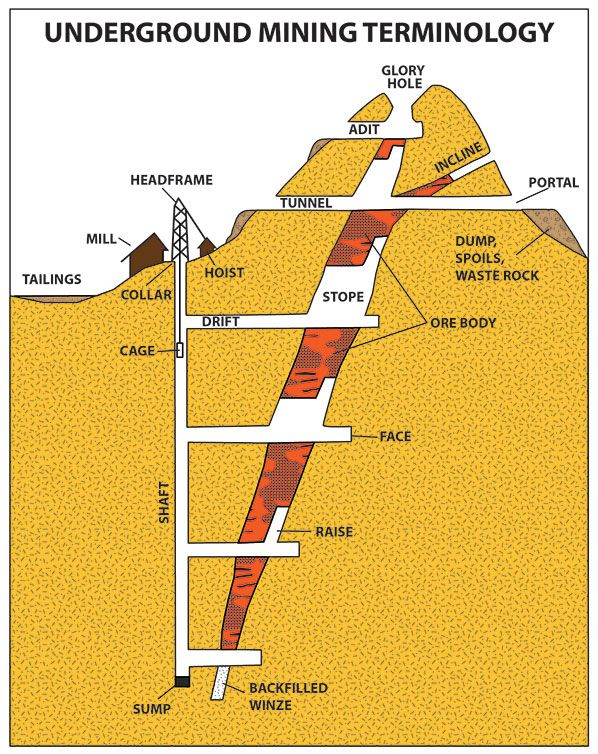


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| --- | --- |
| Patagonia Area Resource Alliance | **ALPHABET SOUP**  ***ACRONYMS & TERMS***  ***FOR ARIZONA ENVIRONMENTAL ACTIVISM***  ***particularly with regard to HARDROCK MINING*** |
|  | **AGENCY-SPEAK** |
| **EC** | **Extraordinary Circumstances** |
| **CE** | **Categorical Exclusion** |
| **EIS** | **Environmental Impact Statement** --- a document outlining the environmental effects of the project on the environment, prepared by the proponent of a project and presented to decision makers and the public |
| **EA** | **Environmental Assessment**  --- an assessment of the impacts caused by a development activity such as mining, logging or grazing |
| **PEA** | **Preliminary Economic Assessment** |
| **EPA** | **Environmental Protection Act** |
| **NEPA** | **National Environmental Protection Act** |
| **ES** | **Endangered species (ESA = Endangered Species Act)** |
| **FOIA** | **Freedom of Information Act** |
| **SOPA** | **Schedule of Proposed Actions** |
| **VRP** | **Voluntary Remediation Program** |
| **FONSI** | **Finding Of No Significant Impact** |
| **NOI** | **Notice of Intent** |
| **ROD** | **Record of Decision** |
| **TESS** | **Federal List of Threatened and Endangered Species** |
| **POO** | **Plan Of Operation** |
| **RFP** | **Request for Proposal** |
| **WOTUS** | **Waters of the US** |
| **TSF** | **Tailings Storage Facility** |
| **HAZMAT** | **Hazardous materials** |
| **CERCLA** | **Comprehensive Environmental Response, Compensation, and Liability Act, known also as Superfund, passed in 1980** |
| **Exceedences** | **Instances where Federally identified air pollutants exceed the air quality Federal standard** |
|  |  |
|  | **AGENCIES & JURISDICTIONS** |
| **FS** | **Forest Service (or USFS, United States Forest Service)** |
| **CNF** | **Coronado National Forest (sometimes just called “the Forest”)** |
| **USBR** | **United States Bureau of Reclamation** |
| **USACE** | **United States Army Corps of Engineers** |
| **FWS** | **(United States) Fish &Wildlife Service** |
| **DOI** | **(United States) Department of Interior** |
| **DOE** | **(United States) Department of Energy** |
| **BP** | **Border Patrol** |
| **ICE** | **Immigration and Customs Enforcement**, |
| **DOT** | **Department of Transportation** |
| **ADOT** | **Arizona Department of Transportation** |
| **SCC** | **Santa Cruz County** |
| **ACC** | **Arizona Corporation Commission** |
| **AZDEQ** | **Arizona Department of Environmental Qualilty** |
|  |  |
| **ADWR** | **Arizona Department of Water Resources** |
| **MSHA** | **Mining Safety and Health Administration** |
| **OSHA** | **Occupational Safety and Health Administration** |
| **FEMA** | **Federal Emergency Management Administration** |
| **CERT** | **Community Emergency Response Team, a program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations** |
|  |  |
|  | **CONSERVATION GROUPS** --- **Patagonia & Santa Rita Mtns and related watersheds** |
| **SC** | **Sierra Club** *(abbreviation in use?)* |
| **PARA** | **Patagonia Area Resource Alliance** |
| **FOSC** | **Friends of Sonoita Creek** |
| **CBD** | **Center for Biological Diversity** |
| **SIA** | **Sky Island Alliance** |
| **TNC** | **The Nature Conservancy** |
| **BRN** | **Borderlands Restoration Network** |
| **PARA** | **Patagonia Area Resource Alliance** |
| **SSSR** | **Save the Scenic Santa Ritas** |
| **WMAN** | **Western Mining Action Network** |
| **DDFI** | **Deep Dirt Farm Institute** |
| **TAPC** | **Tucson Audubon Paton Center** |
| **DOW** | **Defenders of Wildlife** |
| **AWWRR** | **Appleton-Whittell Research Ranch** |
| **HMN** | **Hummingbird Monnitoring Network** |
| **FOSCR** | **Friends of Santa Cruz River** |
| **RWWJ** | **Raven’s Way Wild Journeys** |
| **CZ** | **Circle Z Ranch** |
| **ATA** | **Arizona Trail Association** |
|  |  |
|  | **LEGISLATION-RELATED** |
| **HR** | **House Resolution (US House of Representatives)** |
| **SB** | **Senate Bill (US Senate)** |
| **NFMA** | **National Forest Management Act** |
| **ARS** | **Arizona Revised Statute** |
| **USC** | **United States Code** |
| **CFR** | **Code of Federal Regulations** |
| **CEQ** | **Council on Environmental Quality** |
|  |  |
|  | **UTILITIES** |
| **UES** | **Unisource Energy Services** |
| **TEP** | **Tucson Electric Power** |
| **ROW** | **Right Of Way** |
