

Contaminated Property Valuation



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Contaminated Property Valuation Guideline

The purpose of this guideline is to identify some issues of concern, define typical terminology used, and synthesize findings from studies conducted on contaminated properties. As a result of current research, this guideline has been prepared outlining the basic data necessary to address the valuation issues surrounding property categorized as contaminated or environmentally impaired due to proximity to a known contaminated property. For purposes of this guideline, contamination is a negative impact on any person, object, or area, caused by a hazardous substance, hazardous waste, or petroleum products.

The valuation of contaminated properties has been the subject of increasing research and analysis in the appraisal industry. The growing list of contaminated properties, governmental demands for remediation, cost of cleanup, and market response have increased awareness of the problems associated with valuing and assessing affected properties.

As the number of contaminated properties and lists of contaminants has increased, the need to clarify the issues in valuation has become paramount to fee appraisers and Assessors alike. Interpretation of the validity of appraisal procedures by the courts, appraisers, and Assessors has clarified some issues, but the principles applied in valuing contaminated properties are still in the developmental stage and consensus is far from a reality.

As the market history of contaminated property grows, a clearer picture of the effects of contamination on value is emerging. There is a developing body of literature and research reporting on this subject that is useful in identifying some primary concerns and clarifying issues specific to the valuation of impaired properties. The list of issues in the valuation process is long and complex, but the following summary includes issues of concern that appear to occur most frequently.

Guideline

Contamination may affect property value in two ways: (1) loss of value due to costs of remediation or containment and (2) loss of value due to stigma¹ including loss of value due to proximity or location (a function of stigma). It is important to note that a property may be effected by either one or both influences.

Valuation Procedure for Contaminated Property

As with non-contaminated property, the approaches to value are the same. In the case of the sales comparison approach there may be few or no contaminated properties that have been sold in the market area. In these cases the Assessor may need to expand time frames and market areas in the search for comparable sales. Sales of non-contaminated properties can be used to set a bench mark and adjustments can be made on discounted costs to cure.

The cost approach may be adaptable if the replacement cost is calculated and adjusted based on reliable estimates of remediation costs and/or provable loss in value resulting from negative market impact due to stigma. The danger here lies in overstating the costs of remediation or attributing excessive value loss from stigma. Alternatively, the cost to cure might be considered as functional or economic obsolescence and added to accrued depreciation. Obsolescence could be applied for a specific period or until the property value moves up to current market values.

The most easily measured impact of contamination on value is on the ability of a property to generate income. Because the income approach estimates value by determining the present value of a typical income stream, measuring actual income against income typical (market) for properties of the same type should produce a reasonable estimate of value.

¹ Stigma. A perception that property value is negatively affected despite contamination clean-up; a perception of value loss due to proximity to contamination; an intangible, adverse perception.

Providing proof of contamination rests with the property owner. It is the owner's responsibility to provide certifiable proof that there is evidence of contamination. Unless there is a demand from a government agency to take remedial action there may not be a need to consider a reduction in value.

No value adjustment can be considered until proof of contamination and expenses involved in remediation are provided by the taxpayer. The court has held that the burden of proof that classification and valuation of land for property tax purposes was erroneous is upon the taxpayer.² Although the burden of proof remains with the owner, property values are not set arbitrarily, and when challenged must be defended by the Assessor with supporting evidence from the market. The Assessor must be provided with proof of contamination, costs of cleanup, certifications from governmental agencies, and any partial or less costly solutions that are acceptable to regulators before making any valuation adjustments.

Some companies with multiple locations (gas stations and similar properties), subject to contamination from underground storage tanks, should not be allowed reductions in value unless they have been denied reimbursement by State or Federal funds set aside for this purpose. In some cases, due to the nature or extent of the problem, the property may not be cited for immediate or future remediation. In these incidences the condition may have no significant effect on the property or prevent its ongoing use.

A Phase I environmental audit performed by environmental engineering consultants, and/or technical evaluators, recognized by professional organizations as qualified in the fields of hydrology, geology, chemical engineering, and related disciplines, is the first step in analyzing property to determine if any contamination exists. The Phase I audit is a preliminary examination to discover if contamination is present. The Phase I audit should not be considered as a verification of the type or scope of contamination. The Phase II audit, performed by a recognized evaluator, identifies the type and extent of the

² [Sherill and La Follette v. Mohave County](#) (1975) 22 Ariz. App. 606, 529 P.2d 1200.

contamination. The Phase III Environmental Site Assessment represents the remedial phase of the process.

