

## Glossary

**Acid**—generally means a pH of less than 7.0. Acid mine water generally has a pH of 3.5 to 6.0. Waters with a pH of less than 5 are not suitable for most fish and aquatic organisms.

**Action Level**—the designated point at which some action will be taken. For example, the action level for Lead in soil may be 500 ppm.

**Acre-foot**—an acre of water one foot deep (325,851 gallons). The volume of water beneath the Tar Creek mining area is estimated at more than 2 billion gallons.

**Aerobic**—has or requires oxygen. A condition that adds oxygen to water.

**Administrative Order on Consent**—An agreement between the EPA, state, responsible parties and other natural resource trustees (tribes) of a site. AOC's establish an agreement between the parties to conduct work at a contaminated site, and establishes the responsibilities of the parties.

**Administrative Record**—CERCLA requires an Administrative Record to be kept at the public library nearest to a Superfund Site. This is the historical record of the site. The Administrative Record for the Tar Creek Site is located at the Miami Public Library.

**Algae Bloom**—rapid growth of algae that usually results in discoloration of the water and a strong odor. Algae blooms are reported to occur periodically in Upper Grand Lake due to the input of sewage and other organic materials.

**Alkaline**—has a pH of more than 7; example is lime or baking powder.

**Alpha Radiation**—radiation with a long wavelength with little penetrating strength that can be stopped by paper, but can also be carried by air currents and cause cancer. Example is Radon Gas, which may be present in the Tar Creek mining area.

**Ambient**—background or surrounding conditions, normal; compare this with a measured level under other conditions. Ambient air is the outdoor air.

**AMD—acid mine drainage**—water from a mine with a pH of less than 7.

**Anaerobic**—conditions in soil or water where oxygen is low or is not needed.

**Anomaly**—a change, different, i.e., a skin tumor, an unusual finding.

**Anthropogenic**—derived from humans, i.e., sewage, fertilizer, mining wastes. Usually an undesirable addition to a water body.

**Aquatic**—pertaining to water. Fish, cattails, etc.

**Aquifer**—underground water-bearing layer of rock.

**ARARs**—Applicable and Relevant Recommendations; part of a Record of Decision applying to the proposed clean-up alternatives, which is part of a RI/FS – Remedial Investigation/Feasibility Study.

**ATSDR**—Agency for Toxic Substances and Disease Registry. A branch of the Center for Disease Control (CDC). ATSDR is responsible for conducting health assessments at Superfund Sites.

**Background Level**- a typical or average level of a chemical in the environment. Background often refers to naturally occurring or uncontaminated levels. The town of Afton is utilized as the background for soil levels of metals for the Tar Creek Site.

**Base flow**—typically expected sustained low flow of water from a creek or a well.

**Basin**—the entire watershed where water flows toward a certain river or lake. Tar Creek has its basin that includes Lytle Creek; the Neosho River basin includes Tar Creek.

**Benthos/Benthic**—pertains to bottom; organisms that live on the bottom of a stream or lake.

**BIA**-Bureau of Indian Affairs. A division (Bureau) of the Department of Interior.

**Bioaccumulation**- concentrating contaminants upward through the food chain.

**Bioassay**—putting sensitive test organisms such as minnows in contaminated water for a designated time period to observe effects.

**Bioavailable**—available to be taken up by plants or animals, includes nutrients and contaminants such as heavy metals.

**Biomass**—the weight of matter, organisms, and living material in water or a particular area.

**Bioremediation**—using bacteria or other biological agent to clean up a contaminated site. The bacteria may occur naturally in the area or be added to the site.

**Biota**- the living organisms present.

**Body Burden**- the total amount of a chemical in the body. Some chemicals build up in the body because they are stored in fat or bone or are eliminated very slowly.

**Borehole**—a hole drilled into the ground, usually for sampling rock, minerals, soil or water. Thousands of boreholes exist in the Tar Creek area.