| **SSVEC** | **Sulfur Springs Valley Electric Cooperative** |
|  |  |
|  | **MISCELLANEOUS ACRONYMS** |
| **GIS** | **Geographic Information System** |
| **GPS** | **Global Positioning System** |
| **SNAFU** | **Situation Normal, All Fucked Up** |
| **FUBAR** | **Fucked Up Beyond All Recognition** |
| **POTUS** | **President of the United States** |
|  |  |
|  | **UNITS OF MEASUREMENT** |
| **FT** | **Feet** |
| **LF** | **Linear feet** |
| **SF** | **Square feet** |
| **CF** | **Cubic feet** |
| **CFM** | **Cubic feet per minute, a measure of velocity** |
| **GPM, GPH** | **Gallons per minute, gallons per hour** |
| **GAL** | **Gallons** |
| **PCF** | **Density in Pounds per cubic foot** |
| **IN, SQ IN** | **Inches, square inches** |
| **CU IN** | **Cubic inches** |
| **YARD** | **36 inches, 3 feet, or 0.9144 metes** |
| **M** | **Meters, one of which =**  **39.4 inches** |
| **CM** | **Centimeter, 1/100 of a meter, about the width of your little fingernail** |
| **ACRE** | **Land measure equal to 43,560 SF** |
| **ACRE-FOOT** | **A volume of water equal to 12” of water over 1 acres, 325,851 gal** |
| **HECTARE** | **One kilometer square, or 1 million square meters** |
| **MILE** | **5280 FT** |
| **KM** | **Kilometer, 1000 Meters** |
| **SQ MI** | **Square mile, equal to 640 acres** |
| **SQ KM** | **Square Kilometer** |
| **S, or SECTION** | **One square mile of land, by US Public Land Survey System (PLSS)** |
| **NE-SE-SW-NW** | **The compass directions Northeast- southeast-southwest- northwest** |
| **QUARTER-SECTION** | **A square of land one-half mile on a side, labeled as NE SE SW or NW quarter of Section X** |
| **T or TOWNSHIP** | **36 Sections in a 6x6 square, numbered in east-west bands** |
| **R or RANGE** | **A north-south band of townships relative to a key meridian** |
| **LAT** | **Latitude – degrees north or south of planet’s equator** |
| **LONG** | **Longitude – degrees east or west of Greenwich Meridian** |
| **BEARING** | **A surveying term used to designate direction. The bearing of a line is the acute horizontal angle between the meridian and the line.** |
| **MERIDIAN** | **An established line of reference** |
| **AZIMUTH** | **An angle measured clockwise from any meridian.** |
| **CONTOUR** | **An imaginary line that connects all points on a surface having the same elevation. Their spacing on topographic maps is called CONTOUR INTERVAL.** |
| **SG** | **Specific gravity — The weight of a substance compared with the weight of an equal volume of pure water at 4 ° Celsius.** |
| **# or LB** | **A Pound of material** |
| **Ton** | **A short or net ton is equal to 2,000 pounds; a long or British ton is 2,240 pounds; a metric ton is approximately 2,205 pounds.** |
|  |  |
|  | **ELECTRICAL UNITS and TERMS** |
| **W** | **Watt A basic measurement of power** |
| **KW** | **Kilowatt = 1000 watts** |
| **MW** | **Megawatt = 1,000,000 watts** |
| **GW** | **Gigawatt** |
| **AMP** | **Ampere A basic measurement of electrical current** |
| **V** | **Volt** |
| **XFMR** | **Transformer** |
| **Low Voltage** | **Less than 600 volts, a Federal definition** |
|  | **GEOLOGY and HYDROLOGY** |
| **Deforrmation** | **A general term for the process of folding, faulting, shearing, compression, or extension of the rocks as a result of various Earth forces** |
| **Tectonic forces** | **Forces pertaining to, causing, or resulting from structural deformation of the earth's crust.** |
| **Bed** | **A stratum of coal or other sedimentary deposit.** |
| **Dike** | **An intrusion of igneous rock across other rocks** |
| **Erosion** | **the wearing away of the Earth's surface by wind, water, or glacial action** |
| **Fossilized** | **Preserved by burial in rock or earthy deposits; turned into a fossil** |
| **Aquifer** | **A water-bearing bed of porous rock, often sandstone.** |
| **Syncline** | **A fold in rock in which the strata dip inward from both sides toward the axis. The opposite of an ANTICLINE** |
| **Geochemical** | **Alterations in the Earth's crust as a result of chemical changes** |
| **Geophysical Prospecting** | **Mapping rock structures by measuring magnetic fields, force of gravity, electrical properties, seismic wave paths and velocities, radioactivity, and heat flow** |
| **Fault** | **A slip-surface between two portions of the earth's surface that have moved relative to each other. A fault is a failure surface and is evidence of severe earth stresses.** |
| **Fissure** | **An extensive crack, break, or fracture in the rocks.** |
