Environmental Liability, Policy and Technology in Real Estate Development

by
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ABSTRACT

Under the Federal Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §9601 et seq., "owner/operators" of contaminated real property may face cleanup costs that greatly exceed the value of the property. CERCLA liability is retroactive, is imposed without regard to fault, and – unless the defendant can prove divisibility – is joint and several. Moreover, owner/operators may also face liability under state cleanup statutes, under state tort law, and under the Federal Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. Historically, this potential liability has had a dampening effect on the willingness of investors to acquire and develop property that is or may be contaminated with hazardous materials. As a result, the value of these so-called "Brownfields" properties has been diminished. This thesis explores two propositions regarding this form of environmental liability: 1) that the legislation is moving toward favoring and encouraging the developer of "Brownfields" real estate, and 2) that the most effective means for minimizing liability is a clear understanding of the laws, and an intelligent application of this understanding through the use of due diligence and transactional protections. This thesis attempts to provide information and analysis that would be especially useful to potential developers.

Legislative activity was investigated and the relationship between public concern for health hazards and Congressional activity was studied and quantified to determine the nature of the correlation between these factors. The results indicate a correlation between public concern and Congressional hearings. This thesis also explores legislative concern with the interests of business and local government, as demonstrated by the increase in Congressional hearings leading to a modification of Federal environmental legislation to encourage development and remediation, and by the rapid growth of Brownfields development incentives in the individual States.

As long as public concern does not return to the levels of the mid-1980's, it is likely that future legislation – at both the state and Federal level – will include additional incentives for the development of Brownfields and other contaminated property. The developments in environmental legislation indicate that environmental liability risks will continue to

lessen, making such development more profitable and attractive to an increasing number of developers and other real property investors.

Nonetheless, environmental liability does and should remain a legitimate concern in real estate development. There are key items - which could be considered a "checklist" - that a real estate developer needs to consider in the planning of transactions to undertake any development, especially any Brownfields development or rehabilitation project, to minimize his/her potential environmental liability.

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1.1 Background/Introduction

Concern for the well being of the environment is thought to have taken hold during the flower days of the 1960's with its new wave of social activism and concern. While "Congress passed the first major Federal environmental statute in 1899, it passed no additional significant environmental legislation until the late 1960s (Zuckerman et al, 2000)." Then in 1970, President Nixon created the Environmental Protection Agency (EPA) by Executive Order, and the next two decades saw the passage of the bulk of the Federal legislation that defines the modern "environmental era." Perhaps the three most prominent of these statutes are: (1) the Resource Conservation and Recovery Act (RCRA), *42 U.S.C. §§ 6901*-6992K, enacted in 1970 with major amendments in 1976 and 1984; (2) the Clean Air Act, *42 U.S.C. §§ 7401*-7671q, placed into its present format in 1970, with major amendments in 1977 and 1990, and (3) the Clean Water Act, *33 U.S.C. §§ 1251*-1387, placed into its present format in 1972, with major amendments in 1977 and 1987.

A fourth important environmental statute was enacted in 1980, when the Love Canal incident prompted Congress to enact legislation which would make site and groundwater contamination a high national priority. This was accomplished with the enactment of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (*42 U.S.C. §§ 9601*-9675 (1994)), commonly known as the "Superfund" statute. CERCLA established a $1.6 billion Federal fund, collected from taxes on petroleum and 42 other chemicals (Culligan, 2002), enabling the government to pay for the remediation of hazardous waste sites through the EPA.

Under CERCLA, the EPA has the authority to undertake emergency steps and both short-term and long-term measures to protect public health and safety. In the nomenclature of the statute, long-term ("permanent") cleanup actions are known as "remedial" actions. "In order to be eligible for remedial cleanup under CERCLA, a site must be placed on the National Priority List (NPL) (Culligan, 2002)." Sites are placed on the NPL after an assessment through the Hazard Ranking System (HRS). This model calculates the relative risk to public health and the environment.

The other ability which CERCLA gave the EPA, one that this study examines in greater deal, is the ability to sue parties responsible for the contamination (also known a potentially responsible parties, or "PRPs") in order to recover the cleanup costs. This created a whole new series of issues for the parties to any real property transaction. Dennison outlines a sampling of selected parties and their added liabilities:

1) "Buyers, who may be forced to assume liability for hazardous waste cleanup costs, regardless of their responsibility for the presence or release of hazardous substances on the property.

2) Sellers, who may be held responsible for the investigation and remedial action of environmental problems at a site under Federal and state environmental laws and regulations or as a result of contractual warranties and indemnifications.

3) Real estate brokers, who may be held liable for the failure to disclose known environmental problems associated with the property being sold or who negligently fail to disclose reasonable discoverable environmental contamination.

4) Lending institutions, because the relative value of the property or loan may be significantly decreased due to the presence of environmental contamination, asbestos, or radon. In some cases, lending institutions can be held directly responsible for investigation, remediation, and/or long-term oversight and monitoring costs if they take ownership of foreclosed properties or participate extensively in the management of properties in which they possess a security interest.

5) Landlords, who may be responsible for the ultimate environmental impact of their tenants' improper or negligent waste handling practices.

6) Tenants, who may be subject to immediate termination of their lease upon failure to disclose to the property owner information about know or suspected releases. Under certain circumstances, tenants may be held liable for carrying out their own pollution-related activities on the leased premises.

7) Environmental consultants, who may be held liable for their negligent failure to discover environmental contamination at a give site.

8) Waste Haulers, who accepted hazardous substances for disposal and selected a site later slated for cleanup."

(Dennison, 1996)

The costs of environmental cleanups can be surprisingly high and must be factored into any developer's pro-forma financial statements to determine the financial viability of any acquisition or development project. The following statistics indicate the extent of the potential liability.

1) Average cost of Superfund site investigation and cleanup: $30 MM. Average inception to completion of construction: eight (8) years.

2) Cost of minor groundwater cleanup associated with leaking underground storage tanks (USTs): $200,000 to $250,000.

3) Cost of UST retrofit (30,000 gal.) to meet Federal standards (Dec. 1998): $100,000 per tank.

4) Asbestos insulation removal: $5 to $7 psf.

(Schmall, 2002)

Today, the country has thousands of sites with contaminated soil and groundwater. The NPL is just a small sampling of the thousands of contaminated sites

across the country. Referred to as "Brownfields", these sites are distinct from "Greenfields" as they usually had a previous industrial use. "These sites are often abandoned or, at best, underutilized because potential buyers are concerned about possible costs of remediation and liability (Zuckerman et al, 2001)."

From an infrastructure point of view, it can be argued that the development of Brownfields should be encouraged in preference to development on clean "Greenfields" property, as the infrastructure is already in place. "When business facilities are constructed on Greenfields, 'roads, sewers, schools, residences and other infrastructure must be developed, and new units of government created to levy the taxes to pay for them. Redundant infrastructure not only wastes scarce tax dollars, it adds to the burden on the environment (EPA: Brownfields and PPA, 1997).'" (Zuckerman et al, 2001)

Chapter 5, titled: "Public Concern, Legislative Actions and Further Development Impetus," researches the correlation between the level of "public concern" towards contaminants in the soil and groundwater and legislative action by the government to address these issues. It is postulated that not only are public concern and legislative activity highly correlated, but that private interests (i.e. real property development community) prompt the Federal and State governments to pass legislation which favors this private interest as public concern relaxes. This more favorable legislation (in the form of prospective purchaser agreements, comfort letters and voluntary cleanup programs etc.) is the result of the more relaxed stance of the EPA thereby allowing more development opportunities, new remediation technologies and new Brownfield development incentives.

1.2 Sources of Contamination

Contamination can occur from a wide range of sources, wherever hazardous chemicals can be found. Common causes of groundwater contamination are:

1) "Accidental spills
2) Intentional dumping
3) Leaks in storage tanks
4) Industrial waste pits or ponds
5) Municipal or industrial landfills"

(Culligan, 2002)

Please refer to Appendix II for a detailed description of common contaminants, their fate and transport, and remediation techniques. Culligan describes the following, as seven general categories of contaminated sites:

1) "Closed or abandoned hazardous waste sites requiring cleanup under CERCLA.
2) Active hazardous waste treatment, storage or disposal facilities requiring cleanup under RCRA.
3) Facilities with leaking underground storage tanks (USTs) (used for storing gasoline and other fuels, as well as various chemicals used in manufacturing).
4) Sites managed by the Department of Energy (DOE) (contaminated by the by-products of nuclear weapons manufacturing).
5) Sites managed by the Department of Defense (DOD) (contaminated by the by products of conventional weapons manufacturing and fuels used in the nation's defense fleet).
6) Federal facilities other than those managed by DOD and DOE (such as abandoned mining sites owned by the Forest Service, grain storage facilities, research labs).
7) Sites managed under state laws similar to CERCLA and RCRA."

(Culligan, 2002)

1.3 CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act was enacted by Congress in 1980 in response to the growing awareness by the public of hazardous waste conditions in the nation created by incidents such as Love Canal and Valley of the Drums. *(See Danahy, Karen S., CERCLA Retroactive Liability in the Aftermath of Eastern Enterprises v. Apfel, 48 Buff. L. Rev. 509 (2000))* CERCLA authorizes the Federal government, usually acting through the Environmental Protection Agency (EPA), to remove hazardous substances from real property and return the soil to a non-hazardous condition. The response actions by the EPA are financed from the Hazardous Substance Response Trust Fund, commonly referred to as the "Superfund" established by section 221 of CERCLA, 42 U.S.C. 9631. *(United States v. Maryland Bank & Trust Co. (1986, DC Md) 632 F. Supp. 573, 24 Envt. Rep. Cas. 1193, 16 ELR 20557).* The fund for CERCLA was initially established by placing an extra tax on the petrochemical industry within the United States. In return, the government basically exempted the industry from CERCLA liabilities (petroleum is excluded from the definition of "hazardous substance" under the act). This fund enabled the government to initiate and complete the cleanup even if costs could not be recovered from unknown or insolvent responsible parties. Section 107(a) of CERCLA (42 U.S.C. § 9607(a)) lists the four parties potentially liable under CERCLA: 1) the present owners and operators of the facility where hazardous wastes were released or are in danger of being released; 2) the owners or operators of a facility at the time the hazardous wastes were disposed; 3) the person or entity that arranged for the treatment or disposal of substances at the facility; and 4) the person or entity that transported the substances to the facility. The Federal government is also permitted to recover the costs expended by the EPA for cleaning from responsible parties. 42 U.S.C.S. 9601-57.

"To establish liability under section 107(a) of the Act, the government must establish the following: 1) the site is a "facility", 2) A "release" or "threatened release" of any "hazardous substance" from the site has occurred; 3) The release or threatened release has caused the United States to incur "response costs"; and 4) The defendant is

one of the persons designated as a party liable for costs." *(See id. At 574).* Significantly, the government does not have to prove that the defendant was negligent, or that negligence of the defendant contributed to the release of hazardous substances for which cleanup costs are sought. Zuckerman et al, point out how this potential liability has affected the development industry: "To help the EPA [finance cleanup], CERCLA contains an expansive liability scheme that is based on status, not guilt. Owning real estate is one status on which cleanup liability is based. Hence, buyers, sellers, and lenders have reason to be very careful when transferring contaminated real property. ...For example, a PRP can be held strictly liable for "response costs" if it has generated, transported, or exercised control over the hazardous waste at a facility wherein such waste exists, regardless of whether the PRP caused or even contributed to the pollution (Zuckerman et al, 2000)."

Fines for non-compliance include civil penalties of up to $25,000 per day and criminal liability can be incurred through "...a failure to notify Federal and/or state agencies of a release of a hazardous substance, or submitting false or misleading information (42 U.S.C. 9603(b))."

Zuckerman et al. summarize CERCLA's objectives as follows:

1) "identify active and abandoned waste disposal sites that threaten human health or the environment;
2) prioritize sites;
3) take interim and permanent actions to remedy threats;
4) hold responsible parties liable for the costs;
5) compensate the public for damages to natural resources; and
6) create a fund (the Superfund) to pay for cleaning up abandoned sites when no solvent responsible parties can be found."

(Zuckerman et al, 2000)

In 1986, the Superfund Amendments and Reauthorization Act (SARA) (Pub. L. 99-499, 100 Stat. 1613 (1986)) extended CERCLA funding to $15 billion while imposing more stringent remedial standards, thereby increasing cleanup costs. It is important to note that the Superfund tax, while reauthorized by the SARA amendments, has since expired and has not been reauthorized to date.

1.3.1 Scope of Liability

As stated in CERCLA, responsible parties (the four entities that, as discussed below, are identified in Section 107) are liable for:

a) All costs of removal or remediation action incurred by the United States Government or a State or an Indian tribe not inconsistent with the national contingency plan;

b) Any other necessary costs of response incurred by any other person consistent with eh national contingency plan;

c) Damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from such a release; and

d) The costs of any health assessment or health effects study carried out under Section 104(i) of CERCLA

(*See* 42 U.S.C. § 9607(a)(4))

Response costs include: (1) removal costs for short-term cleanup, containment, or removal; steps to monitor and assess the cleanup; and provisional alternate water supplies for and relocation of residents, (2) remediation costs of permanent cleanup measures, (3) administrative costs, (4) prejudgment interest, and (5) legal costs (Zuckerman et al, 2000). Note that the above excludes the costs of personal injury, business loss and

economic loss, and that defendants must cover their own legal costs to litigate against other parties that contributed to the contamination.

1.3.2 Strict, and Joint and Several Liability

Dennison explains "strict liability" in CERCLA: "CERCLA (*§ 107(a), 42 U.S.C. § 9607(a)),* imposes "strict liability" on potentially responsible parties (PRPs) for response costs resulting from a release of hazardous substances into the environment. In other words, it is unnecessary for the government or a private party to prove that the owner or operator of a facility was negligent or otherwise caused the release. It is merely necessary to establish that a hazardous substance was "released" at the site (Dennison, 1996)."

CERCLA also imposes "joint and several liability" on PRPs. When liability is joint and several, any single defendant can be held responsible for the entire cost of cleanup or other response costs incurred at a site. "A defendant has the burden of proving that the harm is divisible and should be apportioned among the responsible parties. Establishing divisibility, however, is usually an extremely difficult task (Zuckerman et al, 2000)." It is because of this fact that there is a movement by some owners/generators to "tag" their contaminants in order avoid liability or qualify for a de minimis exception.

1.3.3 Potentially Responsible Party (PRP)

CERCLA lists four parties upon whom liability may be imposed:

1) Current owners or operators of a site.
2) Past owners or operators at the time hazardous substances were disposed of at the site.

3) Anyone who arranged for the disposal, transport or treatment of hazardous substances found at the site (generators or "arrangers")

4) Anyone who accepted hazardous substances for disposal and selected the site slated for cleanup.

(*See* 42 U.S.C. § 9607(a)(1)-(4))

"Any person or entity that falls into one or more of these categories is liable for responding to a release of 'hazardous substances.' CERCLA's definition of hazardous substances is quite broad. It includes substances typically found in industrial and manufacturing settings as well as more common substances such as paint, batteries, solvents, drain cleaners, and photographic chemicals (Edens, 2001)." (Please refer to Appendix II for a detailed description of contaminants, their means of transport and remediation techniques).

According to Zuckerman et al, the following are the parties have been found by the courts to be liable:

1. "The present site owner, even if the present owner did not own the site at the time of disposal; *See, e.g., New York v. Shore Realty Corp., 759 F.2d 1032 (2d Cir. 1985);*

2. The owner or operator of the site when disposal occurred; *FMC Corp. v. Northern Pump Co., 668 F. Supp. 1285 (D. Minn. 1987)*

3. Generators who arranged for transportation and disposal of waste at the site; *B.F. Goodrich v. Mertha, 754 F. Supp. 960, 973-74 (D. Conn. 1991).*

4. Transporters of waste to the site; *See United States v. Bliss, 667 F. Supp. 1298, 1307 (E.D. Mo. 1987).*

5. Officers and controlling shareholders of a corporate owner or operator; *See Shore Realty Corp., 759 F.2d at 1052.*

6. Officers and shareholders of generators; *Northeastern Pharm. and Chem. Co., 579 F. Supp. at 847-49.*

7. Non-negligent off-site generators; *See United States v. Monsanto Co., 858 F.2d 160, 168 (4th Cir. 1980).*

8. Real estate developers; *Tanglewood E. Homeowners v. Charles-Thomas, Inc., 849 F.2d 1568 (5th Cir. 1988).*

9. Parent corporations of liable subsidiaries; *United States v. Kayser-Roth Corp., 910 F.2d 24 (1st Cir. 1990);*

10. Successor corporations; *United States v. Mexico Feed & Seed Co., 980 F.2d 478 (8th Cir. 1992).*

11. Landlords and tenants; *United States v. Argent Corp., 21 ERC 1354 (D.N.M. 1984).*

12. Joint ventures; *United States v. South Carolina Recycling of Disposal, Inc., 653 F. Supp. 984 (D.S.C. 1984), aff'd in part, vacated in part, United States v. Monsanto Co., 858 F.2d 160 (4th Cir. 1988).*

13. Lenders; Please refer to Appendix I for a complete overview of United States v. Fleet Factors Corp., 901 F2d 1550.

and

14. Excavators and sending contractors *Kaiser Aluminum v. Catellus Dev. Corp., 976 F.2d 1338 (9th Cir. 1992).*"

(Zuckerman et al, 2000)

Edens describes the extent of the CERCLA definition of "owner or operator": "CERCLA defines an 'owner or operator' as the 'person' owning or operating a facility or, if the facility has been abandoned, as a 'person who owned, operated, or otherwise controlled activities at such facility immediately [prior to such abandonment]' This rather circular definition has been interpreted by the EPA and the courts in such a way that current owners may be found liable even though no hazardous substances were disposed of during their ownership. A person may also be held liable as an 'owner' if that person held title for as little as one hour. Moreover, a person holding equitable title to property may be deemed an owner, and a person who merely signed an agreement to purchase contaminated property could face liability under the act. Courts have also ruled that lessee's fall within the statutory definition of owner. In addition, officers and employees

of companies operating a facility may be treated as owners or operators and, in some cases, held personally liable even though performing the work of the employer. ...Courts have uniformly held that CERCLA imposes strict liability, irrespective of fault. As a result, courts have tended to impose liability on CERCLA defendants who fit into one of the PRP classes and who cannot raise one of the limited defenses set forth in the act. CERCLA liability is also retroactive; entities that disposed of hazardous substances or owned contaminated property before the statute's enactment have been held liable for the resulting response costs (Edens, 2001)." As discussed below, however, a generator may be able to avoid (or limit) liability if it can show that its hazardous substances did not contribute to the contamination that is the subject of the cleanup (or contributed to only a small, divisible component of the contamination).

Edens goes on to explain the difficulty in the allocation of liabilities: "Allocation among owners and operators on the one hand and generators on the other hand can be difficult. Each group obviously seeks to impose a larger share of costs on the other group. In any case, negotiations often deteriorate. As a result, case law has begun to address the allocation of cleanup costs among PRPs through contribution claims filed against one another. The courts have found apportionment to be difficult, particularly at a site where hazardous substances have been present for an extended period and where the substances possess diverse characteristics. Some courts have placed on the defendant the burden of proving that there is a reasonable basis for apportionment (Edens, 2001)." There is a movement by some owners/generators to "tag" their contaminants in order to apportion their responsibility in a contaminant plume which consists of several pollution sources.

1.3.4 Corporate Liability (Piercing the Corporate Veil):

On June 8, 1998, the ruling in United States v. Bestfood, *118 S. Ct. 1876 (1998),* brought to end many years of disagreement on whether parent companies are liable under CERCLA for the actions of their subsidiaries. According to the Supreme Court's decision in this case, the key point is whether the parent had the "authority to control" the waste

decisions of the subsidiary. Edens summarizes the findings of the case: "In *Bestfoods* the Court adopted the general rule that a parent company can be liable for the acts of its subsidiary in two situations: (1) when a basis exists for 'piercing the veil' under traditional corporate law principles; or (2) when the parent company actually 'manage[s], direct[s], or conduct[s] operations specifically related to pollution, that is, operations having to do with the leakage or disposal of hazardous waste, or decisions about compliance with environmental regulations.' Even active participation in the general affairs of the subsidiary will not make a parent company liable unless a basis exists (Edens, 2001)."

1.3.5 Liability of Successor Corporations

Edens also explains that: "CERCLA does not expressly state whether or under what circumstances a company that merges with, acquires, or purchases some or all of the assets of another company succeeds to the liabilities of the predecessor company. Thus, a majority of courts have applied the common law doctrine of successor liability in the CERCLA context. For example, one court that examined the act's legislative history and purpose held that Congressional intent supports the conclusion that, when choosing between taxpayers or a successor corporation, the successor should bear the cost of cleanup. The EPA also has taken the position that successor corporations are liable for the acts of their predecessors (Edens, 2001)."

1.3.6 Liability of Lenders

"Financial institutions that lend money to companies owning or operating property contaminated with hazardous substances have long relied on the 'secured creditor' or 'security interest' exemption to shield them from liability (Edens, 2001)." CERCLA excludes from the definition of owner or operator any person, who, without participating in the management of a facility, holds indicia of ownership primarily to

protect his security interest in the facility (42 U.S.C.S. 9601(20)(A)). This "secured lender exemption" has been the subject of much controversy and various case interpretations of what "participation in management" and "indicia of ownership" really mean.

Court decisions establishing lender liability under CERCLA fall into two main categories: (1) those in which the lenders foreclose on a mortgage and take legal title to a property, and (2) those in which the lenders exercise control over the property or the operations of the borrower. (Edens, 2001) In 1990, the case of the United States v. Fleet Factors Corp., 901 F 2d. 1550, held such a narrow view of the lender exemption that the lending community found this to be a huge disincentive to lending to operational facilities. (See Appendix I, Fleet Factors, for a more detailed discussion of this issue).

In response to the alarm bells ringing throughout the lending community, Congress Amended CERCLA twice; once on October 17, 1986 under the Superfund Amendments and Reauthorization Act (SARA), and again on September 3, 1996, with the Asset Conservation, Lender Liability and Deposit Insurance Protection Act of 1996 (Asset Conservation Law). This amendment codified the short-lived EPA Lender Liability Rule (42 U.S.C.S. 9601 (2000)). The Lender Liability Rule basically stated that one who "owns or operates" presently or at the time of disposal is a PRP except for secured creditors. However, due to the outcome of Fleet Factors, the Asset Conservation Law resolved Fleet Factors by providing specific liability protections for fiduciaries.

1.3.7 Remediation Liabilities (Public vs. Private Litigation)

Cleanup costs under CERCLA can be recovered by either the government or by private parties. With recovery of government incurred response costs it is held that the burden of proof "...is on those who are attempting to prevent the government from recovering cleanup costs to show that specific costs are not consistent with the plan. In

contrast, in litigation between private parties, plaintiffs attempting to recover cleanup costs bear the burden of proving that the costs they incurred are consistent with the plan (Edens, 2001)."

Dennison explains a harsh truth: "The EPA's resources a limited to the point where usually the only parties sued are the ones with the largest financial resources. Private parties must then bring suit to recoup their expenses from other responsible parties. ...CERCLA provides two mechanisms for private parties to recover some or all of the costs associated with environmental cleanup and response: a cost recovery action under CERCLA (§ 107(a), 42 U.S.C. § 9607(a)) and a contribution action under CERCLA (§ 113(f), 42 U.S.C. 9613(f))." CERCLA § 107(a) makes covered parties under CERCLA "liable for ... all costs of removal or remedial action incurred by [government entities and] any other necessary costs of response incurred by any other person consistent with the national contingency plan. CERCLA § 113(f)(1) provides that '[a]ny person may seek contribution from any other person who is liable or potentially liable under section 9607(a)' for response costs (Dennison, 1996)."

1.4 CERCLA Defenses

There are only three defenses which CERCLA allows to absolve PRPs from liability for hazardous substance releases: (1) an act of God; (2) an act of war; or (3) an act or omission of a third party other than the defendant's employee or agent, or one whose act or omission occurred in connection with a contractual relationship existing directly or indirectly with the defendant. (*See 42 U.S.C. § 9607*(b) (1994)).

