RPMGlobal’s Mining for Non Miners (MFNM) course provides a platform of understanding for participants from non-mining backgrounds. The course is interactive and designed to give participants an experience of the operational practices pivotal to the mining industry. During the course, participants will also gain exposure to common terminology used in mining, giving a greater level of industry knowledge and confidence with interacting with core mining staff.

MFNM is ideal for those who are looking to achieve effective working relationships with core mining staff or who have peripheral contact with the mining industry.

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Abutment - in coal mining:
1. the weight of the rocks above a narrow roadway is transferred to the solid coal along the sides, which act as abutments of the arch of strata spanning the roadway;
2. the weight of the rocks over a longwall face is transferred to the front abutment, that is, the solid coal ahead of the face and the back abutment, that is, the settled packs behind the face.

Abutment Pressures - when an opening is created in a coal seam, the stress that was present before the opening was created is re-distributed to the adjacent coal pillars that are left. The areas within the remaining coal where the vertical stress is greater than the average are called abutments and hence the stresses in those areas are called abutment pressures.

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 sulphuric 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 sulphur and nitrogen oxides resulting from fossil fuel combustion.

Acid Mine Water - mine water that contains free acid, mainly due to the weathering of sulphide rock types.

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.

Advance - mining in the same direction, or order of sequence; first mining as distinguished from retreat.

Advance Longwall - the longwall advances away from the mains roads and ‘creates’ access roads in the form of a main gate and tailgate (supply gate or sewer gate).

AIMEX - Asia-Pacific International Mining Expo.

Air Split - the division of a current of air into two or more parts.

Airway - any passage through which air is carried.

Anemometer - instrument for measuring air velocity.

ANFO (Ammonium Nitrate Fuel Oil) - an explosive made by mixing ammonium nitrate and fuel oil.

AN (Ammonium Nitrate) - a component of the widely used explosive ANFO.

Angle of Dip - the angle at which strata or mineral deposits are inclined to the horizontal plane. In most localities, earth movements subsequent to deposition of the strata have caused them to be inclined or folded.

Angle of Repose - the maximum slope at which a heap of any loose or fragmented solid material will stand without sliding or come to rest when poured or dumped in a pile or on a slope.
Angle of Draw - in coal mine subsidence, this angle is assumed to bisect the angle between the vertical and the angle of repose of the material and is 20° for flat seams. For dipping seams, the angle of break increases, being 35.8° from the vertical for a 40° dip. The main break occurs over the seam at an angle from the vertical equal to half the dip.

Anthracite – coal of the highest rank having a high carbon content and a low volatile matter. It has a bright black lustre.

Anticline - an upward fold or arch of rock strata.

Aquifer - a bed of rock strata that contains water. The presence of aquifers must be taken into consideration when designing any mine.

Arch – a steel support of two or three sections which, when bolted together, for a strong permanent support.

Arching - fracture processes around a mine opening, leading to stabilisation by an arching effect.

Area (of an airway) - average width multiplied by average height of airway, expressed in square metres.

Armoured face conveyor (AFC) – an articulated chain conveyor that transports the coal along the longwall face after it has been cut by the coal shearer. From the AFC, the coal is transferred to the beam stage loader.

Ash – inorganic residue after incineration of coal.

Ash Analysis – expresses the composition of ash in terms of its oxides.

Assay - in general, the determination of the quantity of a desired metal per unit mass of the material containing it. The term assay is usually restricted to materials containing precious metals.

Auger - a rotary drill that uses a screw device to penetrate, break, and then transport the drilled material (coal).

Auger Scraper - see wheel tractor-scraper.

Auxiliary Fan – used in conjunction with air ducting to the direct portion of the main ventilating current to the working face.

Auxiliary Operations - all activities supportive of, but not contributing directly to mining.

Auxiliary Ventilation - portion of main ventilating current directed to face of dead end entry by means of an auxiliary fan and tubing.

Azimuth - a surveying term that references the angle measured clockwise from any meridian (the established 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.
angle between the meridian and the line. The meridian is an established line of reference. Azimuths are angles measured clockwise from any meridian.

Bearing plate – a plate used to distribute a given load. In roof bolting, the plate used between the bolt head and the roof.

Bed – a stratum of coal or other sedimentary deposit.

Belt conveyor – a looped belt on which materials can be carried and which is generally constructed of flame-resistant material, of reinforced rubber, or a rubber-like substance.

Belt Extension – adding lengths of structure to a conveyor belt to move its termination point inbye.

Belt Idler – a roller, usually of cylindrical shape, which is supported on a frame and which, in turn, supports or guides a conveyor belt. Idlers are not powered, but turn by contact with the moving belt.

Beltman – a person who operates and maintains the belt.

Belt Retraction – a job of removing lengths of structure from a conveyor belt to move its termination point outbye.

Belt Take-Up – a belt pulley, kept under strong tension parallel to the belt line. Its purpose is to automatically compensate for any slack in the belting created by start-up, and so on.

Belt Weightometer – an appliance for the continuous weighing of material in transit on a belt conveyor.

Bench – a ledge, which in open-pit mines and quarries, forms a single level of operation above which mineral or waste materials are excavated from a continuous bank or bench face. The material or waste is removed in successive layers, each of which is a bench. Several benches may be in operation simultaneously in different parts of and at different elevations in an open-pit mine or quarry.

Bench Height – the vertical distance between the base of one bench and the base of the overlying bench. The bench height is designed by the mine planner. The main constraint on height of bench is usually the limiting thickness that can be handled by the drills and/or the loading equipment.

Bench Face Slope – the angle measured in degrees between the toe of the bench and the crest. Typically this slope is about 60 degrees or in the ratio of two units vertically to one horizontal. The material type and extent of blasting will influence the angle.

Beneficiation – the treatment of mined material, making it more concentrated or richer. Crushing and separating ore into valuable substances or waste by any of a variety of techniques.

Berm – a horizontal shelf or ledge built into an embankment or sloping wall of an open-pit or quarry to break the continuity of an otherwise long slope for the purpose of strengthening and increasing the stability of the slope or to catch or arrest slope slough material. A berm may also be used as a haulage road or serve as a bench above which material is excavated from a bank or bench face.

Berm or Safety Berm – a small horizontal shelf which is usually the remnant of a bench left within the final pit wall slope. The primary purpose of a safety berm is to catch small rocks falling off the sides of the pit walls, to provide access for drainage, and for general slope stability. Berms may be wide enough for light vehicle access (five to ten metres), even if no roads are actually established along them. This allows room for clean-up using small equipment.

Binder – a streak of impurity in a coal seam.

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.

Bituminous Coal – a middle rank coal (between sub-bituminous and anthracite) formed by additional pressure and heat on lignite. Usually has a high energy value and may be referred to as ‘soft coal.’

Black Coal – a general term for coal of either sub-bituminous, bituminous or anthracite rank.

Black Damp - a term generally applied to carbon dioxide. Strictly speaking, it is a mixture of carbon dioxide and nitrogen. It is also applied to an atmosphere depleted of oxygen, rather than having an excess of carbon dioxide. Heavier than normal air.

Blast – a controlled explosion that is used to loosen the substance being mined.

Blast Hole – a hole drilled into rock to accommodate an explosive charge for blasting (breaking) rock or ore.

Blasting Agent – material or mixture consisting of fuel (combustible) and oxidiser, used as an explosive. Ingredients are not classified as explosives.

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.

Blasting Circuit – electric circuits used to fire electric detonators or to ignite an igniter cord by means of an electric starter.

Blast Furnace – the receptacle for iron ore, coke and other raw materials used in the processing of iron ore into pig iron. Pig iron is subsequently processed into steel.

