

## 17.2 GLOSSARY

# A

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**Adit:** An underground mining term; a horizontal or near horizontal access opening to an underground mine with a single opening to the surface (a tunnel has two openings).

**Alkalinity:** The name given to the quantitative capacity of an aqueous solution to neutralize an acid.

**Alluvial:** Said of a placer deposit or sediment, formed by the action of running water, as in a stream channel or an alluvial fan.

**Alluvium:** Unconsolidated sedimentary material including clay, silt, sand, gravel and mud deposited by flowing water.

**Angle of Repose:** The maximum angle of slope, measured from a horizontal plane, at which loose or broken material will come to rest on a pile of similar material.

**Antimony:** Antimony is a chemical element with symbol Sb and atomic number 51 that is lustrous gray metalloid with uses in batteries, munitions, fire retardants, and bearings.

**Aquatic:** Growing, living in, frequenting or taking place in water.

**Aquifer:** A zone, stratum or group of strata acting as a hydraulic unit that stores or transmits water in sufficient quantities for beneficial use.

**Arsenic:** Arsenic is a chemical element with symbol As and atomic number 33; it is a native metallic element with a steel-grey appearance.

**Autoclave:** A pressure vessel used to carry out industrial processes requiring elevated temperature and pressure relative to ambient air temperature and pressure. Provided below is a photo of a typical gold concentrate autoclave with five agitators.



# B

**Ball Mill:** A ball mill is a type of mechanical fine grinder that uses a horizontal rotating cylinder that is partially filled with balls, usually metal, which grinds material to the necessary fineness by friction and impact with the tumbling balls. Ball mills normally operate with an approximate ball charge of 30%. Ball mills are characterized by their smaller (comparatively) diameter and longer length. Provided below is a photo of a typical ball mill.



**Beach:** Unconsolidated material (associated with ore processing facility tailings) that covers a gently sloping zone due to the accumulation of loose, water-borne material.

**Bedrock:** The rock, usually solid, that underlies soil or other unconsolidated material.

**Bench:** In open pit mines and quarries, the ledge which forms a single level of operation where ore and/or development rock is excavated.

**Blast-Hole Drill:** A piece of mining equipment purposed with drilling the holes in which explosives will be loaded. Provided below is a photo of a typical blast-hole drill.



**Brownfield:** A former industrial or commercial site where future use is affected by real or perceived environmental contamination. EPA’s definition of a “Brownfield Site” is found in Public Law 107-118 (H.R. 2869) – “Small Business Liability Relief and Brownfields Revitalization Act” signed into law on January 11, 2002.

**Bulldozer:** A highly versatile piece of mining equipment; a tractor with a curved blade on the front and a ripper arm(s), primarily used for the movement of material. Provided below is a photo of a typical bulldozer.



## C

**Carbon Regeneration Kiln:** Prior to returning barren carbon to the carbon adsorption circuit, it is necessary to regenerate the carbon by removing organic and inorganic contaminants. A carbon regeneration kiln heats the carbon to approximately 1,300 °F to accomplish this. Provided below is a photo of a typical carbon regeneration kiln.



**Cessation:** The temporary or complete stopping.

**Collar:** The surface at the top of a shaft or decline; or the start of a drill hole.

**Colluvium:** A term applied to any loose heterogeneous and incoherent mass of soil, material and/or rock deposited by rainwash, sheetwash or slow continuous creep, usually collecting at the base of hillsides.

**Concentrate:** The valuable fraction of ore that is left after non-economic rock material is removed in processing. This material is what is sent for further processing, usually to a refinery or smelter.

**Contouring (Re-contouring):** Reshaping ground material into a final landform.

**Conveyor:** Mechanical infrastructure, generally electrically driven, which extends from a receiving point to a discharge point and conveys, transports, or transfers material between those points.

**Crest:** In surface mining, the highest point on a working bench.

**Crosscut:** Horizontal or nearly horizontal underground opening driven to intersect an ore body.

**Cyanide:** A naturally occurring organic compound composed of carbon and nitrogen (CN<sub>3</sub>). The solid chemical compound, sodium cyanide, is dissolved in water to form a solution suitable for the extraction of gold and silver from ore by using a leaching process.