Other defenses – with the exception of the potential divisibility defense – have largely proven unavailing. "Parties to CERCLA lawsuits have attempted to employ a variety of defenses. Almost invariably those efforts have failed. For example, although some courts have allowed equitable defenses, such as unclean hands, in CERCLA

actions, others have rejected such defenses as being contrary to Congressional intent. In particular, courts have rejected the caveat emptor defense under CERCLA, which explicitly provides for three statutory defenses: act of God, act of war, or act or omission of a third party. Of these, the third-party defense has been the most widely litigated (Edens, 2001)."

1.4.1 Third Party Defense

As outlined by Edens, a defendant seeking to establish the "third party defense" must establish all three elements of CERCLA § 107(b)(3): "(1) no direct or indirect relationship, contractual or otherwise, exists between the defendant/landowner and the third party who (allegedly) caused the contamination; (2) upon discovery of hazardous substances, the landowner must have exercised due care; and (3) the landowner must establish that he or she took precautions against the acts or omissions of the third party. SARA defined the term 'contractual relationship' to include 'land contracts, deeds, or other instruments transferring title or possession' unless certain narrow showings can be made. (*See* CERCLA § 101(35)(A), *42 U.S.C. § 9601*(35)(A)(1980)). Thus, the property owner may not assert the third-party defense based on the actions of a prior landowner unless certain limited conditions are satisfied. These conditions have come to be known as the 'innocent purchaser' or 'innocent landowner' defense of CERCLA (Edens, 2001)."

1.4.2 Innocent Landowner Defense

The "innocent landowner defense" was added to CERCLA in 1986 with the passing of SARA (Superfund Amendments and Reauthorization Act). A PRP can avoid liability by establishing that the real property was acquired after the property was contaminated and that the PRP had no reason to suspect any contamination present after making an "appropriate inquiry" such as an ASTM Phase I study. (Dennison, 1996)

Zuckerman et al, explain that the "burden of proof for the innocent purchaser defense is simple. Owners must show that, 'at the time of acquisition,' they performed 'all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice in an effort to minimize liability.' (*See [42 U.S.C.]* § 9601(35)(B).) The statute lists the following factors for courts to apply when considering whether a defendant meets the requirements of the innocent purchaser test: (1) any specialized knowledge or experience of the owner; (2) the relationship of the purchase price to the value of the property if uncontaminated; (3) commonly known or reasonably ascertainable information about the property; (4) the obviousness of the contamination; and (5) the ability to detect the contamination by appropriate inspection. Few defendants have been able to meet the requirements of the innocent purchaser test. As a result, most buyers and lenders today insist on the purchaser's due diligence in order to reach a level of assurance that no pollution does exist. If pollution exists, the costs of cleanup are a major part of the negotiations between the seller and the buyer (Zuckerman et al, 2000)." In fact, the courts have no standard with which to follow in determining what is an "appropriate inquiry." (Edens, 2001).

In an attempt to provide an acceptable definition of "appropriate inquiry," the American Society for Testing and Materials (ASTM) released standards for conducting environmental tests. Please see chapter 3 (3.3 to 3.3.3) for a description of an ASTM regulated Phase I,II, and III site assessment. These standards are widely employed in real property transactions. The Phase I study is so widely used that it is now a standard item on almost any real property transaction checklist and is conducted by so many Environmental Engineering firms that there is intense price competition.

1.4.3 De Minimis Settlements

The de minimis exception occurs when a PRP releases a divisible amount of contaminant which provides no material harm or risk. In the review of de minimis exceptions, Edens, provides that "purchasers who may not be able to avail themselves of

the absolute defense under CERCLA (§ 101(35)) may nevertheless be able to minimize their liability by being characterized as de minimis parties. SARA added to CERCLA a provision allowing de minimis settlements. Thus, the EPA may settle with a PRP if 'the settlement involves only a minor portion of the response costs at the facility concerned' and the PRP falls into one of two categories: (1) PRPs for whom the amounts or toxic effects of their contribution of hazardous substances to the site are minimal in comparison to other hazardous substances at the site; and (2) owners of the real property on which the facility is located who did 'not conduct or permit the generation, transportation, storage, treatment, or disposal of any hazardous substance at the facility, and did not contribute to the release or threat of release of a hazardous substance at the facility.' (*See CERCLA § 122(g)(1)(A)(i)-(ii)-(B) (i)-(iii), 42 U.S.C. § 9622(g)(1)(A) (i)-(ii)-(B)(i)-(iii)).* In addition, the property owner must establish that he or she purchased the property without actual or constructive knowledge of the presence of hazardous substances (Edens, 2001)."

As stated earlier, because of the de minimis exceptions, there is a current trend for manufacturers which produce hazardous wastes to have them tagged with a special neutral chemical. In the case of contamination, the tagged chemicals will be used to determine the contribution of said manufacturer to the overall contamination. This trend is particularly popular with large manufacturers with extensive resources, often the prime target in CERCLA cases to foot the bill for remediation costs.

1.5 State Cleanup Statutes

Although liability for cleanup at an NPL site generally will be determined under the CERCLA process, individual states are free to impose additional types of liability (such as liability for personal injury) that go beyond the costs imposed under CERCLA. Moreover, state statutes may impose cleanup liability at sites that the Federal government (or private parties) chooses not to address under CERCLA. CERCLA provides: "Nothing in this chapter shall be construed or interpreted as preempting any state from imposing

any additional liability or requirements with respect to the release of hazardous substances within such State" *See* § 9614(a). Although many states have enacted CERCLA type legislation, some state statutes include a "super lien" which "...allows the state to recoup cleanup costs via a lien placed on the contaminated property, which lien has priority over all pre-existing claims, even those of secured creditors. The validity of the super liens has been upheld by state courts (Garfinkel, 2001)."

Zuckerman et al, list states which have their own "Superfund" statutes as of mid-2000: Arkansas, California, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin, and Puerto Rico (Zuckerman et al, 2000). "In late 1998, the Environmental Law Institute ("ELI") published a report entitled *An Analysis of State Superfund Programs: 50-State Study*. The ELI found that most states followed the CERCLA model for liability by including a broad spectrum of PRPs. The ELI specifically found that:

1. "Forty-three states impose retroactive liability. Only California, Colorado, the District of Columbia, Idaho, Montana, Nevada, Utah, West Virginia, and Wyoming do not. California and Colorado look to Federal law to impose retroactive liability on PRPs.

2. State liability standards are subject to the state court's interpretations, but thirty-two of the states with liability schemes adhere to CERCLA's model of strict, joint and several liability.

3. Although the overwhelming majority of states have the authority to issue administrative orders to force a cleanup action, in many states a PRP

receiving such an order has the right to seek a review of the order by a board or commission or even a state court.

4. Twenty-five states allow recovery of punitive damages, while twenty-two states allow recovery of treble damages. Interestingly, although most states have several penalty provisions, they rely upon their hazardous waste, water pollution, and solid waste laws, not on their state Superfund laws for enforcement.

5. Thirty-two states have independent authority under their laws to recover natural resource damages. Many states, with or without separate authority, have pursued natural resource damage awards. Ten states have recovered such damages under CERCLA, and fifteen states have CERCLA natural resource damage claims pending."

(Zuckerman et al, 2000)

Chapter 2: Liability Under RCRA And State Tort Law

2.1 RCRA

The Resource Conservation and Recovery Act (RCRA) (*42 U.S.C. § 6901 et seq.)*, was enacted in the 1970's, and significantly strengthened in 1984, to address the county's rapidly accumulating municipal and industrial solid wastes. The incredible growth of the U.S. economy after World War II was not mirrored by advancements in waste technology and management. (EPA, RCRA Overview). "For example, at the end of World War II, U.S. industry was generating roughly 500,000 metric tons of hazardous waste per year. This amount continued to increase over the next 50 years. A national survey conducted by EPA in 1996 estimated that 279 million metric tons of hazardous waste were generated nationwide in 1995, more than a 500-fold increase (EPA RCRA Overview)." In response to this issue, and to the ensuing (and increasing) public concern (see chapter 5, which models public concern), Congress placed increasingly stringent measures into RCRA governing the proper handling of wastes.

RCRA provides regulations for the handling of hazardous and non-hazardous wastes. As Edens elaborates: "CERCLA was backward-looking--it was a non-regulatory statute enacted to address lingering problems with former disposal sites and to impose liability for the cost of those cleanups. By contrast, the original RCRA was forward-looking--it was intended to provide a comprehensive regulatory program for the active management of hazardous wastes from the point of generation to ultimate disposal (cradle to grave). Thus, RCRA was of lesser significance for real estate professionals and lenders, except on properties where active hazardous waste facilities existed. The Hazardous and Solid Waste Amendments of 1984, however, served to blur the distinction between CERCLA and RCRA by adding to RCRA enhanced provisions requiring the cleanup of hazardous waste sites. In addition, the 1984 amendments added a new Federal program for the regulation of underground storage tanks (USTs) under RCRA Subtitle I.

These amendments made RCRA more important for real estate professionals and lenders (Edens, 2001)."

RCRA is composed of three interrelated programs: 1) Subtitle D, the solid waste program: 2) Subtitle C: the hazardous waste program, and 3) Subtitle I: the underground storage tank (UST) program. The Subtitle D program establishes minimum criteria for the disposal of non-hazardous municipal and industrial solid wastes, and encourages individual states to establish their own regulatory programs to enforce these criteria. For example, municipal landfills fall under this category. The Subtitle C program is the "cradle to grave" system controlling hazardous wastes from the time their manufactured until final disposal and monitoring. The Subtitle I program regulates the vast number of underground storage tanks that store petrochemical and other hazardous substances. (EPA RCRA Overview). Subtitle I is of particular interest to the real estate industry, as almost every piece of commercial or industrial real property has a UST.

"Currently, RCRA prohibits open dumping; encourages recycling and treatment of hazardous wastes; establishes standards for hazardous waste management; regulates cleanup of active facilities; restricts land disposal of hazardous wastes; provides technical requirements for 'disposal facilities'; controls design standards and use of all USTs installed after December 22, 1988; and establishes hazardous waste permit review procedures for storage, treatment, or disposal facilities. RCRA regulations prescribe detailed requirements for anyone who generates, transports, treats, stores, or disposes of hazardous wastes. Disposal is defined as the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid or hazardous waste on the land or water in such a way that the waste enters the environment (Edens, 2001)."

RCRA provides that states may, with the approval of EPA, operate their own hazardous waste regulatory program in lieu of RCRA, so long as the state program meets all required Federal criteria. (*See* 42 U.S.C.§6926). Many states have done this. These "state RCRAs" are enforceable by EPA and citizens, in the same manner as RCRA itself.

2.1.1 RCRA Liability

RCRA imposes liability, in the form of potential monetary penalties, on hazardous waste generators, hazardous waste transporters, and hazardous waste treatment, storage, or disposal ("TSD") facilities that do not follow RCRA regulations. Unless the property being purchased can be characterized as a TSD facility, this form of RCRA liability is likely to have little relevance for real estate developers.

However, RCRA also imposes liability, for the costs of remediation, on parties whose past or present handling or disposal of hazardous or solid waste has contributed to an "imminent and substantial endangerment to health or the environment." (*See* 42 U.S.C. §§ 6972(a)(1)(B) and 6973). These provisions have been used, both by the Federal government and by private parties, to hold current owners liable for wastes dumped prior to ownership. "For example, in *United States v. Price*, the United States sought injunctive relief against current and past owners of property on which the past owners had operated a landfill for hazardous chemicals. Both past and current landowners denied RCRA liability, arguing that RCRA was designed to prevent future dumping, not to remedy the effects of past waste disposal practices. The court held, however, that the term 'disposal' encompassed the leaking of hazardous wastes into the groundwater; therefore, the government was authorized to bring suits under RCRA to prevent continued harm to the environment. The previous landowners further argued that they were no longer contributing to the disposal of hazardous wastes at the site, but the court rejected this argument, holding them liable because they failed to store chemical wastes properly and to rectify a hazardous condition. Simply put, the court would not allow the previous owners to avoid liability under RCRA simply by selling their property. ...The current owners argued that the disposal of hazardous wastes had occurred before their ownership and, therefore, they did not contribute in any way to the disposal of hazardous wastes. The current owners knew the property had been used as a landfill but failed to investigate, before purchase, whether the landfill had been properly closed. At no time did the current owners 'actively dispose of any wastes at the landfill or actively

contribute to the migration of contaminants from the site.' Nonetheless, the court found that the current owners had contributed 'merely by virtue of their studied indifference to the hazardous condition' that existed. The court held them liable under RCRA for their failure 'to stop the continued leaking of contamination from the site.' Thus, the court imposed an affirmative duty on purchasers either to investigate the property before purchase or to accept the property as is, complete with cleanup responsibilities (Edens, 2001)." However, this view of "disposal" to include passive migration of contaminants was disregarded in the ninth circuit court of appeals case, *Carson Harbor Village, Ltd v. Unocal Corporation and City of Carson (see 270 F. 3d 863, 2001).* In this case, the court of appeals found that "the alleged passive migration of contaminants through soil during the partnership defendants' ownership was not a 'disposal' under § 9607(a)(2) *(See* id*).*"

Grant lists the conditions necessary in order to initiate a RCRA imminent and substantial endangerment claim: "In order to obtain injunctive relief under RCRA, the plaintiff must establish three elements. First, the plaintiff must establish that the conditions at the site may present an imminent and substantial endangerment. Next, the endangerment must stem from the handling, storage, treatment, transportation, or disposal of any solid or hazardous waste (i.e. PCE, TCE etc.). Finally, the defendant must have contributed to such handling, storage, treatment, transportation, or disposal (Grant, 1995)."

Another form of RCRA liability that may be relevant real estate developers is the liability that may be imposed on owners of TSD facilities to perform "corrective action" to remediate past contamination (both on-site and off-site) caused by that facility. *See* 42 U.S.C. §§ 6924 (u) & (v). The RCRA corrective action program can be considered a separate "mini CERCLA" for present – and former – TSD facilities. If the property under consideration was once used to treat, store, or dispose of hazardous wastes, further inquiry into potential corrective action liability is warranted.

A third form of liability that may be relevant to real estate developers is that imposed by the underground storage tank program.

2.1.2 Underground Storage Tanks (UST's)

Almost every real property has an underground storage tank (UST) used to store fuel oil or some other organic hydrocarbon used to supply the building's boiler with fuel. As such, RCRA became a concern to the real estate industry with the enactment of subtitle IX, which sought to deal with the problem of groundwater contamination caused by leaking tanks. (Edens, 2001)

Dennison, describes the properties of a UST and compliance issues: "A UST is defined as any tank (including its connected piping) holding an 'accumulation of regulated substances' that has ten percent or more of its volume under ground. Federal regulations and most state regulations contain a list of tanks that are exempt from regulation (Dennison, 1996)."

Owners of USTs must comply with Federal and State UST regulations (See CFR part 280; 42 U.S.C. §§ 6991-6991(i)). These regulations cover "the design, construction, and operation of USTs from installation to closure, require the cleanup of leaks and spills, and impose record keeping, reporting and financial responsibility requirements on owners and operators of USTs. Non-compliance can leave owners liable for up to $10,000 per tank for violating the tank notification requirement and liable for up to $10,000 per tank/day for failure to comply with the technical requirements. (42 U.S.C. §§ 6991e (d)(1) and 6991b (g)) (Dennison, 1996)."

2.2 State Tort Law

Zuckerman et al, explains why common law tort remedies are important in environmental liability cases: "Because Federal and state statutory remedies are not available to private plaintiffs in certain cases, common law tort remedies are becoming increasingly important. For example, because CERCLA does not apply to most types of petroleum contamination, the common law torts of nuisance and trespass can be especially useful to landowners whose property has been polluted by prior releases of petroleum. Additionally, the recovery of response costs under CERCLA must be consistent with the National Contingency Plan, policies and procedures that the Federal Government follows when responding to incidents involving hazardous substances *(See 42 U.S.C. § 9605 (1994).* This limited remedy is fraught with difficult problems of proof and procedure." (Zuckerman et al, 2000)

Suits brought under strict liability, trespass (both public and private), negligence, and nuisance have been used to address hazardous substance contamination. These suits can provide a number of remedies not available under Federal statute. "For example, the common law plaintiff can recover compensatory and [in states where they are available] punitive damages, not just CERCLA cleanup costs. Additionally, the common law plaintiff can obtain a court order for cleanup or abatement and have a jury decide the facts (Zuckerman et al, 2000)."

2.2.1 Strict Liability

Courts have imposed strict liability on defendants who engage in certain types of activities that are deemed ultra-hazardous or abnormally dangerous. "Liability is imposed without regard to fault for injuries caused from an ultra-hazardous activity." (Dennison, 1996)

According to the Restatement (Second) of Torts (§ 519 (1977)), courts should consider imposing strict liability for a particular activity when a sufficient number of the following factors are present:

(a) the activity poses a high degree of risk of some harm to the person, land or chattels of others;
(b) there is a substantial likelihood that any harm that results from it will be great;
(c) the risk cannot be eliminated by the exercise of reasonable care;
(d) the activity is not a matter of common usage;
(e) the activity is generally inappropriate to the place where it is carried on; and
(f) the value of the activity to the community is outweighed by its dangerous attributes.

(See Zuckerman et al, 2000)

2.2.2 Examples of Strict Liability Cases

As described in Zuckerman et al, the following cases are examples of situations in which strict liability has been applied.

1) "The Federal district court judge in Colorado ruled [that] . . . [t]he widespread use of gasoline in no way diminishes its inherently dangerous character, [and therefore held that] those who store and dispense gasoline for profit, and who attempt to increase that profit by locating their filling stations and incidental storage facilities in or near residential areas, should be held liable for harm resulting to persons or property from gasoline stored at or leaking from those stations *(See City of Northglenn v. Chevron U.S.A., Inc., 519 F. Supp. 515 (D.*

Colo. 1981)." *See also Wellesley Hills Realty Trust v. Mobil Oil Corp., 747 F. Supp. 93 (D. Mass. 1990)* (noting that operation of a gas station constitutes an abnormally dangerous activity, but declining to impose liability for other reasons).

2) "In Maryland, a party who placed a large underground gasoline tank in close proximity to a residence and water-well was strictly liable *(See Yommer v. McKenzie, 257 A.2d 138 (Md. 1969).* The court reasoned that such action involved a high degree of risk of some harm, was not a matter of common usage, and was an activity inappropriate to the residential neighborhood where it occurred."

3) "Missouri applies strict liability to claims based on radiation damage, *(See Bennett v. Malline Krodt, Inc., 6798 S.W.2d 854 (Mo. Ct. App. 1985),* while New Jersey applies strict liability to claims based on a defendant's processing, handling, and disposal of radiation (Disposal of radium is an abnormally dangerous activity under the *Restatement (Second) of Torts. See T&E Ind., Inc. v. Safety Light Corp., 587 A.2d 1249 (N.J. 1991)".*

4)" And in *State Dept. of Envtl. Protection v. Ventron Corp., 468 A.2d 150 (N.J. 1983),* a landowner was held strictly liable for toxic waste spillage."

(Zuckerman et al, 2000)

Zuckerman et al, also describe how some courts have also declined to invoke strict liability, such as in the following cases: "A Louisiana court has held that the dumping of toxic waste in industrial disposal wells is not abnormally dangerous (*See Ewell v. Petro Processors of Louisiana, Inc., 364 So. 2d 604 (La. Ct. App. 1978).*" And in Virginia, "the court held that service station operations did not involve ultra-hazardous activity that would give rise to strict liability (*See Arlington Forest Assocs. v. Exxon, 774 F. Supp. 387 (E.D. Va. 1991).*" (Zuckerman et al, 2000).

2.2.3 Trespass

The Restatement (Second) of Torts provides for trespass claims if one: (a) enters land in the possession of the other, or causes a thing or a third person to do so; or (b) remains on the land; or (c) fails to remove from the land a thing which he is under a duty to remove (§ 162 (1965)). The Restatement also provides that: (1) a trespass may be committed by the continued presence on the land of a structure, chattel, or other thing which the actor has tortuously placed there, whether or not the actor has the ability to remove it; and (2) a trespass may be committed by the continued presence on the land of a structure, chattel, or other thing which the actor's predecessor in legal interest therein has tortuously placed there, if the actor, having acquired his legal interest in the thing with knowledge of such tortuous conduct or having thereafter learned of it, fails to remove the thing. (§ 161) (Zuckerman et al, 2000) Thus, plaintiffs "in actions premised on environmental injury to their property from conditions on neighboring property may assert a common law claim for trespass where contamination on nearby land physically enters their property. A trespass is an actionable invasion of a possessor's interest in the exclusive possession of land (Dennison, 1996)." One who purchases property that is discharging contaminants to a neighboring property, then, may need to be concerned about trespass liability.

2.2.3.1 Trespass Claims Against Former Owners and Occupiers

While California courts have held previous owners and occupiers liable under trespass, most state courts do not take this approach. For example, "in the State of Maine, 'the tort of trespass requires the entry onto land in the possession of another. In [*Hanlin Group v. International Minerals & Chemical Corp759 F. Supp. 925 (D. Me. 1990)*], the complaint [by the purchaser of a chemical plant] alleged that the chemical contamination was already there when [the vendor] took possession. . . . Absent any suggestion of an intrusion onto the land of another, an essential element of the tort of trespass [was]

missing in this case.' (Id.) In Massachusetts, a property owner's release of oil onto the owner's land does not constitute a trespass actionable by a subsequent owner of the property (*See Wellesley Hills Realty Trust v. Mobil Oil Corp., 747 F. Supp. 93 (D. Mass. 1990).* Missouri also follows this rule (*See Cross Oil Corp. v. Phillips Petroleum Co., 944 F. Supp. 787 (E.D. Mo. 1996* (Zuckerman et al, 2000)." Similarly, under New York law, "an actionable trespass must involve wrongful or unjustifiable entry upon the land of another," and former owners are not liable under trespass for contamination remaining on the property. (Zuckerman et al, 2000).

2.2.4 Nuisance

According to Dennison, "nuisance has been the most prevalent cause of action brought by plaintiff-landlord owners for property damage caused by environmental conditions on neighboring property. A nuisance claim represents a common law action for the unreasonable interference with the use and enjoyment of property (Dennison, 1996)."

There are two types of nuisance; public and private. Public nuisance is considered an "unreasonable interference with a right common to the general public. Circumstances that may sustain a holding that an interference with a public right is unreasonable include the following: (1) whether the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience, or (2) whether the conduct is proscribed by a statute, ordinance or administrative regulation, or (3) whether the conduct is of a continuing nature or has produced a permanent or long-lasting effect, and, as the actor [defendant] knows or has reason to know, has a significant effect upon the public right *(See RESTATEMENT (SECOND) OF TORTS § 821B (1964)* (Zuckerman et al, 2000)." An example would be a municipal landfill emitting contaminants into the city drinking water supply.

For example, "in *United States v. Hooker Chemicals & Plastics Corp (722 F. Supp. at 960),* the State of New York and the Federal government sued a chemical company which disposed of wastes in New York's Love Canal to recover costs incurred in preventing further migration of waste, to relocate families, and for other actions taken in response to the waste. [The] State [successfully] moved for summary judgment, [obtaining] a determination that defendant was liable as a matter of law for the creation of a public nuisance at the Canal Landfill Site, as well as for the costs incurred by state in cleaning up the site (Zuckerman et al, 2000)."

2.2.4.1 Private Nuisance

According to Dennison, a private nuisance is an "unreasonable interference with an individual's use and enjoyment of his property, such as when a neighboring landowner discharges hazardous substances onto the property of the complaining landowner (Dennison, 1996)." According to the Restatement (Second) Of Torts, it is a "nontrespassory invasion of another's interest in the private use and enjoyment of land *(§ 821D)."* Zuckerman et al, further states: "an unreasonableness claim "requires the finders of fact to evaluate . . . the severity of the harm vis-à-vis its social value or utility *(Id. at 1245.)* Moreover, "evidence concerning the degree of a defendant's interference in the use and enjoyment of the plaintiff's land and the reasonableness of the interference in the context of wider community interests controls the amount of damages recoverable once liability is established. (Id.) (Zuckerman et al, 2000)."