**Boone Formation**—the topmost water layer or aquifer in the Tar Creek area. The Boone is the strata that contains the lead and zinc, which was mined from 1897-1973 in Oklahoma. The Boone Aquifer is considered highly contaminated in much of Ottawa County.

**Breathable Dust**—dust from chat, floatation ponds, or other sources that is 75 um or less in diameter (very small) that is easily picked up by the wind and can be inhaled deeply into the lungs. Particulate Matter that is in the range of 10 – 2.5 microns is regulated by the EPA and states. Particles in this size range are easily breathed into the lungs and at high levels contribute to asthma and other upper respiratory ailments, including death.

**Brownfield-** a formerly used abandoned, idled or underused industrial area that is contaminated, but could be restored to provide another economic enterprise in the near future. Brownfield sites require partnerships of states, local government, industry, citizens and tribes to qualify for the program. EPA's role is to foster clean up and redevelopment of Brownfield properties for viable economic use.

**Cap**-hard cover placed over a landfill or area of contamination, like a clay barrier covered with topsoil and grass. In some cases, caps may also require a plastic liner in the cap.

**Carcinogen**- agent capable of causing cancer, such as Radon, cadmium, benzene and nicotine.

**Case Study**- the medical or other type of evaluation of a single person or a small number of individuals or a particular site to determine descriptive information, which may be compared to other studies.

**Catholic 40-** a study location near Quapaw on Beaver Creek. Former site of a missionary program run by the Catholic Church for the Quapaw Tribe.

**Cd—cadmium.** A heavy metal present at Tar Creek and a suspected human carcinogen. TLV (Threshold Limit Volume) is 0.05 mg/m<sup>3</sup> in air.

**CD**—a computer disc with information on it.

**CDC**—Center for Disease Control—An agency established by Congress to conduct Human health studies, identify disease threats, and protect the public from major disease outbreaks. See ATSDR's role as a sub-agency of CDC.

**CERCLA**—Comprehensive Environmental Response, Compensation and Liability Act; 1980; a law created by Congress to address abandoned contaminated sites. In 1986 the Act was re-authorized to include provisions that created the Superfund, which is a federal tax on certain industries that would be used to cleanup abandoned contaminated sites that do not have viable responsible parties, and established ATSDR's role to provide health assessments at Superfund Sites.

**CFR**—Code of Federal Regulations (codified laws enacted by Congress). These are published daily and are available at the nearest federal library and on the Internet.

**Central Nervous System**- The part of the nervous system that includes the brain and the spinal cord.

**Chat**—mining wastes the size of small rocks 10 mm and less, generally, composed of chert, sand, gravel and fines. Chat contains heavy metals that, in finer size fractions, wash into surface waters during rainfall events.

**CHAMP**-Community Health Action and Monitoring Program. PRP funded program to study blood lead levels and try to determine source of exposure in the Tar Creek mining towns. Study conducted by Oklahoma University as a contractor for the mining companies.

**Chert**- a tough, fine-grained, silica rock usually found associated with limestone beds.

**Chlorides**—compound composed of at least part chlorine, such as sodium chloride or table salt.

**Chronic**-effect or symptom that develops slowly over a long period of time (more than one year).

**Coliform**—bacteria that originates from the gut of animals. When found in water, it indicates sewage, agricultural contamination.

**Community**—a group of people, plants and animals that interact in a common area.

**Community Involvement**- Strategies to engage individuals, groups and organizations potentially affected by hazardous substances. Community involvement empowers those affected with a better understanding of the situation so that they can assist in making appropriate public health decisions for both the community and themselves.

**Consent Decree**-voluntary or involuntary agreement, usually between the EPA and a PRP, to clean up all or part of a site.

**Contaminant**- any substance or material that enters a system (the environment, human body, food, etc) in quantities at which it is not normally found.

**Contaminant of Concern**—(COC) target chemical; EPA determined that lead was the contaminant of concern at the Tar Creek Superfund Site.

