Acronyms

~	About or approximately
ABCWUA	Albuquerque Bernalillo County Water Utility Authority
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
ATSDR	Agency for Toxic Substances and Disease Registry
BTEX	Benzene, Toluene, Ethyl Benzene and Xylene
BFF	Bulk Fuels Facility
CME	Corrective Measures Evaluation
CMI	Corrective Measures Implementation
CSI	Complex Site Initiative
CSM	Conceptual Site Model
DQO	Data Quality Objective
EDB	Ethylene dibromide
EPA	U.S. Environmental Protection Agency
GWQB	Groundwater Quality Bureau
GWTS	Groundwater Treatment System
HI	Hazard Index
HQ	Hazard Quotient
HWB	Hazardous Waste Bureau
HSWA	Hazardous and Solid Waste Amendments
HWA	Hazardous Waste Act
IM	Interim Measure
LNAPL	Light non-aqueous phase liquid
MCL	Maximum Contaminant Level
mg/l	Milligrams per liter
MNA	Monitored Natural Attenuation
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
NSZD	Natural Source Zone Depletion

OSE	Office of the State Engineer
ppb	Parts per billion
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SDWA	Safe Drinking Water Act
SSL	Soil Screening Level
SVE	Soil vapor extraction
SWMU	Solid Waste Management Unit
ug/l	Micrograms per liter
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
WQCC	Water Quality Control Commission

Glossary of Terms

A

Adsorption

A process where liquids or specific chemicals attach to soil, rock or another solid. Adsorption is often used to describe how oils or chemicals in **groundwater** become attached to the soil or rock components of an **aquifer**.

Aerobic Biodegradation

The breaking down of a chemical by microorganisms, such as naturally occurring bacteria, when oxygen is present. This process may occur in air or water at the surface, or below ground in **soil vapor** or **groundwater**.

Air Sparging

A technique to treat contaminated groundwater. Compressed air is injected into the groundwater through specially designed wells. The air moves upward through the groundwater and soil, releasing the contaminant as vapor which may be extracted and treated using a **soil vapor extraction** system.

Alluvial Fan

A triangle-shaped deposit of gravel, sand, and fine-grained sediment (clay or silt). This sediment is referred to as alluvium.

Alluvium

Material such as clay, silt, sand, and/or gravel deposited by rivers and streams.

Anaerobic Biodegradation

The degradation of compounds by microorganisms without using oxygen.

Aquifer

A zone of soil or rock below the ground surface capable of storing or transmitting water. Water stored by the aquifer is from rain or melted snow that drains through the soil.

Aquitard

Geological formation that may contain groundwater but significant quantities of water will not move through it under normal conditions. May function as a **confining layer**.

Artesian

Groundwater held under pressure in porous rock or soil confined by impermeable geologic formations which rises to the land surface when tapped by a well.

B

Benzene, Toluene, Ethylbenzene, Xylene (BTEX):

The acronym used for compounds typically found in petroleum products such as gasoline and jet fuel.

Bio-augmentation

The addition of bacteria, nutrients, and other materials to increase the **biodegradation** of **contamination** in soil and/or **groundwater**.

Biodegradation

A natural process where bacteria and other biological organisms breakdown organic materials.

Bioremediation

An environmental cleanup method that uses bacteria or other organisms to clean up **contamination**. Bacteria generally break down the contamination into less harmful components, such as carbon dioxide and water. Bioremediation can be used to clean up soil or water. Water and nutrients may be added to the contaminated soils to speed up the breakdown process (see **bioaugmentation**). Some chemicals, such as gasoline, are easily bioremediated while other, such as pesticides, cannot be effectively treated using bioremediation. The contamination can be treated in place (in situ) or the material can be excavated and treated above ground in a different location (ex situ).

Bioslurping

A **groundwater** treatment method that uses vacuum extraction combined with vapor extraction and/or **bioventing** to cleanup **LNAPL**. It is called bioslurping because a “slurp tube” is lower into the LNAPL layer. This tube is then connected to a vacuum pump.

