

## ENVIRONMENTAL HAZARD EVALUATIONS

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### INTRODUCTION

Due to the legal and financial liabilities associated with potentially contaminated property, environmental hazard evaluations are typically conducted as a condition of purchase in real estate transactions. Environmental hazards are structural, operational, or chemical aspects of a historical or presently operating facility that may present some future liability for a potential buyer of property. In response to stringent environmental regulations, particularly those that have been issued to satisfy the mandates of the Resource Conservation and Recovery Act (RCRA), industrial and commercial facilities routinely conduct environmental hazard evaluations. These evaluations are usually specifically oriented to requirements of the law and activities of the subject facilities.

This paper will focus on the components of an environmental hazard evaluation of a typical industrial or commercial property to satisfy condition of purchase requirements. Specific tasks that are completed in the investigation of an industrial facility to satisfy RCRA requirements will be generally discussed in the final section of this paper. Many of the items that will be discussed under the condition of purchase evaluation are components of RCRA investigations.

## CONDITION OF PURCHASE EVALUATION

The potential property buyer typically has been provided little information concerning the environmental hazards of the parcel subject to purchase. For this reason, the hazards evaluation must include not only a historical review of past business practices and filed reports but also a thorough site investigation.

A particular concern related to past business practices includes chemical usage and handling. There are a number of other concerns which will also be addressed herein.

### Historical Review

The historical review of a property is often the most critical yet most sensitive component of the environmental hazards evaluation. Information related to site history is gathered from two sources -from the question business(es) itself and from public records.

In typical condition of purchase contracts, the question businesses (if leases are in effect) are required by the present property owners to make available most non-proprietary information relating to business practices. Therefore interviews may be conducted with appropriate individuals. These interviews should be scheduled and organized. A prepared question format that is oriented towards the interviewee should be prepared. Key individuals who may be interviewed include the plant superintendent, shift manager, and chemical handler (technician).

Due to the nature of environmental problems, not only present facility operations but previous businesses located on the subject premises should be evaluated. It is possible that some past tenant could have illegally disposed of chemicals in the on-site area, thereby presenting a future liability for the

potential buyer. The documentation of past business, especially in cases when they are dissolved, is often a very difficult task requiring extensive record searches.

Documentation of **chemical usage and disposal** should be requested. This documentation includes inventory records that relate to volumes of chemicals that are:

- received;
- stored;
- used;
- reprocessed;
- disposed of.

Usage of chemicals should be documented with a Materials Safety Data Sheet. Disposal of chemicals should be documented with a Manifest Form.

An effective way to survey historical operations at a question facility is to obtain **aerial photographs**. Aerial photographs of the Phoenix metropolitan area are available from the 1940's. In many locations, photographs have been taken in at least five-year intervals. Aerial photographs are indicative of chemical storage and disposal practices, additions to building structures, transportation routes, and topography.

In conjunction with obtaining facility records and reports, **county, state, and federal records** relating to the question facility operations should be obtained. These records or reports may include the following:

- permits for operation/disposal;
- citations;
- soil reports;
- construction drawings;
- flood plain designation;
- water table and ground-water gradient maps.

**Permits** are allowances by regulatory authorities for a facility to operate within a prescribed set of guidelines. Permit applications for wastewater disposal are processed by the Arizona Department of Health Services (beginning July 1, 1987, Department of Environmental Quality). **Citations** are issued when a permit is violated. Permits and citations are reviewed in order to evaluate facility operations that may be in violation of existing regulations and therefore pose a future environmental liability for the prospective buyer.

**Soils reports, construction drawings, and flood plain designation** mostly relate to concerns about the structural integrity of the building and adequate insurance coverage. **Water table and ground-water gradient maps** are available from the Arizona Department of Water Resources. These maps may be critical pieces of information, especially in flood plain areas where the water table is relatively shallow compared to the land surface. In these areas, overland disposal of waste products and the distance to the saturated zone is a primary concern.

#### On-Site Property Inspection

After records from all available sources are collected and reviewed, an on-site inspection should be conducted. The on-site inspection includes a thorough investigation of structures and practices employed inside of the question buildings as well as about outside areas subject to purchase.

Items located inside of buildings that should be investigated include:

- walls, piping, floors, ceilings, roof;
- ventilation system;
- drains;
- stockpiled materials;
- evidence of leaks or spills.

It is imperative that environmental hazards posing future liability for the property buyer are identified. These relate to situations where capital costs will be incurred or where remedial efforts are required. For example, if an improper **ventilation system** is installed at a dry-cleaning operation, the potential buyer may inherit a needed capital improvement.

One of the most costly and publicly-sensitive items related to building structures is the detection and removal of **asbestos**. Asbestos typically occurs in older buildings as insulation in walls, ceilings, floors and around piping. The detection of asbestos in a question property may cause a sales transaction to be modified or halted.

Procedures that are followed in the handling and storage of chemicals inside the facility may indicate potential environmental hazards. **Chemical storage** areas should be identified and inventories recorded. Areas of obvious **leakage** or **spills** should be documented. These areas are particularly important in relation to **floor drains**. Whether the drains discharge into a septic system, public sewer, or outside area should be investigated. The nature and extent of **stockpiled materials** should be noted.

Items located outside of the facility building(s) that should be investigated include:

- drains;
- dry wells;
- water wells;
- stained soil;
- excavations;
- stockpiled materials;
- transformers.