Before determining if a value decrease is warranted, the following data should be provided by the taxpayer:

1. Phase II audit which identifies the type and extent of contamination from a recognized evaluator.

A Phase II report is an in depth study of ground water, air, soils, and improvements to determine the existence of any hazardous waste substance or other contaminants.

2. A “No Action Letter” that is the environmental agency’s (state, local, or federal) technical review.

A No Action Letter follows the Phase II environmental audit and is intended to notify a property owner or assure future buyers that once an approved cleanup is completed, no further remediation will be required. In some cases, these letters may excuse owners from future responsibility or acknowledge the owner’s voluntary testing and cleanup, preventing an enforcement action by a governmental agency.³

3. An estimate of remedial costs and projected time from a professional environmental expert retained to perform the investigation and/or oversee the remedial work. This should also include estimates on less costly alternatives.
4. Documentation of indemnification agreements and governmental reimbursement programs such as PECFA (Petroleum Environmental Cleanup Fund Act), [CERCLA](#) (Comprehensive Environmental Response, Compensation, and Liability Act), or State of Arizona Assurance Fund.

(Note: Government reimbursement is based on availability of funds.)

³ Richard Roddenwig, “Stigma, Environmental Risk and Property Value: 10 Critical Inquiries,” *Appraisal Journal*, October 1996.

Once these requirements are met, the assessing officer can prepare necessary market data and apply the most appropriate appraisal approach(s) to determine the value of the property. The time frame for remediation should be analyzed for possible impact on value.

A data bank of remediated properties, categorized by type of use, contamination, costs, and market history, would prove to be an invaluable tool in creating expertise in this area of assessment. Any reductions made to contaminated properties should be supported by well-researched evidence.

There are a number of other issues associated with the valuation of impaired properties currently under study and debate. For the Assessor, the problem of when and if to consider a value reduction is of primary concern. The maintenance of current market data in the jurisdiction assures the Assessor of a reliable source of information in analyzing market response to the value of contaminated properties.

Once a property is judged to be contaminated or value impaired due to stigma, the method of valuation and amount of value reduction rests on the quality of research data the Assessor has gathered and analyzed. The following examples of value calculations are for illustrative purposes only:

Example

A medium size manufacturing property is leased at a flat rent of \$4.40 per square foot and has an annual net operating income of \$110,000. The property is found to be contaminated but is partially usable during remediation. The loss of usable space will reduce the net operating income to \$85,000 during the one year cleanup. The cost of remediation is a flat contract price of \$250,000 and will be paid over five years at \$50,000 per year. The yearly payment will be paid annually from net operating income. The rents are expected to remain at market level.

	Year 1	Year 2	Year 3	Year 4	Year 5
Income	\$35,000	\$60,000	\$60,000	\$60,000	\$60,000
Present Value Factor	0.892857	0.797194	0.71178	0.635518	0.567427
Present Value of Income	\$31,250	\$47,832	\$42,707	\$38,131	\$34,046
Total Present Value of Income					\$193,966
Residual Value	$\$110,000 / .12 = 916,667 \times \text{Year 5 factor} =$				\$520,142
Property Value					\$714,108

Valuation Influence of Environmental Stigma

Stigma is an intangible factor that could influence market value, but because it is based on public perception, its real significance may not be measurable. Studies indicate that the perception of contamination is related to public response; the greater the understanding of the contamination, the lower the level of fear and thus the less effect on property value. In cases where contamination is low profile, the effects of stigma may be overstated.

The claim of value loss due to stigma is not unusual. This is true of affected properties and those in geographical proximity to contaminated property. In either case, a market study must be done to determine if market data indicates altered behavior of overall market activity evidenced by a decrease in volume of sales or asking prices.

Over time the impact of stigma may be greatly reduced. In cases where market evidence indicates stigma has affected value negatively, an Assessor may decide to treat stigma as a value and time adjustment rather than address the cost to cure the contamination.

Example

A property is located adjacent to a remediated contaminated area. Its current full cash value is \$75,000. Property values for the year were established prior to the discovery of contamination. Three properties sold for \$55,000 when the contamination was cited six months previously. The owner is petitioning for a value reduction of \$25,000 due to stigma. Recent market studies indicate that similar properties within the area are currently selling for \$68,000 to \$72,000. Solution: If the property is in a similar condition and has a similar use, size, age, etc., then a reduction of \$3,000 might be considered for one year. In this case, the current market indicates the effects of stigma have little or no influence on value and the market is improving.

Background / Supporting Information

Assessment vs. Public Policy

The work of the Assessor is to value property, not set environmental or social policy. Property appraisal and assessment are concerned with interpreting market indicators, conditions, and events that affect property value. Any change in value due to environmental concerns should be based on factual observations and interpretation of market data and conditions that substantiate or support the change in value.