2.4.4.2 Public Nuisance

A public nuisance is one that affects so many people that it cannot be considered simply a "private" matter. For example, in *Anderson v. W.R. Grace & Co., 628 F. Supp. 1219 (D. Mass. 1986),* the case made famous by the book (and subsequent movie) *A Civil Action*, "the plaintiffs, including the administrators of the estates of minors who died of

leukemia allegedly caused by exposure to contaminated water, sixteen members of the decedent's immediate families, and others who contracted leukemia or alleged other illnesses, sued the alleged contaminators for wrongful death, conscious pain and suffering, emotional distress, recovery for illness, and increased risk of developing future illnesses. The plaintiffs sought injunctive relief under a nuisance theory. The court held that the alleged contamination of the groundwater constituted a public nuisance, not a private nuisance, because the 'right to be free of contamination to the municipal water supply is clearly a 'right common to the general public,' *(Id. at 1233.)* and plaintiffs were 'only exposed to the water when it was pumped' from drinking water wells to the town (Zuckerman et al, 2000)."

Grant explains how a private person can initiate a public nuisance action under the California public nuisance statute:

> "A private person may maintain a public nuisance action 'if it is specially injurious to himself, but not otherwise.' (quoting CAL. CIV. CODE § 3493 (West 1970)). In *Lincoln Properties, Ltd.*, the court held that the landlord had established the elements of public nuisance. Finding that the defendants had failed to obtain a discharge permit under the applicable county code, the court also ruled in favor of the landlord on his nuisance per se claim, which is an action based on a legislatively declared public nuisance or any condition existing in violation of the code. The defendants argued that the dry cleaners were 'carrying out their business in accordance with standard industry practices.' *(Id. at 20,676-77.)* The court rejected the defendants' claim that the landlord had, therefore, consented to disposal of PCE by requiring in the lease that the tenants only conduct dry cleaning operations on the premises. The court found that 'because [the landlord] established nuisance per se, it [was] entitled to injunctive relief without proof of irreparable harm and regardless of the availability of other remedies.' *(Id. at 20,677.)* (Grant, 1995)."

2.2.5 Damages in Nuisance and Trespass Cases

"In a hazardous waste case, the typical 'measure of damages in trespass and [public and private] nuisance cases involving 'permanent' [or indefinite] injury [is] the diminished market value of the property, plus consequential losses to the use of the land or from discomfort or annoyance to the possessor.' (See *Walker Drug, 972 P.2d at 1246)* In contrast, 'damages from 'temporary' injury, *i.e.*, injury that is remediable, typically include compensation for the cost of remediation or repair to the property or the property's diminished rental or use value during the period in which the injury persists, plus consequential damages (Id.)' (Zuckerman et al, 2000)."

2.2.6 Statute of Limitations in Continuing Nuisance and Trespass

Groundwater pollution is an example of a "continuing tort"—one that can recur as contaminants migrate through the subsurface. "Because states have statutes of limitations for nuisance and trespass that range from one to ten years, labeling a nuisance or trespass as either permanent or continuing can make or break a plaintiff's case (Zuckerman et al, 2000)." This strategy is further described in Zuckerman et al, as follows:

"If a nuisance or trespass is considered permanent, the plaintiff has only one cause of action and only one opportunity to recover. Thus, if the statute of limitations runs, the plaintiff can take no action, since successive actions are not permitted for permanent torts. However, if the trespass or nuisance is deemed continuing, "successive actions [are] maintained for the damages occurring from time to time." (*City of Phoenix v. Johnson, 75 P.2d 30 (1938)* In theory, the difference between a continuing nuisance or trespass and a permanent nuisance or trespass lies in "the ability of man to abate the nuisance." (*City of Phoenix, 75 P.2d at 35.*) If the nuisance or trespass recurs frequently or is constant, then the nuisance or trespass is continuing. If the nuisance or trespass cannot be abated, then it is permanent. In *City of Phoenix v. Johnson*, the Arizona Supreme Court held that if a

nuisance is of such a nature that although the thing itself may continue, yet its injury to another may be abated by human agency, and the owner or perpetrator of the nuisance fails to abate it, the nuisance is a continuing one, and one action does not exhaust the remedies of the parties injured. If, however, the thing is of such a character that it cannot be maintained without continuing to be, in the legal sense, a nuisance, it is permanent in its nature, and the rights of the injured party are exhausted by one action. (Zuckerman et al, 2000)."

It should be noted that in CERCLA, Federal law changed state tort law through Congress invalidating state statutes of limitations inconsistent with this section. Section 309 of CERCLA (42 U.S.C. § 9658), added as part of SARA, mandates that the statute of limitations for "any action brought under State law for personal injury, or property damages, which are caused or contributed to by exposure to any hazardous substance, or pollutant or contaminant, released into the environment from a facility (*see* 9658 (a)(1))", run from the date on which the plaintiff discovered, or reasonably should have discovered that the damages "where caused or contributed to by the hazardous substance or pollutant or contaminant concerned (*see* 9658 (b)(4)(A))" and not from the date upon which the contamination occurred.

2.2.7 Negligence

Negligence is a failure to use for the degree of caution that a "reasonable person" would have undertaken to avoid causing harm to someone else. In an environmental claim, the release of hazardous substances into the environment that causes injury or damage to others could be the basis for a negligence claim.

"The elements for a negligence cause of action are as follows:

a. A duty, or obligation recognized by law, requiring a person to conform to a certain standard of conduct, for the protection of others against unreasonable risk;

b. A breach of the duty to conform to the required standard;

c. A reasonably close causal connection between the conduct and the resulting injury (proximate cause or legal cause); and

d. Actual loss or damage resulting to the interest of another."

(W. Page Keeton Et Al., Prosser And Keeton On The Law Of Torts § 30 at 130 (5th ed. 1984).

In general, the legal "duty" to which the defendant is held is the duty to exercise "due care" under the circumstances. Ordinarily, the question of what constitutes due care under the particular circumstances of the case will be left to the jury in each case. However, "if the evidence establishes that the plaintiff's or defendant's violation of [a] statute or ordinance proximately caused the injury and no excuse or justification for violation is shown by the evidence, responsibility may be fixed upon the violator without other proof of failure to exercise due care. (*Satterlee v. Orange Glenn Sch. Dist., 177 P.2d 279 (1947).* (Zuckerman et al, 2000)." This is what is often referred to as negligence *per se*, or negligence as a matter of law. Unless the statute, regulation, or ordinance in question explicitly states whether violation of its terms constitutes negligence, the decision as to whether to impose negligence *per se* will be up to the courts.

2.2.8 Fraud

Zuckerman et al states that "fraud includes "anything which is intended to deceive, including all statements, acts, concealments, and omissions involving a breach of legal or equitable duty, trust or confidence which results in injury to one who justifiably relies thereon. *(Ach v. Finkelstein, 70 Cal. Rptr. 472, 477 (Cal. Ct. App. 1968),*

quoting Pearson v. Norton, 40 Cal. Rptr. 634, 638 (Cal. Ct. App. 1964). (Zuckerman et al, 2000)."

A seller of real property is obligated to disclose to a potential buyer any environmental defects on the property which the seller knows of should reasonably know of if a general inspection of the property was to be conducted. The "duty" has its limits, however, because the seller must know that the material facts are beyond "the reach of the diligent attention, observation and judgment of the purchaser (Dennison, 1996)."

Fraud cases can be tried on grounds of intentional misrepresentation, negligent misrepresentation, or concealment. Intentional misrepresentation occurs when a defendant makes a representation with the intention to defraud the plaintiff who then acts upon or relies upon that information. Negligent misrepresentation occurs when a defendant makes a false representation to a previous or current material fact without any reasonable ground for believing it to be true. The plaintiff relies upon this representation unaware of its falsity and sustains damages as a result of reliance upon the truth of the representation. Concealment involves the defendant intentionally concealing or suppressing facts inn order to defraud the plaintiff who was unaware of the fact and would not have acted the same if aware of said information. (Zuckerman et al, 2000)

Chapter 3: Contract Provisions/Environmental Insurance

3.1 Avoiding Environmental Liabilities Through Transactional Means

The purpose of this chapter is to introduce and outline the standard provisions contained in sales contracts and leases with the sole intention to limit risks under environmental law. I will also discuss the different types of environmental insurances that are currently available.

3.2 Sales Contracts for Land or Existing Real Property

Zuckerman et al, lists the three stages involved with the transfer of contaminated real property:

> 1. "Investigation of the property for toxic contamination;
>
> 2. Evaluation of the extent and nature of the contamination; and
>
> 3. Negotiation and documentation of each party's rights and responsibilities concerning toxic contamination and, if applicable, remediation or removal of the toxic contamination."
>
> (Zuckerman et al, 2000)

3.3 Investigation of the Property for Contamination

Every piece of real property should have an environmental assessment performed before the transaction. The scope of the assessment should be consistent with the functional history of the property and adjoining properties. The assessment should be

conducted to accomplish three goals: 1) identify the sources of the contamination, 2) locate the pathways of the contamination, and 3) determine the receptors of the contamination (i.e. population, property, air etc.) (Dennison, 1996)

Investigation of the property for contamination takes the form of an ASTM (American Society For Testing and Materials) Phase study. There is a Phase I study (identify if there is possible contamination), Phase II (confirm that there is contamination and how extensive is it) and Phase III (how can this contamination be remediated?).

ASTM was formed in 1898 to create industry standards for materials. In 1989 they began working on the Phase I standards by forming an E-50 committee which was composed of volunteers from the legal, consulting, financial and industrial sectors. The standards were formally adopted in 1992. (Dennison, 1996)

3.3.1 Phase I Study

The Phase I study is a common part of any real property transaction and there are many firms and individuals providing Phase I studies. As such, the pricing provides a minimal profit to the professional conducting the study. The client should pay extra due care to the credentials of the professional conducting the study. A Phase I study is also generally considered an "appropriate level of inquiry" to qualify for the "innocent landowner defense", another reason to place due care in selecting a professional.

"A Phase I Report has two important aspects: (1) an investigation of the historic and present uses of the site, occasionally accompanied by limited on-site testing of soils; and (2) an analysis of whether current operations comply with environmental permitting requirements. Regardless of who requests or provides a Phase I Report, the buyer should focus on matters affecting or potentially affecting the property's use and potential liability issues (Zuckerman et al, 2000)."

Zuckerman et al, lists a good summary of the elements of a Phase I Report (note that Phase I Reports do not include any soil or groundwater testing):

> a. "A review of Federal, state, and local government agencies' lists of contaminated properties;
> b. Discussions with various agency representatives to determine whether a site is known or believed to be polluted but, for whatever reason, not yet on the relevant lists;
> c. A review of the historical uses of the site through interviewing surrounding property owners and reviewing historical aerial photos and title chains; and
> d. An environmental consultant's site inspection to "eyeball" any visible contamination on the property."
> (Zuckerman et al, 2000)

A Word of Caution:

"Whenever a Phase I Environmental Site Assessment is conducted, it must be performed by an environmental professional . . . Further, at the Phase I Environmental Site Assessment level, no practical standard can be designed to eliminate the role of judgment and the value and need for experience in the party performing the inquiry. The professional judgment of an environmental professional is, consequently, vital to the performance of appropriate inquiry at the Phase I Environmental Site Assessment level. (American Society for Testing and Materials, Standard Practice for Environmental Site Assessment, ASTM Standard E 1527 § 4.3.2 (1997))"

It is also important to select a firm which carries errors and omissions insurance. A firm which does not carry said insurance may not be a qualified environmental consultant under ASTM and the "innocent purchaser defense" my not hold in litigation.

"A party who hires an uninsured consultant will not be able to look to the environmental consultant for financial responsibility in the event of an error (Zuckerman et al, 2000)."

3.3.2 Phase II Study

A Phase II study usually include the following elements:

a. "Drilling and sampling exploratory borings to a depth of ten feet below the water table. Samples are obtained every five feet and sent to a state-certified laboratory for analysis.
b. Converting exploratory borings to monitoring wells.
c. Developing monitoring wells and obtaining water samples. Investigators send the water samples to a state-certified laboratory for detection of the contaminants suspected on the site.
d. Preparing a report compiling the data and stating findings, conclusions, and recommendations regarding whether future work is needed at the site."

(Zuckerman et al, 2000)

3.3.3 Phase III Study

A phase III study involves the following:

a. "A complete vertical and horizontal delineation of the contaminate 'plume,' which is the visible or measurable discharge of a contaminant from a given point of origin

b. A contaminant concentration profile to determine the degree of contamination. This delineation makes estimated remediation of the quantity of contaminated soil and groundwater possible. Thereafter, an

investigator can prepare a remediation methodology or work plan that includes cost estimates. The investigator will submit the work plan, along with all previous work plans, to the appropriate regulator for review and approval. Finally, the remediation plan will be implemented. Sometimes the remedial planning, design, and implementation is referred to as Phase IV."
(Zuckerman et al, 2000)

3.3.4 Negotiating Each Party's Rights and Responsibilities

The following is a useful list of provisions as found in Zukerman et al, for the transfer of contaminated or potentially contaminated real property:

1. "Seller's disclosure of known or suspected contamination: If the seller's knowledge is based on reports, the contract should include those reports as exhibits.

2. Seller's representation of no known or suspected contamination: Obviously, the parties will not use this provision if the seller knows or suspects contamination. The language of this representation often varies from "absolute" to "best of the seller's knowledge" to facts only addressed in environmental reports. Also, some sellers attempt to limit their representations to the time that they owned or operated the property.

3. Definitions of hazardous materials: What constitutes hazardous material is often defined by Federal, state, or local statute, ordinance, or regulation. If any doubt exists as to whether certain specific substances fall within such statutes, parties to the contract should remove any doubt. For example, the contract may state: 'Hazardous

materials or substances includes [insert applicable substance, e.g., asbestos, radon, etc.], regardless of whether the named substance is defined as a hazardous waste or substance in any statute, ordinance, rule, or regulation.'

4. Buyer's opportunity to investigate the property for contamination: This provision should be included even if the seller has disclosed the contamination by providing environmental reports. The provision may include wording that gives the buyer a certain period to (a) review the existing environmental report(s) and perform an evaluation, including testing, or (b) prepare an environmental review if the seller has not done so. If the buyer proposes testing, the parties should agree on the extent of the investigation. Additionally, the seller should require the right to split samples in order to have its own consultant confirm the buyer's conclusions. Lastly, the seller should include some language to protect against contamination caused by the buyer during testing and against unreasonable delay.

5. Tenant's estoppel provisions: If the seller leases the property out, the buyer should require a provision that calls for the tenant to state, prior to closing, that the tenant is not aware of any contamination on, at, under, or from the property. If the tenant is unable or unwilling so to state, the provision should allow the buyer to withdraw from the agreement.

6. Buyer's right to terminate: The buyer should have the right to withdraw from the deal if contamination is found during the buyer's due diligence period. This provision is normally part of the clause(s) stating that the closing is contingent upon the buyer's approval of the property's environmental condition.

7. Seller's right to terminate: If the seller is transferring the property for a discounted price in return for the buyer's assumption of all liability, the seller may establish deadlines for the buyer to perform, or begin to perform, certain remediations. If the buyer does not meet the deadlines, the seller may want to withdraw from the deal.

8. Loan contingency: As in most real property contracts, the buyer's responsibilities should be contingent on the buyer's ability to obtain a loan.

9. Provisions concerning renegotiation or postponement of negotiations on certain issues: The discovery of contamination during the buyer's due diligence period could affect the following provisions: purchase price; closing date; release clauses; indemnity clauses; allocation of remediation costs; responsibility or control over the remediation; and measures to ensure payment of the remediation costs, such as escrow holdbacks, letters of credit, financial guaranties, offsets against the buyer's note, insurance, etc."

(Zuckerman et al, 2000)

3.3.5 Indemnity and Release Clauses

A release clause will absolve one side of the party from any future liabilities in case of future remediation costs or other environmental liabilities. If the seller wants a release from liability, then usually a lower transaction price is negotiated to compensate for the increased buyer risk.

An indemnity clause, however, "goes farther than a release clause by giving the indemnitee (usually the released party) a right to recover from the indemnitor (usually the releasing party) in the event of a third party action. As with release clauses, parties use

both broad and narrow indemnity clauses. Some parties will agree to indemnify only for known contamination, while others will agree to indemnify for unknown contamination as well. Sometimes the seller will indemnify the buyer, and sometimes the buyer will indemnify the seller (Zuckerman et al, 2000)."

The following are provisions that the indemnitor may want to include:

> 1. "third party claims for personal injury or property damage arising from conditions existing after the transfer of title;
> 2. third party claims for personal injury;
> 3. remediation orders or response cost demands from government agencies when costs exceed a certain sum;
> 4. any contamination arising from hazardous materials or conditions not identified in the parties' environmental reports;
> 5. conditions caused by the buyer after closing (a provision that creates an inherent burden of proof issue that the agreement should address);
> 6. asbestos;
> 7. polychlorinated biphenyls (PCBs); and
> 8. groundwater contamination."
> (Zuckerman et al, 2000)

"The buyer should demand indemnification for unknown contamination that exists at the time of the sale, but is not discovered until some time after the sale. The indemnity should extend not just to the buyer, but also to the buyer's officers, directors, stockholders, employees, agents, representatives, affiliates, successors, and assigns. In addition, if the buyer has affiliates, the indemnity should extend to each of the affiliates and their agents and representatives (Zuckerman et al, 2000)."

3.3.6 *"As Is" Clauses*

The courts have held that "as is" clauses do not transfer environmental liability to a purchaser or "even protect against CERCLA contribution actions by purchasers. Instead, courts consistently hold that "as is" provisions preclude only breach of warranty causes of action against sellers (Zuckerman et al, 2000)."

3.4 *Creation of a Redevelopment Agency*

If the site has significant physical economic blight or is in the local government interest for redevelopment, a Redevelopment Agency could be formed. The advantages to creating a Redevelopment Agency are numerous. In California, for example, a Redevelopment Agency is created by local government under the authority of State law and exists as an entity of the State. In fact, physical and economic blight are legally required predicates for the creation of a Redevelopment area. The advantage is that they are exempt from any subsequent local law changes (elections, etc) which conflicts with the Redevelopment Plan. Redevelopment Agencies have the power to buy and sell property (whether by negotiation or eminent domain), to provide development financing and to take out development financing. The incentive for the city to create a Redevelopment Agency is that they will receive new tax revenues through the development. (Smalley, 2002)

"A major advantage which Redevelopment Agencies share in common with other state and local governmental entities in the United States is the ability to issue bonds which pay interest to the investor free of income taxation. This tax exemption allows municipal issuers to pay much lower rates of interest while yielding a return to the investor which is equivalent to a higher taxable rate. Local agencies not only benefit from this lower cost of funds for their own projects; they may offer such low-cost funds to private developers on a conduit basis for specified types of projects which meet certain standards of public benefit (Smalley, Mission Bay Project Documents, 2001)."

3.5 Environmental Insurance

Today, there are several insurers against environmental liability. Insurance can be obtained to protect against suits by government and private individuals for cleanup and damage and claims by neighbors for migrating pollution. In the early 1980's, court rulings that general liability insurance included CERCLA and other environmental liabilities prompted the insurance industry to include "absolute pollution exclusions." There are currently several plans being offered which include "cleanup cap" insurance and liability insurance. (Zuckerman et al, 2001)

3.8.1 Cleanup Cap Insurance

Zuckerman et al, lists the general offerings and features of cleanup cap insurance:

1) "cleanup costs, as defined in a remediation study, that are above the anticipated cost of cleanup;
2) cleanup costs at, adjacent to, or from the defined site location;
3) off-site cleanup costs incurred in the cleanup of pollutants that originated from the cleanup at a covered location pursuant to the Remedial Action Plan;
4) change orders required by governmental authorities that are incurred during the policy term;
5) additional, optional coverage for new-found contamination discovered in the course of performing cleanup pursuant to the Remedial Action Plan at a covered location.
6) policy attaches over a prescribed self-insured retention, which is equal to the expected cost of cleanup plus a 'buffer layer.'
7) Premium discounts are available if the insured shares in the cost overruns.
8) $ 70 million per loss and aggregate limits are available.

9) The insured may select to cover professional liability.

10) Multi-site programs are usually available.

11) Terms of ten years or more are usually available.

12) Preliminary premium indications can be provided within 24 hours based on the insured's selection of estimated cleanup costs, coverage limitations, the buffer layer, co-insurance, etc."

(Zuckerman et al, 2001)

3.8.2 Pollution Liability Insurance

Pollution liability insurance basically covers owners and operators against the factors which could make them liable under CERCLA (i.e. pollutants discovered and/or migrating, transporting pollutants and disposing of pollutants). The coverage is, like CERCLA, backward and forward looking. It also covers legislative changes to include future actionable contaminants. It is important to note that "coverage depends on the insurer but is almost never available once remediation begins (Zuckerman et al, 2001)."

3.9 Lease Considerations

Grant, explains that while "the tenant wants to allocate the risk for environmental contamination entirely to the landlord. Landlords cannot accept the entire responsibility because it may be the tenant that contaminates the property. Reciprocal indemnities, along with a clear identification of the party responsible for the remediation work once liability is determined, are the preferred approach." He also explains that a lease "...should include a right to enter the premises and cure the breach with a duty on the tenant to reimburse the landlord. In light of the high costs associated with environmental contamination, an explicit right specifically to enforce the obligations of the other party would be prudent because the right to cure and seek reimbursement is much less appealing when the costs are extraordinarily high. No landlord wants to clean up a

tenant's environmental contamination and then pursue the tenant for reimbursement (Grant, 1995)."

Chapter 4: Brownfields

4.1 Brownfields

There are thousands of sites in the U.S., many previously used for industrial uses, which have soil and groundwater contamination. These sites are abandoned and they are underutilized because potential purchasers are afraid of their potential risks under the Federal and State environmental laws. The advantages that these sites provide to the real estate developer include an existing infrastructure (a major municipal expense) and many with high locational value (i.e. waterfront and central business district (CBD) sites). "Remediating Brownfields and decreasing the number of Greenfield developments is in our country's interest. When business facilities are constructed on Greenfields, 'roads, sewers, schools, residences and other infrastructure must be developed, and new units of government created to levy the taxes to pay for them. Redundant infrastructure not only wastes scarce tax dollars, it adds to the burden on the environment. (EPA: Brownfields and PPA, 1997) (Zuckerman et al, 2001)."

4.2 Development Impetus

Realizing the relative shortcoming of the Superfund program, the first move by the EPA to encourage Brownfield development was the passing of the "Working Draft of the Brownfield Action Agenda" issued on January 25, 1995. The EPA Brownfields Initiative program is composed of four components: 1) removal of sites from CERCLIS, 2) prospective purchaser agreements (PPAs), 3) comfort/status letters and 3) state voluntary cleanup laws. (Dennison, 1996)

4.2.1 Removal of Sites From CERCLIS

"On March 29, 1995, the EPA adopted new procedures for maintaining its Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) (60 Fed. Reg. 16,053) (Dennison, 1996)." The EPA uses CERCLIS database to track sites slated for cleanup under CERCLA. Basically, the EPA decided to remove sites from this database sites which it considered did not require any further evaluation or specifically "No Further Response Action Planned" (NFRAP). The purpose was to eliminate any disincentives to purchase and redevelopment of sites included in CERCLIS. By the end of 1996, the EPA had removed at least 25,000 NFRAP sites from a list of 38,000 sites in CERCLIS. (Dennison, 1996)

On a more macro level, communities with Superfund sites face lower home values and increased reluctancy for businesses to relocate there. For example, "Kohlhase (1991) examined the impact on property values when the EPA places a toxic waste site on the Superfund list, meaning that the site becomes a Federal priority for cleanup efforts. Using data from Houston, she estimated that property values within a 6.2 mile radius of the site were decreased by as much as $3,310 for each mile closer to the site following the EPA announcement (DiPasquale & Wheaton, 1996)." This tradeoff between public health and economic development is aligned with the Brownfield development initiatives. (Ashford and Rest, 2001)

4.2.2 Prospective Purchaser Agreements

The prospective purchaser agreement ("PPA") which introduced the "innocent purchaser" (*U.S.C § 9601*(35)(A) (1994)) defense was originated with SARA (the Superfund Amendments and Reauthorization Act of 1986. "The innocent purchaser defense provides that any person who purchased a contaminated site without notice, after performing adequate due diligence, will not be held liable under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"). In

order to assert this defense successfully, present landowners must establish: (1) they purchased the property without any knowledge of the releases or discharges, (2) at the time of the acquisition they exercised "all appropriate inquiry into the previous ownership and uses of the property," and (3) their inquiry was "consistent with good commercial or customary practice in an effort to minimize liability." (*Id.* § 9601(35)(B)). The innocent landowner exemption applies not only to current owners of property, but also to intervening owners *(See Westwood Pharm., Inc. v. Nat'l Fuel Gas Distrib. Corp., 964 F.2d 85 (2d Cir. 1992)* or to innocent transferees of shares in a corporation holding contaminated property. *(See United States v. Pac. Hide & Fur Depot, Inc., 716 F. Supp. 1341 (D. Idaho 1989).* Courts also have interpreted CERCLA to exempt entities acquiring land on which a hazardous waste site is located and transferring it while acting in the capacity of "conduits," not as owners. (*See In re Diamond Reo Trucks, Inc., 115 B.R. 559 (Bankr. W.D. Mich. 1990).* As a result of this new innocent purchaser defense, developers began to ask for assurances that they would not be sued for pre-existing contamination. ...In response, in 1989 the EPA issued *Guidance on Landowner Liability Under Section 107(a)(1) of CERCLA, De Minimis Settlements Under Section 122(g)(1)(B) of CERCLA, and Settlements with Prospective Purchasers of Contaminated Property, the Guidance Notice* ("Guidance Notice"). (*See 54 Fed. Reg. 34,235* (Aug. 18, 1989). The Guidance Notice stated that prospective purchasers could agree to provide the EPA with due consideration, generally cash, in return for certain assurances regarding future enforcement action; *i.e.*, the EPA would neither sue nor seek other forms of contribution from the developer for CERCLA costs. *(See New Guidance Notice, 60 Fed. Reg. 34,792 (July 3, 1995)* (Zuckerman et al, 2001)."