**Criteria**—what you measure a sample result against, a standard.

**Cumulative Impacts**—the total impact of multiple contaminants or activities that might affect a site, considered additively.

**CW—Constructed wetland** (man-made wetland).

**Data**—numbers, facts, a plural word, i.e. “data are” is correct usage. Quantified results of an investigation or study.

**DEQ-** Refers to the Oklahoma Department of Environmental Quality (ODEQ). This is the state agency tasked with responsibility for environmental protection through monitoring the environment and enforcing environmental laws.

**Dermal-** referring to the skin. Dermal absorption means absorption through the skin.

**Detection Limit**—concentration below which the method of detection is not accurate.

**Detritus**—organic material in soil or water.

**Dissolved**—chemically incorporated into water, will not settle out.

**DO—dissolved oxygen** in water. Ranges from 0-12, typically. DO of less than 6 is potentially harmful to many aquatic species.

**DOI—Department of the Interior**, includes Bureau of Indian Affairs (BIA), United States Fish and Wildlife Service (USFWS) and United States Geological Survey (USGS).

**Dose-** the amount of substance to which a person is exposed. Dose often takes body weight into account.

**Draft -** A working document/proposal that is not final.

**Ecology-**study of the relationship between living organisms and their environment.

**E. Coli**—a bacteria from warm-bodied animals.

**Ecosystem-**a group of communities composed of biological and physical elements; typically a fairly large system of plants and animals.

**Effluent-**wastewater discharged from a facility discharging processed wastewater.

**Emission-**release or discharge of a substance into the environment.

**Endangered Species-**plants or animals on a USFWS list that enjoy special protection under the Endangered Species Act.

**Environmental Assessment (EA)**-a preliminary analysis of a property or proposed project/activity, required by National Environmental Policy Act (NEPA), to determine whether an Environmental Impact Statement (EIS) is required. Generally, if no adverse environmental impact is found during the EA, an EIS is not required.

**Environmental Contamination**- presence of hazardous substances in the environment. Environmental contamination may affect the health and quality of life of people living and working near the contamination, in addition to impacts to natural resources.

**Environmental Impact Statement (EIS)**- A detailed study required under National Environmental Policy Act (NEPA) to assess potential environmental impacts for a proposed project or major action undertaken by a federal or state agency, or tribal government.

**Environmental Justice**-The fair treatment and meaningful involvement of all people regardless of race, ethnicity, culture, income, or educational status with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**EPA**—Environmental Protection Agency; a federal agency established in 1970 to protect and restore the environment.

**Epidemiologist**-one who studies factors involved in the incidence and control of disease

**Eutrophic**—highly fertilized (nutrient rich- phosphorus and nitrates) aquatic system.

**Exposure**-Contact with a chemical by swallowing, by breathing, or by direct contact. Exposure may be short term (acute) or long term (chronic).

**Exposure Investigation** – The collection and analysis of site-specific information to determine if human populations have been exposed from environmental contaminants released from hazardous waste sites.

**Fact Sheet**-a one or two page summary of a longer report, or a brief update.

**Fauna**—animals.

**Fecal Bacteria**—bacteria found in the wastes of warm-blooded animals.

**FERC**—Federal Energy Regulatory Commission. Regulates lakes with hydroelectric dams such as the one on Grand Lake. Interested primarily in electric power production.

**Fines**—material that will pass through a number 200 screen; very small material. Fines are found in the old floatation ponds on the Tar Creek Superfund Site.

**Flora**—plants.

**Floodplain**-area along a river or stream that is at least occasionally flooded.

**Fugitive Emissions**-emissions from a regulated facility that are accidental, i.e. spills and air releases of controlled substances.

**Galena**—lead sulfide, the ore that produces lead.

**Generator**-a formal term for an owner of a site (individual or corporate) that is responsible for a hazardous substance/waste.

**GIS**—Geographical Information System – a computer hardware and software system designed to collect, manipulate, analyze, and display spatially referenced data from satellite images.