Bioventing

A technique to treat soil contaminated with petroleum products or organic chemicals. Air is forced into the soil through specially designed wells. The oxygen enhances growth of naturally occurring bacteria in soils. The bacteria feed on the **contaminants** in the soils, chemically breaking down the contaminants into non-hazardous components.

C

Calibration

A process to ensure measurement accuracy by a particular analytical method or instrument of environmental samples.

Carcinogen

A cancer-producing substance.

Cleanup

Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms **remedial action**, removal action, response action, or **corrective action**.

Cleanup Level

A **cleanup** level is the concentration of a **contaminant** that indicates that the **cleanup** objectives are met. Cleanup levels are established by the applicable federal or state regulatory agency by environmental media (i.e., soil, vapor, surface water or **groundwater**), contaminant, and type of **receptor**. Cleanup levels are not the same as screening levels. If a contaminant is present at a **concentration** above the applicable screening level it does not necessarily mean that cleanup is required but it does indicate that additional risk evaluation is necessary.

Community Water System (CWS)

A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. CWSs are regulated under the **Safe Drinking Water Act**.

Compound(s)

A thing that is composed of two or more separate elements.

Concentration

The amount of a chemical or substance in a given environmental medium.

Conceptual Site Model (CSM)

A conceptual site model is a conceptual understanding of a site that identifies potential or suspected sources of hazardous substances, types and **concentrations** of hazardous substances, potentially contaminated media, and actual and potential **exposure pathways** and **receptors**. Typically this model is developed during the scoping of the remedial investigation and further refined as additional site information is collected. It is a tool used to assist in making decisions at a site.

Cone of Depression / Area of Influence

A roughly cone-shaped depression that is produced in an **aquifer** by pumping in a well. The radius of water affected around the well is called the area of influence. This area of influence varies, depending upon many factors such as the characteristics of the rock or soil formation (material) the water must travel through to get to the well.

Confined Aquifer

An **aquifer** bounded on the top by a relatively impermeable layer of material such as clay. Although the **confining layer** may hold water, it does not allow water to freely move through it.

Confining Layer

A layer or bed of impermeable or distinctly less **permeable** material lying below or above one or more **aquifers**. When the confining layer lies between two aquifers, it keeps water from the upper aquifer separated, or confined, from water in the lower aquifer.

Contaminant

Any physical, chemical, biological, or radiological substance in air or soil or water that has an adverse effect. Any substance whose **concentration** exceeds background concentrations or which is not naturally occurring in the environment.

Contamination

The presence of a **contaminant** in any environmental media, including soil, surface water, sediment, **groundwater**, **soil vapor**, ambient air or indoor air.

Corrective Action

The term corrective action typically refers to the **cleanup** process or program under **RCRA** and all activities related to investigation, characterization, and cleanup of a release of hazardous wastes or hazardous waste constituents. The term may also refer to a specific action taken to remediate contamination at a given facility.

Corrective Measures Evaluation (or Study)

Before choosing a **cleanup** approach or set of final remedies, a range of measures will be analyzed and evaluated for their advantages and disadvantages relative to the site-specific conditions. Significant public participation is encouraged during this portion of the **corrective action** process.

D

Data Quality Objectives

Qualitative and quantitative statements of the overall level of uncertainty that a decision-maker will accept in results or decisions based on environmental data.

Dissolved Phase

The phase of a petroleum spill or leak that results when the water soluble components in **LNAPL** (e.g. benzene or **EDB**) dissolve in **groundwater**. Typically, the **contaminant** mass dissolved in the **saturated zone** is smaller compared to the contaminant mass located within the contaminated soil in unsaturated source zones.

Downgradient

The direction that **groundwater** flows, similar to "downstream" for rivers. The direction of groundwater flow does not necessarily reflect the topography of the surface.