**Cyanidation:** A type of ore processing facility where prepared ore is exposed to aqueous cyanide under a set of specific conditions to extract gold and silver.

## D

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**Decant:** to flow so as not to disturb the sediment. The goal being to separate water from sediment and fines.

**Deposit:** An accumulation of natural resources, such as gold and silver, other minerals, metals, coal, oil, gas, etc. that may be pursued for its intrinsic value; e.g. a gold and silver deposit.

**Development Rock:** The rock that must be removed and disposed of to gain access to and excavate ore. Also referred to as “waste rock”.

**Discharge:** The volume of water flowing past a point per unit time; commonly expressed as cubic feet per second (cfs).

**Drill Pad/Platform:** Terrain prepared to facilitate setup of a drill rig and ancillary support equipment and materials. Provided below are photos of a typical road-accessible drill pad (left) and a typical helicopter drill pad (right).





**Drill Jumbo:** A drilling jumbo consists of one, two to four rock drill carriages, sometimes a platform, which the miner stands on to load the holes with explosives, or clear the face of the tunnel.



## E

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**Elevation:** A vertical survey method to a point on the Earth's surface to indicate height; usually from the datum of mean sea level.

**Embankment:** A linear structure, usually constructed of earth or rock, as an extension above the natural ground surface so as to retain water or tailings.

**Energy Dissipaters:** Structures, usually built of rock or concrete, to disrupt and steady the flow of water and the like.

**Erosion:** The wearing away of the land surface by running water, wind, ice or other geologic agents including gravitational creep.

**Escape Egress Raise:** A method of exit from underground workings which people can access safely in an emergency such as a fire, spill, underground instability, or similar emergency. The goal of the escape egress raise is to create redundancy, so that people have multiple options to safely exit an unsafe area. Provided below is a photo of a typical underground escape egress raise.



**Evaporation:** the process by which a substance changes from a solid or liquid state into a vapor or gas.

**Excavation:** The process of removing soil and/or rock and materials from one location and transporting them to another.

**Excavator:** A piece of heavy construction or mining equipment used to dig material (e.g. a large backhoe or shovel). Provided below is a photo of a typical excavator.



**Exploration:** The search for deposits of useful minerals.

## F

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**Fault:** A displacement of rock along a shear surface or linear plane.

**Feasible:** See Practicable.

**Fill Material:** Soil or loose rock used to raise the surface of low-lying land, such as an embankment to fill a hollow.

**Floodplain:** Any low-level flat land the borders a stream that may be covered by its waters during a flood stage.

**Footwall:** For a dipping fault, the footwall is the block of rock positioned under the fault, the hanging wall is the block of rock positioned over the fault.

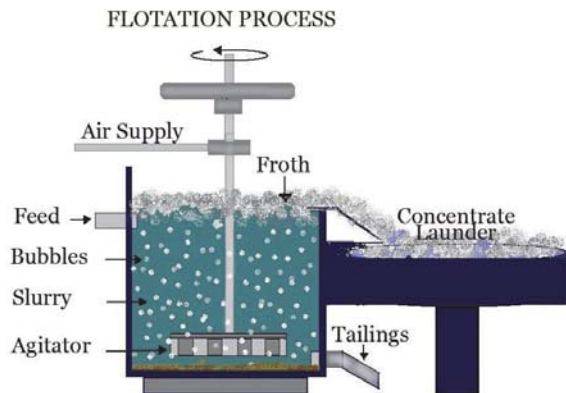
**Forebay:** An artificial pool of water upstream of a larger waterbody. Forebays are typically used in flood control to act as a buffer during flooding, impounding water, settling coarse sediment, and releasing water in a controlled way into the larger waterbody.

**Fractures:** Any break in the rock due to mechanical failure by stress; includes cracks, joints and faults.

**Frontend Loader:** A piece of heavy construction or mining equipment consisting of a large bucket connected to a hydraulic boom system mounted on a body; usually fitted with rubber tires. Provided below is a photo of a typical frontend loader (loading a haul truck).