Bleeder or Bleeder Entries – special air courses developed and maintained as part of the mine ventilation system and designed to continuously move air-methane mixtures emitted by the goaf or at the active face away from the active workings and into mine-return air courses. Also called Exhaust ventilation lateral.

Bolt Torque – the turning force in Newton-metres applied to a roof bolt to achieve an installed tension. The turning force of 1 newton acting on a 1 metre length. The approximation of 1 kg corresponding to 10 N is sometimes used as a rule of thumb in everyday life and in engineering.

Booster – an explosive of special character, used in small quantities to improve the performance of another explosive. A high explosive used to initiate an explosive charge.

Booster Fan – an underground installation of secondary fans to assist the main fans ventilating the mine.
Bord and Pillar – Method of underground coal mining where bords and cut-throughs are driven to form pillars.

Borehole – any deep or long drillhole, usually associated with a diamond drill.

Bottom – floor or underlying surface of an underground excavation.

Boss – any member of the managerial ranks who is directly in charge of miners (for example, ‘shift-boss,’ ‘face-boss,’ ‘fire-boss’).

Box-Type Magazine – a small, portable magazine used to store limited quantities of explosives or detonators for short periods of time at locations in the mine that are convenient to the blasting sites where they will be used.

Brattice or Brattice Cloth – fire-resistant fabric or plastic partition used in a mine passage to confine the air and force it into the working place. Also termed ‘line brattice,’ ‘line canvas,’ or ‘line curtain.’

Breaker – circuit breaker in electrical circuits.

Break Line – the line that roughly follows the rear edges of coal pillars that are being mined. The line along which the roof of a coal mine is expected to break.

Breakthrough – a passage for ventilation that is cut through the pillars between rooms. (Also known as a cut through).

Bridge Carrier – a rubber-tyre-mounted mobile conveyor, about 10 metres long, used as an intermediate unit to create a system of articulated conveyors between a mining machine and a room or entry conveyor.

Bridge Conveyor – a short conveyor hung from the boom of a mining or lading machine or haulage system, with the other end attached to a receiving bin that dollys along a frame supported by the room or entry conveyor, tailpiece. Thus, as the machine boom moves, the bridge conveyor keeps it in constant connection with the tailpiece.

Brow – a low place in the roof of a mine, giving insufficient headroom.

Brown Coal – coal of the lowest rank, of a soft friable nature and high moisture in an air-dried sample.

Brushing – digging up the bottom or taking down the top to give more headroom in roadways.

Bug Dust – the fine particles of coal or other material resulting from the boring or cutting of the coal face by drill or machine.

Bump or Burst – a violent dislocation of the mine workings that is attributed to severe stresses in the rock surrounding the workings.

Burden – the volume of rock that lies within the zone of influence of a charge of explosive; the volume of rock to be broken by any hole or charge. Distance between blast holes measured perpendicular to the free face.

Butt Cleat – a short, poorly defined vertical cleavage plane in a coal seam, usually at right angles to the long face cleat.

Butt Entry – a coal mining term that has different meanings in different locations. It can be synonymous with panel entry, sub main entry, or in its older sense it refers to an entry that is ‘butt’ onto the coal cleavage (that is, at right angles to the face).

Bunker – a temporary storage area for mineral – usually associated with an in feed and out feed system. Bunkers can have various designs – vertical, inclined or horizontal.

Cage - in a mineshaft, the device, similar to an elevator car, that is used for hoisting personnel and materials.

Caking Coal – The caking behaviour is critical to coke making. A successful coke must be strong and not powdery. Prime coking coals have GK indexes of G (and its subdivisions). If the GK index is less than G, a weak, unstable coke is made.

Calorific Value - the quantity of heat that can be liberated from one pound of coal or oil.

Cannel Coal – a massive, non-caking block coal with a fine, even grain and a conchoidal fracture which has a high percentage of hydrogen, burns with a long, yellow flame, and is extremely easy to ignite.

Canopy - a protective covering of a cab on a mining machine. The top section of a longwall shield.

Cap - a miner’s safety helmet. Also, a highly sensitive, encapsulated explosive used to detonate larger but less sensitive explosives.

Cap Block - a flat piece of wood inserted between the top of the prop and the roof to provide bearing support.

Cap Lamp – a rechargeable, battery operated light worn on a miner’s safety helmet.

Car - a railway wagon, especially any of the wagons adapted to carrying coal, ore, and waste underground.

Car Cable – the electric trailing cable on a shuttle car.

Car-Dump - the mechanism for unloading a loaded car.

Carbide Bit - more correctly, cemented tungsten carbide. A cutting or drilling bit for rock or coal, made by fusing an insert of moulded tungsten carbide to the cutting edge of a steel bit shank.

Carbon Credit – a measure devised by the Kyoto Protocol to reduce world greenhouse gas emissions. One credit represents the elimination of a single tonne of carbon dioxide from the atmosphere which can then be sold, for example to emitters that exceed their emissions cap in a carbon trading scheme.
Carbon Footprint – in simple terms, a measure of the greenhouse gas a person, organisation or entity emits or has caused to be emitted. It should incorporate direct emissions (for example, emissions produced on-site) and indirect emissions (for example, emissions that result from use or purchase of product such as airline travel).

Carbon Neutral – a pledge to reduce net emissions to zero. Correctly done, this entails a detailed calculation of total emissions (‘carbon footprint’), followed by implementation of an efficiency program to reduce as much energy use as possible (for example, by removing and/or substituting ‘energy-hungry’ sources, switching to green power, changing energy behaviour patterns). As a last resort, remaining residual emissions may be abated through an accredited carbon offset scheme.

Carbon Offset – a unit of greenhouse gas (the equivalent of one tonne of carbon dioxide) that is saved, abated or sequestered and then sold to compensate for the same amount emitted elsewhere. To be considered credible, an offset must satisfy certain criteria.

Carbon Sequestration – long-term storage of carbon or carbon dioxide in the forests, soils, ocean or even underground depleted oil or gas reservoirs, or aquifers.

Carbon Trading – also known as Carbon Emissions Trading. It is a price placed on carbon emissions, but rather than a tax it works by a ‘cap’ being placed on the amount of emissions permitted by a participating organisation. Those that cannot meet their cap are forced to either buy credits (‘trade’) or reduce their emissions.

Carbon Tax – an alternative to carbon emissions trading, which, if introduced, would entail a tax on the consumption of carbon-based non-renewable fuels such as petrol. While an emissions trading model means the government sets the emission level to be achieved (by the ‘cap’), a carbon tax model means the government would add a tax for the volume of emissions generated.

Cavity – an area of roof in an underground mine where rock has fallen, usually due to lack of support or natural structures, such as faults. Hazardous situation.

Cast - a directed throw. In strip-mining, the overburden is cast from the coal to the previously mined area.

Certified - describes a person who has passed an examination to do a required job. Also used to describe equipment tested for suitability to be used in a mining operation.

Chain conveyor - a conveyor on which the material is moved along solid pans (troughs) by the action of scraper crossbars attached to powered chains.

Chain Pillar - the pillar of coal left to protect the gangway or entry and the parallel airways.

Charging Up - filling up drill holes with explosives.

Charge - the explosive or blasting agent used in a blast hole.

Check Curtain - sheet of brattic cloth hung across an airway to control the passage of the air current.

Check Inspector – official of the union appointed by the underground employees to look after interests regarding safety. The duties are described in the regulations governing mining operations.

Chock - large hydraulic jacks used to support roof in longwall and short wall mining systems. Also known as powered roof supports.