|  |  |
| **Fault zone** | **A fault, instead of being a single clean fracture, may be a zone hundreds or thousands of feet wide. The fault zone consists of numerous interlacing small faults or a confused zone of gouge, breccia, or mylonite.** |
| **Groundwater Recharge** | **The natural process of infiltration and percolation of water from land areas or streams, or by artificial means, through permeable soils into water-holding rocks that provide nderground storage (“Aquifers.”)** |
| **Fracture** | **A general term to include any kind of discontinuity in a body of rock if produced by mechanical failure, whether by shear stress or tensile stress. Fractures include faults, shears, joints, and planes of fracture cleavage.** |
| **Formation** | **Any assemblage of rocks which have some character in common, whether of origin, age, or composition. Often, the word is loosely used to indicate anything that has been formed or brought into its present shape.** |
| **Friable** | **Easy to break, or crumbling naturally. Descriptive of certain rocks and minerals.** |
| **Horizon** | **In geology, any given definite position or interval in the stratigraphic column or the scheme of stratigraphic classification; generally used in a relative sense.** |
| **Vein** | **A mineralized zone having a tabular form. Its depth and length are much greater than its width. Often the zone is steeply dipping** |
|  |  |
|  | **A FEW CHEMICALS and MINERALS** |
| **CFCs** | **Chlorofluorocarbons — Human-produced chemical compounds containing chlorine, fluorine and carbon which are thought to be responsible for ozone-layer depletion.** |
| **Pyrite** | **A hard, heavy, shiny, yellow mineral, FeS2 or iron disulfide, generally in cubic crystals. Also called iron pyrites, fool's gold, sulfur balls.** |
| **ANFO** | **An explosive mix of ammonium nitrate and fuel oil, the primary explosive used in mining, and by terrorists.** |
| **Cyanide** | **A highly poisonous substance used in extracting gold and silver** |
| **Sandstone** | **A sedimentary rock consisting of quartz sand united by some cementing material, such as iron oxide or calcium carbonate.** |
| **Nitrogen oxides (NOx)** | **Formed when nitrogen (N2) combines with oxygen (O2) in the burning of fossil fuels, from the natural degradation of vegetation, and from the use of chemical fertilizers. A significant component of acid deposition and photochemical smog. The primary source of nitrogen oxide emissions is automobile exhaust.** |
|  |  |
|  | **ECOLOGICAL and CONSERVATION TERMS** |
| **Biodiversity** |  |
| **Habitat** |  |
| **Threatened species** |  |
| **Endangered species** |  |
| **Migration** |  |
| **Pollination** |  |
| **Wildlife Corridor** |  |
| **Remediation** |  |
| **Taxonomy** |  |
| **Evolution** |  |
| **Coevolution** |  |
| **Riparian Habitat** | **Lands comprised of the vegetative and wildlife areas adjacent to perennial and intermittent streams** |
| **Open Space** | **Publicly owned or privately designated area characterized by great natural or scenic beauty whose existing openness, natural conditions or present state of use, if retained, would maintain or enhance the conservation of natural or scenic resources, biological diversity or the production of food and fiber.** |
| **Conservation Easement** | **A tool for acquiring open space with less than full-fee purchase, whereby a public agency buys only certain specific rights from the landowner. These may be positive rights (providing the public with the opportunity to hunt, fish, hike, or ride over the land), or they may be restrictive rights (limiting the uses which the land may be devoted to in the future).** |
| **Global climate change** | **This term usually refers to the gradual warming of the earth caused by the greenhouse effect. Many scientists believe this is the result of man-made emissions of greenhouse gases such as carbon dioxide, chlorofluorocarbons (CFC) and methane,** |
| **Greenhouse effect** | **The natural phenomenon that occurs when certain atmospheric gases trap radiated heat in the atmosphere. The greenhouse effect keeps the atmosphere warm and makes life on earth possible.** |
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|  | **ONLINE RESOURCES** |
| **NEPA guide** | <https://ceq.doe.gov/docs/get-involved/Citizens_Guide_Dec07.pdf> |
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**A GLOSSARY OF HARDROCK MINING TERMS**