Valuation Concepts

An important issue occurring frequently in the valuation of contaminated properties is distinguishing between value in *exchange* and value in *use*. In Arizona, by statute, the Assessor assigns value based on full cash value. There are two types of valuation concepts to consider when valuing contaminated property: value in exchange and value in use. Value in exchange is the price that would tend to occur as a result of the interaction of the market forces of supply and demand. Value in use takes valuation to an added step by saying that if a property fulfills a utility, it has value despite the traditional theory of the market being the indicator of value. "Value in use suggests that

a property which is still in use, or which can be used in the near future, has a value to the owner...many recent court decisions have held that property that has use, has value, even though a traditional market may not be immediately apparent.”⁴ The concept of value in use is affirmed by the Arizona Supreme Court’s opinion in *Recreation Centers of Sun City, Inc. v. Maricopa County*, which states, “Thus, although a particular restriction may destroy marketability, the property may have value in use to the owner and should therefore be assessed and taxed.”⁵

In the case of contaminated properties, the concept of value in use is important because it challenges the claim that a property has no value if the cost of remediation exceeds its market value. If the cost of remediation exceeds the replacement cost, the “value in use” concept can be applied. Value in use states that value lies in utility. This concept has been applied to contaminated properties as well as restricted use properties.

Factors Influencing Value

Market response to contamination is not always in direct proportion to the extent or seriousness of the condition. The severity of contamination affects the value in terms of cost, time to cure, and loss of income. The more severe the problem, the greater the cost of cleanup, containment, and possible future monitoring. In extreme cases, the cost to correct a problem may limit the property’s future utility.

Because contaminated properties have unique conditions, the current and future utility of the property must be determined. The location and type of property may influence a loss of value or utility due to contamination. For example, the value of a manufacturing facility in a heavily populated area would probably experience greater value impact due to public sensitivity to reports of nearby contamination (i.e., stigma) than a plant located among other industrial plants or in a sparsely populated location. A plant located in a highly populated area could be perceived as less valuable because its location puts the

⁴ International Association of Assessing Officers (IAAO), “Standard on the Valuation of Property Affected by Environmental Contamination,” (Chicago: IAAO, 1992).

⁵ [Recreation Centers of Sun City, Inc. v. Maricopa County](#), 162 Ariz., 281, 782 P.2d 1174 (1989).

owner/user at a higher risk for legal action based on health claims and/or migrating contamination.

In some cases, government regulations may require that an entire industry install equipment to eliminate or abate an environmental hazard. Costs in these situations would not lessen a property's value but would be considered a typical business expense or a capital investment.

A Phase II environmental report will confirm that the property is indeed contaminated, as well as verify the extent and nature of the contamination. It is essential to determine the seriousness of the problem through the Phase II report and cleanup cost estimates. Without this data, the property cannot be valued as a contaminated property. Once the presence of contamination is established and costs are estimated, the property can be valued by the applicable approach(s).

Liability

Liability for the cost of cleanup or remediation normally rests with the owner/operator or past owner whose business activities precipitated the contamination. The "Superfund" is a federal source of funds that may be used in cases where immediate remedial action must be taken or where no financially responsible party can be found. In cases where immediate action is funded by the government, the EPA can seek to recover costs from responsible parties.

Remediation Costs

The costs associated with environmental contamination are the costs of discovery and costs to cure. An environmental assessment report, Phase I audit, establishes whether there is a likelihood of contamination. The Phase II audit identifies the contaminant, its chemical properties, and its physical location on the property. Environmental assessment reports must be prepared by qualified independent analysts or governmental agencies. Costs associated with audits and related matters should not be

considered a cleanup cost in valuing the property. Typically, the only costs that should be considered for valuation purposes are those direct costs necessary to cleanup the property.

Estimates of the costs to cure, contain, and/or monitor must be supplied by a recognized expert in remediation of contaminated property. The cost to cure may be overstated or understated; the progress and actual costs of remediation must be monitored to verify actual costs involved.

Expenditures resulting from migrating contamination (i.e., legal fees, environmental testing or consulting, and costs related to current or future liability) are not part of remediation costs associated with the property causing the contamination. All costs (including attorneys' fees) which may result from an enforcement action by the state or federal government or from a trespass action by another property owner are considered business expenses and are irrelevant to the valuation of the subject property. Additionally, any cleanup costs that have been reimbursed through government and/or private indemnity sources should not be considered as part of remediation costs.