Cinder Coal (Natural Coke, Cinder) – coal that has been significantly altered by heat associated with natural igneous activity, usually local in character.

Clay Vein - a body of clay-like material that fills a void in a coal bed.

Cleat - the vertical cleavage of coal seams. The main set of joints along which coal breaks when mined.

Clean Coal Technologies – a number of innovative, new technologies designed to use coal in a more efficient and cost-effective manner while enhancing environmental protection. Several promising technologies include: fluidised-bed combustion, integrated gasification combined cycle, limestone injection multi-stage burner, enhanced flue gas desulphurisation (or ‘scrubbing’), coal liquefaction and coal gasification.

Climate Change – a gradual change in the climate because of change in the earth’s atmosphere that may include an increase in global temperature (global warming) and changes to rainfall and wind intensities. Scientific evidence has shown humans have contributed to climate change largely by burning fossil fuels. Greenhouse gas is also emitted from agriculture and land clearing. As greenhouse gases accumulate in the atmosphere, less heat from the sun is able to be reflected. Hence, a ‘greenhouse’ effect is created, whereby heat is trapped and the earth’s temperature increases.

Coal - a solid, brittle, more or less distinctly stratified combustible carbonaceous rock, formed by partial to complete decomposition of vegetation. Coal varies in colour from dark brown to black. It is not fusible without decomposition and is very insoluble.

Coal Block – a section of in situ coal that may range in size, generally pillar to longwall block.

Coal Dust - particles of coal that can pass through a No. 20 sieve.

Coal Gasification – the conversion of coal into a gaseous fuel.

CHPP – Coal Handling Preparation Plant.

Coal Handling Preparation Plant – a plant used to upgrade the quality of coal including crushing, sizing and drying. Usually refers to the reduction of ash forming mineral in coal.

Coal Mine – a mine or pit from which coal is obtained. This includes all structures, facilities, machinery, tools, equipment, shafts, slopes, tunnels, excavations, and other property, real or personal, placed upon, under, or above the surface of such land by any person, used in extracting coal from its natural deposits in the earth. The work of preparing the coal that has been extracted, including coal preparation facilities, is also part of the coal mine. The British term is colliery.

Coal Mines Regulation Act (CMRA) – all coal mines in NSW must operate within this act. The Act can be viewed on the NSW Department of Mineral Resources website.

Coal Reserves - measured tonnages of coal that have been calculated to occur in a coal seam within a particular property or lease boundary.
Coal Washing – the process of separating undesirable materials from coal based on differences in densities. Pyritic sulphur, or sulphur combined with iron, is heavier and sinks in water; coal is lighter and floats.

Coke – the final product of the carbonisation of coal. A hard, dry carbon substance produced by heating coal to a very high temperature in the absence of air.

Coke Oven – an enclosed vessel in which coking coal is converted to coke for use in steel making. The airtight compartments into which coking coal is charged and subsequently heated to about 1000 degrees Celsius.

Coking Coal – coal that is suitable to be used to produce coke. Coke is used in the process to produce steel products.

Collar - the term applied to the timbering or concrete around the mouth (top) of a shaft. The beginning point of a shaft or drillhole at the surface.

Collery - British name for coal mine.

Column Flotation – a pre-combustion coal cleaning technology in which coal particles attach to air bubbles rising in a vertical column. The coal is removed at the top of the column.

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).

Compressed Air – a high volume energy created using compressors. Pipes & hoses supply numerous forms of equipment from pumps to rock drills.

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.

Continuous Miner - a machine that simultaneously extracts and loads coal or rock. This is to be distinguished from a cyclic unit, which must stop the extraction process in order for loading to commence.

Contour - an imaginary line that connects all points on a surface having the same elevation or value.

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, and so on.

Core Sample – a cylinder sample generally 25 to 150mm in diameter drilled out of an area to determine the geologic and chemical analysis of the overburden and coal.

Coupling – a tube that connects the shank to the steel.

Cover - the overburden of any deposit.

Creep - the forcing of pillars into soft bottom by the weight of a strong roof. In surface mining, a very slow movement of slopes downhill. Also relevant to the longwall face conveyor alignment to maingate.

Crib - a roof support of prop timbers or ties, laid in alternate cross-layers, log-cabin style. It may or may not be filled with debris. A crib may also be called a chock or cog, or be known as taking time to eat or break from work.

Cribbing - the construction of cribs or timbers laid at right angles to each other, sometimes filled with earth, as a roof support or as a support for machinery.

Crop coal - coal at the outcrop of the seam. It is usually considered of inferior quality due to partial oxidation, although this is not always the case.

Crossbar - the horizontal member of a roof timber set supported by props located either on roadways or at the face.

Crosscut - a horizontal member of a roof timber set supported by props located either on roadways or at the face.

Crosscut Tunnel - a passageway driven between the entry and its parallel air course (or air courses) for ventilation purposes. Also, a tunnel driven from one seam to another through or across the intervening measures; sometimes called ‘crosscut tunnel’, or ‘breakthrough’. In vein mining, an entry perpendicular to the vein. Also known as cut through.

Cross Entry - an entry running at an angle with the main entry.

Cross Measure – usually applies to a tunnel or drift that is excavated through varying types of strata from one level to another.

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.

CSN – Crucible Swelling Number. The higher the number, the better the coking properties.

Cut-off Grade - the unit metal content at which ore is separated from waste. This is an economic distinction.

Cut-out Grade - the unit metal content at which ore is separated from waste. This is an economic distinction.

Cutter or Cutting Machine - a machine, usually used in coal, that will cut a 10- to 15-cm slot. The slot allows room for expansion of the broken coal. Also applies to the person who operates the machine and to workers engaged in the cutting of coal by pick or drill.

Cut Through – the roadway that joins on to another. Cut throughs are numbered in sequence going inbye along the length of the development.

Cycle Mining - a system of mining in more than one working place at a time; that is, a miner takes a lift from the face and moves to another face while permanent roof support is established in the previous working face. Also known as “place changing” or “cut and fit.”
Deadman – usually refers to a switch that operates power to a machine. The operator needs to keep the deadman switch on while it is safe to do so.

Decline – an inclined roadway or drift connected with the mining or transporting of coal.

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 - generally means 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.

Deputy – supervisor in charge of a section or district of a mine, and all employees working therein. The statutory duties, responsibility and authority of a deputy are documented in the regulations governing mining.

Detectors - specialised chemical or electronic instruments used to detect and monitor mine environment, for example, gases, smoke, air velocity.

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 - work undertaken to open up an area of an underground mine, as distinguished from the work of actual mineral extraction.

Diffusion - blending of a gas and air, resulting in a homogeneous mixture. Blending of two or more gases.

Diffuser fan - a fan mounted on a continuous miner to assist and direct air delivery from the machine to the face.

Digability - a description of how much effort is required to excavate a given material.

Digging height - maximum safe digging height of an excavator.

Dilute - to lower the concentration of a mixture; in this case, the concentration of any hazardous gas in mine air by adding fresh intake air.

Dilution - waste material adjacent to the ore that is ‘unavoidably’ mined with the ore. The amount of dilution is a function of equipment type, size and physical differences (for example, colour — whether the operator can actually see the difference between waste and ore at night).

Dip - the inclination of a geologic structure (bed, vein, fault, and so on) from the horizontal; dip is always measured downwards at right angles to the strike.

Direct haulage – a single rope haulage system usually installed or an inclined roadway/drift for materials access.
E

Eickhoff – a mining equipment manufacturer specialising in longwall shearsers and chainless haulage system for AFCs. The company is based in Germany, and has operations in America, Great Britain, Poland and South Africa.