Inadequate staffing at the EPA and a mixed reaction on behalf of the development community, as the risk premium attached to Brownfield development was not abated enough with the new regulations, resulted in few PPA agreements. However, in response the EPA revised the guidelines in 1995. "Under the 1995 guidelines, the EPA may sign a PPA to encourage reuse or development of contaminated property that will provide substantial indirect benefits to the community, while providing a lesser benefit to the EPA. *(60 Fed. Reg. 34,794 (July 3, 1995).* Thus, under the 1995 guidelines, the standard

for PPAs is lower and more relaxed. Not unexpectedly, the EPA has increased the number of sites eligible for PPAs (Zuckerman et al, 2001)." It should be noted that the EPA has final say in all PPA matters. "If the EPA refuses to enter into a PPA, no administrative or judicial appeal is available (Zuckerman et al, 2001)." At the same time, creating an adversarial relation with the EPA is not in the developer's best interest if it plans to engage in future Brownfield developments. The 1995 guidelines also include a covenant by the United States not to sue for any existing contamination. "Developers who enter into PPAs with the EPA also are protected under CERCLA against actions by others for (1) recovery of their own costs or (2) contribution claims in which a defendant attempts to transfer some liability to the developer. *(See 42 U.S.C. § 9613(f) (1994).* (Zuckerman et al, 2001)

4.2.3 Comfort/Status Letters

Comfort/status letters are issued by the EPA's regional offices in order to encourage Brownfield development. The letters contain information obtained by the EPA regarding site contamination and are utilized by developers and their lenders to determine their risk of CERCLA liability. "Although they do not protect developers against future CERCLA actions, comfort/status letters may be helpful in obtaining financing (Zuckerman et al, 2001)."

4.2.4 State Initiated Brownfield Programs

State initiated Brownfield programs, also referred to as "voluntary cleanup programs" provide an extra incentive for private sector Brownfield development. The party "volunteers" to remediate any contamination present on the site as part of their development plan in exchange for either covenants by the state either not to sue (protects against future legislative changes or a "no further action" letter which states that the site was remediated according to state Superfund guidelines. (Zuckerman et al, 2001) Further,

remediation requirements are no longer fixed at the strict CERCLA standard of drinking quality water. The introduction of a "risk based corrective action" (RBCA) evaluates each site individually and bases remediation levels according to the proposed site usage (See 4.3 for further details of RBCA).

The risks of Federal liability are not mitigated at all by State programs. However, many State programs are recognized by the EPA equivalent to the Federal program and "the EPA has entered into a Memorandum of Agreement ("MOA") with some states, which acknowledges the adequacy of these states' programs and declares that the EPA will not invoke Federal action under CERCLA unless exceptional circumstances exist (Zuckerman et al, 2001)." State voluntary programs also no not absolve the right of any party to seek damages using common law tort damages.

Please refer to Chapter 5: "Public Concern / Legislative Actions / Further Development Impetus" which proposes that the trend in legislation will further provide incentives for Brownfield development as the legislative focus is now trying to align public health and safety with the interests of private developers. The needs of the private development industry are further met with the advent of modern environmental insurance. The result should be that if prospective buyers and lenders automatically reject a site that is or is perceived to be contaminated, it is not based on a rational choice but instead on irrational behavior.

4.2.5 Criteria for Brownfield Developers

Zuckerman et al, finds the following as the key requirements for the purchase and redevelopment of a contaminated property:

1) "The prospective property must have sufficient 'redevelopment potential;' *i.e.*, the property must be (a) sufficiently large, and (b) in a suitable location for remediation.
2) The relevant regulatory officials must be known to be reasonable.
3) Any prospective site must be significantly contaminated; otherwise, redevelopment wastes the company's technical expertise and capabilities and financial resources."

(Zuckerman et al, 2001)

Please refer to Appendix III for a transactional "checklist" before engaging in any real property transaction.

4.3 *Technical Developments Encouraging Brownfield Development*

The evolving scientific and regulatory views on health risks and soil and groundwater cleanup feasibility and the reduced liability barriers influenced by the new regulatory climate (see Chapter 5) are providing new incentives for Brownfield development.

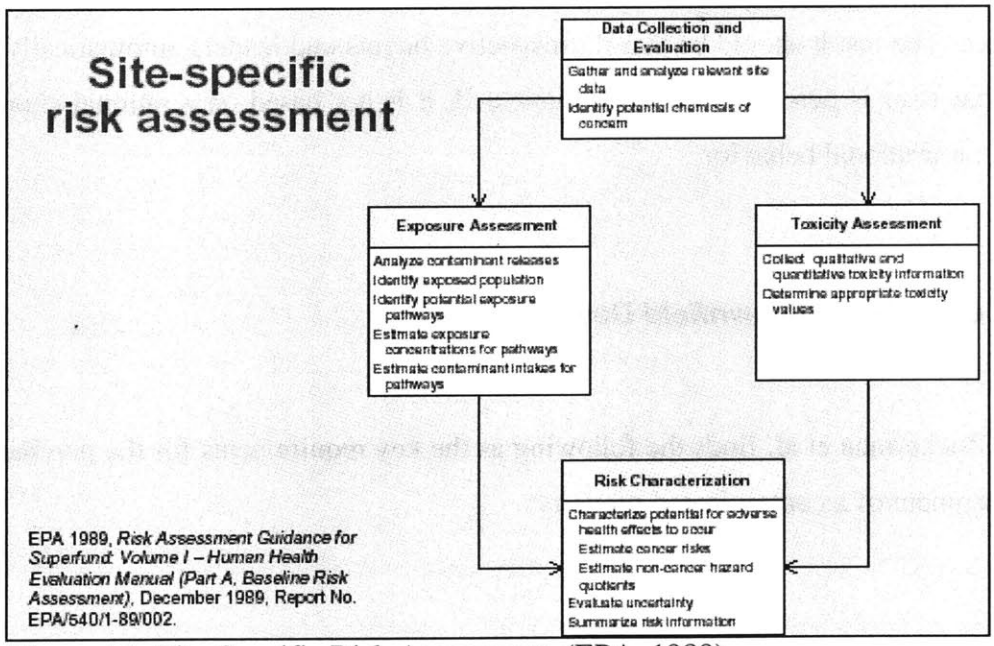

Figure 4.1: Site-Specific Risk Assessment. (EPA, 1989)

The development of RBCA (Risk Based Corrective Action) gives the government flexibility to base site cleanup on actual risk (both carcinogenic and non-carcinogenic) to potentially exposed populations in light of the contemplated land use. Additionally, studies by engineers have shown that natural attenuation or bioremediation may be as effective as expensive invasive methods such as pump and treat and regulators are allowing chemicals to remain in place if technically not practical to remove or stable in containment zones (i.e. deep impermeable subsurface cavities).

Chapter 5: Public Concern / Legislative Actions / Further Development Impetus

5.1 Introduction

The purpose of this chapter is to explore and analyze a possible association regarding "public concern" towards contaminants in the soil and groundwater and Congressional hearing activity and legislative action by the government addressing these issues.

One explanation of such an association is that public concern and legislative activity are highly correlated and that the recent relaxation of the public's concern in this area has prompted the Federal and State governments to pass legislation more in favor of the private "development" community (buyers, sellers and lenders), thereby allowing more development opportunities, new remediation technologies and new Brownfield development incentives.

Another explanation is that anti-regulatory biases on the part of both the government and the industry-influenced media has created an apparent association. Distinguishing between these two explanations is difficult from the existing data and would require an independent assessment of public concern beyond that reflected in media coverage (Priest, 1988).

As Priest stated, "the public at large has a two-way relationship with the media (television, periodicals and radio). The media derive their material partially from what the public is doing and is concerned about. For professional and commercial reasons, it also covers what it believes is or will be of interest to the public. In this, media coverage is inflected by the discussions and rhetoric of politicians who not only reflect but try to anticipate or shape public opinion, sometimes seeking to meld it to the agendas of diverse and often hidden interest groups. These multiple inputs to media discourse are, for example built into the practice of opinion polls. ...The media directly effects legislation

by providing information to legislators and covering Congressional events, such as hearings (Priest, 1988)."

As previously stated in Chapter 1, the advantages of Brownfield development could benefit both the public and private developer interests. Firstly, development on a Brownfield has the advantage of building upon pre-existing infrastructure. Thus, governments do not need to pay to develop them through taxes. At the same time, there is no downtime to the developer as the infrastructure is already installed. Secondly, encouraging the private development of contaminated properties ensures the Government's goal of cleaning them up - at least to some degree - at the developer's expense. It is clear that having the government clean up a site and then try to collect the costs from PRPs is inefficient.

5.2 Development of the Model

5.2.1 Factors

The factors used to generate the model included "public concern" and Congressional hearings for the period of 1980 to 2001.

a. Public concern was measured by counting the number of articles printed in the New York Times for each year where the subject of the article was either "toxic and hazardous substances" or "soil contamination." These terms were chosen as they were determined to be the closest standard New York Times indexing terms to the model.

   Public concern was also measured by counting the number of articles printed in the New York Times for each year where the subject of the

article was "environmental cleanup" which includes articles related to Superfund and Bioremediation.

b. Congressional hearings were counted for the same period where the subject matter of the hearing was "environmental pollution and control" or "soil pollution." A separate count was made for hearings where the subject was "hazardous substances Superfund."

5.2.2 Assumptions

This model makes the following assumptions

a. The New York Times is representative of "public concern" of the American public for the entire 21-year period of the study.
b. The number of articles can represent the level or intensity of "public concern" where the subject concerns "toxic and hazardous substances", "soil contamination" and "environmental cleanup."
c. The number of Congressional hearings on "environmental pollution and control", "soil pollution" and "hazardous substances Superfund" are indicative of their attention to the issue.
d. Congress firstly acts on behalf of the American public and secondly on the interests of business or private interests. Thus, a decrease in public concern means that Congress will shift focus to represent the interests of business.

5.2.3 Data Collection

5.2.3.1 Sources

a. Data for "public concern" was collected from the New York Times for the period of 1980 to utilizing the Lexis-Nexis database system.
b. Congressional hearing data was entirely collected utilizing the Lexis-Nexis Academic "Congressional Universe" database.

5.3 Calibration of Model

Three comparisons were made to test the correlation of the factors:

Run 1: "Public concern" on "toxic and hazardous substances" or "soil contamination" was compared to Congressional hearings on the topics of "environmental pollution and control" or "soil pollution."

Run 2: "Public concern" on "toxic and hazardous substances" or "soil contamination" was compared to Congressional hearings on the topic of "hazardous substances Superfund."

Run 3: "Public concern" on "environmental cleanup" was compared to Congressional hearings on the topic of "hazardous substances Superfund."

A chart comparison detailing the progression of States with Brownfield developments incentive legislation is also presented as a comparison.

5.4 Analysis

Run 1:

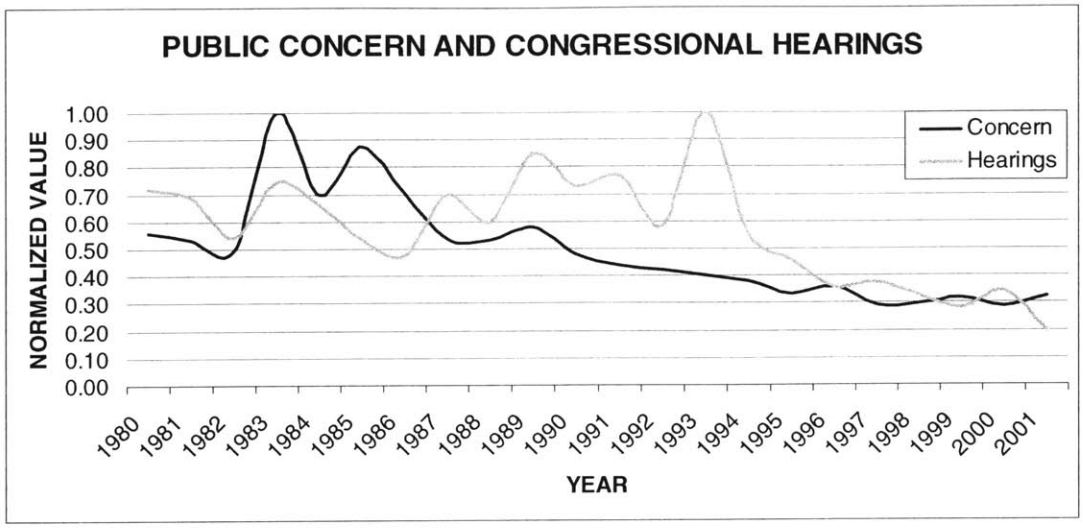

Figure 5.1: Public Concern and Congressional Hearings

Figure 5.1 illustrates the general correlation between public concern and Congressional hearing on like matters. Next, public concern is plotted against Congressional hearings on Superfund.

Run 2:

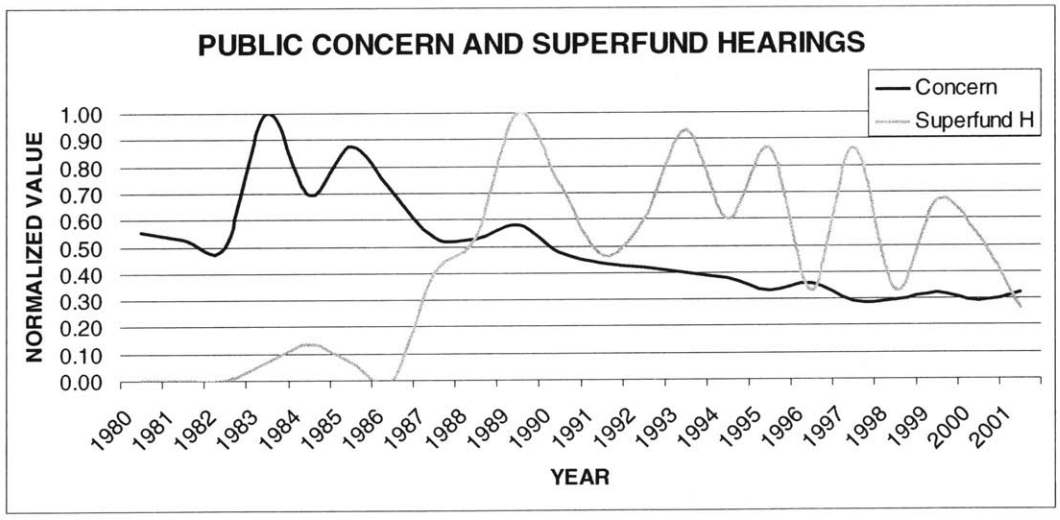

Figure 5.2: Public Concern and Superfund Hearings

Figure 5.2 reveals something very interesting. As overall public concern was subsiding, there was a flurry of Congressional hearings on Superfund. Looking closely at the content of the hearings it revealed that Congress was working for private developer interests by amending Superfund to make the regulations less restrictive thereby encouraging real property transactions and redevelopments, Brownfields developments and allowing the EPA to increase its frequency of Record of Decisions (RODs).

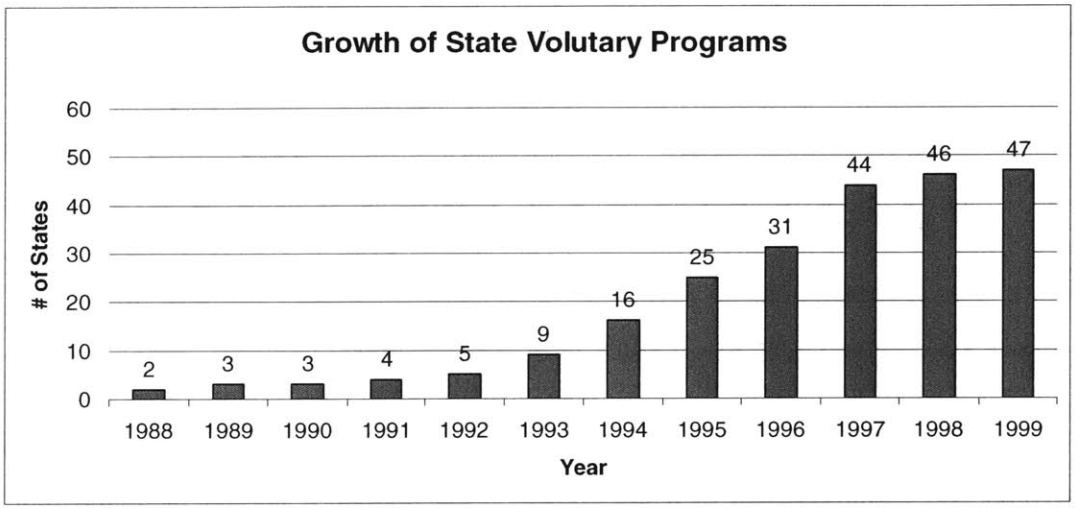

Figure 5.3: Growth of State Voluntary Programs (Rakestraw, 2000)

The other objective of the amendments to Superfund and the Brownfield development impetus was the growth of State voluntary programs which also intend to encourage development of contaminated properties. As observed in figure 5.3, one can see a nice inverse concern and growth in these programs.

The last run was to compare public concern over Superfund and the Congressional hearings on the same matter.

Run 3:

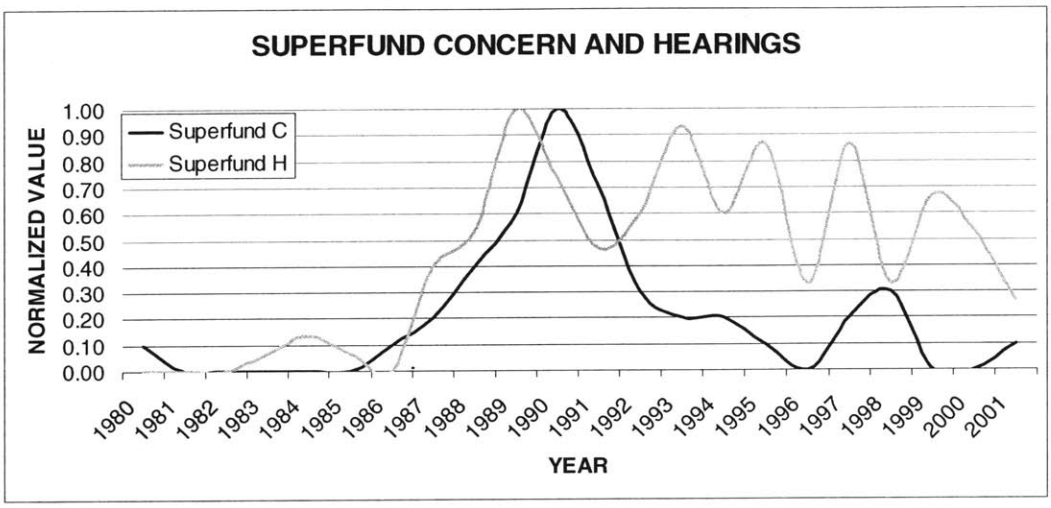

Figure 5.4: Superfund Concern and Superfund Hearings

Again, one can see a general correlation between the public concern over Superfund and Congressional hearings on the same matter. It should be noted that the large activity in both hearings and concern occurred when the myriad of amendments went into legislation progressively leading to the current push for Brownfield developments.

To bring to light the fluctuations presented in the Congressional hearings time series, it would be useful to list some significant dates in environmental legislation. The dates also include some significant agency action and State legislation:

1980 – "CERCLA was legislated introducing some wide variations in interpretation of liabilities.

1983 – New Jersey introduces the Environmental Cleanup Responsibility Act. This was the most stringent cleanup law when passed. It required

industrial and commercial sites to be clean before any sale, transfer or closing.

1986 - CERCLA was amended with SARA, introducing the following exemptions from liability: 1) "innocent landowner defense" and 2) "secured creditor exception (SCE) (See Chapter 2b on an analysis of CERCLA and Fleet Factors). The decision of Fleet Factors sent the lending community into an uproar and greatly restricted the availability of capital for construction loans and permanent mortgage financing.

1993 - ASTM publishes the Phase I environmental site assessment (ESA) standard and New Jersey passes the Industrial Site Recovery Act. This Act added language that human cancer risk from contaminant exposure must not exceed one in one million.

1994 – EPA launches the Brownsfield Economic Redevelopment Initiative

1995 – EPA launches the Brownfields Action Agenda, a program under Superfund which funded over 300 pilot programs. The EPA selected different sites to test redevelopment models, remove regulatory barriers and facilitate coordinated public and private efforts at all levels of government.

Michigan amended state cleanup laws to eliminate strict liability in favor of causal liability and ASTM publishes the Risk Based Corrective Action Standard.

1998 - New Jersey introduces the Brownfields and Contaminated Site Remediation Act to further encourage development by including such protections such as innocent purchaser exceptions, covenants not to sue, presumptive remedies (helps expedite redevelopment because prior DEP

approval is not required), tax incentives (tax deductibility of up to 75% of remediation costs), incentives for using innovative remediation technologies and lender liability exemptions for underground storage tanks (USTs).

2001 – On December 20th, the Brownfield Reform and Small Business Liability Relief Act introduced a small business liability exemption (de micromis exemption) which "exempts PRPs disposing of <110 gallons of liquids or <200 lbs solids from liability for NPL cleanups. It also exempts small businesses that disposed of only municipal solid wastes. The Act carries no Federal enforcement, meaning that parties conducting cleanups under the program is protected from future Superfund enforcement, protection from having to cleanup pollution from migrated from off-site and a guarantee that ASTM standards satisfy the innocent landowner defense." (Shanahan, 2002)

Looking closer at the Congressional hearings on Superfund in some of the peak years, as reflected in Figure 5.4, the following themes emerged:

1989

-Proposals by the EPA to allow States to administer Superfund cleanups

-Biases in site identification and remedy selection process

-Impact of CERCLA on SBA lending, recommendations to limit the lender liability

-CERCLA liability concerns on the petroleum industry

-Evaluation of incentives for innovative and alternative hazardous waste remediation techniques.

1993

-Review of innovative remediation methods

-Liability problems of small business with CERCLA cost recovery actions.

-Reform Superfund retroactive liability

-Development of State voluntary cleanup and redevelopment programs

1997

-Superfund reform and small business liability

-Need for enhanced public participation in Superfund process

-Review of Cleanup Acceleration Act

-Provisions to grant Superfund liability exemptions

-unfairness of CERCLA to small business

2000

-Provide financial assistance to cleanup abandoned Brownfields

-Improve State programs

-Pace of site cleanups

-Progresss of Superfund reform programs

The legislation seems to follow generally the concerns raised in the hearings. For example, the passing on December 20th of the Brownfield Reform and Small Business Liability Relief Act seems to address the small business concerns. In addition, the concern for the enhanced participation of the public in the Superfund process can be addressed by the Environmental Justice of the EPA. Environmental Justice currently supports and evaluates 15 demonstration projects to see if the collaborative process can resolve local environmental justice problems. Collaboration involves the coordination of two (2) or more Federal agencies acting together with local stakeholders (i.e. residents, community groups, religious affiliates etc.).