E

Effluent

Treated (or un-treated) wastewater that flows out a treatment plant.

Ethylene Dibromide (EDB)

A colorless, heavy, synthetic liquid that was primarily used in anti-knock gasoline mixtures, including aviation fuel, to prevent the buildup of lead-oxide. The **maximum contaminant level** for **EDB** in **groundwater** is 0.05 micrograms per liter (or 0.05 parts per billion), as defined by the NMED and **EPA**.

Exposure Pathway

The route of **contaminants** from the source of contamination to potential contact with a **medium** (air, soil, surface water, or **groundwater**) that represents a potential threat to human health or the environment. Determining whether **exposure pathways** exist is an essential step in conducting a **risk assessment**.

Extraction Well

A well specifically designed to withdraw **groundwater** or **soil vapor** for treatment.

F

Fate and Transport

A term used to discuss the movement of chemical **contaminants** through water or air, the synergistic effects of the contaminants in that environment, and the eventual disposition of that contaminant.

Free product/ free phase

A petroleum product in the liquid phase. Free phase contamination typically refers to fuel present in the

environment before it has mixed into soil or water.

G

Granulated Activated Carbon

An effective absorbent primarily due to its extensive porosity and very large available surface area. By definition, granular activated carbon (as opposed to powdered activated carbon) is composed of particles with sizes greater than 0.8 mm, about the size of coarse sand. Activated carbon is manufactured from a variety of raw materials, including wood, coal, and coconut shells, making it plentiful, relatively inexpensive, and versatile.

Groundwater

Water found beneath the earth's surface that fills pores between soil particles such as sand, clay, and gravel or that fills cracks in bedrock. Precipitation that does not evaporate or runoff to surface waters percolates downward through soil and becomes groundwater. A formation of rock or soil is called an **aquifer** when it can yield a usable quantity of water.

H

Hazard Index

The sum of the hazard quotients attributed to non-**carcinogenic** hazardous substances with similar critical endpoints.

Hazard Quotient?

The hazard quotient is the calculated health risk for exposure to non-cancer causing chemicals. Hazard Quotient values are calculated based on EPA risk assessment criteria. A value of 1 or below does not indicate exposure will result in adverse health effects.

Hazardous and Solid Waste Amendments (HSWA)

The Federal HSWA to **RCRA** passed by Congress in 1984 granted **EPA** expanded authority to require **corrective action** at RCRA-permitted treatment, storage and disposal facilities (TSDFs) for releases of hazardous constituents from solid waste management units (SWMUs). One of the primary purposes of this law was to prevent RCRA sites from becoming future Superfund sites by requiring permitted RCRA facilities to take prompt remedial measures for past, present, and potential **contaminant** releases originating from their facility.

Hydraulic Gradient

In general, the direction of **groundwater** flow due to changes in the depth of the **water table**. Just as water flows downhill, water in the ground moves from areas of high elevation to areas of low elevation. The slope of the water table is the hydraulic gradient. The hydraulic gradient determines the speed of groundwater flow. A steep gradient causes groundwater to move faster than a nearly horizontal gradient.

Hydrocarbons

Chemical **compounds** that consist primarily of carbon and hydrogen, such as petroleum.

Hydrogeology

The part of hydrology that deals with the distribution and movement of **groundwater** in the soil and rocks of the earth's crust, most commonly in **aquifers**.

Hydrology

The study of the movement, distribution, and quality of water throughout the earth.

I

Influent

Untreated wastewater flowing into a treatment plant.

In situ

In-situ means "in place". Used to describe any treatment technique that treats **contaminated** water or soil in place.

Interim Measure

Early action(s) taken to eliminate, reduce, or control the hazards posed to humans and the environment by a site or to expedite the completion of site **cleanup**. The **interim measure** step precedes the final corrective measures and often occurring while site characterization is underway.

