers of property during a period of public concern or uncertainty may experience some stigma damages that can be calculated using objective sales data, passive owners who merely hold their property for the duration suffer no objective economic loss. Since the public’s fear of stigma does not continue indefinitely, decreases in property values may persist only briefly. If passive owners are compensated for such a transitory event, they actually receive a windfall unrelated to any loss in dollars and cents. Some critics of stigma damages properly argue that courts are ill-advised to speculate about future reactions in the real estate market. It makes better sense to wait and see whether property value, in fact, suffers when remediation is complete than to speculate in advance about the market’s reaction years down the road. Courts also must consider the policy implications of allowing recovery for what essentially amounts to future damages that may never be realized if claimants choose not to sell their property.

Unquestionably, the courts are divided on whether stigma damages are recoverable in any context. Although a review of the state of the law is beyond the scope of this Article, important points should be noted. First, courts have generally required passive owners seeking stigma damages to prove that their properties are physically contaminated. Mere proximity to another contaminated site is generally insufficient evidence to justify recovery. These decisions inherently recognize that passive owners sustain no injury if their properties are not actually impacted by pollution. Second, some advocates point to the fact that taxation and eminent domain cases are increasingly recognizing the impact of environmental contamination in determining property values in these cases. It should be noted, however, that in those instances, the impact of stigma is determined for a present and immediate need—similar to a sale. In tax cases, for example, the property’s valuation has an immediate financial consequence, namely, higher or lower taxes. Moreover, unlike a judgment for damages, the property’s value for tax purposes is subject to review and adjustment—ensuring that as stigma fades, the property’s value will increase. In condemnation cases, the property’s value is ascertained to determine a fixed sum to which the owner is entitled as the result of a governmental taking. Insofar as stigma is concerned, condemnation awards serve the same purposes as a sale. If stigma exists, it is reflected in the award once and for all because the award terminates the owner’s interests in the property. Viewed in this perspective, the tax and eminent domain cases might be cited to support the relevance of stigma in cases where a seller has sold property at a lower price as a direct result of contamination. Those analogies are inapposite, however, to support passive owners who have not suffered an immediate and direct financial loss.

Environmental tort liability has expanded remarkably in recent years, but every principle must ultimately reach its logical, factual, and legal limits. Whatever the merits of stigma damages in general may be (and there are substantial questions about that issue), compensating passive owners of uncontaminated properties serves no legitimate societal purpose. Persons who own real estate hold their properties as capital assets and realize true gains or suffer true losses only when the properties are sold. Furthermore, the real estate market fluctuates on a daily basis, and it is influenced by a host of factors with environmental issues being only one of many concerns. In reality, claims for pre-sale stigma damages ask courts and juries to make awards based upon losses that have not occurred and may never occur. Such speculations require clairvoyance—a discipline not (yet) recognized in our jurisprudence.

143 Id. at 2.
144 Id.
145 See Davis and Longo, supra note 119 at 10,348; see also Wise and Pfeifenberger, The Enigma of Stigma: The Case of the Industrial Excess Landfill, 8 Toxics L. Rptr. 1435, 1439 (1994).
146 See e.g., Cabot, supra note 128 at 28.
147 Muldowney and Harrison, supra note 122 at 537.