In a recent interview (Winter, 2001) conducted with Stephanie Pullen Brown, branch chief in the EPA's Office of Site Remediation Enforcement in Washington, she outlined some of the changes occurring at the Agency and in the industry in general to favor redevelopment and further developer protections. Ms. Brown spoke positively about the Agency having several regions "on the cutting edge," getting sites cleaned-up in new innovative ways and listening to the PRP's suggestions. She spoke about reforms made to encourage settlement through such things as "reduced oversight" and "policies for de minimis, de micromis and peripheral party settlements. Ms. Brown also spoke highly of the new policies "benefiting certain business transactions." She stated that "Prospective Purchaser Agreements resolve new owner's liability so property can be redeveloped—and site cleanup increases the land's value. So that cover looks a bit different to me now than it might have looked three years ago." *(See Mason, 2001, Snapshot Interview, 15 Nat. Resources & Env't 184).*

To further expand on the assumption that Congress firstly represents the interest of the American public, Bernstein (1989) states, "there is a deeply entrenched belief in democratic societies that constituencies control the behavior of their representatives. ...In the United States, it justifies the use of elections to select members of Congress. ...In short, the belief that constituencies control the behavior of their representative, especially the behavior of members of Congress, has achieved the status of a myth." He goes on to explain that constituencies will elect and reelect those representatives which support policies which favor their views and representatives want to be reelected. Thus, representatives will favor the views of the constituencies. However, he concludes that the fact that only a small minority of constituents actually act as the "myth" would suggest and overall constituent influence is rather small.

An interesting commentary on the formative years of the EPA, Ripley & Franklin (1976) explain that in its first few years, the EPA (1974) took an aggressive position on many issues but this stance created a backlash from the industries it regulated to seek exemptions from the regulation. However, it was the energy crises of 1973 (oil embargo against the United States) which first weakened the EPA's position. The energy crises

renewed the need for domestic energy production which, in turn, required the EPA to amend its regulations (i.e. Clean Air Act) to enable more domestic energy production, such as greater use of coal. The EPA's position between the demands of energy and the environment has forced it to make compromises on the environment.

5.5 Conclusion

The results of the model exhibit a correlation of public concern and Congressional hearings. The data reveals the concern of Congress with the interests of private development sector and local government by the increase in hearings modifying environmental legislation to encourage development and remediation and the rapid growth of Brownfield development incentives among the States. This is clearly reflected in the changes in legislation discussed in Chapters 1 to 4 and the new remediation methods discussed in Appendix II which are now an option under the new legislation.

As long as public concern remains low, future development might be expected to include more incentives toward the development of Brownfields and other contaminated property at both the Federal and State level. The time series outlining the developments in environmental legislation in the previous section indicates that environmental liability risks will continue to lessen making such development more profitable and attractive to an increasing number of developers and other real property investors.

A satisfactory test of an equally-plausible alternative explanation that industry was able to influence the media into not placing environmental reporting on a high priority – and hence create a false impression that public concern has dwindled – was not investigated. And it would be important to do so if developers are not lulled into false security on changing public attitudes. Contaminated communities continue to be highly agitated with polluters and there is no sign of decreases in their outrage (Ashford and Rest, 2001). Even if it could be shown statistically that people in general are less concerned, this is unlikely to be true on a specific contaminated community basis. Hence

developers are warned to move cautiously and to be respectful of traditional historic public interests and concern.

Chapter 6: Conclusions

6.1 Conclusions

The goal of this study was to explore two propositions regarding environmental liability under CERCLA, RCRA and state tort laws: 1) that the legislation is moving toward favoring and encouraging the developer of "Brownfields" real estate, and 2) that the most effective means for minimizing liability is a clear understanding of the laws, and an intelligent application of this understanding through the use of due diligence and transactional protections.

In Chapters 1 and 2, an overview of CERCLA, RCRA and State tort law was presented. Environmental liability can render the "owner/operators" of contaminated real property liable to face cleanup costs that greatly exceed the value of the property. The liability can be retroactive and joint and several.

Chapter 3 explored ways to minimize environmental liability through transactional means such as indemnity and release clauses and currently available insurances such as "Cleanup Cap Insurance" and "Pollution Liability Insurance." Chapter 4 discussed the current development impetus through the EPA encouraging state initiated Brownfield programs, Prospective Purchaser Agreements (PPA's), comfort/status letters and innovative (i.e., cost effective and effective) remediation technologies. Research conducted in the course of this study through literature review and contact with real estate attorneys and developers underscored the great importance of a clear understanding of real estate contract law and environmental transactional protections and insurances.

Chapter 5 explored the possible association regarding "public concern" towards contaminants in the soil and groundwater and Congressional hearing activity and legislative action by the government addressing these issues. The possible association was studied to explain that public concern and legislative activity are highly correlated and that the recent relaxation of the public's concern in this area has prompted the

Federal and state governments to pass legislation more in favor of the private "development" community (buyers, sellers and lenders), thereby allowing more development opportunities, new remediation technologies and new Brownfield development incentives.

The model developed and applied in this thesis revealed a correlation between public concern and Congressional hearings. The data showed that as public concern lessened, the concern of Congress shifted towards with the interests of private development sector through increased hearings modifying environmental legislation to encourage development and remediation and the rapid growth of Brownfield development incentives among the States. These modifications in legislation are discussed in Chapters 1 to 4 and new remediation techniques, now possible under the new legislation, are discussed in Appendix II. Chapter 5 also concluded that as long as public concern does not return to the levels of the mid-1980's, it is likely that future legislation – at both the state and Federal level – will include additional incentives for the development of Brownfields and other contaminated property. However, it is clear that environmental liability does and should remain a legitimate concern in real estate development. A "checklist" is presented in Appendix III, of which any real estate developer needs to consider in the planning of transactions to undertake any development, especially any Brownfields development or rehabilitation project, to minimize his/her potential environmental liability.

It is felt that the current impetus to encourage Brownfield development can benefit both the government and private developer. Brownfields have a pre-existing infrastructure, so the Government does not need to pay to develop them through taxes, and the developer faces no downtime for their installation. Additionally, the encouragement of private sector development of contaminated properties meets the Government's goal of effectively remediating contaminated properties to ensure public health safety while doing so mostly on the developer's expense.

Chapter 5 also discussed the possibility that the anti-regulatory biases on the part of both the government and the industry influenced media created an apparent association between public concern and Congressional hearing activity. An improvement on this study would require an independent assessment of public concern beyond that reflected in the New York Times and to test whether industry was able to influence the media into not placing environmental reporting on a high priority – and hence create a false impression that public concern had dwindled. If this is the case, developers should not feel that they could be less cautious in their due diligence on a "Brownfield" or other contaminated property transaction. Again, developers need to move cautiously and fully understand and consider the potential liabilities and mitigate risks through a thorough understanding of the laws and transactional protections and insurances.

Appendix I: Fleet Factors

Introduction:

CERCLA excludes from the definition of owner or operator any person, who, without participating in the management of a facility, holds indicia of ownership primarily to protect his security interest in the facility. 42 U.S.C.S. 9601(20)(A). This "secured lender exemption" has been the subject of much controversy and various case interpretations of what "participation in management" and "indicia of ownership" really mean. In 1990, the case of the United States v. Fleet Factors Corp., held such a narrow view of the lender exemption that the lending community found this to be a huge disincentive to lending to operational facilities. n1

Congress Amended CERCLA twice; once on October 17, 1986 under the Superfund Amendments and Reauthorization Act (SARA), and again on September 3, 1996, with the Asset Conservation, Lender Liability and Deposit Insurance Protection Act of 1996 (Asset Conservation Law). This amendment codified the short-lived EPA Lender Liability Rule. 42 U.S.C.S. 9601 (2000).

My purpose here is to discuss some important cases decided since enactment by Congress of CERCLA until the Fleet case and subsequently discuss several important cases since and detail how the "lender exemption" aspect of CERCLA has changed form from enactment in 1980 until today.

Cases Prior to Fleet Factors:

1) The United States vs. Mirabile was the first case to differentiate between acceptable and unacceptable involvement of a secured lender in the financial management of a facility. n2 Here the Mirabile's joined the American Bank and Trust Company (ABT) and Mellon Bank (East) National Association (Mellon) among others as

third party defendants. The Mirabiles contended that the bank's involvement with Turco in their financial control make them liable for the "creation of the hazardous conditions at the Turco site." n3 as an "owner or operator."

Mellon and ABT argued that their financial control of the site exempted them from liability under CERCLA within the secured lender exemption. The court found that the statutory definition of "owner or operator" became critical in the case:

'owner or operator' means ...(ii) in the case of an onshore facility or an offshore facility, any person owning or operating such facility . ...Such term does not include a person, who, without participating in the management of a vessel or facility, holds indicia of ownership primarily to protect his security interest in the vessel or facility. 42 U.S.C. 9601(20)(a). The judge emphasized that the above wording suggests that as long as the secured creditor does not become involved with the affairs of the actual owner or operator, liability will not exist. The problem was how far could the creditor go in protecting "...its financial interests before it can be said to have acted as an owner or operator within the meaning of the statute." n4

Interpreting statute 42 U.S.C. 9601(9), the judge determined that reference to management of a "facility" infers that involvement in the operations and waste generation or disposal infers liability. The financial ability to control such activities and not the actual control is not sufficient to infer liability onto the lender. n5

The activities of the lender between foreclosure and the assignment by ABT to the Mirables were found to be consistent with a lender trying to protect their secured interest. However the actions of Mellon were found to be of doubt. It was found that Mellon did become involved into the day-to-day operations of the facility. As such the court denied the motion for summary judgment on behalf of Mellon. It was found that the Mellon loan officer Peter McWilliams became involved with daily operations as he testified that his superiors at Mellon wanted him to have a "more day-to-day hands-on involvement." n6

Again the guidance of 42 U.S.C. 9601(20)(a) as to determine the meaning of the terms "owner" and "operator" were found too vague to allow for an objective ruling in this case. n7

As the site was assigned only four months later, it was exempt under CERCLA's 101(20)(a) exclusion. The court found that the purchase of the land was taken to protect its security interest in the property and promptly assign the property to another owner after four months sold the site to the Mirabiles. n8

2) The case of United States v. Maryland Bank & Trust Company (MB&T) involves whether a bank who upon foreclosing on the mortgage to a piece of property and then subsequently purchases the piece of property is liable under CERCLA for the clean-up of toxic wastes dumped on the property prior to the bank's purchase of said property. n9

MB&T purchased the property they previously foreclosed on at the foreclosure auction on May 15, 1982. Subsequently the bank took title to the property and was record owner for nearly four years. In the discussion, the Judge stated that the central question was whether MB&T's actions fall under the "owner" or "operator" as defined in the code. MB&T contends that they were nether an owner or operator at the time the waste was dumped. MB&T was a mortgagee at that time and held an "indicia of ownership primarily to protect his security interest in the vessel or facility." U.SC. 9601 (20)(A). n10

The court found that the purchase by MB&T of the site at the foreclosure sale was thought to protect its investment in the property and not to protect its security interest. MB&T held the title for nearly four years before clean-up was initiated. The judge felt that if MB&T could be held not liable under CERCLA, secured lenders would have an advantage over other investors; "The interpretation of section 101(20)(a) urged upon the Court by MB&T runs counter to the policies underlying CERCLA. Under the scenario put forward by the bank, the Federal government alone would shoulder the cost of

cleaning up the site, while the former mortgagee-turned-owner, would benefit from the clean-up by the increased value of the now unpolluted land. At the foreclosure sale, the mortgagee could acquire the property cheaply. All other prospective purchasers would be faced with potential CERCLA liability, and would shy away for the sale. Yet once the property has been cleared at the taxpayers' expense and becomes marketable, the mortgagee-turned –owner would be in a position to sell the site at a profit." n11 "...Mortgagees, however, already have the means to protect themselves, by making prudent loans." n12 As such MB&T's motion for summary judgment was denied.

3) In the United States v. Nicolet, Inc., et al., the idea of "piercing the corporate veil" was introduced into CERCLA liability. "The United States has alleged that because the defendant T&N was the alter ego of Keasbey, a corporation potentially liable under CERCLA, the corporate veil between T&N and Keasbey should be pierced." n13 The United States alleged that as T&N was the sole stockholder and active in management of Keasbey at the time hazardous waste disposal, it is liable as an "owner and operator" under CERCLA. n14

The United States also alleged that because T&N "had the capacity to control both the disposal and resultant release as well as to abate damage from such releases,.." it is liable as both former owner and operator. n15

T&N argued that it was not involved in the day-to-day aspects of the operation of the facility and thus is not liable under section 107 of CERCLA. The judge noted that only in United States v. Mirabile, supra. did the issue of the extent of mortgagee involvement in the management of a facility brought CERCLA liability. In this case, judge Newcomer held that the mortgagee must be "...at minimum, participate in the day-to-day operational aspects of the site." n16 In United States v. Fleet Factors Corp. 724 F. Supp. at 960, it was established that a secured lender avoided CERCLA liability if it "...does not participate in the day to day management of the business or facility either before or after the business ceases operations." n17

4) In Guidice, et al., v. BFG Electroplating and Manufacturing Co., Inc., the Court for the Western District of Pennsylvania considered the National Bank of the Commonwealth's (Bank) motion for summary judgment. BFG filed a third party complaint against, among others, the current and past owners of an adjoining site called "Berlin Property." BFG claimed that the adjacent property "Berlin Property" contaminated its own property.

In this case National Bank approved a line of credit to Berlin Metal secured by accounts receivable. Berlin Metal then defaulted on its loan. Subsequently the Bank filed for foreclosure and purchased the property. A deed was delivered to the Bank and it paid all insurance and taxes for the property and subsequently leased the property to a trust created by Colomba and Anthony Runco (Runco). n18

The Bank argued that it was not liable under CERCLA as it was not a former owner or operator of the Berlin Property when hazardous wastes were released. The court then considered two points of time; the period prior to foreclosure of the property and the period that the Bank owned the property. The court found that the Bank had only protected its security interest before foreclosure and did not "...participate in the day to day management of the business or facility." n19

However after the Bank purchase the property, the case discussed the divergence of case law relating to after a secured lender purchases a security interest in United States v. Mirabile, 15 Envtl. L. Rep. And United States v. Maryland Bank & Trust Co., 632 F. Supp. 573. The 1986 amendments to CERCLA (SARA) were also mentioned to support the view held in Maryland Bank & Trust that once a secured lender acquires title to a property it should not be excluded from liability under CERCLA. "When a lender is the successful purchaser at a foreclosure sale, the lender should be liable to the same extent as any other bidder at the sale would have been. n20

As such, the court found that the security interest exemption did not apply to the Bank for the period after the foreclosure sale in which it held title to the property and is a

potentially liable party as an owner or operator. It was also evident that the Bank was aware of the leaking drums of hazardous materials during its ownership of the property. n21

United States v. Fleet Factors Corp:

United States v. Fleet Factors Corp., 901 F. 2d. 1550, on appeal from the United States District Court for the Southern District of Georgia, was the case which set the financial lending community into alert. This was the first case to extend the idea of "owner" or "operator" within CERCLA liability through having the ability to influence the handling of toxic wastes by having financial control of a property. Previous cases generally held that the secured lender exemption applied so long as there was no actual day-to-day operational or managerial control on the property. n22

"The appellate court held appellant's conduct brought it outside the statutory exemption for secured creditors outlined in CERCLA, 42 U.S.C.S. 9601(20)(A) because it participated in the financial management of the facility to the degree that it was capable of influencing the facility's treatment of hazardous waste." n23 The outcome was the court's denial of Fleet's motion for summary judgment and the finding that Fleet was not exempt from liability under CERCLA as a secured lender "...because its activities could have influenced the facility's treatment of the waste." n24

After foreclosing on its security interest, Fleet contracted with Baldwin Industrial Liquidators (Baldwin) to auction the facility's inventory and equipment. Afterwards, Fleet contracted with Nix Riggers (Nix) to remove unsold equipment and render the facility in "broom clean" condition in order for the foreclosure sale. n25

Discounting Fleet as liable as a current owner and operator, the case then states that Fleet could be liable as an "owner" or "operator" at the time of hazardous waste disposal as detailed in 9607(a)(2). "There is no dispute that Fleet held an "indicia of

ownership" in the facility through its deed of trust to SPW, and that this interest was held primarily to protect its security interest in the facility. The critical issue is whether Fleet participated in management sufficiently to incur liability under the statute. n26

Relying primarily on United States v. Mirabile, discussed previously, the court agreed that Fleet's involvement with SPW did not reach day-to-day operation or management of the business or facility and therefore was not liable as a "owner" or "operator." However, the court found that after Fleet contracted with Baldwin and their presence on the facility exceeded permissible involvement in the operation. "Under the standard we adopt today, a secured creditor may incur section 9607(a)(2) liability, without being an operator, by participating in the financial management of a facility to a degree indicating a capacity to influence the corporations treatment of hazardous waste." n30 In essence, the idea formulated in Maryland Bank & Trust Co. was upheld with the view that lenders should make prudent loan decisions.

Subsequently, due mainly to the backlash by lenders to the decision rendered in Fleet, the EPA drafted its Final Lender Rule in 1992 that basically exempted lenders from the liability found in the Fleet case. The EPA's rules were substantive changes to CERCLA used to interpret liability under CERCLA. n27

Cases Subsequent to Fleet Factors:

1) In United States v. Kayser-Roth Corp., Inc., 910 F.2d 24, 1990, the First Circuit Court of Appeals decided whether a parent company of a dissolved subsidiary could be held liable under CERCLA as a owner and operator. In this case a spill of trichloroethylene (TCE) occurred as the result of an accident and the defendant Kayser argued that it was not considered a disposal under CERCLA. That argument was rejected as "spilling" is part of the statutory definition. See 42 U.S.C. 9601 (29). The court based its decision on the interpretation of "operator" given by other courts. References to the Fleet case include that an owner through security interest can be held directly liable if

actively involved in management." n28 and "In addition, a corporation that was an owner through holding a security interest and became active in the management of the corporation has been held liable. United States v. Fleet Factors Corp., 901 F.2d 1550, 1557." n29

The Appeals Court found that the District Courts opinion that "Kayser –Roth ...exerted practical total influence and control over Stamina Mills' operations." United States v. Kayser-Roth Corp., 724 F. Supp. 15, 18. n30

The district court also found that Kayser-Roth had control over the environmental matters of the site and held direct knowledge that "Stamina Mills employed a scouring system that used TCE; indeed [it] approved the installation of that system ...[and] was able to direct Stamina Mills on how the TCE should have been handled." n31

Thus the decision of the District Court that Kayser-mills was an "operator" under CERCLA and liable for the cost of hazardous waste clean up was upheld by the Appellate court.

2) In re Bergsoe Metal Corporation v. The East Asiatic Company, Ltd, the Court of Appeals for the Ninth Circuit discussed whether the Port was considered an "owner". Again the Port owned the plant as the deed was in its name, while the Port contends that it qualifies for the security interest exemption under CERCLA. Here the court considered whether the Port could be liable through its participation in management of the Bergsoe plant. The court realized that there is little guidance within the statute as to how far a lender can be involved with the management of a facility before invoking liability. " To date, only one Federal circuit has addressed this question. In Fleet Factors, the Eleventh Circuit considered several alternative rules. The government proposed that a secured lender that participates in any manner in the management of a facility is excluded from the security interest exemption. Id, 901 F.2d at 1554. Fleet Factors proposed a rule adopted by certain district courts, that participation in the financial management is

allowable, but participation in the day-to-day or operational management of a facility will subject the creditor to liability. Id. The Eleventh Circuit adopted an intermediate rule:

[A] secured creditor may incur section 9607(a)(2) liability ...by participating in the financial management of a facility to a degree indicating a capacity to influence the corporation's treatment of hazardous wastes...a secured creditor will be liable if its involvement with the management of the facility is sufficiently broad to support the inference that it could affect hazardous waste disposal decisions if it so chose." n32

The court then rebuked this ruling by stating that the court in Fleet factors erred in its opinion by "equating the power to manage with actual management." n33 "...we hold that a creditor must, as a threshold matter, exercise actual management authority before it can be held liable for action or inaction which results in the discharge of hazardous wastes. Merely having the power to get involved in management, but failing to exercise it, is not enough. n34 As such the court affirmed the district courts opinion that the Port qualified for the security interest exemption and did not participate in the management of the Bergsoe plant.

Fleet Factors was later proceeded in 1993, as a remand from the Eleventh Circuit to implement the EPA Final Lender Rule of 1992:

3) On May 12, 1993, the Eleventh Circuit court filed its final decision on the Fleet Factors case. 821 F. Supp. 707. The EPA had initiated, in response to the Fleet ruling, a proposed rule for interpreting the secured lender exemption to be included in 9601(20)(a). After such ruling was issued, the appellate court now applied this Rule in deciding liability in the Fleet case. Again the involvement of Fleet's agents Baldwin and Nix voided Fleet's exemption from liability under 9607(b) as an "operator." The Lender Liability Rule issued by the EPA did provide two standard to which lenders actions could be measured; a General Test and foreclosure provisions. n35 It was found that Baldwin's handling of the hazardous waste and Nix's actions, both agents of Fleet, were not protected by the EPA's foreclosure provisions. "Although done in preparation for the

auction, Baldwin's moving of several hundred damaged, corroded, leaking drums is not protected by the Foreclosure Provisions because it was not consistent with the NCP [National Contingency Plan] or done under the supervision of an NCP on-scene coordinator." n36 "When hazardous substances are readily identifiable as such, are present in significant quantities, and are in such a condition that the environmental threat they pose is apparent, the handling of those substances indicates impermissible participation in management unless it is done in accordance with 42 U.S.C. 9607(d)(1)." n37 Nix also engaged in similar activities with regard to its salvage operations after the liquidation auction. ".. Nix haphazardly shoved the drums of chemicals about the site to make way for salvage operations, backed into and crushed the drums with tractors, scraped (and chopped with hatchets) asbestos –laden insulation form equipment and machinery, and allowed that insulation to accumulate on the floor with other miscellaneous rubbish." n38 As such, the actions of Fleet's agents constituted disposal of hazardous waste, voiding the secured creditor exemption and making Fleet liable under 9607(a)(2) owner or operator. n39

4) Shortly after the Fleet decision, Kelly v. EPA 304 U.S. App. D.C. 369, challenged the EPA's Lender Liability Rule and the court vacated the regulation as "Since the EPA lacked authority to restrict private rights of action arising under CERCLA by regulation, their interpretation was not entitled to deference." n40

The intent of the EPA rule was to resolve any conflicting judicial interpretations as to the extent and scope of the secured lender exemption and the outcomes in cases such at United States v. Maryland Bank & Trust Co., and United States v. Fleet Factors Corp., as previously discussed here. "We held in Wagner Seed Co., v. Bush, 292 U.S. App. D.C. 44, 946 F.2d 918 (D.C. Cor. 1991), cert. Denied, 118 L.Ed.2d. 304, 112 S. Ct. 1584 (1992), that the President had broadly delegated his statutory authority powers to EPA, and it is "the administering agency" for the statute. However, we had previously recognized that with respect to any specific regulation, EPA must demonstrate "either explicit or implicit evidence of Congressional intent to delegate interpretive authority"

Linemaster Switch Corp. v. EPA, 291 U.S. App. D.C. 40, 938 F.2d. 1299, 1303 (D.C. Cir. 1991)." n41

5) In Kemp Industries, Inc. v. Safety Light Corp., et al, 857 F. Supp. 373, in a sale-leaseback situation, the Plaintiff tried to hold Prudential liable under 42 U.S.C. 9607(a)(2) as an owner or operator. The court subsequently found that Prudential held title primarily to protect its security interest in the property. Citing the Fleet Factors case, the court found that "...there was no participation by Prudential in the management of Lot 13 or the USR building. Prudential, as stated, did not participate in the operations or management of properties involved in the Program." n42 The court recognized the controversy that Fleet created regarding 'participation in management' of a secured lender to void exemption from CERCLA liability. n43

6) In Z & Z Leasing, Inc. vs. Graying Reel, Inc. et al, 873 F. Supp. 51, a defendant Comercia Bank (Bank) entered a motion for summary judgment. Here the defendants, previous owners, produced hazardous wastes and the plaintiff is seeking a claim under the current mortgagee Bank. While the Bank filed a claim against the plaintiff for recovery of outstanding debt, it did not foreclose on the property due to the fact it was aware of possible hazardous waste contamination of the property. The plaintiff argued that the Bank was an "operator" under CERCLA through its coordination of environmental surveys conducted on the property. The Bank argued that these actions were undertaken to protect its security interest in the property and it was never involved in the day-to-day operations of the site. n44

Citing U.S. v. Fleet Factors, the "Plaintiff contends that for "operator" liability to attach, it is sufficient to find that the Bank participated in the financial management of the facility to a degree which indicates that it had the capacity to influence the facility's treatment of hazardous waste. Pl. Br. Opp'n Def.'s Mot. Summ. J. at 11-12 (citing U.S. v. Fleet Factors Inc. etc)." n45

Rejecting the Fleet ruling, the court then stated that it does not hold with such narrow interpretation of the statute because "...such an interpretation would largely eviscerate the exemption Congress intended to afford secured creditors." n46 As such, the court granted the Bank's motion for summary judgment. n47

7) Most recently, the case Monarch Tile, Inc. v. The City of Florence, 212 F. 3d 1219 (May 25, 2000), the Eleventh Circuit Court of Appeals rejected an interpretation of statute held in the Fleet case. The Fleet case was superseded by Statute in this case regarding the definition of "owner" or "operator" which was previously expanded in Fleet. n48

In this case the defendant's motion for summary judgment was affirmed as it qualified as a secured lender under CERCLA. The case stated that, "The terms "owner" and "operator" do not have any special meanings under CERCLA, but are to be given their ordinary meanings." n49 Quoting the Fleet Factors case, "CERCLA holds the owner or operator of a facility containing hazardous waste strictly liable to the United States for expenses incurred...." n50 Immediately following the case states "The terms "owner" and "operator" do not have any special meaning under CERCLA, but are to be given their "ordinary meanings." Redwing Carriers, Inc. v. Saraland Apartments, 94 F.3d 1489, 1498 (11th Cir. 1996)." n51

The court recognized that "While much of Fleet Factors' reasoning and holding remain intact" n52, the amendments of CERCLA by Congress in 1996 through 42 U.S.C. 9601(F)(I)(II) removed the "merely having the capacity to influence" within "participate in management" as brought down in the Fleet case. As such, the appellate court upheld the district courts finding that the appellee was exempted from liability under 42 U.S.C. 9601(20)(A) as a secured lender holding "indicia" of ownership primarily to protect its security interests. n53

Conclusion:

In 1996, Congress passed an amendment to CERCLA which basically restored the short-lived EPA Final Lender Rule into law. "9601(20)(f)(i) the term "participate in management" (I) means actually participating in the management or operational affairs of a vessel or facility; and (II) does not include merely having the capacity to influence, or the unexercised right to control, vessel or facility operations;..."