**Froth Flotation:** Part of the ore processing facility process used to separate minerals, such as antimony and gold, from other non-economic rock material in the ore. Provided below is a schematic illustrating a typically flotation cell (left) and a photo of typical gold flotation froth (right).



**Fugitive Dust:** Dust particles suspended randomly in the air, usually from road travel, excavation, and rock loading operations.

## G

**Geochemistry:** The study of the distribution and amounts of chemical elements in minerals, ores, rocks, soils, water and the atmosphere and the study of the circulation of these elements in nature.

**Geosynthetic Clay Liner (GCL):** GCL is a woven fabric-like material that typically consists of two layers of geosynthetics stitched together enclosing a layer of processed sodium bentonite, which has a very low hydraulic conductivity. Provided below are typical photos of GCL.



**Geotechnical:** Concerned with the engineering design aspects of slope stability, settlement, Earth pressures, bearing capacity, seepage control and erosion.

**Grade:** based on the degree of purity of the mineral.

**Grader:** A piece of heavy construction or mining equipment; self-propelled machine with a row of digging teeth (behind) and a blade (front) to spread and level the material. Provided below is a photo of a typical grader.



**Grading:** The act of manipulating and leveling the ground surface.

**Groundwater:** Water beneath the land surface in the zone of saturation below the water table.

**Guard Rail:** A strong fence at the side of a road intended to reduce the risk of serious accidents. Provided below is a photo of a typical guard rail.



## H

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**Hanging wall:** For a dipping fault, the hanging wall is the block of rock positioned over the fault, the footwall is the block of rock positioned under the fault.

**Haul Road:** A road used by large (typically off-road vehicles) trucks to relocate material for deposition or construction purposes.

**H-poles:** Wooden structures used to lift, hold-up and secure power lines.





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**Induction Furnace:** An electrical furnace in which the heat is applied by induction heating of metal such as iron, steel, copper, aluminum and precious metals. Provided below is a photo of a typical gold/silver induction furnace.



**Infiltration:** The movement of water or other fluid into the soil (or other medium) through pores or other openings.

**Infrastructure:** The underlying foundation or basic framework; substructure of a community (i.e. schools, police, fire department, roads, water, sewer systems, etc.)



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**Jaw Crusher:** A jaw crusher is a mechanical device that uses compressive force for breaking of particles such as large rocks. The compressive force is achieved by the two jaws of the crusher of which one is fixed while the other reciprocates. Provided below is a photo of a typical jaw crusher.



# K

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**Kilovolts (kV):** A unit of measurement for electrical potential energy; 1kV = 1000 Volts.

# L

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**Leachate:** The solution obtained by leaching.

**Leaching:** The process of applying a chemical agent to bond preferentially with and dissolve materials such as gold and silver.

**Liners:** Low permeability material (clay or synthetic) used to create a barrier, such as between tailings and the ground surface.

# M

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**Mine:** An opening or excavation in the ground for the purpose of extracting minerals.

**Mine Life:** The period in which through labor, capital and tangible resources the ore reserves will be extracted.

**Mineralization:** The process by which a mineral or minerals are introduced to rock, resulting in a valuable or potentially valuable deposit; a zone of ore.

**Mining:** The science, technique, and business of mineral discovery and exploitation; the act of extracting ore out of the ground.

**Mitigation (Mitigate):** Includes: avoiding an impact altogether by not taking action or certain parts of an action; minimizing impacts by limiting the degree of magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating or restoring the environmental effects; reducing or elimination of the impact over time by preservation and maintenance of operations during the life of the action; and/or compensating for the impact by replacing or proving substitute resources or environments.

**Moisture Content:** The amount of moisture in the medium. Moisture is defined as water diffused in the atmosphere or the sample.

# N

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**Neutralization:** A chemical reaction in which an acid and a base react quantitatively with each other. In a reaction in water neutralization results in there being no excess of hydrogen or hydroxide ions present

in solution. The pH of the neutralized solution depends on the acid strength of the reactants. Neutralization is used in many applications.