Electrical Grounding - to connect with the ground to make the earth part of an electrical circuit.

Elevating Scraper - see wheel tractor-scraper.

Endless – applied to rope haulage systems, consists of a main rope (between the tracks) and a rail rope for balance.

Energy Coal – coal used to provide heat for steam raising as part of the electricity generation process.

Entry -
1. an underground horizontal or near-horizontal passage used for haulage, ventilation, or as a main way;
2. a coal heading;
3. a working place where the coal is extracted from the seam in the initial mining; same as ‘gate’ and ‘roadway,’ which are both British terms.

Evaluation - the work involved in gaining a knowledge of the size, shape, position and value of coal.

Excavator - a digging vehicle consisting of an articulated arm (boom, stick), bucket and cab mounted on a pivot (a rotating platform) atop an undercarriage with tracks or wheels.

Exploder - a portable electrical energy source used to initiate electric detonators e.g. Beethoven, Nissan.

Exploration - the search for mineral deposits and the work done to prove or establish the extent of a mineral deposit. Also, prospecting and subsequent evaluation.

Explosive - any rapidly combustive or expanding substance. The energy released during this rapid combustion or expansion can be used to break rock.

Extraction - the process of mining and removing ore from a mine.

F

Face -
1. the exposed area of a coal bed from which coal is being extracted.
2. the area of the mine from which material is being extracted.

Face cleat - the principal cleavage plane or joint at right angles to the stratification of the coal seam.

Face conveyor - any conveyor used parallel to a working face that delivers coal onto another conveyor.

Factor of Safety - the ratio of the ultimate breaking strength of the material to the force exerted against it. If a rope will break under a load of 6000 lbs., and it is carrying a load of 2000 lbs., its factor of safety is 6000 divided by 2000 which equals 3.

Fall - a mass of roof rock or coal that has fallen in any part of a mine.

Fan, Auxiliary - a small, portable fan used to supplement the ventilation of an individual working place.

Fan, Booster - a large fan installed in the main air current, and thus in tandem with the main fan.

Fan Signal - automation device designed to give alarm if the main fan slows down or stops.

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.

Fault Zone - a fault, instead of being a single clean fracture, may be a zone hundreds or thousands of metres wide. The fault zone consists of numerous interlacing small faults or a confused zone of gouge, breccia, or mylonite.

Feeder - a machine that feeds coal onto a conveyor belt evenly.

FEL (Front End Loader) – a rubber-tyred, articulated loading machine.

Fill - any material that is put in place of the extracted ore to provide ground support.

Fire Damp - the combustible gas, methane, CH4. Also, the explosive methane-air mixtures with between 5% and 15% methane. A combustible gas formed in mines by decomposition of coal or other carbonaceous matter, and that consists chiefly of methane.

Firing - exploding holes charged with explosive.

Fissure - an extensive crack, break, or fracture in the rocks.

Fixed carbon – the part of the carbon that remains behind when coal is heated in a closed vessel until all of the volatile matter is driven off.

Flameproof Equipment – equipment within which an explosive mixture of gas can ignite without igniting the explosive gases surrounding the outside of the equipment.

Flat-Lying - deposits and coal seams with a dip up to 5 degrees.

Flight - the metal strap or crossbar attached to the drag chain-and-flight conveyor. Also spelt Flite.

Flotation – wet process for the separation of coal from waste rock. The coal particles are lifted or floated to the surface by air bubbles in a liquid.

Float Dust - fine coal dust particles carried in suspension by air currents and eventually deposited in return entries. Dust consisting of particles of coal that can pass through a No. 200 sieve.
Floor - the 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.

Floor Heave – the process of the floor of an underground mining area being forced upward due to ground pressure.

Flue Gas Desulphurisation – any of several forms of chemical processes that remove sulphur compounds formed during coal combustion. The devices, commonly called ‘scrubbers,’ combine the sulphur in gaseous emissions with another chemical medium to form inert ‘sludge’ which must then be removed for disposal.

Fluidity – the degree to which coal becomes plastic over certain temperature ranges during the carbonisation process. The measurement of “maximum fluidity” is used by some steel makers in assessing the ability of coal particles to mix with other coals in a coke oven blend. Maximum fluidity is determined by placing a sample of finely ground coal in a crucible and measuring the speed of rotation of a paddle placed within the crucible which is heated. A gravitational force is applied to the paddle and the maximum rotation of the paddle is measured to dial divisions per minute or DDPM. The temperature at which the paddle reaches maximum rotation differs for varying coal types.

Fluidised Bed Combustion – a process with a high degree of ability to remove sulphur from coal during combustion. Crushed coal and limestone are suspended in the bottom of a boiler by an upward stream of hot air. The coal is burned in this bubbling, liquid-like (or fluidised) mixture. Rather than released as emissions, sulphur from combustion gases combines with the limestone to form a solid compound recovered with the ash.

Fly Ash – the finely divided particles of ash suspended in gases resulting from the combustion of fuel. Electrostatic precipitators are used to remove fly ash from the gases prior to the release from a power plant’s smokestack.

Foam – can be used in either cementitious or resin based to fill a cavity, usually in a longwall situation.

Footwall -
1. the lower wall of an inclined or horizontal fault
2. the junction of the ore body and the country rock on the lower side of the lode, that is, the wall upon which the ore body may be considered to be resting

Footwall and hanging wall - the footwall is the side of the pit underlying a sloping orebody or steeply dipping coal seam. The hanging wall is on the side overlying the orebody—if you imagine all of the ore removed, the remaining waste would be overhanging. The terms originated in underground mining but are now also commonly used in open-pit mining.

FOPS (Fall Over Protective Structure) – a structure fitted to surface mining excavators that protects the operator in the event that the machine falls over on its side.

Formation – any assemblage of rocks that have some characteristic in common, whether origin, age, or composition. Often, the word is loosely used to indicate anything that has been formed or brought into its present shape.

Fossil Fuel – any naturally occurring fuel of an organic nature, such as coal, crude oil and natural gas.

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.

Frangible - fragile, brittle. A material is frangible if through deformation, it tends to break into fragments rather than deforming plastically and retaining its cohesion as a single object.

Friable - easy to break, or crumbling naturally. Descriptive of certain rocks and minerals.

Frictional Ignition – caused when a blunt tool-cutter pick strikes an object, or quartz-bearing strata and creates a spark that is hot enough to ignite the methane.

Fuse - a cord-like substance used in the ignition of explosives. Black powder is entrained in the cord and, when lit, burns along the cord at a set rate. A fuse can be safely used to ignite a cap, which is the primer for an explosive. Now made redundant by more modern firing/detonator cord.

G

Gallery - a horizontal or a nearly horizontal underground passage, either natural or artificial.

Gas Drainage – a process whereby a series of holes are drilled into a known gaseous area, then suction is applied to the holes to draw out/dilute the gas content of the coal linked to outburst management.

Gasification – any of various processes by which coal is turned into low, medium, or high energy gases.

Gate End Box – an electrical centre used in a panel to control and distribute power to face machinery.

Gate Roadway – a roadway that provides access to a working panel.

Gathering Conveyor or Gathering Belt - any conveyor which is used to gather coal from other conveyors and deliver it either into mine cars or onto another conveyor. The term is frequently used with belt conveyors placed in entries where a number of room conveyors deliver coal onto the belt.

Geologist - one who studies the constitution, structure, and history of the earth’s crust, conducting research into the formation and dissolution of rock layers, analysing fossil and mineral content of layers, and endeavouring to fix historical sequence of development by relating characteristics to known geological influences (historical geology).