Adapted from <http://www.rocksandminerals.com/glossary.htm>

–with most references to coal removed, along with some of the more detailed engineering references to the day-to-day construction and workings of mines.



A

Acid deposition or acid rain — Refers loosely to a mixture of wet and dry "deposition" (deposited material) from the atmosphere containing higher than "normal" amount of nitric and sulfuric acids. The precursors or chemical forerunners of acid rain formation result from both natural sources, such as volcanoes and decaying vegetation, and man-made sources, primarily emissions of sulfur and nitrogen oxides resulting from fossil fuel combustion.  
  
Acid mine water — Mine water that contains free sulfuric acid, mainly due to the weathering of iron pyrites. Sometimes referred to as **Mine-affected Water,** an industry-supported term to replace **Acid Mine Drainage.**  
  
Active workings — Any place in a mine where miners are normally required to work or travel and which are ventilated and inspected regularly.  
  
Adit — A nearly horizontal passage from the surface by which a mine is entered and dewatered. A blind horizontal opening into a mountain, with only one entrance.  
  
Auger — A rotary drill that uses a screw device to penetrate, break, and then transport the drilled material (coal).  
  
Auxiliary operations — All activities supportive of but not contributing directly to mining, such as storage yards and parking lots.  
  
B

**Backfill**— Mine waste or rock used to support the roof after mineral emoval.  
  
**Barren**— Said of rock or vein material containing no minerals of value, or in deposits too thin to be workable.  
  
**Base Metal** a general term applied to relatively inexpensive metals, such as copper, zinc, lead   
  
**Bearing**— A surveying term used to designate direction. The bearing of a line is the acute horizontal angle between the meridian and the line. The meridian is an established line of reference. Azimuths are angles measured clockwise from any meridian.  
  