Certain types of contamination are more costly to remedy and may require monitoring over a long period, whereas the costs of cleanup or containment of some pollutants is more predictable in both time and money. For the Assessor, an updated file on cleanup costs (for various types of contaminants) would be invaluable in determining a market range of baseline costs attributable to remediation. (Note: No precedent has been found addressing confidentiality issues regarding disclosure of actual remediation costs for contaminated properties.)

Indemnification

Indemnification agreements are becoming more common when properties, which may require later cleanup, are sold. The effect of indemnification agreements should be

capitalized into the market value of the property, thus eliminating the need for value adjustments. Only atypical agreements would require adjustments.

Indemnification agreements are of consequence to the Assessor because a value reduction for costs of remediation could result in a double benefit to an owner, if an instrument of indemnification already exists. As an example, if the owner is given a value reduction and is later reimbursed through an indemnification agreement or a government grant, he has received both reduction and reimbursement which constitutes an incorrect double benefit.

Any monetary awards from governmental reimbursement programs set up to alleviate the liability of cleanup costs should be verified with the agency making the grant. The Petroleum Environmental Cleanup Fund Act (PECFA), the Comprehensive Environmental Response, Compensation, and Liability Act ([CERCLA](#)) are governmental sources of remedial funds. In Arizona, the Arizona State Assurance Fund and the Underground Storage Tank Revolving Fund, administered by the [Arizona Department of Environmental Quality](#), are state sources of such funds.

Glossary

Abatement. A method of reducing the degree or intensity of pollution, or the use of such a method.

Activated Carbon. A highly absorbent form of carbon, used to remove odors and toxic substances from gaseous emissions or liquid effluent.

Adjoining Properties. Any real property or properties the border of which is contiguous or partially contiguous with that of the (subject) property, or that would be contiguous or partially contiguous with that of the (subject) property but for a street, road, or other public thoroughfare separating them.

Aquifer. Geological formation, group of formations or part of a ground formation which is usually gravel or porous, that is capable of yielding water to wells or springs.

Arizona State Assurance Fund. Administered by [ADEQ](#) distributing assistance to qualified applicants subject to availability of funds. Responsible for distribution of reimbursement funds for remediation of certain contamination conditions such as LUST sites, (Leaking Underground Storage Tanks).

Biodegradable. The ability of a substance to be broken down physically and/or chemically by microorganisms.

Biological Hazardous Wastes. Any substance of a human or animal origin—other than food wastes—which is to be disposed of and could harbor or transmit pathogenic organisms including, but not limited to pathological specimens such as tissues, blood elements, excreta, secretions, bandages, and related substances.

By-Product A material produced without separate commercial intent during the manufacture or processing of other materials or mixtures.

CAA. Clean Air Act; Federal law enacted to regulate/reduce air pollution. Administered by the EPA.

Carcinogens. A general term meaning agents which cause cancer. Also, a specific list of materials compiled by the U.S. Public Health Service which are known or suspected to be carcinogenic.

CERCLA. The Comprehensive Environmental Response Compensation and Liability Act of 1980; known as “Superfund” and administered by the EPA.

CFR. Code of Federal Regulations.

Closure. Actions taken by the owner or operator of a hazardous waste facility to prepare the site for long-term care and to make it suitable for other uses after it has stopped accepting waste.

Combustible Liquid. Any liquid having a flash point above 100 degrees Fahrenheit and below 200 degrees Fahrenheit as determined by tests.

Container. Any portable device in which a material is stored, transported, treated, disposed or otherwise handled.

Commercial Waste. All solid waste emanating from establishments engaged in business. Including, but not limited to, solid waste originating in stores, markets, office buildings, restaurants, shopping centers and theaters.

Compliance Monitoring Program. A program used to determine whether ground water performance standards are exceeded.

Contained Impairments. Impairments which are wholly contained within a structure, such as asbestos in a commercial office building.

Contamination. The degradation of natural water, air or soil quality as a result of man's activities, to the extent that its usefulness is impaired.

Contingency Plan. A document setting forth an organized, planned and coordinated course of action to be followed in order to prevent pollution in case of fire, explosion, or discharge of hazardous waste constituents which could threaten human health and the environment.

Corrective Action Plan. The sixth "Phase" in the Environmental Site Assessment after Phase I, Phase II, the No Action Letter, Phase III remedial investigation and the Feasibility Study. The Corrective Action Plan designs the cleanup action and obtains all agency approvals.

Cost to Cure/Cost to Control. The cost or expense of cleaning up environmental contamination. In some cases complete cure is impossible, and cost to cure is actually *cost to control*. [CERCLA](#) and [RCRA](#) clearly indicate that control is the objective, cure being implicitly if not explicitly recognized as a usually unattainable goal.