Geological plans - a set of plans representing the characteristics of the deposit. Structure plans show absolute elevation (above sea level or above some datum) and typically represent the controlling geological structures or weathered surface. Cross sections (usually prepared on regular intervals across the deposit) typically illustrate the trend of geology across the deposit. Longitudinal sections are perpendicular to the cross sections. Contour plans show attributes of equal value, such as gold grade, sulphur content or economic value. These plans are a fundamental part of the mine design and scheduling process.

Goaf – the area abandoned and left to collapse after the extraction of coal - an acronym for Ground Opposite Advancing Face.
Gob - the term applied to the part of the mine from which the coal has been removed and the space more or less filled up with waste, rock and gases. Also, the loose waste in a mine, also called goaf.

Global climate change - this term usually refers to the gradual warming of the earth caused by the greenhouse effect. Many believe this is the result of man-made emissions of greenhouse gases such as carbon dioxide, chlorofluorocarbons (CFC) and methane.

Grade -
1. the unit metal content in rock. Expressed in percentage, or as grams per tonne.
2. the slope of a surface.

Grain - in petrology, that factor of the texture of a rock composed of distinct particles or crystals which depends upon their absolute size.

Grizzly - Coarse screen across a dump point that prevents oversized bulk material from entering a material transfer system that is constructed of rails, bars, beams, and so on.

Ground control - the regulation and final arresting of the closure of the walls of a mined area. The term generally refers to measures taken to prevent roof falls or coal bursts.

Ground pressure - the pressure to which a rock formation is subjected by the weight of the superimposed rock and rock material or by diastrophic forces created by movements in the rocks forming the earth’s crust. Such pressures may be great enough to cause rocks having a low compressional strength to deform and be squeezed into and close a borehole or other underground opening not adequately strengthened by an artificial support, such as casing or timber.

Gunite - a cement applied by spraying to the roof and sides of a mine passage. Can also be used as an injection material.

Hanging wall -
1. the upper wall of an inclined or horizontal fault;
2. the junction of the ore body and the country rock on the upper side of a lode.

Hard Coking Coal - coals that make hard coke when carbonised in the coke oven.

Haulage - the transportation of personnel, materials or ore from one point to another, generally in a near horizontally direction. Vertical transportation is generally called hoisting.

Haulageway - any underground entry or passageway that is designed for transport of mined material, personnel, or equipment, usually by the installation of track or belt conveyor.

Haulroad - roads used by the main haulage trucks to move waste and ore out of the pit. Because of the size and weight of open-pit mining equipment, these roads must be specially constructed. By contrast, access roads are used only by light vehicles (graders, water trucks, pumps, blasting equipment) and are designed to a much lower standard of construction.

Head Section - a term used in both belt and chain conveyor work to designate the portion of the conveyor used for discharging material.

Headframe - the structure surmounting the shaft that supports the hoist rope pulley, and often the hoist itself.

Heading - a tunnel formed by mechanical means, such as continuous miner or explosives or roadheading machine. Used to provide access for persons, materials, and ventilation.

Heaped Volume – See struck volume.

Heaving - applied to the rising of the bottom after removal of the coal; a sharp rise in the floor is called a ‘hogs back’.

Highwall – the unexcavated face of exposed overburden and coal in a surface mine or in a face (bank) on the uphill side of a contour mine excavation.

Highwall Miner - a highwall mining system consists of a remotely controlled continuous miner or auger which extracts coal and conveys it to the outside. The cut is typically a rectangular or circular horizontal cut from a high wall bench, reaching depths of several hundred feet or deeper.

Hogsback - a sharp rise in the floor of a seam.

Hoist - a drum on which hoisting rope is wound in the engine house, as the cage or skip is raised in the hoisting shaft.

Hoisting - the vertical transport of material.

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.

Horseback - a mass of material with a slippery surface in the roof; shaped like a horse’s back.

Hydraulic - of or pertaining to fluids in motion. Hydraulic cement has a composition that permits it to set quickly under water. Hydraulic jacks lift through the force transmitted to the movable part of the jack by a liquid. Hydraulic control refers to the mechanical control of various parts of machines, such as coal cutters, loaders, and so on, through the operation or action of hydraulic cylinders.

Hydrocarbon - a family of chemical compounds containing carbon and hydrogen atoms in various combinations, found especially in fossil fuels.

Hydrology - the study of water and gas flow through the ground or rocks.
Initiate - act of detonating high explosive by means of a detonator or by detonating cord (for example, Cordtex).

Inbye - in the direction of the working face.

Incline - any entry to a mine that is not vertical (shaft) or horizontal (adit). Often incline is reserved for entries that are too steep for a belt conveyor (+17 degrees through to -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 Resources – mineral for which estimates of the rank, quality, and quantity have been computed partly from sample analyses and measurements and partly from reasonable geologic projections. Defined by the JORC code.

Inferred Resources – mineral 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. Define by the JORC code.

In situ - in the natural or original position. Applied to a rock, soil, or fossil when occurring in the location in which it was originally formed or deposited. In situ is a Latin phrase meaning in the place.

In situ bank density – the density of the material while it is in the ground.

Inspector – person appointed by a statutory authority under the mining regulations. Their duties include examining the mine to ascertain whether the regulations relating to the operations are being observed.

Intake - the passage through which fresh air is drawn or forced, using fans into a mine or a section of a mine.

Immediate Roof - the roof strata immediately above the coal bed, requiring support during the excavation of coal.

Interburden – usually the strata between two working sections.

Intermediate Section - a term used in belt and chain conveyor network to designate a section of the conveyor frame occupying a position between the head and foot sections.

Isopach - a line, on a map, drawn through points of equal thickness of a designated unit. Synonym for isopachous line; isopachyte.

Isopachous line; isopachyte.

Isanol - an explosive containing ammonium nitrate, polystyrene and vegetable oil. It has less strength than ANFO.

ITH rig – an in-the-hole hammer pneumatic rock drilling machine. Also known as a down the hole rig (DTH).

Jack – a percussion drill used for drifting or stopping that is mounted on a telescopic leg that has an extension of about 2.5 m. The leg and machine are hinged so that the drill need not be in the same direction as the leg. Also known as air leg.

Jackrock – a caltrop or other object manufactured with one or more rounded or sharpened points, which when placed or thrown, present at least one point at such an angle that it is peculiar to and designed to puncture or damage vehicle tyres.

Job safety analysis (JSA) – the process that creates a job breakdown that gives a safe, efficient job procedure. A JSA is used to create a safe working procedure (SWP).

Joint Coal Board (JCB) – two major operating divisions are JCB Health and Coal Mines Insurance. Coal Mines Insurance provides workers’ compensation insurance services to all coal mines in NSW. JCB Health provides the occupational health services associated with Coal Mines Insurance, and also health-related services that enable the Board to discharge its legislated responsibilities of the health of mine workers.

Joint - a divisional plane or surface that divides a rock and along which there has been no visible movement parallel to the plane or surface.

JORC Report - a report adhering to the guidelines established by the Australasian Joint Ore Reserves Committee (JORC) for the ‘Reporting of Mineral Resources and Ore Reserves’. Providing a JORC report (or JORC code) is a mandatory reporting requirement for publicly listed resources companies in Australia, and is designed to provide a common reference for shareholders. More information is available at http://www.jorc.org/main.php.

JOY Mining Machinery – a manufacturer and supplier of mining equipment. Joy can supply all the components for a longwall mining installation. Joy’s international headquarters are in Pennsylvania, USA; their Australian headquarters are in Moss Vale, NSW. They also have operations in China, Mexico, Poland, Russia, South Africa and United Kingdom. You can visit their website at www.joy.com.au

Kettle bottom - a smooth, rounded piece of rock, cylindrical in shape, which may drop out of the roof of a mine without warning. The origin of this feature is thought to be the remains of the stump of a tree that has been replaced by sediments so that the original form has been rather well preserved.