**GPS**—Global Positioning System, an instrument that reads coordinates from satellites to identify precisely where a feature is located. Used to identify a position in the field, and plot positions on a map.

**Gradient**—rate of change, such as a streambed falling at a gradient of 10 ft per mile.

**Groenockite**—(CdS) cadmium sulfate, a metals salt and a potential human carcinogen.

**GRDA**—Grand River Dam Authority. Has permit authority over Grand Lake development and sale of hydropower from the dam.

**Groundwater**- water contained in a porous underground rock formation.

**Groundwater Recharge**—Replenishing the ground water; example—rainwater entering the Boone formation and raising its water level. Streams, such as the Spring River, may recharge groundwater aquifers during periods of low rainfall.

**Habitat Limited Aquatic Community**— A beneficial use classification in Oklahoma’s Water Quality Standards that designates a stream as not supporting the propagation of fish and aquatic species. Tar Creek was re-classified to this designation because of “irreversible man-made causes.”

**Habitat**—the part of a physical location where plants and animals live.

**Ha**—hectare; 2.5 acres

**Hardness**—The measure of calcium carbonate or calcium sulfate in water. Also a measure of Cd and Mg in water, which usually corresponds with its alkalinity.

**Hazard**- a source of risk only if an exposure pathway exists.

**Hazardous Waste**—a legal term meaning a substance/material that can no longer be used for its intended purpose, is a listed hazardous waste and/or has certain characteristics that cause it to be controlled by EPA through specific environmental laws.

**Health Consultation**- a study conducted by ATSDR to obtain information from a community potentially impacted by a Superfund Site. Study report will provide findings and may recommend further action(s) and inform the community on ways to minimize exposure.

**Health Study**- any investigation of exposed individuals that would assist in determining exposure or possible public health impacts by defining health problems, also called a health outcome study or pilot health study.

**Heavy Metals**—a group of metals (elements), usually toxic to humans and the environment. Included are: lead, zinc, mercury, cadmium, chromium, arsenic, manganese, selenium and barium.

**Hectare**—approximately 2.5 acres

**HEPA**—High Efficient Particulate Air—a filter that removes 99.97% of particles larger than 5 microns from the air. Useful for removing lead or asbestos particles from the air.

**Herculaneum**-A small town 30 miles south of St. Louis, Mo. where Doe Run, one of the PRPs at Tar Creek, is spending millions of dollars to remediate a lead-contaminated Site.

**High Access Area (HAA)**-areas such as school playgrounds, parks, daycares.

**Hydrology**- the physical aspects, such as flow or recharge, in a water system (surface or groundwater).

**Hydraulic Gradient**-the direction of flow of ground water.

**Hydrolysis**- reaction in which water reacts with a substance to form two or more new substances. Example: oxide and acid water is formed from iron sulfides in the mine water.

**IAG**- inter-agency agreement: written agreement between agencies such as the EPA and the Corps of Engineers regarding who will perform certain work and who will pay for it.

**Impact**---a negative environmental change or effect.



**Impoundment**-body of water created by a dam or other barrier.

**Information**—not data, hearsay, second party description, verbal description, etc.

**Infrastructure**—the local schools, railroads, roads and other services.

**Ingestion**-swallowing either by eating or drinking. After ingestion, chemicals can be absorbed into the blood and distributed throughout the body.

**Inhalation**-breathing. Exposure may occur from inhaling contaminants because they can be deposited in the lungs.

**Interstate Commerce**-clause in the U.S. Constitution that reserves for the federal government the right to regulate business across state lines, such as transporting chat.

**In Situ**---in the field, not in a bottle or lab; takes place in its original location.

**Intermittent Stream**—A dry stream bed that runs only during wet season.

**Inter**—between.

**Intra**—among.

**Invertebrates**—animals with no backbone, such as insects, spiders and crayfish, etc.

**Iron hydroxide**—the red precipitate found in Tar Creek, caused by iron in the water forming rust.

**Iron—Fe**—a common heavy metal found in the Tar Creek drainage; the reaction that occurs naturally when iron in the form of iron pyrite ( $\text{FeS}_2$ ) is exposed to water and oxygen producing the red color in Lytle, Beaver, and Tar Creeks.