**Beneficiation**— The treatment of mined material, making it more concentrated or richer.  
  
**Berm**— A pile or mound of material capable of restraining a vehicle.  
  
**Bit**— The hardened and strengthened device at the end of a drill rod that transmits the energy of breakage to the rock. The size of the bit determines the size of the hole. A bit may be either detachable from or integral with its supporting drill rod.  
  
**Blasting agent**— Any material consisting of a mixture of a fuel and an oxidizer.  
  
**Blasting cap**— A detonator containing a charge of detonating compound, which is ignited by electric current or the spark of a fuse. Used for detonating explosives.  
  
**Borehole** — Any deep or long drill-hole, usually associated with a diamond drill.  
  
  
C

**Cage** — In a mine shaft, the device, similar to an elevator car, that is used for hoisting personnel and materials.  
  
**Cap**— A miner's safety helmet. Also, a highly sensitive, encapsulated explosive that is used to detonate larger but less sensitive explosives.  
  
**Carbide bit**— More correctly, cemented tungsten carbide. A cutting or drilling bit for rock or coal, made by fusing an insert of molded tungsten carbide to the cutting edge of a steel bit shank.  
  
Cementation --- precipitation or growth of a binding material around grains or fragments of rocks

**Certified**— Describes a person who has passed an examination to do a required job.

**Claim – (or Mineral Claim or Mining Claim)** a mining right that grants a holder the exclusive right to search and develop any mineral substance within a given area. **Patented claims h**ave become titled property under the 1872 General Mining Act, while **Unpatented claims** on public lands require a fNEPA process for mine exploration, development and production.  
  
**Collar**— The term applied to the timbering or concrete around the mouth or top of a shaft. The beginning point of a shaft or drill hole at the surface.  
  
**Comminution** — The breaking, crushing, or grinding of coal, ore, or rock.  
  
**Competent rock**— Rock which, because of its physical and geological characteristics, is capable of sustaining openings without any structural support except pillars and walls left during mining (stalls, light props, and roof bolts are not considered structural support).

**Concentrate** ---A product containing a valuable mineral or metal and from which most of the waste material has been removed   
  
**Contact** — The place or surface where two different kinds of rocks meet. Applies to sedimentary rocks, as the contact between a limestone and a sandstone, for example, and to metamorphic rocks; and it is especially applicable between igneous intrusions and their walls.

**Contaminant –** introduced species, substance or material which was either not previously present or was present in a lesser amount, and that may have a harmful effect on air, water or soil   
  
**Conveyor** — An apparatus for moving material from one point to another in a continuous fashion. This is accomplished with an endless (that is, looped) procession of hooks, buckets, wide rubber belt, etc.  
  
**Core sample** — A cylinder sample generally 1-5" in diameter drilled out of an area to determine the geologic and chemical analysis of the overburden.  
  
**Cover**— The overburden of any deposit.  
  
**Crusher**— A machine for crushing rock or other materials. Among the various types of crushers are the ball mill, gyratory crusher, Handsel mill, hammer mill, jaw crusher, rod mill, rolls, stamp mill, and tube mill.  
  
  
D

**Decline** --- A slightly inclined opening which usually starts at the surface. It may be traveled by foot or rubber wheeled vehicle.

**Demonstrated reserves** — A collective term for the sum of coal in both measured and indicated resources and reserves.  
  
**Deposit**— Mineral deposit or ore deposit is used to designate a natural occurrence of a useful mineral, or an ore, in sufficient extent and degree of concentration to invite exploitation.  
  
**Depth**— The word alone generally denotes vertical depth below the surface. In the case of incline shafts and boreholes it may mean the distance reached from the beginning of the shaft or hole, the borehole depth, or the inclined depth.  
  
**Detectors**— Specialized chemical or electronic instruments used to detect mine gases.  
  
**Detonator** — A device containing a small detonating charge that is used for detonating an explosive, including, but not limited to, blasting caps, exploders, electric detonators, and delay electric blasting caps.  
  
**Development mining**— 1) an activity ranging from confirmation of a mineral deposit to the decision to build a mine; 2) all geological, engineering and economic work necessary to ensure profitable mining and compliance with applicable laws   
  
**Diffusion**— Blending of a gas and air, resulting in a homogeneous mixture. Blending of two or more gases.  
  
**Dilute**— To lower the concentration of a mixture; in this case the concentration of any hazardous gas in mine air by addition of fresh intake air.  
  