L

Light Non-Aqueous Phase Liquid (LNAPL)

LNAPLs are undissolved chemicals, typically petroleum products, which float on the surface of groundwater rather than mix with it. A good analogy would be oil and vinegar salad dressing.

Lithology

A term used to describe the physical and mineralogical characteristics of rock. Common names may denote a specific type of rock (e.g., sandstone, granite, etc.) or may denote the general mode of rock formation (e.g., sedimentary).

M

Maximum Contaminant Level

A federally designated, enforceable drinking water standard, or legal threshold limit of a substance, set to ensure that water is safe for drinking and other uses. The MCL varies for each **contaminant** being analyzed.

Media

The fundamental components of the environment including water, sediment, soil, and flora and fauna.

Microorganism

A microscopic organism, especially a bacterium, virus, or fungus.

Migration

The movement of chemicals or elements in soil or **groundwater**, usually influenced by gravity and the **porosity** and **permeability** of soil and rock.

Model

A conceptual, mathematical, or physical representation of a real system. The model is used to understand various processes in the physical system.

Monitored Natural Attenuation (MNA):

Describes a range of physical and biological processes which, unaided by human intervention, reduce the **concentration**, toxicity, or mobility of chemical or radioactive contaminants. These processes take place whether or not other active cleanup measures are in place.

Monitoring Well(s)

Wells installed for the purpose of collecting samples such as those used to characterize the extent of **contamination**, the direction of **groundwater** flow, and the types and quantities of groundwater and **soil gas**. Used to analyze possible groundwater contaminants from sampled.

N

Natural attenuation

The natural breakdown of hazardous substances in the environment. Many hazardous substances will slowly degrade or breakdown into non-hazardous substances through natural processes in the environment. Natural attenuation may be approved as a remedy for **contamination**, particularly if other efforts have been exhausted without achieving the applicable **cleanup levels**, and as long as there is little chance that the contamination will pose a threat to people, plants or animals. Regular monitoring of soil and **groundwater** may be required to ensure that natural attenuation is occurring.

Non-Aqueous Phase Liquid (NAPL)

Contaminants that remain undiluted as the original bulk liquid in the subsurface (e.g., **free product**).

P

Paleochannel

A remnant of an ancient river or stream channel either filled in or buried by younger sediment. Paleochannels can often act as conduits for **groundwater contamination**.

Parts Per Billion (ppb)/Parts Per Million (ppm)

Units commonly used to express **contamination** ratios, as in establishing the maximum permissible amount of a **contaminant** in water, land, or air.

Unit	1 ppm	1 ppb
Volume	One drop of dye in 18,000 gallons of water	One drop of dye in 18 gallons of water
Time	1 minute in 2 years	1 second in 32 years
Money	1 cent in $10,000	1 cent in $10,000,000
Weight	1 ounce of salt in 31 tons of potato chips	1 pinch of salt in 10 tons of potato chips
Area	1 square foot in 23 acres	1 square foot in 36 square miles

Pathway

The means by which a hazardous substance, or agent, comes into contact with a **receptor**.

Permeability

The rate at which liquids pass through soil or other materials in a specified direction.

Plume

A well-defined area of **contamination** in **groundwater**, soil or air downstream from the source. A **contaminant** plume in groundwater is the area of water which, as it moves underground, carries the contaminant with it. The portions of the plume close to the source will have higher **concentrations** than the portions further away from the source. Natural physical, chemical, and biological processes diminish the concentration levels as the water carries the contaminant away from the source.

Pores

Small openings between grains in rocks.

Porosity

The ratio between openings (voids, pores) in rocks or soil to the total volume. It is a measure of the ability of soil/rock material to store water. The more openings, the more water that may be stored.

Pump and Treat

A **groundwater** treatment technique that includes removal of the groundwater by pumping it to the surface and treating it by various methods, such as carbon absorption. **Extraction wells** are drilled into the **contaminated** groundwater plume to collect the water, bringing it to the surface for treatment.