**Issue**—topic or concern

**ITEC**—Inter-Tribal Environmental Council, a project of the Cherokee Nation's Office of Environmental Services. Provides technical assistance to tribes in Oklahoma and Texas.

**Karsts**—topography (land surface) of carbonate rocks that includes shafts, sinkholes, caves, etc.

**Kg**—kilogram—2.2 pounds.

**Lead** – the Contaminant of Concern at the Tar Creek Superfund Site; a metal that was mined at the site; a metal that can cause health and learning problems.

**LEAD**---Local Environmental Action Demanded Agency, Inc.—A local citizens advisory group directly involved with Tar Creek and other environmental concerns in Northeast Oklahoma.

**Leachate**-water that percolates through a chat pile and picks up heavy metals.

**LEPC**-Local Emergency Planning Committee; state-required local organization (specific to counties and/or larger cities) responsible for developing emergency response plans for each community.

**Linnology**—the study of fresh waters. Interaction between water quality and the organisms present.

**Load; Loading**—a number, amount or concentration of metals or other materials passing a given point in a stream or river.

**Lytle Creek**- Originates near the Kansas border north of Picher and merges into Tar Creek just above the Douthat Bridge. A diversion dyke was built in 1986, as part of the OU1 remedy, to divert the stream to a new convergence with Tar Creek in order to prevent surface water from entering a collapse feature between the dyke and Douthat Bridge.

**MCL**—Maximum Contaminant Level—The maximum concentration of a chemical allowed in drinking water.

**MDL**—Method Detection Limit—the lowest concentration that can be accurately measured.

**Mean**—average of several samples.

**Media**—soil, water, air, plants, animals or any other parts of the environment that can contain contaminants.

**Mayer Ranch**: location in Commerce, OK where a constructed wetland is being studied. Adjacent to the brick factory. Was the first area where acid mine water surfaced in 1979.

**Medical Monitoring**- the periodic medical screening of a defined population for a specific disease or for biological markers of disease that they may be at significantly increased risk.

**Micron** - one millionth of a meter; 1000 microns (u) make one millimeter (mm), a thousandth of a meter.

**Mg/Kg**—milligram per kilogram—in soil, similar to part per million.

**Mg/l**—milligrams per liter—a standard unit for expressing chemicals in water—parts per million.

**Mg/M3**—milligram per cubic meter—in air—similar to part per million.

**Morbidity**- illness or disease. Morbidity rate is the number of illnesses or cases of disease in a population.

**Mortality**- the proportion of deaths to the population of the region, nation; the death rate of any particular disease.

**MSDS** -Material Safety Data Sheet; the information available with each hazardous product that describes its hazards and how to handle the material safely.

**Natural Attenuation**— a clean-up option that involves leaving the site alone and letting it eventually clean itself up. This is seldom a viable option because it takes too long.

**NEPA**-National Environmental Protection Act. Primarily deals with water discharges.

**Nitrate**—**NO<sub>3</sub>**—major nitrogen nutrient form in water.

**Non-Point Source Discharge**—a discharge that cannot be specifically defined, i.e. fertilizer coming from a field.

**NPL**—National Priority Listing, EPA's list for Superfund sites. Tar Creek was rated very high on this list in 1983.

**NRC**—National Response Center—EPA hotline for cleanups, spills, etc. 1-800-424-8802.

**NRCS**—Natural Resource Conservation Service. Part of the US Department of Agriculture.

**NRDAR**—Natural Resource Damage Assessment and Restoration, a federal process that allows natural resource trustees, federal government, states and tribes, to collect damages to natural resources caused by pollution.