**Dip**— The inclination of a geologic structure (bed, vein, fault, etc.) from the horizontal; dip is always measured downwards at right angles to the strike.  
  
**Discovery** --- the knowledge of the presence of valuable minerals within or close enough to a location to justify a reasonable belief in their existence

**Drainage** — The process of removing surplus ground or surface water either by artificial means or by gravity flow.

**Drift**— A horizontal passage underground. A drift follows the vein, as distinguished from a crosscut that intersects it, or a level or gallery, which may do either.  
  
**Drill**— A machine utilizing rotation, percussion (hammering), or a combination of both to make holes. If the hole is much over 0.4m in diameter, the machine is called a **borer.**  
  
E

**Electrical grounding**— To connect with the ground to make the earth part of the circuit.  
  
**Entry**— An underground horizontal or near-horizontal passage used for haulage, ventilation, or as a mainway.

**Exploration**— 1) The search for mineral deposits and the work done to prove or establish the extent of a mineral deposit. 2) Prospecting and subsequent evaluation.

**Exploratory Drilling** –- the drilling of boreholes from the surface or from underground workings to seek and locate mineral deposits, oil and gas reserves and to establish geological structure   
  
**Extraction** — The process of mining and removal of ore from a mine.

F

**Face** --- The rock surface which excavation techniques are being preformed upon to advance a horizontal opening

**Fall**— A mass of roof rock which has fallen in any part of a mine. Also called **Rock-fall**  
  
**Fill** — Any material that is put back in place of the extracted ore to provide ground support.  
  
**Floor**— That part of any underground working upon which a person walks or upon which haulage equipment travels; simply the bottom or underlying surface of an underground excavation.  
   
G

**Gallery**— A horizontal or a nearly horizontal underground passage, either natural or artificial.

**Gangue** --- Non-valuable minerals which are associated with the valuable minerals. The ore is made up of both of these.   
  
**Geologist**— One who studies the constitution, structure, and history of the earth's crust, conducting research into the formation and dissolution of rock layers, analyzing fossil and mineral content of layers, and endeavoring to fix historical sequence of development by relating characteristics to known geological influences (historical geology).  
  
**Geotechnical engineering**— The branch of engineering that specializes in assessing the stability and strength of soil and rock materials, as well as groundwater conditions. With regard to mining, geotechnical engineering principles are used to determine the appropriate design of mine features such as pit walls, tunnels, and earthen embankments.  
  
**Gunite**— A cement applied by spraying to the roof and sides of a mine passage.

H

**Haulage** — The horizontal transport of ore, coal, supplies, and waste. The vertical transport of the same is called **hoisting.**  
  
**Headframe**— The structure surmounting the shaft which supports the hoist rope pulley, and often the hoist itself.  
  
**Hoist** — A drum on which hoisting rope is wound in the engine house, as the cage or skip is raised in the hoisting shaft.  
  
  
I

**Incline** — Any entry to a mine that is not vertical (shaft) or horizontal (adit). Often incline is reserved for those entries that are too steep for a belt conveyor (+17 degrees -18 degrees), in which case a hoist and guide rails are employed. A belt conveyor incline is termed a slope. Alt: Secondary inclined opening, driven upward to connect levels, sometimes on the dip of a deposit; also called "inclined shaft".  
  
**Incompetent** — Applied to strata, a formation, a rock, or a rock structure not combining sufficient firmness and flexibility to transmit a thrust and to lift a load by bending.  
  
**Indicated mineral resources**— Ores for which estimates of the rank, quality, and quantity have been computed partly from sample analyses and measurements and partly from reasonable geologic projections.

**Inferred mineral resources**— Ore in unexplored extensions of the demonstrated resources for which estimates of the quality and size are based on geologic evidence and projection. Quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repletion of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence.

I**nfrastructure** ---1) from mining companies’ perspective:physical improvements to support mining, such as buildings, gas pipes, water lines, sewage and water systems, telephone cables and reservoirs. It may also include roads, railways, airports, bridges and electrical cables 2) from County & town government perspective: Public services and facilities, such as sewage disposal systems, water supply systems, other utility systems, and roads  
  
**In situ**— In the natural or original position. Applied to a rock, soil, or fossil when occurring in the situation in which it was originally formed or deposited.