## O

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**Off-highway Trucks:** Also known as a Haul Truck, a truck of such size, weight, or dimensions that it cannot be used on public highways. Provided below is a photo of a typical off-highway haul truck.



**Open Pit Mining:** A type of surface mining that involves excavation of the ore and development rock by above ground techniques. The result of such an operation is known as an “open pit.”

**Ore:** A deposit of rock from which valuable material or minerals can be economically mined for profit. Minerals to be recovered at the Stibnite Gold Project include antimony, gold, and silver.

**Ore Processing Facility:** The general process of separating the valuable constituent (e.g. gold, silver, antimony) from the undesirable or non-economic constituent of the ore material.

**Outfall Location:** The location of the mouth of the stream or the outlet of the lake; or the vent or end of a drainpipe, tube, ditch, canal that carries tailings slurry.

## P

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**Parameter:** A variable as a part of a set of comparable variables or limits, boundaries or guidelines.

**Patented Claim:** Land granted by the U.S. government to a private party based on mineral value and meeting other requirements under the federal mining laws. It is private property whereby the owner has title to the surface and mineral resources. Note: generally, patents for mining claims are no longer issued by the U.S. government.

**Piezometer:** A device for measuring moderate ground water pressures.

**Policy (Policies):** A guiding principle upon which is based a specific decision or set of decisions.

**Portal:** Entrance to an underground mine. Provided below is a photo of a typical underground mine portal.



**Practicable or Feasible:** Capable of being reasonably done under practical conditions, including economic and technical factors.

**Probable Maximum Flood (PMF):** The PMF is the largest flood that could conceivably occur at a particular location, usually estimated from Probable Maximum Precipitation (PMP), and where applicable, snow melt, coupled with the worst flood producing catchment conditions.

## Q

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**Quaternary Alluvium:** Deposits of alluvium, mainly sorted sands, gravel and boulders of streams and alluvial fans. The Quaternary Period is the current geologic time periods of the Cenozoic Era and spans from approximately two and half million years ago to present. The most recent period is the Holocene period that began approximately 12,000 years ago.

## R

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**Raise:** Underground opening driven upward from one level to a higher level or to the surface; a raise may be either vertical or inclined.

**Ramp:** Inclined underground opening that connects levels or production areas: ramps are inclined to allow the passage of motorized vehicles. Ramps are usually driven downward.

**Raptor-Deterring:** A design that minimizes the available space on top of a utility pole and restricts the clearance for the birds to fly, build nests and perch.

**Reclamation:** Returning disturbed land to a productive form, usually with conformity with a predetermined Land Management Plan (LMP) or government approved plan or permit.



**Redd:** A spawning nest that is built by salmon and steelhead in the gravel of streams or the shoreline of lakes. It is formed by the female using her tail to dig in a small area of gravel in the bottom of the stream or shore. Here she forms several depressions in the gravel forming egg pockets into which she deposits her eggs.

**Reserves:** Identified resources of mineral or fuel bearing rock from which a mineral can be extracted profitably with existing technologies under present market conditions.

**Resource:** Reserves plus all other mineral deposits that may become available – either known deposits that are not economical or technologically recoverable, or deposits that have been inferred yet not fully discovered (see *Reserves*).

**Right-of-Ways:** A strip of land or corridor over which a powerline, access road or maintenance road can pass.

**Riparian:** A type of ecological community that occurs next to streams and rivers directly influenced by water. It is characterized by certain types of vegetation, soils, hydrology, and fauna and requires free or unbound water conditions more moist than normally found within that area.

**Riparian Zone:** Terrestrial areas where the vegetation and microclimate are influenced by perennial and intermittent water, associated with high water tables.

**Runoff:** Precipitation or snowmelt that is not retained on the site where it falls, not absorbed by the soil; the natural drainage away from an area.

## S

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**SAG Mill:** SAG is an acronym for semi-autogenous grinding. SAG mills are essentially autogenous mills that utilize a small ball charge (typically 10-20%) to aid in grinding. A SAG mill is generally used as a primary or first stage grinding solution. SAG mills are characterized by their large diameter and short length as compared to ball mills. Provided below is a photo of a typical SAG mill.