**Nutrient**—substance needed by plants to grow, example—nitrates and phosphates.

**NTU**—Nephelometric Turbidity Unit—units for measuring and reporting turbidity.

**ODEQ**—Oklahoma Department of Environmental Quality (see DEQ).

**ODOT**—Oklahoma Department of Transportation. Agency regulates road, air and rail transportation in Oklahoma, where they delegated authority from the federal government.

**Oligotrophic**—under-fertilized—non-polluted water.

**Order of Magnitude**—a ten times change. Example 10 to 100.

**Organic**— alive or was alive.

**Organism**—a plant or animal, a living thing.

**OSHA**—Occupational Safety and Health Administration. A federal organization whose purpose is to protect worker health and enforce health and safety regulations.

**OSDH**—Oklahoma State Department of Health.

**OU**—Operable Unit, a part or section of a large or complex Superfund Site. Tar Creek has four OUs so far and could have more in the future.

**OU 1**—EPA Operable Unit 1—first clean-up work by EPA at Tar Creek. Consisted of plugging wells and water diversion. Work was completed in 1987.

**OU 2**— EPA Operable Unit 2; project involving removal of contaminated soil and replacement with clean soil in Picher, Cardin, Quapaw, North Miami, and Commerce. In addition, High Access Areas in Miami and on tribal lands, and the Tar Creek Flood plain to the Neosho River are also included in OU2.

**OU 3**— EPA Operable Unit 3; small project in Cardin, OK involving the cleanup of the old Eagle-Picher headquarters located on Quapaw Tribal land. Some chemicals found on the site that were not related the mining operations were also removed from the site.

**OU 4** EPA Operable Unit 4; work planned that primarily involves a study of chat piles and their contribution to surface and groundwater contamination. No public input was solicited in deciding this scope of work.

**O and M**—operations and maintenance; the long-term work following a cleanup action that insure contaminants will continue to be removed.

**Oxidation**—a reaction in which oxygen combines chemically with another substance. Rust is an example of oxidation.

**Parameter**—the object of a study or measurement, example; Lead, DO and temperature are examples of parameters.

**Particulates**-solid minute particles in the air.

**PA/SI-Preliminary Assessment/Site Investigation**; the initial process in a Superfund investigation.

**Pb—lead**— a heavy metal, one of the Tar Creek mine contaminants; EPA’s contaminant of concern at the Tar Creek Superfund Site.

**PEL/TLV- Permissible Exposure Limit or Threshold Limit Value**; an OSHA or ACGIH limit on human exposure to airborne contaminants.

**Petitioned Public Health Assessment-** a public health assessment conducted at the request of a member of the public by ATSDR.

**pH-** the measure of acidity or alkalinity of a material

**Phosphate**—PO<sub>4</sub>—major phosphorus nutrient formed in water.

**Phyto**—pertains to plant.

**Phytoremediation**—clean-up option involving the use of plants to take up the contaminant.

**Piezometric Surface**—the level at the top of a body of water where some pressure is exerted.

**Plankton**—tiny plants or animals that drift with the water currents.

**Plume**-concentration of contaminants in air, water or soil extending from a specific source.

**Point Source**—A discharge from a facility that has an EPA permit to discharge accepted levels of pollutants into air or water.

**Pollution**—The presence of a chemical or element in a media of the environment above background levels of naturally occurring chemicals or elements, or foreign to the media.

**Potable Water**-water that is acceptable to drink.

**Potentially Exposed**-Valid information indicates the presence of contaminant(s) of public health concern in air, water, soil, food chain, or surface water and some evidence that some people have identified route(s) of exposure.

**Primary Drinking Water Standards**—levels of chemicals allowed in drinking water.

**Primary Treatment**—to take the solids from sewage water.

**PRP**—Potential Responsible Party, may have caused the contamination of a site, at one time owned the site, and may be responsible for the clean up.