The "capacity to influence" view founded in the Fleet case was too far reaching and obviously not the intent of Congress when they drafted CERCLA in 1980. Most recently, the Monarch Tile v. City of Florence found that the "..terms "owner" and "operator", as expanded in meaning in the Fleet case, do not have any special meaning under CERCLA but are to be given their ordinary meanings." n54

Footnotes:

n1. United States v. Fleet Factors Corp., 901 F.2d 1550, 1990 U.S. App. LEXIS 8266, 20 Bankr. Ct. Dec. (LRP) 977, 31 Env't Rep. Cas. (BNA) 1465, 20 Envtl. L. Rep. 20832 (11th Cir. Ga. 1990) at p. 1556.

n2. United States v. Mirabile (1985, ED Pa) 15 ELR 20992 at Lexis p.2.

n3. See id. at Lexis p. 2.

n4. See id.

n5. See id. at Lexis p. 6.

n6. See id.

n7. See id.

n8. United States v. Maryland Bank & Trust Co. (1986, DC Md) 632 F. Supp. 573, 24 Envt. Rep. Cas. 1193, 16 ELR 20557.

n9. See id.

n10. See id. at 577.

n11. See id. at 578.

n12. United States v. Nicolet, Inc. (1989, ED Pa) 712 F. Supp. 1193, 29 Envt. Rep. Cas. 1851, 19 ELR 21192. at p. 1197.

n13. See id.

n14. See id. at 1199.

n15. See id. at 1201.

n16. See id. at 1201.

n17. Guidice v. BFG Electroplating & Mfg. Co. (1989, WD Pa) 732 F. Supp. 556, 30 Envt. Rep. Cas. 1665, 20 ELR 20439.

n18. See id. at 559.

n19. See id. at 561.

n20. See id.

n21. United States v. Fleet Factors Corp., 901 F.2d 1550, 1990 U.S. App. LEXIS 8266, 20 Bankr. Ct. Dec. (LRP) 977, 31 Env't Rep. Cas. (BNA) 1465, 20 Envtl. L. Rep. 20832 (11th Cir. Ga. 1990)

n22. See id. at 1550.

n23. See id. at 1551.

n24. See id.

n25. See id. at 1555.

n26. See id. at 1557.

n27. Danahy, Karen S., COMMENT: CERCLA Retroactive Liability in the Aftermath of Eastern Enterprises v. Apfel, 48 Buff. L. Rev. 509 (2000)

n28. United States v. Kayser-Roth Corp., 910 F.2d 24, 1990 U.S. App. LEXIS 13125, 31 Env't Rep. Cas. (BNA) 1932, 20 Envtl. L. Rep. 21462 (1st Cir. R.I. 1990) at p. 25.

n29. See id. at 25.

n30. See id. at 26.

n31. See id. at 26.

n32. In re Bergsoe Metal Corp., 910 F.2d 668, 1990 U.S. App. LEXIS 13541, 31 Env't Rep. Cas. (BNA) 1785, 20 Envtl. L. Rep. 21229 (9th Cir. Or. 1990) at p. 670.

n33. See id. at 671.

n34. See id. at 671.

n35. United States v. Fleet Factors Corp., 821 F. Supp. 707, 1993 U.S. Dist. LEXIS 6564, 37 Env't Rep. Cas. (BNA) 1495, 23 Envtl. L. Rep. 20961 (S.D. Ga. 1993) at Lexis p. 8.

n36. See id. at Lexis p. 12.

n37. See id. at Lexis p. 12.

n38. See id. at Lexis p. 13.

n39. See id.

n40. Kelley v. United States EPA, 304 U.S. App. D.C. 369, 15 F.3d 1100, 1994 U.S. App. LEXIS 1715, 38 Env't Rep. Cas. (BNA) 1193, 24 Envtl. L. Rep. 20511 (1994) at Lexis p. 1.

n41. See id. at Lexis p. 3.

n42. Kemp Indus. v. Safety Light Corp., 857 F. Supp. 373, 1994 U.S. Dist. LEXIS 9731, 39 Env't Rep. Cas. (BNA) 1167, 25 Envtl. L. Rep. 20113, 131 A.L.R. Fed. 687 (D.N.J. 1994) at p. 391.

n43. See id.

n44. Z & Z Leasing v. Graying Reel, 873 F. Supp. 51, 1995 U.S. Dist. LEXIS 466, 40 Env't Rep. Cas. (BNA) 1220, 25 Envtl. L. Rep. 20802 (E.D. Mich. 1995)

n45. See id. at 53.

n46. See id. at 53.

n47. See id.

n48. Monarch Tile, Inc. v. City of Florence, 212 F.3d 1219, 2000 U.S. App. LEXIS 11676, 13 Fla. L. Weekly Fed. C 684, 50 Env't Rep. Cas. (BNA) 1641 (11th Cir. Ala. 2000)

n49. See id. at 1219.

n50. See id. at 1219.

n51. See id. at 1222.

n52. See id. at 1222.

n53. See id. at 1224.

n54. Danahy, Karen S., COMMENT: CERCLA Retroactive Liability in the Aftermath of Eastern Enterprises v. Apfel, 48 Buff. L. Rev. 509 (2000)

Appendix II: Contaminant Fate and Transport, and Remediation Techniques

Toxic Chemistry

While there are many scenarios of toxic contamination which may occur, several recurring themes prevail for the real property developer: soil contamination by organic and inorganic chemicals; leaking underground storage tanks (UST's); polychlorinated biphenyls (PCBs); lead paint in residential buildings and friable asbestos.

The purpose of this chapter is to give a general overview of the types of contaminates which are prevalent, their properties and methods of transportation through the air, soil and groundwater and current and newly proposed remediation technologies.

Common Contaminates

Figure A2.1 lists the most frequently located groundwater contaminants at hazardous waste sites and their common sources. Following is a brief description of several of these contaminants.

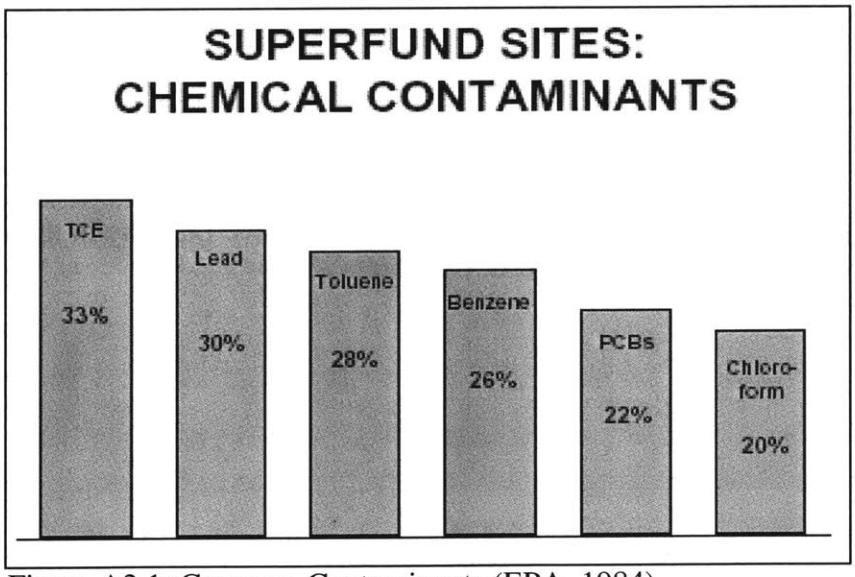

Figure A2.1: Common Contaminants (EPA, 1984)

Gasoline

Gasoline is defined as "a volatile mixture of flammable liquid hydrocarbons derived chiefly from crude petroleum and used principally as a fuel for internal-combustion engines." (AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (4th ed. 2000) Gasoline is a very common organic contaminant found across the United States and its presence can be linked to leaking UST's at gas stations.

As detailed in the following remediation methods discussion, remediating gasoline is quite simple as it organic and oxidizes easily. However, the use of methyl tertiary butyl ether (MTBE) as a gasoline oxygenate additive has "made cleanups of former gasoline station sites more problematic in some states (Zuckerman et al, 2001)." MTBE became a widely used gasoline oxygenate after the phasing out of lead in gasoline. In addition, MTBE is more widely used than Ethanol as it can be produced right at the gasoline production refinery.

Chlorinated Volatile Organic Compounds (CVOCs)

CVOCs have been around "since production first began in Germany in the nineteenth century. Tetrachloroethene ("PCE") was discovered in 1821; 1,1,1-tetrachloroethane ("TCA") was discovered in 1840; and Trichloroethelene ("TCE") was discovered in 1864 (Zuckerman et al, 2001)."

Zuckerman et al, provides an interesting history of CVOC usage in the United States:

"In the United States, TCE and PCE production began in 1923, and widespread CVOC use in manufacturing began in the 1940s when TCE replaced carbon tetrachloride as a metal degreaser and dry cleaning solvent. However, by the mid-1950s, PCE began to

replace TCE as the dry cleaning solvent and metal degreaser. In the 1960s, PCE began to replace TCE in high boiling point applications. In 1974, degreasing operations produced an estimated 6.2 million pounds of waste solvents. By the 1980s, 80 percent of the TCE produced in the United States was used for vapor degreasing. By the early 1990s, that number had dropped to approximately 65 percent. Despite its being phased out due to its ozone depleting properties, TCE usage began to increase in the mid-1990s (Zuckerman et al, 2001)."

Chlorinated solvents are usually present in the subsurface as both a non-aqueous phase liquid (NAPL) and dissolved contaminants in the groundwater. NAPLs are organic liquids that do not mix freely with water. "NAPLs have been the focus of substantial research and much regulatory concern with respect to site remediation, because NAPLs are extremely common, may travel large distances in the subsurface, and have complicated groundwater cleanup at many hazardous waste sites (Culligan, 2000)." NAPLs can either be defined as dense (DNAPL) or light (LNAPL):

1) DNAPL - "DNAPLs are immiscible hydrocarbon liquids that are denser than water, such as chlorinated solvents, wood preservative wastes, coal tar wastes, PCBs and some pesticides. DNAPLs can sink to great depths, can penetrate into bedrock fractures, can move as a liquid in a direction different from the flow of groundwater and can act as a continual source of groundwater contamination over time." ((EPA Presumptive Remedies) Residual concentrations of DNAPL will remain immobile in the soil and act as source of toxic vapor and dissolved contaminants partitioning to infiltrating rainwater. (Shanahan, 2002). The immobilization is due to DNAPLs being denser than water, they are drawn into the soil volume non-wetting relative to water and wetting relative to air. Typical densities for TCE are 1.58 Kg/m^3, PCE 1.31 Kg/m^3 compared to air which is 1.17 Kg/m^3 (Shanahan, 2002).

It is important to note that, due to the properties of DNAPL, a question of whether a spill of DNAPL will reach the water table is not a function of time, but of the volume spilled. From an engineering point of view, as the DNAPL reaches an "impermeable" layer, it forms pools which are very hard to find in the field.

2) LNAPL – Movement similar to DNAPLs in the unsaturated zone, but at the water table, the LNAPLs floats as they are lighter than water. The LNAPL will spread out laterally, forming a pancake on top of the water table. This factor also makes them frequently found at the groundwater table/vadose zone interface. (EPA Presumptive Remedies)

What makes NAPLs so difficult to remediate is their residual saturation, that is propensity to form small globules which become entrapped within the porous soil materials by capillary forces. This entrapment resists the groundwater flow under normal operating conditions for pump-and-treat. The only method of removal is dissolution into the aqueous phase or volatization into a gas phase. (Culligan, 2000).

Trichloroethylene (TCE)

An example of a DNAPL, Trichloroethylene does not occur naturally in the environment. "At room temperature and sea level pressure, TCE is a colorless, nonflammable, extremely volatile, irritating liquid, with a chloroform-like odor (Zuckerman et al, 2001)." As a DNAPL, TCE is denser than water at 1.47g/cm^3 (water being 1 gr/ cm^3) and less viscous than water at 0.566 cP (water being equal to 1 cP) (NRC, 1994) "These properties are significant because chemicals with densities greater than water and viscosities less than water can penetrate uncoated concrete easily (Zuckerman et al, 2001)."

While common sources for TCE are dry cleaning and metal degreasing, "in 1987, approximately 85 percent of manufactured TCE was used for metals cleaning and degreasing, 1.0 percent in adhesives, 1.0 percent in paint removal and stripping, and 6 percent in miscellaneous applications. Because of TCE's wide usage as a metal degreaser, TCE contamination to soil and groundwater occurs at many commercial and industrial facilities (Zuckerman et al, 2001)."

It is interesting to note that a TCE plume resulting from industrial usage is illustrated by the Woburn, Massachusetts case that was the subject of the book (and subsequent movie) entitled "*A Civil Action.*" (*See* Jonathan Harr, A Civil Action (Vintage Books 1995)).

Tetrachloroethene (PCE)

Commonly known as "perc", PCE, like TCE, is usually found in dry cleaning and metal degreasing. It has similar properties for transport as TCE except that it is denser and more viscous than TCE: density equal to 1.63 gr/cm^3 and viscosity equal to 0.89 cP, compared to TCE at 1.47 gr/cm^3 and 0.566 cP, respectively (NRC, 1994). Zuckerman et al, gives a nice history of PCE usage in the U.S.:

"...currently the principal dry cleaning solvent used in the United States and has many other industrial uses. In the late 1970s, many businesses, other than those in the dry cleaning industry, began to move away from PCE. In 1987, 56 percent of PCE production was used by the dry cleaning industry, 29 percent by chemical intermediate industries, 11 percent as a metal and degreasing chemical, and 4 percent in miscellaneous industries. By 1991, dry cleaning industry usage had increased to 60 percent (Zuckerman et al, 2001)."

Zuckerman et al, also comments on the extent of PCE contamination in central California:

In central California, PCE has contaminated groundwater in more than 200 municipal wells, and most of this contamination is from dry cleaners. Newer dry cleaners have machines in which all processes occur within a self-contained and enclosed steel unit. Dry cleaners typically use between 15 and 40 gallons of PCE per month (Zuckerman et al, 2001).

Vinyl Chloride (VC)

Vinyl chloride (VC) is also a CVOC which results from plastic and record manufacturing. It occurs as a flammable, explosive gas with an ether-like odor (Zuckerman et al, 2001). VC is less dense than water at 0.91 gr/cm^3 (Hemond and Fechner, 1994). VC is the result of the degradation of TCE and PCE which continues to degrade into ethane. "A known human carcinogen, VC is considered more toxic than both TCE and PCE (Zuckerman et al, 2001)."

Methane (CH4)

Methane is a natural gas which like, carbon dioxide and water vapor, are greenhouse gases. Methane can pose a large problem at municipal solid waste landfills if it is not captured or incinerated properly. As a gas, methane is explosive and has resulted in numerous landfill fires in the U.S.

According to Zuckerman et al:

"Approximately 70 percent of worldwide methane emissions are from anthropogenic, or human, sources. In the United States, these include landfills (37 percent of emissions), natural gas and oil production (20 percent), enteric fermentation, which includes ruminant livestock emissions (19 percent), livestock manure management (10 percent), coal mining and production (10 percent), and other sources such as domestic

sewage (4 percent). Other worldwide sources include methane emissions from agricultural sources such as rice paddies and from tropical forest burning, when the hydroxyl radical (OH) in atmospheric water vapor reduces carbon monoxide (CO) from burning vegetation to form methane (Zuckerman et al, 2001)."

Related to real estate development, methane emission problems may occur when a piece of real property is constructed on a site where subsurface methane is produced. This may occur in areas with capped landfills or natural gas or oil production facilities. As such, a developer should inquire about adjacent property uses and previous uses and look for any deed restrictions. The construction of a substructure on such property would require the placement of an impermeable membrane to encapsulate the substructure and a closed venting system running from the substructure to the roofline.

Lead

Today, the most common scenario involving lead exposure occurs when the children of residential apartment occupants eat lead laden paint chips which have become pliable or broken away from the painted surface. As such, the potential purchaser or current owner of existing residential structures should concern themselves with the risks of lead exposure.

According to Dennison, "Congress first responded to the problem of lead-based paint in the environment with the Lead-Based Paint Poisoning Prevention Act of 1971 (LPPPA) (42 U.S.C. §§ 4801-4846). Congress enacted the LPPPA with the intention of reducing allowable levels of lead in paint, authorizing funds for lead screening programs, and mandating research on future lead paint abatement programs (Dennison, 1996)."

One of the legalities to note is the statute of limitations of minors to bring a suit only begins to run when the child reaches the age of majority. With lead exposure

liability, no innocent purchaser's exemption exists because reasonable due diligence would indicate the presence of lead. However, the innocent landowner defense is valid. For several cases on the matter, *See 42 U.S.C. § 9601*(35)(B) (1994). *See also Cameron v. Martin Marietta Corp., 729 F. Supp. 1529, 1531 (D.N.C. 1990); United States v. Pac. Hide & Fur Depot, Inc., 716 F. Supp. 1341, 1346 (D. Idaho 1989).*

Zuckerman et al, list three techniques for lead abatement:

"The three basic techniques for lead abatement are component replacement or removal; enclosure, paneling, or wainscoting; and encapsulation....A certified inspector should complete a survey of the property and recommend one of the three abatement techniques (Zuckerman et al, 2001)."

Radon

It is estimated that 5,000 to 20,000 people die from lung cancer attributable to radon exposure. Like methane, radon is a colorless and odorless occurring radioactive gas formed by the decomposition of naturally occurring uranium which is prevalent in certain areas of the U.S. Dennison, explains: "The EPA and U.S. Geological Survey have identified certain geological formations across the country where uranium deposits are prevalent. The fork-shaped Reading Prong, a uranium-rich geological formation that cuts across northeastern Pennsylvania, northern New Jersey, and Southern New York, has been identified as a primary suspect in generating radon gas (Dennison, 1996)"

With the construction of buildings in areas with radon production in the subsurface, the gas can migrate through gaps and cracks in the foundation collecting within the home or building and posing human health risks. Like Methane, developers must take into consideration constructing a building with an impermeable membrane

below the concrete slab and passive venting of subsurface radon above the building's roofline.

Asbestos

Asbestos was widely used in building materials from the early 1900s until the late 1970's for its insulative and fire-retardant properties. As Dennison, explains: "Asbestos can be found in many forms, including sprayed-on insulation and fireproofing materials, preformed rolls, blankets and insulation batts, pipe wrap shingles, interior roofing and floor materials, mastics, putties, caulks, moldings, and brake linings (Dennison, 1996)."

The health risk of asbestos is that it is known to cause respiratory tract cancers through the inhalation of airborne asbestos fibers. It is important to note that asbestos is most dangerous in its friable form and so sometimes taking the wrong action is worse than taking no action. For example, the remediation of asbestos could cause the substance to become friable and, if not controlled properly, become a hazard to occupants. (Dennison, 1996)

Asbestos that is in place in private buildings is not subject to Federal regulation and does not need to be removed. However, if asbestos fibers are exposed to the air and become friable, they need to be remediated. This can be accomplished by encapsulation by a sprayed-on coating or complete removal.

Developers need to consider the presence of asbestos in real property that will be renovated or demolished. These actions may disturb the asbestos and require special handling (and extra expense and risk).

Transportation and Fate of Contaminants in the Subsurface

Risk assessment and the remediation of contaminants in the soil and groundwater requires a detailed understanding of how chemicals move within and interact with the physical subsurface environment. (EPA Seminar Pub. Transport and Fate, 1989)

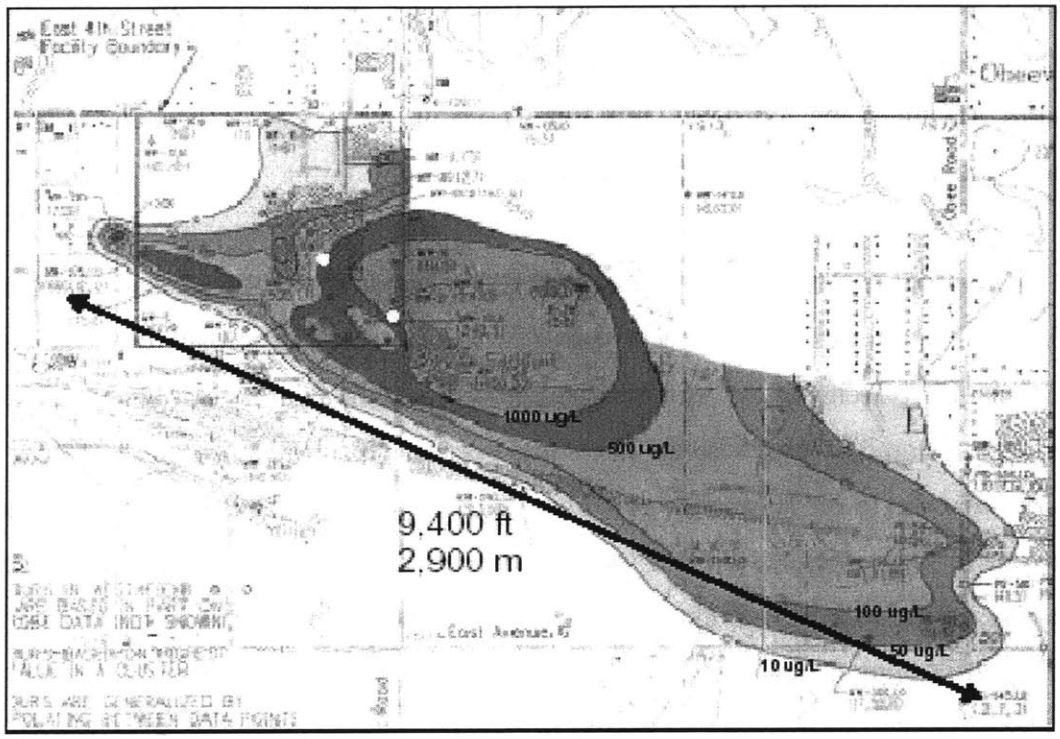

Figure A2.2: Example of contaminant plume travel and chemical concentrations. (Burns & McDonnell, 1994)

Vadose Water and Aquifers

In order to have a clear understanding of how contaminants transport in the subsurface, it is important to know a little hydrogeology. In particular the unsaturated vadose zone and the saturated zone.