Kerf - the undercut of a coal face.

Kibble – a container or bucket used to hoist people or materials in and out of shafts.
L

Lamp -
1. the electric cap lamp worn for visibility.
2. the flame safety lamp used in coal mines to detect methane gas concentrations and oxygen deficiency.

Layout - the design or pattern of the main roadways and workings. The proper layout of mine workings is the responsibility of the manager aided by the planning department.

Lift -
1. the amount of coal obtained from a continuous miner in one mining cycle.
2. the change in elevation from the loading bench to the dumping bench.

Lignite – a brownish-black coal composed of vegetable matter that has been altered more than in peat, but less than in sub-bituminous coal.

Liquefaction – the process of converting coal into a synthetic fuel, similar in nature to crude oil and/or refined products, such as gasoline.

LHD – an articulated loading machine used underground. An LHD is suitable for loading, hauling and dumping material.

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

Load -
1. to place explosives in a drill hole.
2. to transfer broken material into a haulage device.

Loading machine - any device for transferring excavated material into the haulage equipment commonly called a loader, that is load haul dump (LHD).

Loading pocket - transfer point at a shaft where bulk material is loaded by bin, hopper, and chute into a skip.

Longwall Mining – one of two major underground coal mining methods currently in use. Employs a shearer and rotating cutting drums, which move mechanically back and forth across a face of coal that is usually several hundred metres long. The loosened coal falls onto a conveyor for removal from the mine.

Longwall Top Coal Caving (LTCC) – a process whereby the lower section (3-4m) of coal is removed by a conventional longwall, followed by a trailing conveyor to absorb/collect the upper coal remaining. Developed in France, now popular in China.

Loose Coal - coal fragments larger in size than coal dust.

LOX (Limit of Oxidisation) - The point at which the natural oxidation of a mineral deposit has ceased. Mineral quality is different after this point. Usually displayed as a LOX line on mine maps.

M

Magazine - a bulk storage area for explosives and/or detonators.

Main entry - a main haulage road. Where the coal has panels, main entries are driven at right angles to the panels.

Main fan - a mechanical ventilator installed at the surface; operates by normally exhausting or sometimes blowing to induce airflow through the mine roadways and workings.

Manhole - a safety hole constructed in the side of a gangway, tunnel, or slope in which a miner can be safe from passing locomotives and car. Also called a refuge hole.

Man shift – one person working one shift comprises a man shift. Output of coal in tonnes per man-shift is accepted as a measure of the efficiency of the operation.

Manway - an entry used exclusively for personnel to travel from the shaft bottom or drift mouth to the working section; it is always on the intake air side in gassy mines. Also, a small passage at one side or both sides of a breast, used as a travelling way for the miner, and sometimes, as an airway, or chute, or both.

Measured Resources – mineral for which estimates of the rank, quality, and quantity have been computed from sample analyses and measurements from closely spaced and geologically well-known sample sites, such as outcrops, trenches, mine workings, and drillholes. The points of observation and measurement are so closely spaced and the thickness and extent of mineral are so well defined that the tonnage is judged to be accurate within 20 percent of true tonnage. The spacing of the points of observation necessary to demonstrate continuity of the mineral differs from region to region. Defined by the JORC code.

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.

Methane Monitor - an electronic instrument often mounted on a piece of mining equipment, that detects and measures the methane content of mine air.

Mine Development - the term employed to designate the operations involved in preparing a mine for ore/coal extraction. These operations include tunnelling, sinking, cross-cutting, drifting, and raising.

Miner - a person who is engaged in the business or occupation of extracting ore, coal, precious substances, or other natural materials from the earth’s crust. See also Continuous Miner.

Mineral - a compound occurring naturally in the earth’s crust, with a distinctive set of physical properties, and a definite chemical composition.
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.

Mining Plans - these plans represent the areas planned to be excavated, or actually excavated by the mining equipment. Parts of these mining plans show geological features, but the main purpose of the plans is to show design features such as mining limits, haul road and access roads, and haulage ramps. The mining plans are an integral part of the scheduling process as they trace out the conversion of geological data into mining blocks having spatial relationships and production and economic attributes.

Mining Recovery - the reverse of dilution. This recognises that not all of the material that was planned to be mined actually is mined. Sometimes material is not possible to mine because of physical constraints. These are the mining losses. This should not be confused with metallurgical recovery, which is a function of the processing plant.

Misfire - a charge or part of a charge which for one of any number of reasons has not exploded. Specific safety procedures must be observed.

Mitsui Miike – a shearer manufacturer that is based in Japan. Most of their website is in Japanese, but some of it is in English. It is a useful resource to gain an insight into coal mining in Japan.

Muck or Muckpile – pile of broken rock to be removed.

Mucking – process of removing broken rock.

Mud cap - a charge of high explosive fired in contact with the surface of a rock after being covered with a quantity of wet mud, wet earth, or sand, without any borehole being used. Also termed adobe, dobie, and sandblast (illegal in coal mining).

Mullock - waste rock, also called waste.

Natural ventilation - ventilation of a mine without the aid of fans or furnaces.

Nip - device at the end of the trailing cable of a mining machine used for connecting the trailing cable to the trolley wire and ground.

Nipper – a mine worker responsible for maintaining the correct level of consumable items in a working area. The vehicle a nipper uses is sometimes also called a nipper.

Nip point – danger area where two items come together, such as a conveyor belt and a roller.

Nonel - non-electric detonator.

NPV (Net Present Value) - the value in today’s dollars of the net cash flow from a project. NPV is used in mine studies to analyse the profitability of a projected investment or project.

Open end pillar - a method of mining pillars in which no stump is left; the pockets driven are open on the goaf side and the roof is supported by timber.

Opencast or open-cut or open-pit - a mine working open to the surface; similar to a quarry. Opencast pits are started along an outcrop and continue downward until the thickness of overburden prevents further economic exploitation. The operations are highly mechanised, and may be divided into two parts: 1. removal of overburden 2. removal of exposed ore

The extent of economic opencast mining depends on the ratio of the thickness of overburden to that of the ore. The quality of the deposit also influences the ratio.

Ore - rock containing minerals that have economic value.

Orebody - a solid, naturally occurring mineral aggregate of economic importance, from which one or more valuable constituents may be recovered by treatment.

Outburst – a sudden release of gas, coal, or rock due to elevated pressures. Strict controls are required for drainage, or approaching outburst risk zones.

Outbye - nearer to the mine entrances, and hence farther from the working face. The opposite of inbye; often referred to as ‘on the outbye side of something’.

Outcrop – mineral that appears at or near the surface.

Outside Dump - if possible, mining plans try to dump unwanted waste material back into the worked out pit area (an in-pit dump), because this is usually less costly and it aids rehabilitation. An outside dump—any dump located beyond the pit limits—must be built at the start of the mine (even if it may be re-handled back into the worked out pit later), and often at other times throughout the mine life. Many metalliferous mines never reach the point where they can dump waste back into the worked-out pit.

Overburden –

1. layers of soil and rock covering a mineral deposit. Overburden is removed prior to surface mining and replaced after the mineral is taken from the seam.
2. the waste material that must be removed to uncover ore. Overburden can be subdivided into various categories; and also as ‘weathered’, ‘oxidised’ and so on. A more generic term for overburden is ‘waste’.
3. distance between the surface level and the target deposit.
Overall Pit Slope Angle - the overall angle between the toe of the bench for the lowest bench in the mine and the crest in the uppermost bench at the surface. This overall angle may be limited by geological characteristics (the base of the ore zone) or geotechnical characteristics (the maximum safe slope angle). The overall angle allows for safety berms, drainage, haul roads and access roads.