Cover Material. Soil or other suitable material that is used to cover wastes daily or periodically in a properly operated sanitary or secure landfill.

Cradle to Grave. The tracking of the source, quantity, concentration and type of hazardous waste from generation through final disposal.

[CWA](#). Clean Water Act.

Decomposition. Breakdown of a material or substance (by heat, chemical reaction, electrolyses, decay, or other processes) into parts or elements or simpler compounds.

Decontamination. The process of making any person, object or area safe by absorbing, destroying, neutralizing, or making harmless by removing biological or chemical agents.

Deferred Utility. The time required to implement the cleanup of a contaminated site and obtain necessary approvals from environmental agencies.

Detection Monitoring Program. A program used to ensure that any leakage from land treatment facility is discovered.

Discharge. The release of any waste stream or any constituent thereof to the environment which is not recovered.

Discharge/Hazardous Waste Discharge. The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.

Disposal Facility. A collection of equipment and associated land area which serves to receive waste and dispose of it. The facility may have available one, many or all of the large number of disposal methods.

Domestic Waste(s). Solid waste, garbage and rubbish, which originate in residential areas.

DOT. U.S. Department of Transportation. Regulates transportation of chemicals and other substances, to aid in the protection of the public as well as fire, law enforcement and other emergency-response personnel, particularly when transportation incidents occur involving hazardous materials. Detailed DOT classification lists specify appropriate warnings, such as Oxidizing Agent or Flammable Liquid, which must be used for various substances.

Dump. A land site at which waste is disposed of in a manner which does not protect the environment, is susceptible to open burning, or is exposed to the elements, vermin and/or scavengers.

Effluent. 1) Solid, liquid or gas wastes which enter the environment as a byproduct of man-oriented processes. 2) The discharge or outflow of water from ground or sub-surface storage.

Electromagnetic Radiation. Waves emitted by various sources, including power lines, radio transmitters, and microwave sources.

Encapsulation. The complete enclosure of a waste in another material in such a way as to isolate it from external effects such as those of water or air.

Enclosure. The construction of a physically impermeable and structurally sound barrier around the risk source and its primary control mechanism. The difference between encapsulation and enclosure is in the structural strength of the barrier.

Environment. The sum total of all the external conditions that may act upon an organism or community to influence its development or existence.

Environment Assessment. A report showing the results of investigation into environmental contamination often required by the EPA and other regulatory agencies to establish the extent of contamination.

Environmental Contaminant. Any tangible substance or intangible occurrence, which may degrade property, resulting in decreased utility or having an effect on value.

Environmental Impairment. An environmental impairment is the result of negative economic impact because of an environmental risk.

Environmental Lien. A charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including, but not limited to, liens imposed pursuant to [CERCLA 42 USC 9607\(l\)](#) and similar state or local laws.

Environmental Professional. A person possessing sufficient training and experience necessary to conduct a site *reconnaissance*, *interviews*, and other activities in accordance with Practice [E1527](#), and from the information generated by such activities, having the ability to develop conclusions regarding recognized *environmental conditions* in connection with the property in question.

Environmental Risk. An environmental risk results when four components such as a potential hazard, unreliable containment, mode of transport and target (water source) interact in a manner that results in a substantive risk to human beings or sensitive environments.

Environmental Site Assessment (ESA). See *Environment Assessment*.

EPA. The U.S. Environmental Protection Agency. Federal agency with environmental protection regulatory and enforcement authority. Administers the [Clean Air Act](#), [Clean Water Act](#), [FIFRA](#), [RCRA](#), [TSCA](#), [CERCLA](#) and other federal environmental laws.

Excess Operating Expenses. Those future costs that may be required to monitor the cleanup and maintain the property at an uncontaminated level.

Explosive. Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion.

Facility. All contiguous land and structures, other appurtenances and improvements on the land, used for treating, storing, or disposing of hazardous waste. It may consist of several treatment, storage, or disposal operational units (i.e., one or more landfills, surface impoundment's, or combinations of them).

Feasibility Study. 1) A detailed examination of the technical, environmental, engineering, economic, legal and practical suitability of a proposed facility or technology for use at a specific location. 2) The fifth "Phase" in the Environmental Site Assessment

after Phase I, Phase II, the No Action Letter, and the Phase III Remedial Investigation. The Feasibility Study will determine cleanup options.

FIFRA. Federal Insecticide, Fungicide and Rodenticide Act. Regulations administered by EPA under this act require that certain useful poisons, such as chemical pesticides, sold to the public contain labels that carry health hazard warnings to protect users.