**Public Health Advisory** –A statement by ATSDR that a release of hazardous substances or a physical hazard poses a significant risk to human health; recommendations made to reduce exposure and eliminate or mitigate the significant risk to human health.

**Public Comment**- an opportunity for the general public to comment on agency findings or proposed activities.

**Public Health Hazard** –sites that pose a public health hazard as a result of long-term exposures to hazardous substances.

**Pump and Treat**—to pump contaminated groundwater through a treatment facility.

**QA/QC**—Quality Assurance/Quality Control. A documented process or plan that guides scientists conducting research at a site in sampling techniques, use of instruments, laboratory analysis, shipping and data storage techniques.

**Qualitative**- Information obtained about a site that is normative in nature, that is, not mathematically derived. Interviews or surveys used to describe how people utilize wild foods (such as fish) in a particular area is qualitative information.

**Quantitative**- Mathematically derived information/data obtained in a scientifically controlled manner such that its accuracy may be verified repeatedly (within a narrow margin of significance). The federal census is an example.

**Radium**-a radioactive decay product of uranium.

**Radon**—a radioactive gas produced by decay of radium.

**RCRA**—Resource Conservation and Recovery Act of 1976; the law that defines hazardous substances, and requires strict control of facilities that use hazardous substances and generate hazardous wastes. Requires permits for the treatment, storage and disposal of hazardous wastes.

**Recharge/ Recharge Area**-process or area where water transfers from the surface to the groundwater. (See groundwater recharge).

**Reduction**—the opposite of oxidation; involves removal of oxygen from a compound

**RD**—**Remedial Design**—the cleanup plan for a Site or operable unit.

**Remedial Action**—a specified clean-up action at an NPL site; can be any duration, any cost.

**Removal Action**—a specified EPA clean-up action, cannot last more than 12 months or cost more than \$2.2 million.

**Residence Time**—period required to flush a water body or system. Example: 60-100 years to flush the Boone aquifer.

**Restoration**—action taken to return damaged resources to baseline conditions; may include rehabilitation, replacement, or acquisition of equivalent habitat.

**RI/FS**—Remedial Investigation/Feasibility Study. A broad-based review of a site or part of a site to determine what clean-up alternatives to undertake. RI assesses the nature and extent of contamination and associated health and environmental risks; FS consider the range and effectiveness of clean up options.

**Riparian Vegetation**—stream margin plants

**Riparian** – the banks of a stream

**Risk**- in risk assessment, the probability that something will cause injury, combined with the potential severity of that injury.

**Risk Assessment**—the formal process of evaluating and placing a numerical value on the impacts of exposure to certain pollutants.

**ROD**—Record of Decision, the official report and conclusion reached by EPA on the status, severity and selected clean up options for a site, or part of a site.

**Roubidoux Formation**—the deeper aquifer at Tar Creek that is used as a drinking water source by local communities and is being monitored to measure any contamination of acid mine water from the Boone Formation.

**Route of Exposure**-the media (water, air, soil) from which a person may contact a chemical substance.

**Sample**—an accurate representation or measurement of a media.

**Secondary Drinking Water Standards**—non-numerical standards for drinking water such as taste, odor, and color.

**SARA-Superfund Amendment and Reauthorization Act**. Created the Superfund (see also CERCLA). Includes also the “Right to Know Act.” Requires facilities to insure worker’s right to know, and protection from hazardous chemicals in the workplace; as well as, the

public's right to know about use and disposal of hazardous chemicals at facilities in their communities.

**Scoping**-deciding what work will be included in a project; possibly the most critical point of input for citizens and stakeholders.

**Secondary Recreation Water Body**—A water body (such as a stream) that cannot be used for primary body contact/recreation.

**Secondary Treatment**—usually settling ponds, after solids are removed.

**Sediment Sink**—long-term storage of a material such as heavy metals in sediment.

**Sediment**—material that has settled to the bottom of a water body. This can be both silt (inorganic material) and organic material.