R

Resource Conservation and Recovery Act (RCRA)

RCRA, enacted in 1976, is the principle federal law in the United States governing the disposal of solid waste and hazardous waste.

Receptor

A person, plant, animal, ecosystem or habitat that may be harmed by the presence of a contaminant in the environment.

Remedial Action

Any action taken to investigate, monitor, assess and evaluate the release or threat of release of hazardous substances or **contaminants** to the environment. It may also refer to the actual "**cleanup**" of the environment by various removal, treatment, monitored remediation, or **corrective actions**. The term "cleanup" is sometimes **used** interchangeably with the terms remedial action, removal action, response action, remedy, **remediation**, or **corrective action**.

Remediation

Action undertaken to clean up or restore a **contaminated** site.

Respiration

A biochemical process that releases stored energy, such as glucose or sugar, for use by an organism. Respiration occurs in an organism's cells and can be fueled by oxygen (aerobic) or without oxygen (anaerobic). This happens in all forms of life. Usually, this process uses oxygen, and is called aerobic respiration. When they don't get enough oxygen, cells use anaerobic respiration, which doesn't require oxygen. This process produces lactic acid, and makes less energy than when oxygen is used.

Risk Assessment

A study to characterize the nature and magnitude of health risks to humans and ecological **receptors** from chemical **contaminants** that may be present in the environment. An assessment examines potential risks posed by the site if no cleanup action was taken and what cleanup levels need to be established to be protective of human health and the environment. There are two types of risk assessments. Human health risk assessment looks at the risks to humans from **contamination** at the site and an ecological risk assessment looks at the risks to ecosystems, such as plants, fish, and animals.

S

Safe Drinking Water Act

Main federal law that ensures the quality of the country's drinking water. Under SDWA, the **EPA** sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

Saturated Zone

The zone where voids of the soil or rock are filled with water. In an **unconfined aquifer**, the **water table** forms the upper boundary of the saturated zone.

Sentinel Well

A monitoring point established at a location between the leading edge of the **plume** and possible **receptors** (e.g., drinking water well, public and private potable wells, and wellhead protection areas) to ensure that there will be time for other **remedial actions** to be taken if the plume migrates beyond predicted boundaries. Preferably a sentinel well needs to be a clean well.

Smear Zone

Soils between the top and bottom of the **groundwater** table that becomes **saturated** by the groundwater due to **water table** fluctuations. This area may become contaminated if **contamination** is floating on the top of the groundwater or if soil contamination extends into the smear zone.

Soil Vapor (Soil Gas)

The vapor or gas phase of a substance that is found in the unsaturated zone.

Soil Vapor Extraction (SVE)

A treatment technique that uses vacuum pressure to remove vapors from subsurface soils through special extraction wells.

Surfactant

A chemical substance that lowers the surface tension of a liquid in which it is dissolved.

U

Unconfined Aquifer

An **aquifer** where the water level (**water table**) is free to rise and fall in response to atmospheric pressure.

V

Vadose Zone

The zone between the earth surface and the **water table** within which the moisture content is less than saturation. The soil pore space typically contains air or soil vapor. This zone is also referred to as the Unsaturated Zone.

Vapor Intrusion

Vapor intrusion is a process by which chemicals in soil or **groundwater** migrate to indoor air above a contaminated site.

Volatile Organic Compounds (VOCs)

Carbon-based **compounds** that can evaporate easily into the air when at room temperature. Propane, benzene, and other components of gasoline are all volatile organic compounds.

W

Water Level

The upper limit of the **saturated zone**. It is measured by installing wells that extend a few feet into the saturated zone and then recording the water level in those wells.

Water Table

The boundary between the **saturated** and unsaturated zones. Generally, the level to which water will rise in a well (except an artesian well).

Work Plan

Written plan that describes the planned actions, such as sampling and analysis, site investigation, site assessment or **risk assessment**. It includes the justification and instructions for conducting these activities.