Fill Dirt. Dirt, soil, sand or other earth, that is obtained off-site, that is used to fill holes or depressions, create mounds, or otherwise artificially change the grade or elevation of real property. It does not include material that is used in limited quantities for normal landscaping activities.

Final Closure. The measures which must be taken by a facility to render the landfill portion environmentally innocuous when it determines that it will no longer accept waste for treatment, storage, or disposal on the entire facility.

Flood Plain. The lowland that borders a river, which is usually dry, but is subject to flooding when the stream overflows its banks.

Formaldehyde. Chemical constituent of certain insulation materials and glues which may enter air and become contaminant.

Generator. Any person, by site, whose act or process produces hazardous waste identified or listed by [40 CFR Part 261](#).

Grab Sample. A single sample of waste water taken at neither set time nor flow.

Hazardous Chemicals. Hazardous materials used in the workplace which are regulated under OSHA “right-to-know” regulations in [29 CFR - 1910.1200](#).

Hazardous Materials. In a broad sense, any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human being.

Hazardous Substances. Any substance designated under various federal acts as toxic or hazardous, including hazardous solid waste, toxic air pollutants, and imminently hazardous chemicals and mixtures, but does not include petroleum and natural gas products or synthetic fuel gas.

Hazardous Waste. A solid waste that may pose a present or potential hazard to health or to the environment and is ignitable, corrosive, toxic, or reactive.

Hazardous Waste Generation. The act or process of producing hazardous waste. Includes the resulting or left over material from usage of hazardous substances.

Hazardous Waste Landfill. An excavated or engineered area on which hazardous waste is deposited and covered. Proper protection of the environment from the materials to be deposited in such a landfill requires careful site selection, good design, proper operation, leachable collection and treatment and thorough final closure.

Hazardous Waste Site. A location where hazardous wastes are stored, treated, incinerated, or otherwise disposed of.

Heavy Metal. High-density metallic elements (i.e., mercury, chromium, cadmium, arsenic and lead) which are generally toxic to plant and animal life in low concentrations.

Identification Code for EPA. The individual number assigned each generator, transporter and treatment, storage, or disposal facility by state or federal regulatory agencies.

Ignitable. Capable of being set afire.

Impaired Value. The value giving due consideration to the impact of environmental contamination or risks known or assumed to be present. See direct impairment, uncontained impairment, contained impairments, indirect impairment.

Incineration. An engineered process using controlled flame combustion to thermally degrade waste materials. Devices normally used for incineration include rotary kilns, fluidized beds and liquid injectors. Incinerators must meet clean air standards.

Indemnification. Bonds established to provide security against future costs resulting from previously existing contamination, usually provided by the seller to facilitate a sale of contaminated property.

Indirect Impairment. Having proximity to a known impairment.

Industrial Wastes. Unwanted materials produced in or eliminated from an industrial operation. Hazardous wastes contain substances which, in low concentrations, are dangerous to life (especially human) for reasons of toxicity, corrosiveness, mutagenicity and flammability.

Innocent Landowner. A landowner who purchased property subsequent to contamination, but had no knowledge of, and did not contribute to, the contamination and must have made all “appropriate inquiries” into the property prior to purchase. If qualified, the “innocent landowner” is not liable under [CERCLA](#).

Intrinsic Value. Value that remains when cost to cure a contamination problem exceeds original market value (see *Value in Use*).

Isolation. The prevention of access to a risk source except possibly by trained and equipped personnel. It may be accomplished by something as simple as a fence, or by something as complex as a controlled-atmosphere structure.

Lagoons. See *Pits, Ponds, or Lagoons*.

Landfills. A conventional sanitary landfill is “a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading solid wastes in thin layers, compacting the wastes to the smallest practical volume and applying cover materials at the end of each operating day.” A secure chemical waste landfill should be designed to provide complete protection to the quality of surface and sub-surface waters, thereby making site selection very important. Potentially hazardous wastes frequently require various types of pre treatment before they are disposed (i.e., neutralization, chemical fixation or encapsulation). Some types of wastes also require segregated disposal.

Liability. Responsibility for cleanup costs associated with environmental contamination.

LUST Fund. Part of Arizona Assurance Fund for remediation of leaking underground storage tanks, a.k.a. The Underground Storage Tank Revolving Fund.

Midnight Dumper. An idiomatic term referring to a person who disposes of hazardous or noxious wastes in a stealthy, illegal manner.

Monitoring Well. A well used to obtain water samples for water quality analysis or to measure ground water levels.

NAPL. Non aqueous-phase liquids--liquid contaminants often trapped in soil or bedrock.

National Pollutant Discharge Elimination System (NPDES). Establishes permit system for industrial discharges.