**Services or IDIQ Contract**- A Contractor, which has an existing agreement with the EPA or other agency to perform work. CH2M Hill is the Services Contractor to EPA on the OU 2 work.

**Significant**—can be a statistical term that means a true difference based on established criteria.

**Significant Health Risk**- circumstances where people are or could be exposed to hazardous substances at levels that pose an urgent public health hazard or a public health hazard.

**Site**—the specified location under consideration, a very specific place.

**Soft Water**—around 15-20 mg/l CaCo<sub>3</sub>; makes heavy metals more toxic.

**SOW**- Scope of Work; explains what will (or was) done at a site.

**Solubility**—degree that solids dissolve in liquids, i.e., heavy metals have different degrees of solubility.

**Sphalerite**—Zinc sulfate (ZnS)

**Stakeholder**—group or people with a vested interest in a project.

**Stratified**—in layers.

**Stream Channelization**—to confine a stream to a man-made channel.



**Stream Loading**—the pounds of materials (metal, etc.) passing some specified point in the stream each day/month/year. 13 tons of metals pass down Tar Creek every day.

**Subsidence**—to lower the earth's surface in a given location, cave-in. There are over 80 subsidence areas in the Tar Creek Superfund Site.

**Substrate**—solid material in a stream or lake where organisms attach.

**Superfund**- A tax on the petroleum industry and others that generate hazardous chemicals that is utilized to clean up abandoned contaminated sites where no viable responsible parties exist. Created in 1986 as the reauthorization of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

**Surveillance**-the periodic screening of a defined population for a specific disease or biologic marker of disease for which the population is at significantly increased risk.

**Suspended**—particles drifting in water that will settle out very slowly.

**Synergistic Effect**—combined effect of all factors.

**TAG**—Technical Assistance Grant. Money provided by EPA to hire a consultant to work with the affected citizens at a Superfund Site. At Tar Creek, LEAD Local Environmental Action Demanded has a TAG and hired a consultant.

**TAT**-Technical Assistance Team; an EPA contractor for sampling soil or water at a site.

**TLV**- Threshold Limit Value: the amount of a contaminant a worker can be exposed to (breathe) without wearing a respirator.

**Tailing Ponds** — areas where washed mine tailings were settled, leaving fines one to six feet deep. Usually surrounded by dykes. Dykes at the Tar Creek Site have been breached.

**Tailings**—chat, piles of mining waste residue at Tar Creek.

**TCLP**—Toxicity Characteristic Leaching Procedure; a process to measure chemicals in soil or water through concentration of the sample. Used to assess the ability of contaminants to filter through soil.

**Temporal**—time-related.

**Teratogen**—Substances that cause deformity in an infant; occurs during fetal development.

**Tertiary Treatment** — water treatment that usually involves chemical or advanced physical treatment.

**Tolerant Species**—can stand extreme conditions in a water body (like carp).

**Trace Element**—small amount, usually a nutrient to organism. Some metals are trace elements.

**Tri-state Trustee Partnership**—group including three states, eight Indian tribes, and the Department of Interior (DOI).

**Tritium**—chemical used to determine how aquifer infiltrates water. This process can determine if contaminated water from the mines has entered the Roubidoux Formation.

**Turbidity**—clarity of water, usually due to suspended materials.

**USFWS**—United States Fish and Wildlife Service; an agency in the Department of the Interior. The agency regulates migratory species, threatened and endangered plants, animals, and aquatic life.

**USGS**—United States Geological Service; an agency in the Department of the Interior; branch of government that studies soil and ground water.

**Ug/l**—micrograms per liter—part per billion.

**Viability**-ability to live in certain conditions.

**Wetlands**- an area that is wet all or part of the year. The plants that grow there typically identify wetlands.

**Work Plan**- the written plan that explains what is to be done at a Site.

**Water Quality**—the assessment of the physical and chemical constituents in water.

**Zn—zinc**—an ore that was mined in the Tri-state mining district; one of the mine contaminants.