Potential conduits for ground-water contamination must be closely scrutinized during environmental hazard evaluations. These conduits may occur as drains or wells. Almost all Superfund investigations

have been initiated due to the occurrence of ground-water contamination. In many cases, the principal responsible party for the contamination has not been identified. In some cases, the present property owners are liable, at least partially, for remediation of a contamination problem they did not cause. Therefore, emphasis of conducting the environmental hazards evaluation is to identify any potential problems and remove this liability from the prospective buyer or at least make him aware of the problem.

Present site conditions may be indicative of historical disposal practices. **Stained areas** may point out potential soils or ground-water contamination. **Excavated areas** or locations that have been covered with new fill may indicate disposal sites. The nature and extent of **stockpiled materials** including the containment conditions should be scrutinized.

One possible liability is the location and condition of **electrical transformers**. Many existing transformer oils have PCBs as a component because of its stable chemical properties. The current regulations (under the Toxic Substances Control Act-TSCA) provide that PCB concentrations in excess of 50 ppm are considered hazardous. Transformer oils exceeding the PCB concentration of 50 ppm are required to be disposed of at an appropriate hazardous wastes facility. This regulation is currently being modified and the 50 ppm level will become more stringent. Most public utilities that own transformers have programs to test for and report on PCB levels.

### Soil and Water Testing

Depending on the results of the historical records review and the site inspection, soil and water tests may be required. The general strategy for soil and water testing is to assume a conservative phased approach. Constituents selected for chemical analysis are based on information related to the nature of the business and chemical inventory records.

The technique of soil sampling employed depends on the objectives of the study. If a general site reconnaissance is desired at a site that has unidentified solid debris, backhoe excavations in a random sampling grid may be preferred. If specific locations of soils contamination have been identified and the objective is to document contaminant movement in the vadose zone, hand augering or drill-rig borings might be employed.

Soils are typically composite sampled at several depth intervals. Depending on the specific chemical groups being investigated, a soil sampling program might require that samples are collected and composited from 0 to 2 feet and from 2 to 4 feet. Depending on the physical dynamics of the chemicals being analyzed, if no contamination occurs in the 0 to 2 foot interval, the deeper interval may not be analyzed.

Ground water is tested if the vertical extent of soil contamination has not been delimited or there is evidence of direct discharge into an aquifer. There are well-documented techniques for collecting ground water with various sampling apparatuses from different sized wells. Costs for monitor well installations vary but they may represent an investment that makes a property purchase prohibitive. An average cost for a 150 foot monitor well installed in alluvium might approach \$10,000. Ground-water contamination beneath a subject operation may not be the result of on-site activities but due to the conduct of up-gradient facilities.

#### RCRA FACILITY INSPECTION

Investigation of RCRA facilities are usually in response to application for permit, verification of permit requirements, or closure/post-closure actions. The RCRA requirements are related to "cradle to grave" maintenance of facility operations and chemical usage. Permits are required for the storage and handling, transport, and disposal of hazardous chemicals. The operations and chemical uses of the facility must be

fully documented and presented in technical format to satisfy the requirements of the RCRA regulations.

Regulations established by the Environmental Protection Agency to satisfy the legal requirements of RCRA are found in Title 40 (Protection of Environment) of the Code of Federal Regulations (40 CFR). Major chapters under 40 CFR include regulations that apply to the following:

- 40 CFR 263 - Transporters
- 40 CFR 264 - Treatment, Storage, and Disposal Facilities - Permitted or New Facilities
- 40 CFR 265 - Treatment, Storage, and Disposal Facilities - Interim Status Facilities
- 40 CFR 266 - Recyclers
- 40 CFR 268 - Land Disposal
- 40 CFR 280 - Tanks

Any RCRA inspection or investigation should closely follow the referenced guidelines. It is recommended that the appropriate State regulatory contact is apprised of the study and allowed to comment on the study approach.

Inspection and collection of data at RCRA facilities in order to permit their activities are often lengthy and tedious exercises. The following is a skeleton list of items that must be addressed (if applicable) in order to permit existing treatment, storage, or disposal facilities:

- descriptive analysis of process waste streams;
- personnel training;
- preparation of contingency plans;
- ground-water monitoring;
- closure plans;
- post-closure plans;
- financial assurance;
- technical description of containers;
- technical description of tank systems;

- technical description of surface impoundments;
- technical description of waste piles;
- technical description of land treatment;
- technical description of landfills;
- technical description of incinerators.

Some of the most stringent requirements in the application for RCRA permits relate to the description of ground-water dynamics beneath a subject facility. The direction and rate of ground-water flow must be addressed. This information is obtained from the monitoring of piezometers for water level measurements and testing of a pumping well. The aquifer testing of a pumping well with response drawdown water level measurements at observation wells will provide information that is used to formulate a ground-water flow equation.

The simplest and most often used ground-water equation is the Darcy equation. The Darcy equation is used to arrive at time of travel estimates for potentially discharged contaminants. If the ground water occurs at a relatively deep level, time of travel estimations may be calculated for both the vadose zone and the saturated zone.

Soils investigations are typically conducted when a facility or facility process is to be "closed". The procedures required to close a facility are delineated in the 40CFR Parts 264 and 265. Before a facility is properly closed, the subject operation must show that handling and disposal practices did not result in environmental contamination. If remediation is required due to closure investigations, monitoring of subject environmental matrices may be required under a post-closure plan.