National Priorities List (NPL). The list of sites determined to pose enough risk to become “Superfund” sites.

No Action Letter. Environmental Site Assessment after Phase I and Phase II have been completed. Environmental agency technical review.

Non-Point Source. Source from which pollutants emanate in an unconfined and unchanneled manner, including, but not limited to: 1) water effluent not controlled through NPDES permits or traceable to a discrete identifiable origin, but result from natural processes, such as non-channeled runoff, precipitation, drainage or seepage; and 2) air contaminant emissions from landfills and surface impoundment's.

Nonphysical Contamination. Any recognized contaminant that does not consist of any tangible, physical substance.

Non-Time Critical (NTC). Non emergency portion of environmental contaminated, Superfund site.

Offsets. Environmental permits allow certain amounts of air pollutants to be released into the environment. If an industry wishes to expand, it first may be required to reduce its current level of emissions, so that the expanded plant will not emit more air pollution than did the original plant.

Operations and Maintenance Program. A specific, written program of daily functions, training, equipment, and discipline intended to provide observation of the environmental risk and the maintenance of the primary and man-made secondary control mechanisms.

OSHA. Occupational Safety and Health Administration of the U.S. Department of Labor. Federal agency with safety and health regulatory and enforcement authorities for most U.S. industry and business. Code of Federal Regulations Title 29.

Owner/Operator. The owner of a hazardous waste treatment, storage or disposal facility, as well as any person ultimately responsible for decision-making authority over the facility. Under Superfund ([CERCLA](#)) the term is extremely broad, and includes landlord, tenants, and any entity with indicia of ownership.

PECFA. Petroleum Environmental Cleanup Fund Act.

Permits. Official approval and permission to proceed with an activity controlled by the permitting authority.

Phase I and II Reports. Phase I determines any prior violation pertaining to hazardous wastes or substances and requires physical inspection of the property. Phase II is an in-depth study of ground water, air, soils, and improvements, to determine existence of any hazardous waste or substance, or other contaminants.

Phase III. Environmental Site Assessment after Phase I, Phase II, and the No Action Letter have been completed. It is a remedial investigation to determine the extent of contamination.

Physical Contaminant. Any Substance recognized by the EPA or local or regional authorities.

Pits, Ponds, or Lagoons. Man-made or natural depressions in a ground surface that are likely to hold liquids or sludge containing *hazardous substances* or *petroleum products*. The likelihood of such liquids or sludge being present is determined by evidence of factors associated with the pit, pond, or lagoon, including, but not limited to, discolored water, distressed vegetation, or the presence of an obvious waste water discharge.

Point Source. A discernible, confined and discrete conveyance, including, but not limited to a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal-feeding operation, or vessel or other floating craft from which pollutants are or may be discharged. Does not include return flow from irrigated agriculture.

Pollution. Contamination of air, water, land or other natural resources that will or are likely to create a public nuisance or to render such air, water, land or other natural resources harmful, detrimental or injurious to public health, safety or welfare, or to

domestic, municipal, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other life.

Polychlorinated Biphenyls (PCBs). A series of hazardous compounds used for a number of industrial purposes, which are now found throughout the natural environment. PCBs are toxic to some marine life at concentrations of a few ppb (parts per billion) and are known to cause skin diseases, digestive disturbances and even death in humans at higher concentrations. PCBs are persistent in the environment and do not easily decompose and biomagnify up the food chain.

Ponds. See *Pits, Ponds, or Lagoons*.

Primary Control Mechanism. Acts to prevent the risk from entering the transport mechanism and becoming an actual, as opposed to a potential, threat to an entity that may be damaged by the risk source.

Radon. Radioactive gas which may enter structures from beneath the ground and contaminate air.

Reclamation. Restoration to a better or more useful state, such as land reclamation by sanitary land filling or making materials from solid waste.

Recycling. As commonly used, using discarded materials and objects in original or changed form rather than wasting them. Precisely used, refers to sending a material back into the process by which it was first formed.

Remediation. The process of eliminating environmental contamination to restore the property to an uncontaminated state.

Removal with Disposal. The physical removal of the risk source, usually involving the destruction of the primary control mechanism, and the disposal of the risk source in another location. Removal with disposal does not end the owner's (at the time of

removal) financial risk; it freezes title to the risk source with that owner for as long as the risk source may exist in its new location. This may involve that owner in later Superfund liabilities even if the risk source is relatively benign.

Removal with Destruction. Destruction means the reduction or transformation of the risk source to non-risk elements or form. If it can be accomplished, the destruction of the risk source after removal is the only method for cutting off future liability, although it will do nothing about any liabilities associated with the past presence of the risk source or the actual removal and destruction activities. Removal with destruction is usually technically difficult and expensive.