J  
  
**Job Safety Analysis (J.S.A.)**— A job breakdown that gives a safe, efficient job procedure.  
  
K

**Kerf**— The undercut of a rock face.

L

**License ---** the act of securing or obtaining authority to conduct an activity. Includes both legal permits and **Social License**

**Life of Mine ---** the length of time a mine is or could be in production

**Lithology** — The character of a rock described in terms of its structure, color, mineral composition, grain size, and arrangement of its component parts; all those visible features that in the aggregate impart individuality of the rock. Lithology is the basis of correlation in coal mines and commonly is reliable over a distance of a few miles.

**Locator ---** a licensee who locates a claim or for whom a claim is located

M

**Measured mineral resources**— Rock for which estimates of the rank, quality, and quantity of a mineral have been computed from sample analyses and measurements from closely spaced and geologically well-known sample sites, such as outcrops, trenches, mine workings, and drill holes.   
  
**Meridian** —— A surveying term that establishes a line of reference. The bearing is used to designate direction. The bearing of a line is the acute horizontal angle between the meridian and the line. Azimuths are angles measured clockwise from any meridian.  
  
**Methane**— A potentially explosive gas formed naturally from the decay of vegetative matter, similar to that which formed coal. Methane, which is the principal component of natural gas, is frequently encountered in underground coal mining operations and is kept within safe limits through the use of extensive mine ventilation systems.  
  
**Mine development**— The term employed to designate the operations involved in preparing a mine for ore extraction. These operations include tunneling, sinking, cross-cutting, drifting, and raising.  
  
**Mineral**— An inorganic compound occurring naturally in the earth's crust, with a distinctive set of physical properties, and a definite chemical composition.

**Mineralization –** the process by which a mineral is introduced into a rock, resulting in a valuable or potentially valuable deposit

**Mineral Rights** --- ownership rights to the minerals located on or below a property  
**Mining Engineer** — A person qualified by education, training, and experience in mining engineering. A trained engineer with knowledge of the science, economics, and arts of mineral location, extraction, concentration and sale, and the administrative and financial problems of practical importance in connection with the profitable conduct of mining.  
  
N

**Natural ventilation**— Ventilation of a mine without the aid of fans or furnaces.  
  
  
O

**Open Pit Mining -**-- a method of extracting rock or minerals from the earth by their removal from an open pit

**Outcrop** --- The part of a mineral deposit which intercepts the surface.   
  
**Overburden—** Layers of soil and rock covering a coal seam. In surface mining operations, overburden is removed prior to mining using large equipment. When mining has been completed, it is either used to backfill the mined areas or is hauled to an external dumping and/or storage site.  
  
  
P

**Percussion drill**— A drill, usually air powered, that delivers its energy through a pounding or hammering action.  
  
**Permissible** — That which is allowable or permitted. It is most widely applied to mine equipment and explosives of all kinds which are similar in all respects to samples that have passed certain tests of the MSHA and can be used with safety in accordance with specified conditions where hazards from explosive gas or coal dust exist.  
  
**Permit**— As it pertains to mining, a document issued by a regulatory agency that gives approval for mining operations to take place.  
  
**Pillar**— In underground mining, an area of rock left to support the overlying strata in a mine; sometimes left permanently to support surface structures.

**Placer** --- a deposit of sand or gravel that contains particles of gold, gemstones, or other heavy minerals of value. It’s opposite, an underground deposit. is called a **Lode** location and mining claims are classified as either Placer or Lode..  
 **Plan**— A map showing features such as mine workings or geological structures on a horizontal plane.

**Portal**— The structure surrounding the immediate entrance to a mine; the mouth of an adit or tunnel.  
  
R

**Raise**— A secondary or tertiary inclined opening, vertical or near-vertical opening driven upward form a level to connect with the level above, or to explore the ground for a limited distance above one level.  
  
**Reclamation**— The restoration of land and environmental values to a surface mine site after the coal is extracted. Reclamation operations are usually underway as soon as the coal has been removed from a mine site. The process includes restoring the land to its approximate original appearance by restoring topsoil and planting native grasses and ground covers.  
  