The vadose zone is lies above the phreatic surface in an unconfined aquifer which is bounded by the capillary zone and the soil water zone. Water found in the unsaturated materials in this zone is called vadose water. (Culligan, 2000).

Groundwater is stored in a geological formation called an aquifer. An aquifer contains water and allows significant amounts of water to flow through it. There are two types of aquifers: unconsolidated and consolidated.

"Unconsolidated aquifers consist of uncemented granular materials, such as sand or gravel. They store water in the interstitial pore space among the grains. Consolidated aquifers consist of more or less solid rock. They store water primarily in solution channels, fractures and joints. In some dual porosity rock systems, water can also be stored in the interstitial pore space (Culligan, 2000)."

Groundwater flow can be explained in terms of recharge and discharge. Precipitation permeates the surface, at rates which depend on the porosity of the soil, and makes its way to recharge the aquifers, then gravity and the hydraulic gradient cause the water to flow and discharge into the rivers and oceans. This flow is not constant over the seasons however. In the Northeast, groundwater recharge is high in the spring when there is snowmelt, high precipitation and low evapotranspiration (caused by air temperature). Generally, in the summer months, soil moisture requirement and evapotranspiration use all of the infiltrating water. (Culligan, 2000). Figure A2.3 below, illustrates this cycle.

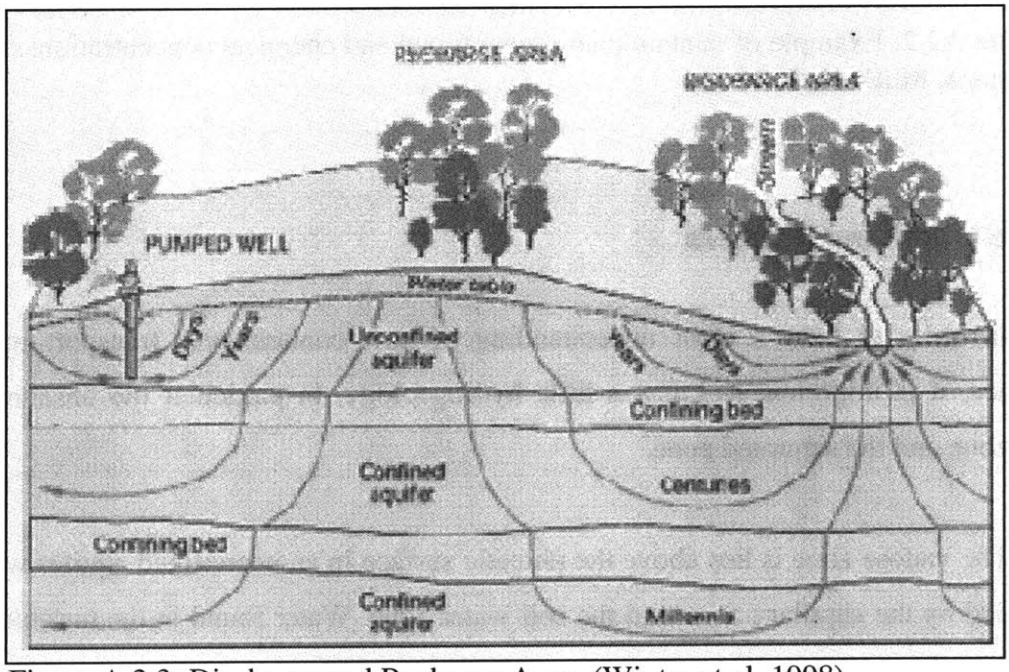

Figure A 2.3: Discharge and Recharge Areas (Winter et al, 1998)

The transportation of toxins into the subsurface usually takes the following scenario; chemicals either leak out of equipment or containers or are dumped onto the land surface or permeable or cracked surface (i.e. concrete), dumped into leaking drain pipes or begin to escape from leaking underground storage tanks. Toxins tend to flow in response to gravity and ground water flow, so the contaminant then travels vertically through the soil at rates which depend on the soil type (i.e. course sandy soil is more porous than clay). The chemical then reaches an underground aquifer which serves to accelerate the horizontal movement of the chemical. It is in this stage that the chemical can pollute large areas an adjacent properties.

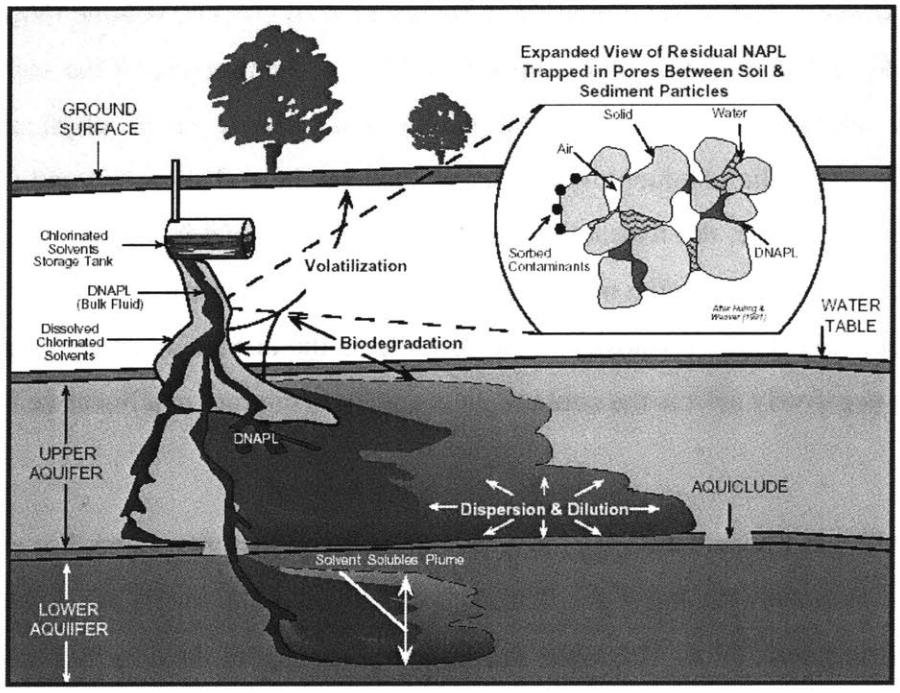

Figure 2. As the bulk chlorinated solvent moves through the subsurface, some of the liquid may be trapped in the soil or sediment pores (residual saturation); some may evaporate (volatilization); some may become sorbed to the surface of the soil particles (sorption) and some may dissolve in the ground water (dissolved plume). Since bulk chlorinated solvents are more dense than water, the liquid tends to move down below the water table. As the dissolved plume moves, the concentration of the dissolved solvents is lowered by dispersion and dilution effects. Microorganisms may degrade hydrocarbons that are dissolved, volatilized or sorbed.

Figure A2.4: Contaminant Travel in the Subsurface

(Source: U.S. EPA Remedial Technology Fact Sheet, MNA, 1999)

There are three principles in which contaminants move in the subsurface: advection, mechanical dispersion and molecular diffusion. Advection is the linear movement of a particle. Dispersion is the increase in volume area that the chemical

occupies as it moves by advection. Finally, diffusion is the reduction in concentration of the chemical as it mixes with the water contained in the soil. Most mathematical models are based on an advection-dispersion formula to determine chemical transportation.

Observe the micro view of soil in the vadose zone (unsaturated zone above the water table) in the diagram A2.4 above. One can see that the volume is occupied by air, water and solid particles. Although the water is unsaturated in this zone, it is held in tension in the soil spores. The gas volume, liquid volume and solid volume make up the total volume (V_T) of the soil while the mass of solids within this total volume gives the soil bulk density. The void volume (V_V), represented by the gas volume (V_G) and liquid volume (V_L) taken over the total volume (V_V / V_T) is the porosity of the soil. The soil obviously retards the movement of the chemical depending on its physical properties such as the hydraulic conductivity (as determined by the soil porosity) and tortuosity of the soil. For example, the hydraulic conductivity of silty sand is 10^{-2} to 10^{-7} meters per second (m/s) compared to the conductivity of compacted clay/silt which is 10^{-9} to 10^{-11} m/s (Daniel, 1994). The tortuosity of the soil affects the dispersion of the contaminant as tortuosity negatively affects the contaminants ability to migrate in a linear fashion.

Different toxins themselves have a hydraulic conductivity value. For example, the higher the viscosity, the lower the density (i.e. fuel oil, cold water) and lower hydraulic conductivity; slower flow. The lower the viscosity, the higher the density (i.e. chlorinated solvents) and hydraulic conductivity; faster flow. TCE has a hydraulic conductivity that is approximately 2.6 times that of water (Shanahan, 2002).

It is important to understand the effects of vapor-phase transport into a properties basement. The advection of soil gases occurs due to the differential pressure. "Houses tend to be under negative pressure due to hot air advection out of chimneys and furnace flues. As such, any cracks or other gaps in the foundation provide a pathway for gas

transport into homes and possibly threatening the health of the inhabitants (Shanahan, 2002)."

Examples of Contaminant Transportation Problem

1) A cubic meter of unsaturated soil is contaminated by TCE at a residual saturation of 0.2. You can assume soil porosity of 0.25. Rainwater infiltrates at a rate of 500 mm/yr (typical for sand and gravel aquifers in Massachusetts). How long will the soil remain contaminated assuming that dissolution into the infiltrating water is the only removal mechanism??

In order to solve this problem, we need the density of TCE which is 1.46 gr/cm^3 (Hemond and Fechner, 1994). 1 m^3 of soil equals 1000 liters which is multiplied by the residual saturation (0.2) and porosity (0.25) resulting in 73,000 gr of TCE. The rain infiltrates at 500 mm/yr which equals 50 liters/yr or 500 gr of TCE removal per year. Thus, 73,000 gr TCE/500 gr/yr removal equals ~150 years.

2) The situation here is the discovery of arsenic in the groundwater near a local leather tannery where a dump occurred three (3) years ago. The laboratory result indicated a maximum arsenic concentration of concentration of 0.5 mg/L in the groundwater samples taken near the tannery. The average groundwater head at this location is 5 m above the mean sea level. Located 1 km. downstream from the tannery is a drinking well. At this location, the average head is 2.5 m above mean sea level. The aquifer connecting both locations is known to be fine sand. The concern is the level of arsenic present in the drinking well knowing that an average man of 70 kg consumes 2.5 liters of water per day with a regulated limit of 0.05 mg/L of arsenic concentration.

The solution to this question requires calculating the head gradient (5m – 2.5m/1000m) = 0.0025. Elapsed time is 3 years. Initial concentration is 0.5 mg/L. The hydraulic conductivity of the soil can be approximated to 10^{-5} m/sec., the porosity at 30%

for fine sand and the retardation factor at 1. Using the diffusion equation for this problem, the concentration calculates to a negligible value and thus there is no problem with the water supply.

Contaminant Remediation

CERCLA, RCRA and many state regulations require that contaminated soil be remediated to the point where a child could consume it and groundwater be remediated to clean drinking water standards. Other states require remediation to the point of natural surrounding area levels. These standards have been questioned by many in industry and government because the groundwater in many areas will never be used for consumption and the risk of soil consumption at a commercial setting is negligible. In addition, the current remediation technologies have indicated in many cases that the time (decades) and expense to reach such standards is not possible (Culligan, 2000). It is clear that these factors made remediation and redevelopment of such sites in the private sector very unattractive.

With the introduction of new remediation methods and relaxed environmental legislation, there are six alternative cleanup goals:

a) "Complete restoration – removal of all traces of contamination
b) Nondegradation – removal of contamination to natural background levels or detection limits.
c) Health-based standards – such as the drinking water standards.
d) Technology based standards – require cleanup to the capabilities of the best available technology.
e) Partially restricted use standards – cleanup to nonpotable uses, such as irrigation.
f) Containment – contamination remains in place but is prevented from migrating off site."

(Culligan, 2000)

Remediation of Volatile Organic Compounds (VOCs)

Organic compounds can have greatly different interactions with the subsurface environment due to their range of physical and chemical properties. "For example, because chlorinated solvents are only slightly soluble and are more dense than water, they can penetrate deep into aquifers and remain as an immiscible phase for prolonged periods of time. In contrast, a spill of acetone will not penetrate into the groundwater because of its low density. Also, because of its miscibility with water, the acetone will dissolve quickly and become available for further chemical and biological reactions (EPA Seminar Report Transportation and Fate, 1989)." Organic reactions can transform a chemical into other less toxic chemicals or bind with other organic and inorganic chemicals. For example, hydrolysis (the abiotic reaction of dissolved compounds with water molecules) of chlorinated compounds often yields an alcohol or alkene (EPA Seminar Report Transportation and Fate, 1989). The reactions are so complex, that there is a large standard deviation between testing and formulaic predictions about chemical fate and real world site remediation.

CVOC's tend to degrade in an oxygen rich environment but degrade faster in an anaerobic or microorganism reaction environment. The most common method of remediation is the "pump and treat" system where ground wells are drilled in strategic locations relative to the contaminate plume. This water is then pumped from the aquifer to the surface where it is treated. The clean water is then returned to the subsurface while the contaminants are transported from the property. "However, the problem with pumping and treating is that it requires numerous extraction wells and expensive pumping systems that produce large volumes of extracted contaminated groundwater (Zuckerman et al, 2001)." Additionally, according to CERCLA laws, once the contaminant leaves the subsurface, it is subject to the myriad of laws surrounding CERCLA. This moves many to favor in-situ methods of remediation where the contaminant never reaches the surface but is remediated below the surface instead.

Remediation Technologies

The following are some examples of some of the current available remediation technologies. Following are examples of some of the new alternative methods of growing interest now that legislation is changing.

Pump-And-Treat

Pump and treat is a common and expensive remediation technique which involves the drilling of pumping and monitoring wells to strategically intercept the contaminated groundwater as it flows (See figure A2.5 below). The pumping of the contaminated wells reduces the hydraulic head of the water table creating a type of vacuum which leads the contaminants into the well. The contaminated water is then treated ex-situ. This process occurs until the contaminant plume has been pumped to the point where the groundwater is rendered safe for human consumption.

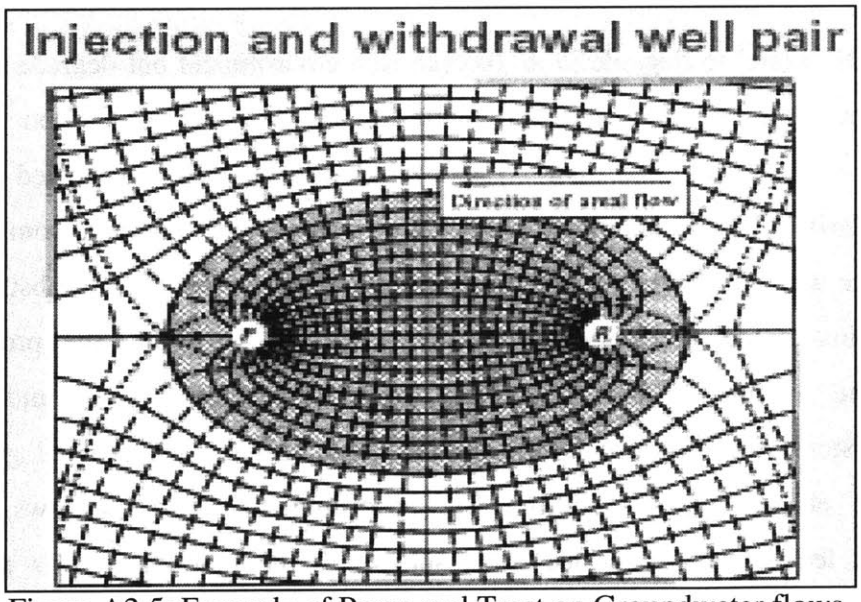

Figure A2.5: Example of Pump and Treat on Groundwater flows

(Source: NRC, 1994)

As can be reasonably assumed from the above description, the pump-and-treat technique is very expensive and can take a very long time for complete remediation. However, it is one of the most widely used ground-water remediation technologies used at about 75% of Superfund sites where the groundwater is contaminated and most RCRA sites (EPA, Introduction to Pump and Treat Systems).

Air Sparging

Air sparging injects air under the groundwater table by direct well injection. The contaminants are captured above the water table. Air sparging extracts volatile contaminants and can promote bioremediation. The limitations of this technology include: poor flushing in low porosity areas and difficulty operating at levels below ~10 meters (Culligan, 2000). Often coupled with soil vapor extraction, air sparging has proven to be an established and cost effective alternative to pump-and-treat (Zuckerman et al, 2001).

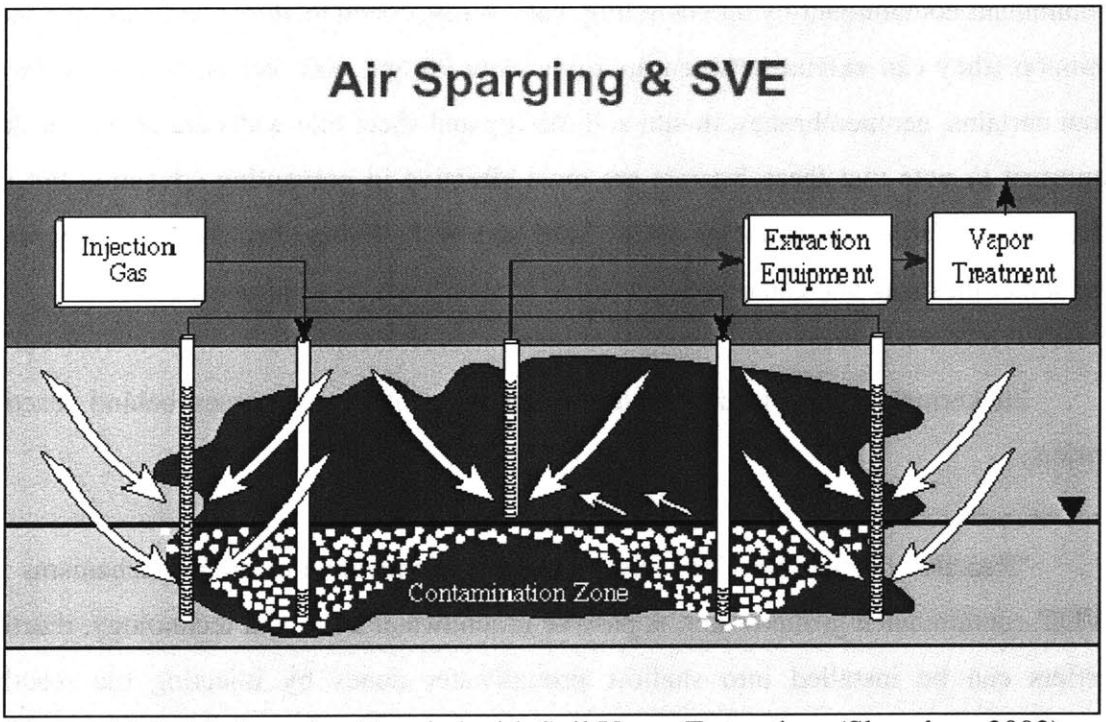

Figure A2.6: Air Sparging Coupled with Soil Vapor Extraction. (Shanahan, 2002)

Chemical Oxidation

Chemical oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile and/or inert. The most common oxidizing agents used are ozone, hydrogen peroxide, hypochlorites, chlorine and chlorine dioxide. While certain contaminants are more resistant to oxidization than others and the requirement for large quantities of oxidizing chemicals, in-situ chemical oxidization can rapidly degrading certain contaminants (Shanahan, 2002). Difficulty in injecting the chemicals to low porosity areas and that some chemical reactions may further contaminate the soil and groundwater, are some of the limitation to this technique (Culligan, 2000).

Vertical Cut-Off Wall and Reactive Barriers

As the name suggests, subsurface vertical cut-off walls serve the purpose of contaminant containment by an encircling wall. While concrete slurry walls are the most common (they can extend between approximately 90 and 400 feet below the surface), grout curtains, geomembranes, in-situ soil mixing and sheet pile walls are also used. It is important to note that these barriers are most effective in preventing advection but not diffusion, a relative disadvantage (H.V. Mott and W.J. Weber, J.r., 1991). Slurry walls also sometimes leak and can degrade when in contact with contaminants.

Zuckerman et al, provide a clear description of the processes behind reactive barriers:

"Reactive barriers provide some of the most innovative cleanup mechanisms for CVOC-contaminated groundwater. A passive groundwater treatment technology, reactive barriers can be installed into shallow groundwater zones by injecting the reactive substance through standard vertical wells or horizontal wells (for areas under buildings or other structures or in trenches). For CVOCs, particularly PCE and TCE, reaction walls

using iron filings have proven very effective. Generally, a mixture of iron and sand is placed in a trench that crosses or intersects the contaminated plume. The iron acts as a reductant by supplying electrons to the absorbed CVOCs, thereby breaking off the chlorine atoms; solubilized ferrous iron acts as a reductant; or the metallic iron acts as a catalyst for the reaction of hydrogen with the CVOCs. More recently, zinc has been used in place of iron (Zuckerman et al, 2001)."

Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) is an in-situ (below surface) or ex-situ (above surface) remediation process which "physically removes contaminants from the vadose zone (area above the permanent water table) soils by inducing air flow through the soil matrix. The flowing air strips the volatile compounds from the solids and carries them to extraction wells. The recovered vapors may require further treatment." (EPA Presumptive Remedies) Some of the limitations of SVE include: (like air sparging) difficulty in flushing areas with low porosity and difficulty in removing contaminants bound to the soil (i.e. DNAPLs) (Culligan, 2000).

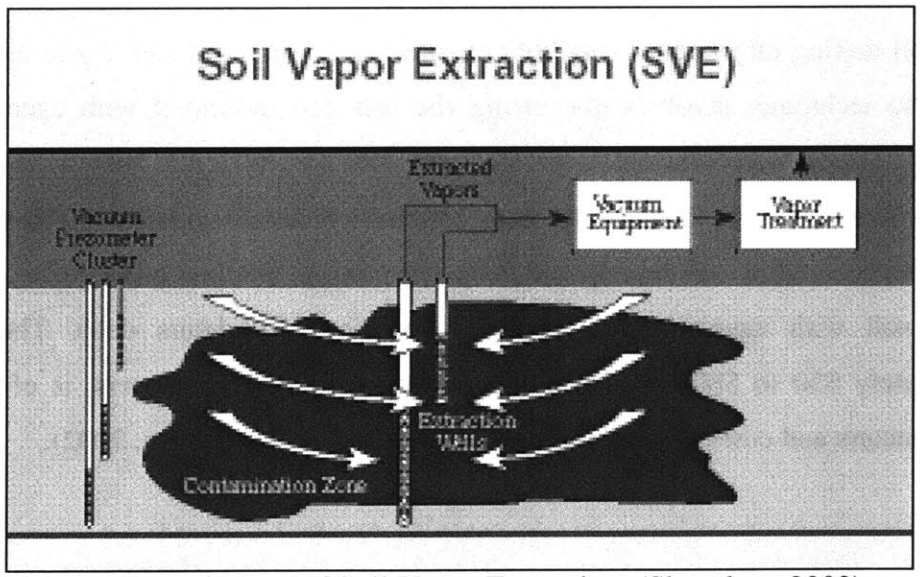

Figure A2.7: Diagram of Soil Vapor Extraction. (Shanahan, 2002)

Thermal Resorption

Thermal desorption is an ex-situ process in which uses heat exchange to vaporize organic contaminants from the soil. The vapors are then condensed and collected for further treatment. Unlike incineration, below, thermal desorption volatizes the contaminants and concentrates them needing regulated off-site disposal (EPA Presumptive Remedies)

Incineration

Incineration as the name suggests uses extremely high temperatures (>900 Deg. Celsius) to oxidize and thus destroying the toxic compounds from the soil (EPA Presumptive Remedies). The advantages of incineration include the ability to have processing conducted on-site and the destruction of organic wastes without any off-site transportation of the waste required.