Repair. The restoration of the primary control mechanism(s) to a functional state whereby the risk source may be maintained such that human health and/or environment are protected.

Reportable Quantity. The minimum quantity of hazardous waste generated as a result of a discharge or spill, which must be reported to EPA or the National Response Center.

Representative Sample. A sample of a universe or whole, such as a waste pile, lagoon, or ground water, which can be expected to exhibit the average properties of the universe or whole.

Residual Value. The value of the property after cleanup of environmental contamination.

Resource Conservation. Reduction of the amounts of waste that are generated, reduction of overall consumption and utilization of recovered resources.

Resource Conservation and Recovery Act ([RCRA](#)). A federal act which gives EPA the authority to develop a nationwide program to regulate hazardous waste from “cradle to grave”. Enacted in 1976, the act was established to “protect human health and the environment from the improper handling of solid waste and encourage resource

conservation.” Hazardous wastes under [RCRA](#) are either *characteristic* (i.e., ignitable or corrosive) or they are *listed* as hazardous and therefore regulated under EPA.

Risk Assessment. Evaluation of the threat to public health and the environment posed by a hazardous waste facility, considering probability of incident and its effects.

Rubbish. Solid wastes which are not liable to rot, consisting of both combustible and non-combustible wastes, including paper, wrappings, cardboard, tin cans, yard clippings, wood, glass, bedding, crockery and similar materials.

SARA. Superfund Amendment and Reauthorization Act. Enacted in 1984, [SARA](#) provided minor changes to [CERCLA](#), or the Federal Superfund Program.

Site. The property on which a facility is located. Two or more pieces of property which are divided only by public or private right(s)-of-way and which are otherwise geographically contiguous are considered a single site.

Solid Waste. Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return, flows, or industrial discharges which are point sources.

Solvent. Liquid that is capable of dissolving another substance; used in a number of manufacturing / industrial processes including the manufacture of paints and coatings for industrial and household purposes, equipment cleanup and surface degreasing in metal-fabricating industries.

Stigma. A perception that property value is negatively affected despite contamination cleanup; a perception of value loss due to proximity to contamination; an intangible, adverse perception.

Storage. When used in connection with hazardous waste, the containment of hazardous waste, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste.

Storage Facility. The facility which stores wastes, except generators, who store their own wastes for specified periods of time for subsequent transport off-site.

Superfund. The Comprehensive Environmental Response, Compensation and Liability Act of 1979 provides the federal government with the mechanism to take emergency or remedial action to cleanup both abandoned and existing disposal sites whenever there is a release or potential threat of a release of a hazardous substance which may present imminent and substantial danger to public health and welfare.

Surface Impoundment. A facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with synthetic materials) which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundment's are holding, storage, settling and aeration pits, ponds and lagoons.

Target. An entity that may be damaged by the risk source (human beings, animals, wetlands, etc.).

Toxic Substances. Chemicals which are subject to the regulations issued under the Toxic Substances Control Act by the U.S. Environmental Protection Agency ([40 CFR](#)); this term is also used in a generic sense to mean "toxic chemicals" or "toxic agents."

Toxics. Recognized hazardous substances in the environment.

Tradeable Allowances. See *Offsets*.

Transport/secondary Control Mechanisms. The means by which a risk source may come into proximity to the entity that may; be damaged by the risk source (human beings, animals, wetlands, etc.)

Treatment Facility. Any facility which treats hazardous waste, Treatment processes, other than ponds and lagoons, which 1) are directly connected to a manufacturing process by a pipe or other fixed and enclosed means, and 2) if discharging into a municipal sewer system, have the appropriate approval by the municipality and shall not be considered treatment facilities.

Treatment Storage, and Disposal Facility (TSDF). A business that treats, stores, and disposes of hazardous waste. Regulated by [RCRA](#).

TSDFs. Hazardous waste Treatment, Storage and Disposal Facilities.

Underground Storage Tank (UST). Any tank and associated piping that has more than 10 percent of its volume underground. If leaking, these tanks are known as LUSTs.

Uncontained Impairment. Impairments not bounded by an enclosure such as a structure, such as soils, ground water, and endangered species.

Unencumbered Value. The value of property without consideration of any detrimental environmental contamination.

Unimpaired Value. The value considering all restrictions on use and costs of ownership other than those imposed by the presence of an environmental risk or contamination.

Value in Use. The ability of property to generate income or otherwise retain some value or use to the owner, regardless of the presence of contamination.