Overcast (undercast) - enclosed airway which permits one air current to pass over (under) another without interruption.

Panel –
1. a coal mining block that generally comprises one operating unit. Can be continuous miners or longwall.
2. one of a number of active mining areas in the whole mine.

Panic bar - a switch, in the shape of a bar, used to cut off power to the machine in case of an emergency.

Parting
1. a small joint in coal or rock.
2. a layer of rock in a coal seam.
3. a side track or turnout in a haulage road.

Pattern - a dimensioned plan of holes to be drilled for blasting a face.

PCI Coal (Pulverised Coal Injection) – coals that are suitable for direct injection into the blast furnace in a pulverised state. PCI replaces oil and displaces some quantity of coke.

Peat - the partially decayed plant matter found in swamps and bogs, one of the earliest stages of coal formation.

Percentage Extraction - the proportion of an orebody that is removed from the mine. The remainder may represent ore in pillars or ore that is too thin or inferior to mine or lost in mining. Shallow mines working under townships, reservoirs, and so on, may extract 50%, or less, of the entire orebody, the remainder being left as pillars to protect the surface. Under favourable conditions, mining may extract from 80 to 95% of the entire orebody. With pillar methods of working, the extraction ranges from 50 to 90%, depending on local conditions.

Perfussion 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 that are similar in all respects to samples that have passed certain tests of the regulating authorities, 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.

Phosphorous – to be avoided in coking coal because it accumulates in hot metal giving undesirable properties in resultant steel.

Piggy-back - a bridge conveyor.

Pig Iron – the product of the reduction of iron ore in a blast furnace or a the direct reduction furnace.

Pillar - an area of ore left to support the overlying strata in a mine; sometimes left permanently to support surface structures.

Pillar Robbing - the systematic removal of the coal pillars between rooms or chambers to regulate the subsidence of the roof. Also termed bridging back the pillar, drawing the pillar, or pulling the pillar.

Pinch - a compression of the walls, roof, or floor of a coal seam so as to squeeze out the coal.

Pinning - roof bolting.

Pit Limits - the plan extent of mining after all ore and waste has been taken out. The limits are a function of economics and physical factors such as faulting, lease boundaries and so on. Even if you do not intend to reach the mining limits for 30 years, it is important to know where the limits are. As well as determining where the final pit limits are likely to be, it is also important to know where they are not likely to be, and where they are likely to change with changing resource economics. To avoid an embarrassing relocation, surface facilities should preferably be positioned adjacent to a pit limit that is insensitive to changing economic conditions (for example, a pit limit defined by faulting or lack of ore).

Pit slope - the angle at which the wall of an open-pit or cut stands as measured along an imaginary plane extended along the crests of the berms or from the slope crest to its toe.

Pitch - the inclination of a seam; the rise of a seam.

Plan - a map showing features such as mine workings or geological structures on a horizontal plane.

Pneumoconiosis - a chronic disease of the lung arising from breathing coal dust (Black Lung).

Portal - the structure surrounding the immediate entrance to a mine; the mouth of an adit or tunnel.

Portal bus - track-mounted, self-propelled personnel carrier that holds 8 to 12 people.

Post - the vertical member of a timber set.

Powder Factor (PF) – kilograms of explosive to blast one bank cubic metre (bcm) of rock.

Preparation plant - a place where coal is cleaned, sized, and prepared for market. Also known as a wash plant or CHPP.

Prills - cellular sub-globular AN particles formed by spraying AN solution against a stream of air.

Primary roof - the main roof above the immediate top. Its thickness may vary from a few to several thousand feet.
Primer (booster) - a package or cartridge of explosive that is designed specifically to transmit detonation to other explosives and which does not contain a detonator.

Primer - a cartridge of HE (high explosive; or a prefabricated precast booster) incorporating the detonating device. This is the key element of a charge of explosives.

Production - the winning of material from the ground.

Prop - coal mining term for any single post used as roof support. Props can be timber or steel; if steel, they will be screwed, yieldable, or hydraulic.

Proximate analysis - a physical, or non-chemical, test of the constitution of coal. Not precise, but very useful for determining the commercial value. Using the same sample (1 gram) under controlled heating at fixed temperatures and time periods, moisture, volatile matter, fixed carbon and ash content are successfully determined. Sulphur and thermal energy content are also generally reported with a proximate analysis.

Pyrite - a hard, heavy, shiny, yellow mineral, FeS2 or iron disulfide, generally in cubic crystals. Also called iron pyrites, fool's gold, sulphur balls. Iron pyrite is the most common sulfide found in coal mines. Can cause frictional ignitions.

Red dog - a non-volatile combustion product of the oxidation of coal or coal refuse. Most commonly applied to material resulting from in situ, uncontrolled burning of coal or coal refuse piles. It is similar to coal ash.

Regulator - device (wall, door) used to control the volume of air in an air split.

Reserve - that portion of the identified resource that can be economically mined at the time of determination. The reserve is derived by applying a recovery factor to that component of the identified resource designated as the reserve base. Defined by the JORC Code.

Resin Bolting - a method of permanent roof support in which steel rods are grouted with resin.

Resources - concentrations of ore in such forms that economic extraction is currently or may become feasible. Resources are broken down into identified and undiscovered resources. Identified 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.

Respirable dust - dust particles 5 microns or less in size, which may be retained by the lungs.

Respirable Dust Sample - a sample collected with an approved coal mine dust sampler unit attached to a miner, or so positioned as to measure the concentration of respirable dust to which the miner is exposed, and operated continuously over an entire work shift of the miner.

Retreat Mining - a system of robbing pillars in which the robbing line, or line through the faces of the pillars being extracted, retreats from the boundary toward the main arterial roadways (mains).

Return - the air or ventilation that has passed through all the working faces of a split, usually laden with gases/dust/higher temperatures/moisture. The mine pathways that return air follows to exit to the surface.

Return Air - air or ventilation that has passed through the workings. In general, it will contain relatively high concentrations of gas and dust.

Return Idler - the idler or roller underneath the cover or cover plates on which the conveyor belt rides after the load that it was carrying has been dumped at the head section and starts the return trip toward the foot section.

Rib - the side of a pillar or the wall of an entry. The solid coal on the side of any underground passage. Same as rib pillar.

Rider - a thin seam of coal overlying a thicker one.

Rimpull - tractive force that a machine is able to generate, often given in Newtons or kilograms force. Manufacturers of large mining vehicles nearly always publish the rimpull curves of their equipment, which TALPAC uses to calculate their speeds and segment times along haul routes.

Ripper - a coal extraction machine that works by tearing the coal from the face.

Rob - to extract pillars of coal previously left for support.

Robbed Out Area – the part of a mine from which the pillars have been removed.

Roll -
1. a high place in the bottom or a low place in the top of a mine passage.
2. a local thickening of roof or floor strata, causing thinning of a coal seam.
Roll Over Protective Structure (ROPS) - a framework, safety canopy, or similar protection for the operator when equipment overturns.

Roof - the stratum of rock or other material above an orebody; the overhead surface of a coal working place. Same as ‘back’ or ‘top.’

Roof Bolt - a long steel bolt driven into the roof of underground excavations to support the roof, preventing and limiting the extent of roof falls. The unit consists of the bolt (up to 4 feet long), steel plate, expansion shell, and pal nut. The use of roof bolts eliminates the need for timbering by fastening together, or laminating, several weaker layers of roof strata to build a beam.