Soil Mixing

Soil mixing may occur using both ex-situ (most common) and in-situ techniques. The ex-situ technique involves excavating the soil and mixing it with agents before backfilling. While more expensive, in-situ techniques are utilized as they avoid bringing the contaminant to the surface and invoking extensive Federal regulations. This technique has two forms: shallow soil mixing and deep soil mixing. Shallow mixing uses augers to mix the soil with agents and is effective to about 10 meters deep. The cost is approximately \$50 to \$80/m^3 . Deep soil mixing uses multiple augers, is effective to about 20 meters and costs approximately \$190 to \$300/m^3 (Shanahan, 2002).

New Remediation Technologies

The experience gained through Superfund cleanups since its inception in 1980 on different site reactions to different remediation efforts combined with the reduction in public concern with the soil and groundwater contamination lead the EPA to develop presumptive remedies including new remediation technologies as a way to accelerate cleanups through expressed issuance of Record of Decisions (RODs). With the new relaxed stance of the EPA toward site remediation, more technically and cost efficient method of remediation have emerged. The following details some of the new technologies available.

Bioremediation

Bioremediation is the use of microorganisms to destroy or immobilize organic waste materials. These organisms include: bacteria (both aerobic and anaerobic), fungi and actinomcetes (filamentous bacteria). These microorganisms destroy the organic contaminants by using the chemicals for their own growth and reproduction. Their growth is very rapid as long as a large carbon source is present, growth which can double the population in 45 minutes. Soils can contain 100 to 1000 aerobic bacteria per gram of soil increasing to 10^5 in one week if a carbon source is introduced (Shanahan, 2002).

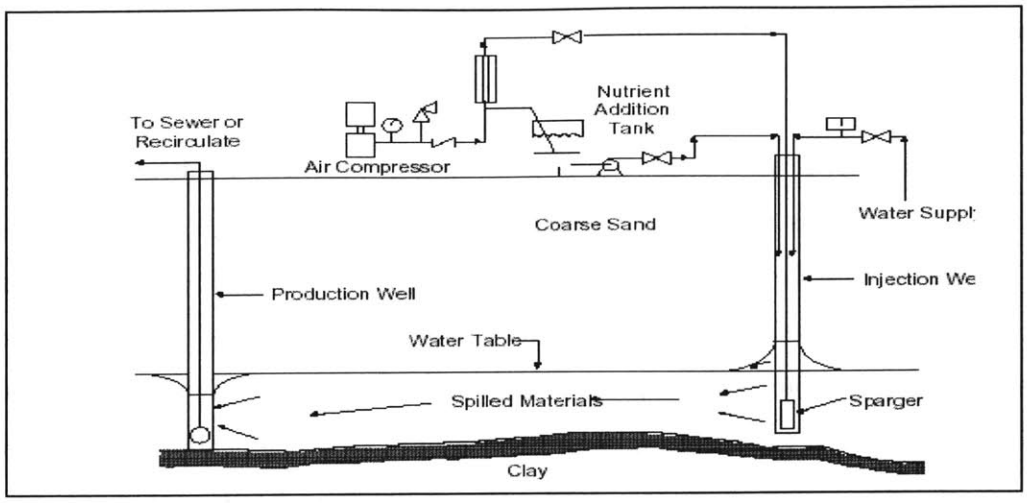

Figure A 2.8: Typical Schematic for Aerobic Subsurface Bioremediation (Thomas and Ward, 1989)

While the first commercial application of bioremediation occurred in 1972 with the Sun Oil pipeline spill in Ambler, Pa., it is only recently that the technique is gaining popularity (Shanahan, 2002).

Bioremediation is most effective with simple hydrocarbons and petroleum fuels, aromatic hydrocarbons and alcohols and esters. Chlorinated hydrocarbons have decreasing degradability within increasing chlorine substitution (Shanahan, 2002).

The technologies for bioremediation include ex-situ (biopiles) and in-situ (bioventing) aeration of soils and the addition of carbon source to stimulate bacterial growth. Floating product is remediated through bioslurping, a two-phase vapor extraction that also encourages biodegredation (Shanahan, 2002).

Phytoremediation

Phytoremediation is a new technology that is similar to bioremediation except that it relies on macroscopic plants instead of microorganisms to absorb the organic contaminants and subject them to metabolization or phytovolatization. Phytoremediation

"takes advantage of the propensity of certain plants and trees to tolerate and concentrate certain contaminants including heavy metals, explosives, and organic compounds (Shanahan, 2002)." The advantage of phytoremediation is the understandably low-cost while limitations include effectiveness where contaminants are relatively deep and wider acceptance among regulatory agencies.

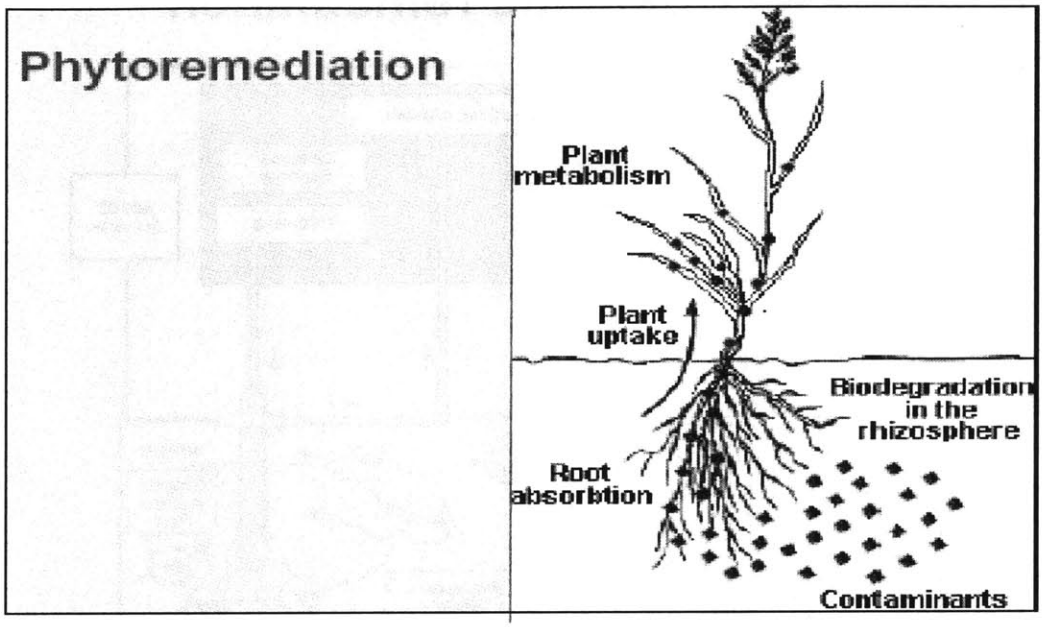

Figure A 2.9: Principle Behind Phytoremediation. (Chan, Keng-Yong, 2000)

Electrokinetic Remediation

"Electrokinetic remediation (ER) is a process which removes metals and organic contaminants from low permeability soil, mud, sludge, and marine dredging. ER uses electrochemical and electrokinetic processes to desorb, and them remove, metals and polar organics. The principle of electokinetic remediation relies upon application of a low-intensity direct current through the soil between ceramic electrodes that are divided into a cathode array and an anode array (Shanahan, 2002)." This concentrates the metals and contaminants to the electrodes which are then removed and treated. Alternatively, treatment zones are placed between the electrodes and the contaminants are treated within the soil.

This technique is rarely used in the United States as the electricity required is great, costing an estimated $\$117/m^3$. However, if there is no other effective in-situ technology to remediate metals in fine-grained soils, then this technique would be potentially competitive (Shanahan, 2002).

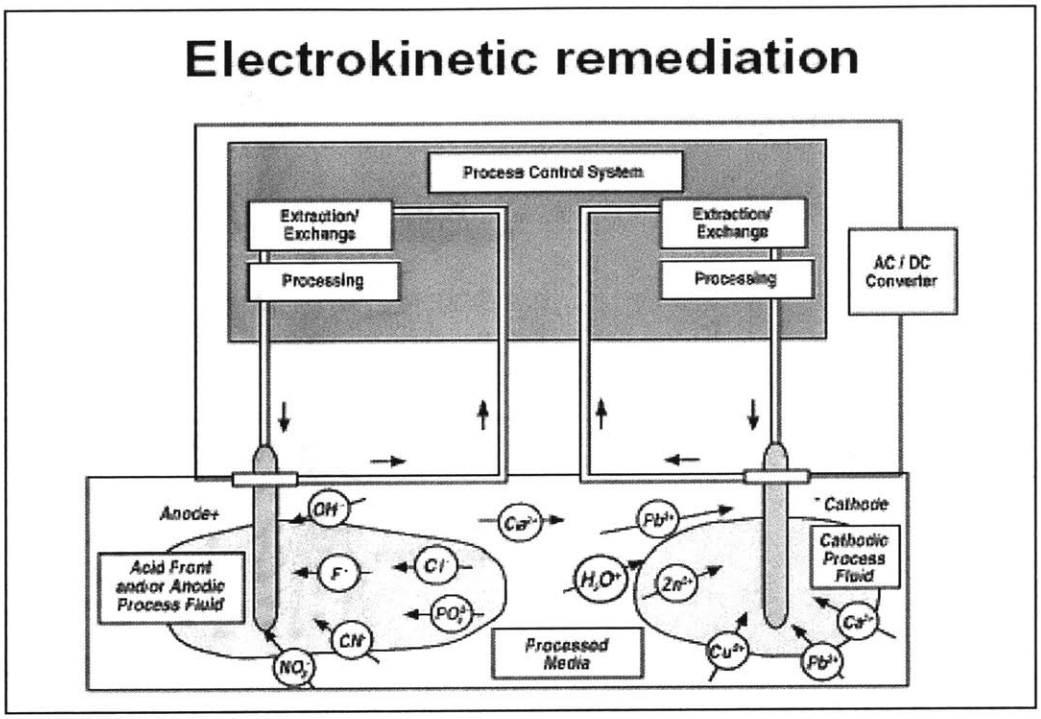

Figure A2.10: Electrokinetic Remediation. (Van Deuren et al, 2002)

Monitored Natural Attenuation (MNA)

The term "monitored natural attenuation" is the reliance on natural processes already inherent in the environment to meet specific remediation goals. The EPA now accepts this method of remediation within the "context of a carefully controlled and monitored site cleanup approach. To be considered an acceptable alternative, MNA would be expected to achieve site remedial objective within a time frame that is reasonable compared to that offered by other more active methods (EPA MNA Fact Sheet, 1999)." "This method is allowed when active treatment technologies are no longer effective in lowering CVOC concentrations, or active treatment is no faster than MNA. MNA is not a no-action treatment technology; it may require long-term monitoring,

through sampling and testing, of numerous groundwater parameters established by research (Zuckerman et al, 2001)."

The significance to the real property developer is that MNA requires no invasive measures by man to remediate the site and thus greatly reduce the costs. It is also a recognization by the EPA and environmental remediation specialists that natural reactions and processes can be as effective as expensive "pump and treat" methods in certain cases.

Spills of chlorinated solvents such as PCE, TCE and TCA usually form a both NAPL and dissolved contaminant in the subsurface. The common "pump and treat" systems are expensive and slow with NAPL's and dissolved contaminants. With favorable conditions, MNA can be quite effective in the remediation of the dissolved contaminants (EPA MNA Fact Sheet, 1999).

There are five (5) processes of MNA with regard to chlorinated solvents:

1) Biodegradation (transformation of compounds by living creatures such as microorganisms). Noting that most ground water contains dissolved oxygen, the effectiveness of biodegradation depends on the geochemical environment. Some toxins degrade more effectively in an aerobic environment and others in an anaerobic environment. For example, benzene is degraded most rapidly aerobically while TCE is degraded anaerobically. A common sequence of degradation for fuel oils and solvents follows: 1) fuel oil degraded aerobically, using the available oxygen and creating an anaerobic environment, 2) chlorinated solvents degrade in the created anaerobic conditions, forming vinyl chloride, and 3) the vinyl chloride is degraded aerobically in the subsequent aerobic zone (Shanahan, 2002).
2) Sorption (the trapping of contaminant flow in soil and sediment particles preventing further movement)

3) Dispersion and Dilution (as contaminant travels further away from source, can be dispersed and diluted to minimal risk levels for human and environmental exposure)
4) Chemical Reactions (some chlorinated solvents (i.e. TCA) can be degraded by reactions without microbial activity)
5) Vitalization (chlorinated solvents are volatile and evaporate into the atmosphere by air and sun exposure.

(EPA MNA Fact Sheet, 1999)

Appendix III: Checklist for Developers/Purchasers

Environmental Liability Minimization

Transaction Checklist

Innocent Landowner Defense

- Have both yourself and a qualified professional conduct an appropriate inspection of the entire property. Keep in mind that the Innocent Landowner due diligence factors which courts consider are:

  a) "Specialized knowledge or experience of landowner
  b) The relationship of purchase price to property value if uncontaminated
  c) "Commonly known" or "reasonably ascertainable" information about the property
  d) The "obviousness" of the contamination
  e) The ability to detect contamination by appropriate inspection
  f) Levels of inquiry determined at time of acquisition of the property" (Schmall, 2002)

- Determine the extent of the contamination, if any, by having and ASTM approved study of the property. Consider having a Phase II ESA study conducted as extra assurance of the condition of the property. The ASTM Phase II ESA includes a media sampling by a qualified professional to investigate "recognized environmental condition" (REC) from a Phase I study with the goal that the professional can state "there is no reason basis for suspecting a disposal/release" after the sampling is conducted. (Schmall, 2002)

Contractual Release from CERCLA liabilities

- Remember that even if the seller has a settlement with the EPA under CERCLA settlement authority (42 U.S.C. §9622(f)), if the seller was not a de minimis party (CERCLA Section 122(g)(1)(B), it must include a reopener for unknown conditions, it must be subject to public review and comment and there is a mandatory EPA 5 year review of remedial decisions. (Schmall, 2002)

- How will we structure an indemnity clause that would be honored as between the parties which entered into them where parties intended to release and cover environmental claims? Remember that "CERCLA expressly recognizes that it does not abrogate contracts between private parties for indemnification (42 U.S.C. §9607(e)". As-is clauses defeat only breach of warranty claims, not CERCLA claims. (Schmall, 2002)

- Do we have boilerplate indemnity provision? The following is a standard indemnity provision for lenders that has been used in California transactions:

"(1) Seller shall indemnify, protect, hold harmless, and defend Buyer, its directors, officers, employees, agents, and Lender, its directors, officers, employees, and agents from and against any and all liability, including without limitation (a) all foreseeable and unforeseeable consequential damages, directly or indirectly arising from the use, generation, storage, or disposal of hazardous materials by Buyer or by any of the site's prior owners or operators, and (b) the cost of any required, necessary, or advisable repair, testing, investigation, cleanup, detoxification, or disposal, and the preparation of any necessary plans or reports, to the full extent that such liability is attributable, directly or indirectly, to the presence or use, generation, storage, release, or disposal of hazardous materials by

any person on the property before the close of escrow. Seller's obligations under this indemnity shall survive the closing.

(2) Seller, on behalf of itself and its successors and assigns, waives and releases Buyer, Lender, and their successors and assigns from any and all demands, claims, legal or administrative proceedings, losses, liabilities, damages, penalties, fines, liens, judgments, costs, or expenses whatsoever (including, without limitation, attorneys' fees and costs), whether direct or indirect, known or unknown, foreseen or unforeseen, arising from or relating to the property or any law or regulation applicable thereto, including any environmental claims relating to the presence of harmful or toxic substances in, on, under, or about the property or their migration from or to other property, whether arising prior to or after the closing date, including, without limitation, any claims under or on account of (a) the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as the same may have been or may be amended from time to time, and similar state statutes, and any regulations promulgated thereunder, and (b) any other Federal, state, or local law, ordinance, or rule. For purposes of this agreement, hazardous materials shall include but not be limited to substances defined as "hazardous substances," "hazardous materials," or "toxic substances" in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (Title *42 United States Code § § 9601*-9675); the Hazardous Materials Transportation Act, as amended (Title *49 United States Code § § 1801*-1819); and the Resource Conservation and Recovery Act of 1976, as amended (Title *2 United States Code § § 6901*-6992(k)) and any substance defined as "hazardous waste" in the California Health and Safety Code § 25117 or as "hazardous substance" in the California Health and Safety Code § 25316 and in the regulations adopted and publications promulgated under these laws.

(3) Seller understands and agrees that Buyer and Lender will contact the [all appropriate Federal, state or local agencies] regarding the contamination at the site, and any requirement, order, request, or recommendation by the [all appropriate Federal, state or local agencies] to investigate, test, monitor, or

remediate the site or dispose of any materials from the site will immediately trigger Seller's indemnity obligation."

(Zuckerman et al, 2001)

- **Disclosure/warranties by seller:**

    - "Seller should warrant that they have provided all sampling data in their possession
    - Seller likely will try to avoid broader representations. For example: 'There are no Hazardous Substances on or beneath the Property except as disclosed' (Schmall, 2002)."

Obtaining Environmental Insurance for Defense costs and Cleanup

- Obtain environmental liability insurance. There are currently several plans being offered which include "cleanup cap" insurance and liability insurance. Note that after 1985, Comprehensive General Liability (CGL) clauses have absolute pollution exclusions. There has been extensive litigation regarding whether there is a "suit" or not, was the release "sudden and accidental" or "expected /intended" and is there property damage. As such, since the late 1980's Pollution Legal Liability insurance and Remediation Cost Cap insurance is available. (Shmall, 2002)
    - "Cleanup cap insurance permits landowners to set reserves and makes attracting buyers easier. Prospective owners are protected against a financial loss that could damage their operations. This type of insurance helps to assure lenders that borrowers will be able to repay the loan. Government agencies have assurances that if the costs exceed the budgeted amounts, insurance is available to complete the remediation (Zuckerman et al, 2001)."

- "Obtain Pollution Legal Liability Insurance (PLL). For a higher price, one can obtain coverage for all pre-existing and unknown liabilities, offsite and onsite, except increased development costs. The policy periods now commonly run as long as 20 years and premiums are decreasing (Schmall, 2002)."

Brownfield Development Impetus

- When considering the purchase of a Brownfield, there are several key items to keep in mind:
  - Does the State in which the property is located have any State Brownfield programs, or "voluntary clean up programs" (VCP's) which you see as attractive to development, any that you see as unattractive? (Zuckerman et al, 2001)
  - What is the potential Risk Based Corrective Action (RBCA) profile of the property?
  - Do the existing utilities and locational values warrant the environmental and construction risks of site development?
  - Does the site qualify for "comfort" letters or State Brownfield statutes containing covenants not to sue?
  - Do you find that these changes have made Brownfield development more attractive or are there risks still present which need to be changed in order for development to be more attractive?
  - Does the potential development contract protect or guarantee against the State's or private parties ability for future litigation against the volunteer for site contamination?

  (Zuckerman et al, 2001)

- Consider the following to be significant requirements in purchasing or redeveloping Brownfields contaminated properties:

    - "The prospective property must have sufficient "redevelopment potential;" i.e., the property must be (a) sufficiently large, and (b) in a suitable location for remediation.
    - The relevant regulatory officials must be known to be reasonable.
    - Any prospective site must be significantly contaminated; otherwise, redevelopment wastes the company's technical expertise and capabilities and financial resources (Zuckerman et al, 2001)."

Transaction Planning Issues

- **Initial Questions:**

    - "Are there hazardous substances on the property?
    - Does the property's history indicate that hazardous substances were sent off the site for storage, treatment, disposal, or recycling?
    - What environmental permits regulate activities on the property? Are the permits transferable? What permits are required for the buyer's operations?
    - Has soil, groundwater, surface water, or air at the site been tested?
    - Is the property identified by the EPA or a state in CERCLIS or another database as a potential problem or Superfund site?
    - What role is the lender planning to assume in the management and control of the property?
    - Is the property involved in any type of enforcement action, litigation, or regulatory directive?
    - Are UST's present on the property?
    - Have any liens been imposed on the property as a result of an environmental activity?"

    (Edens, 2001)

- **Pre-Transaction Strategy:**

  - Identify the goals in acquiring the property.
  - Decide on a choice of entity to acquire/develop the property. It is advisable to form a subsidiary LLC to undertake the transaction. An LLC structure provides the greatest protections to the assets and personal liabilities in an environmental case (Schmall, 2002). However, note that the LLC structure will not protect the manager for actions taken as manager for violating environmental protection laws such as health and safety codes. (Zuckerman et al, 2001).
  - Can the site qualify for the formation of a "Redevelopment Agency"? In California, a Redevelopment Agency is created by local government under the authority of State law and exists as an entity of the State. The advantage is that they are exempt from any subsequent local law changes (elections, etc) which conflicts with the Redevelopment Plan. (Smalley, 2002)

  (Schmall, 2002)

- Have you conducted a sufficient degree of environmental assessment to:

  - "quantify potential future cleanup, cost recovery and natural resource damage liability to the government?
  - If you have potential cleanup liability, whether there are solvent, identifiable responsible parties who could be sued to reimburse cleanup costs?
  - your ability to qualify as a CERCLA "innocent landowner?"
  - the incremental environmental costs of development, given the contaminated soil at the property, even after cleanup is completed?
  - whether there are special resources issues that will delay/prevent development" (for example: endangered species, wetlands or

contaminated plumes or groundwater contamination entering from other adjacent properties)
(Schmall, 2002)

- Does the site contain Wetlands? Are you aware of the fines and remediation costs of construction due to delineation errors, how will you minimize these risks? (Garfinkel, 2001)

- "Will the Seller permit a Phase II media sampling? Keep in mind that the results are rarely kept confidential and it could trigger Government reporting and cleanup obligations for the owner.

- Engage and work closely with the local EPA office or other state agency to determine the level of contamination present and required level of clean-up.

- If obtainable and worth the cost (in terms of risk/benefit analysis) obtain a State or Federal Prospective Purchaser Agreement (with covenants not to sue)

- Resolve specified environmental problems before closing to obtain a No Further Action/Closure letter from environmental agencies

- Require Seller to resolve the specific environmental problems before closing (e.g. removing and closing abandoned underground storage tanks (UST's))"

(Schmall, 2002)

- **Post-Closing Strategy:**

    - Obtain post-closing indemnities (try to obtain from the Parent corporation) from the Seller in the purchase Agreement with cost and

time caps. Note that the Seller will probably want cost-sharing percentages from specific liabilities.

- If Seller indemnifies, create provisions for sharing control: "1) how Buyer notifies Seller of claim/liability, 2) Mechanism for Seller to investigate and accept/reject demand for indemnity, 3) Who has the lead in negotiating the claim with the government or private parties, 4) Who selects counsel, and 5) Access to witnesses, documents and the property."

(Schmall, 2002)

- Make sure that all of the interest groups which may have an interest in the property are involved in the project and create a coalition of all the environmental groups through communication and transparency of information.

Contaminant Related

- If contaminants present, bid for a professional remediation firm to handle cleanup and a separate independent firm to supervise the cleanup. Remember that lowest cost is not the best method for choosing a remediation firm. Base the decision on qualifications (i.e. Professional Engineer, errors and omissions coverage, previous clients).

- Enter into a fixed price contract for the remediation effort with a very detailed scope of work. Determine from the EPA and local regulatory agencies which scope of work will be acceptable to them. Obtain a bond for the performance of the remediation contract and have a separate independent remediation contractor oversee the work.

- Remediation methods vary greatly in cost. Have the remediation firm offer different alternatives, determine the effects of each method on construction and timing costs and plug the numbers into your pro-form numbers to see the effect on project viability.

- Is the building being acquired, if any, a residential building? Does the property contain lead-based paint?

- Does the building contain any asbestos? Is it encapsulated or in an undisturbed state? Will any renovation or demolition disturb the asbestos making is friable?

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