**Sediment:** Earth material transported, suspended and deposited by air, water or ice; also the some material once it has been deposited.

**Sedimentation:** The act or process of accumulating sediment in layers; including the deposition, transportation and actual diagenetic changes to form ultimate consolidation.

**Seismic:** Of or pertaining to earthquakes or Earth vibration, including those that are artificially produced.

**Shovel:** Any bucket-equipped machine used for digging and loading earthy or fragmented rock materials; shovels can be electrically (rope) or hydraulically powered. Provided below are photos of a typical hydraulic shovel (left) and a typical rope shovel (right).



**Sinuosity:** A continuous curve, as in a stream course.

**Slurry:** A highly fluid mixture of water and finely divided material; either naturally occurring such as a muddy lake-bottom deposit; or man-made like the tailings slurry sent through pipe for treatment.

**Smelter:** A furnace in which the raw materials of ores are melted to produce metal.

**Socioeconomic:** Pertaining to or signifying the combination or interaction of social and economic factors.

**Soil:** The natural medium for the growth of plants; a term used in the soil classification for the collection of natural earthy materials on the Earth's surface.

**Soil Productivity:** The capacity of the soil, in-situ, to produce a specified plant or sequence of plants under a certain ecosystem. Productivity is generally dependent on availability of soil moisture and nutrients as well as length of growing seasons.

**Spigot(s):** a faucet or cock for controlling the flow of liquid from the pipeline.

**Stibnite:** The chemical formula for antimony sulfide ( $Sb_2S_3$ ). A lead-gray mineral with a brilliant metallic luster. It is the principal ore of antimony.

**Stockpile:** Material piled for future use.

**Stope:** Underground excavation made by removing ore from surrounding rock.

**Stormwater:** The runoff that reaches stream channels immediately after rainfall or snowmelt.

**Surface Water Channels:** Pathways which remove water from its natural course; mostly by means of a ditch.

**Sulfide:** A mineral compound characterized by the bonding with the native element of sulfur (S).

**Supernatant Pool:** In a tailings impoundment, the water that gathers above the settled tailings material.

**Synthetic liner:** A protective layer comprised of man-made materials installed along the bottom, sides and/or top of a disposal area to reduce the fluid migration into or out of that disposal area.

## T

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**Tailings:** The non-economic, ground rock material that remains after the valuable minerals have been removed from the ore by milling and subsequent mineral recovery circuits.

**Tailings Storage Facility (TSF):** The TSF embankment and all associated infrastructure needed to safely, efficiently and successfully manage and store tailings.

**Topography:** A configuration of surface including its relief, elevation, and the portion of natural and human created features.

**Tributary (Tributaries):** A stream, feeding, joining, or flowing into a larger stream or into a lake.

## U

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**Underground Mining:** A mining method consisting of an adit or shaft access where ore is mined using various methods and hauled to the surface.

**Unpatented Claim:** A parcel of Federal (U.S.) land that a private individual (or company) has asserted a right of possession and staked and filed for a locatable mineral deposit or deposits under the federal mining laws. The claimant has possession of the land with the right to extract minerals, pursuant to federal, state and local regulations. No land ownership is conveyed from the U.S. government to the claimant.

## V

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**Vegetation:** All the plants or plant life of a place, taken as a whole.

**Velocity:** The rate of change of the position of an object, equivalent to a specification of its speed and direction of motion, e.g. 60 miles per hour to the North.

## W

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**Wall Rock:** Wall in which an ore deposit is enclosed.

**Waste Rock:** Barren rock or rock of too low a grade to be mined economically.



**Water of the United States:** A jurisdictional term from the Clean Water Act and implementing regulations referring to wetlands, streams, and other water bodies within the scope of fill permitting requirements under Section 404 of the Act.

**Watershed:** The entire land area that contributes water to a particular drainage system or stream.

**Wetland:** A land area that is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem.

**Windrow:** A ridge of soil, typically pushed-up by a grader or bulldozer, usually for the purposes of safety or delineation.