**Reserves –** an estimate within specified accuracy limits of the valuable metal or mineral content of known deposits that may be produced under current economic conditions and with present technology; that part of the reserve base that could be economically extracted or produced at the time of determination

**Resources**— Concentrations of coal in such forms that economic extraction is currently or may become feasible. Coal resources broken down by identified and undiscovered resources. Identified coal resources are classified as demonstrated and inferred. Demonstrated resources are further broken down as measured and indicated. Undiscovered resources are broken down as hypothetical and speculative.  
  
**Roll protection**— A framework, safety canopy, or similar protection for the operator when equipment overturns.  
  
**Royalty** — The payment of a certain stipulated sum on the mineral produced.  
  
S

**Sampling**— Cutting a representative part of an ore (or coal) deposit, which should truly represent its average value.  
  
**Self-contained breathing apparatus**— A self-contained supply of oxygen used during rescue work from coal mine fires and explosions; same as SCSR (self-contained self rescuer).  
  
**Severance** — The separation of a mineral interest from other interests in the land by grant or reservation. A mineral dead or grant of the land reserving a mineral interest, by the landowner before leasing, accomplishes a severance as does his execution of a mineral lease.  
 **Shaft**— A primary vertical or non-vertical opening through mine strata used for ventilation or drainage and/or for hoisting of personnel or materials; connects the surface with underground workings.  
  
**Shaft mine** — An underground mine in which the main entry or access is by means of a vertical shaft.  
  
**Shale**— A rock formed by consolidation of clay, mud, or silt, having a laminated structure and composed of minerals essentially unaltered since deposition.  
  
**Shift**— The number of hours or the part of any day worked.  
  
**Slope**— Primary inclined opening, connection the surface with the underground workings.  
  
**Slope mine** — An underground mine with an opening that slopes upward or downward to the ore body

**Sloughing**— The slow crumbling and falling away of material from roof, rib, and face.  
  
**Social License** *needs definition*

**Span**— The horizontal distance between the side supports or solid abutments along sides of a roadway.  
  
**Stope** — Any excavation made in a mine to remove ore that has been made accessable by shafts and drifts.  
  
**Strike**— The direction of the line of intersection of a bed or vein with the horizontal plane. The strike of a bed is the direction of a straight line that connects two points of equal elevation on the bed.  
  
**Subsidence** — The gradual sinking, or sometimes abrupt collapse, of the rock and soil layers into an underground mine. Structures and surface features above the subsidence area can be affected.  
  
**Sump**— The bottom of a shaft, or any other place in a mine, that is used as a collecting point for drainage water.

**Surface Rights** –- The rights to use the surface of the land, excluding mineral rights; whereas, sub-surface rights are rights to the minerals under the surface of the land See **Mineral Rights**

**Survey** --- 1. examining and outlining the physical or chemical characteristics of the Earth's surface, subsurface, or internal constitution by topographical, geological, geophysical, or geochemical measurements; 2. the associated data or results obtained in a survey; a map or description of an area obtained by surveying  
  
  
T

**Tailings** --- Any material that has been through a mineral processing plant and has been rejected as waste.

**Tunnel**— A horizontal, or near-horizontal, underground passage, entry, or haulageway, that is open to the surface at both ends. A tunnel (as opposed to an **adit)** must pass completely through a hill or mountain.

U

**Undercut**— To cut below or undermine the coal face by chipping away the coal by pick or mining machine. In some localities the terms "undermine" or "underhole" are used.  
  
**Underground mine** — Also known as a "deep" mine. Usually located several hundred feet below the earth's surface, with various methods of conveyance to the surface.

V

**Ventilation**— The provision of a directed flow of fresh and return air along all underground roadways, traveling roads, workings, and service parts.  
  
**Violation**— The breaking of any town, county state or federal law, related to mining or other activities  
  
**Virgin** — Unworked or untouched; often said of areas where there has been no mining.  
  
  
W

**Waste** — That rock or mineral which must be removed from a mine to keep the mining scheme practical, but which has no value.  
  
**Winning**— The excavation, loading, and removal of coal or ore from the ground; winning follows development.  
  
**Winze** --- A vertical or sub-vertical opening that is driven downward from a horizontal opening.   
  
**Workings**— The entire system of openings in a mine for the purpose of exploitation.