Roof Fall - a mine cave-in, especially in permanent areas such as entries. Can be localised or extensive.

Roof Jack - a screw or pump-type hydraulic extension post made of steel and used as temporary roof support.

Roof Sag - the sinking, bending, or curving of the roof, especially in the middle, from weight or pressure.

Roof Support - unbalanced internal forces in the roof or sides, created when ore is extracted.

Roof Trusses - a combination of steel rods anchored into the roof to create zones of compression and tension forces and provide better support for weak roof and roof over wide areas.

Room and Pillar Mining - a method of underground mining in which some of the ore is left in place to support the roof of the active mining area. Large pillars are left while rooms of coal are extracted.

Room Neck - the short passage from the entry into a room.

Round - planned pattern of drill holes fired in sequence in development, shaft sinking, or stopping. First the cut holes are fired, followed by relief, lifter, and trim holes.

Royalty - the payment of a certain stipulated sum on the mineral produced.

Rubbing Surface - the total perimeter (top, bottom, and sides) of an airway.

Run-of-Mine (ROM) - raw material as it exists in the mine; average grade or quality.

Run-of-Mine and Product Ore - run-of-mine refers to ore after it has been mined, with quantities and quality characteristics accounting for losses and dilution. Planning adjustments to account for likely dilution involve discrete steps. In situ geological material is ‘converted’ to mineable material, by allowing for weathered zones, lease boundaries, yield or quality cut-offs thickness criteria and economic criteria. Run-of-mine ore characteristics allow for mining losses and dilution. Run-of-mine characteristics are ‘converted’ to estimated product characteristics by allowing for plant efficiency, recoveries, and other adjustments. These steps are an important process in the conversion of, or build up of a database fully reflecting the characteristics of the ore as it passes from an undisturbed state in the ground, until it leaves the mine site in some marketable form.

Safety fuse - a train of powder enclosed in cotton, jute yarn, or waterproofing compounds, which burns at a uniform rate; used for firing a cap containing the detonation compound, which in turn sets off the explosive charge. Now superseded by detonator cord.

Safety lamp - a lamp with steel wire gauze covering every opening from the inside to the outside to prevent the passage of flame if explosive gas is encountered.

Sampling - cutting a representative part of an ore deposit, which should truly represent its average value.

Sandstone - a sedimentary rock consisting of quartz sand united by some cementing material, such as iron oxide or calcium carbonate. Usually hard to drill or break.

Scaling - removal of loose rock from the roof or walls. This work is dangerous and a long bar (called a scaling bar) is often used.

Schedule - plan of future events. Usually numeric.

Scoop - a rubber tyred, battery or diesel-powered piece of equipment designed for cleaning roadways and hauling supplies.

Scrapper - see wheel tractor-scaper.

Scrubber - any of several forms of chemical or physical devices that remove sulphur compounds formed during coal combustion. These devices, technically known as flue gas desulphurisation systems, combine the sulphur in gaseous emissions with another chemical medium to form inert sludge, which must then be removed for disposal.

Seal - commonly used to separate old workings to active workings; must be properly designed and constructed to be fit for purpose.

Seam - a stratum or bed of coal.

Secondary roof - the roof strata immediately above the orebody bed, requiring support during the excavating of ore.

Second means of egress – the alternative roadways from the working area of the mine which can be used in an emergency.

Section - a portion of the working area of a mine.

Selective mining - the object of selective mining is to obtain a relatively high-grade mine product. This usually entails the use of a much more expensive stoping system and high exploration and development costs in searching for and developing the separate bunches, stringers, lenses, and bands of ore.

Self-contained Breathing Apparatus - a self-contained supply of oxygen used during rescue work from coal mine fires and explosions.
Self-Rescuer - a small filtering device carried by a miner underground, either on their belt or in their pocket, to provide them with immediate protection against carbon monoxide and smoke in case of a mine fire or explosion. It is a small canister with a mouthpiece directly attached to it. The wearer breathes through the mouth, the nose being closed by a clip. The canister contains a layer of fused calcium chloride, known as hopcalite, that absorbs water vapour from the mine air. The device is used for escape purposes only because it does not sustain life in atmospheres containing deficient oxygen. The length of time a self-rescuer can be used is governed mainly by the humidity in the mine air and the physical activity level of the wearer; it is usually between 30 minutes and one hour.

Sequential Firing - a system in which the holes with least delay are detonated progressively, reducing the burden on each subsequent hole fired.

Severance - the separation of a mineral interest from other interests in the land by grant or reservation. A mineral deed 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 hoisting of personnel or materials; connects the surface with underground workings. Shafts can also connect sub-surface workings from one level to another. Therefore providing storage capacity.

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.

Shank - short, threaded rod extending out of a drifter (drill).

Shearer - a mining machine for longwall faces that uses a rotating action to shear the material from the face as it progresses along the face. Shearers can be DERDS or SERDS (Double/Single Ended Ranging Drum Shearer).

Shift - the number of hours or the part of a day worked.

Shortwall - an underground mining method in which development roads are driven by a continuous miner to the boundary or economic limit, then a narrow (25m to 100m) face equipment is installed and retreated using modified ventilation techniques.

Shuttle Car - a self-discharging truck, generally with rubber tyres or caterpillar-type treads, used for receiving coal from the loading or mining machine and transferring it to an underground loading point, mine railway or belt conveyor system.

Sinking - the process by which a shaft is sunk.

Skid -
1. a track-mounted vehicle used to hold trips or cars from running out of control.
2. a flat-bottom personnel or equipment carrier used in low coal.
3. a flat, heavy duty tray fitted with runners rather than tracks or wheels. Used to mount equipment that is periodically moved short distances.

Skip - a container being hoisted from a slope or shaft. Usually a skip shaft would have two skips working alternately, that is, one full skip at bottom while one skip empties at the surface.

 Slack/sleck -
1. small coal.
2. the finest-sized soft coal, usually less than one inch in diameter.

Slag - the waste product of the process of smelting.

Slate -
1. a miner’s term for any shale or slate accompanying coal.
2. geologically, it is a dense, fine-textured, metamorphic rock, which has excellent parallel cleavage so that it breaks into thin plates or pencil-like shapes.

Slate Bar - the proper long-handled tool used to pry down loose and hazardous material from roof, face, and ribs.

Slickenside - a smooth, striated, polished surface produced on rock by friction.

Slip -
1. a fault.
2. a smooth joint or crack where the strata have moved on each other.

Slope -
1. primary inclined opening, connecting the surface with the underground workings.
2. the exposed face of an open pit mine.

Slope Mine - an underground mine with an opening that slopes upward or downward to the coal seam.

Slope Stability - the resistance of any inclined surface, e.g. the wall of an open-pit or cut, to fracture by sliding or collapsing.

Sloughing - the slow crumbling and falling away of material from roof, rib, and face.

Solid - mineral that has not been undermined, sheared out, or otherwise prepared for blasting.

Sounding - knocking on a roof to see whether it is sound and safe to work under.

Spad -
1. a flat spike hammered into a wooden plug anchored in a hole drilled into the mine ceiling from which is threaded a plumb line.
2. an underground survey station similar to the use of stakes in marking survey points on the surface.
3. a pointer spad, or sight spad, is a station that allows a mine foreman to visually align entries or breaks from the main spad.

Spacing - the distance between adjacent shot holes parallel to the free face.

Span - the horizontal distance between the side supports or solid abutments along sides of a roadway.

Specific Energy – the energy in kilocalories or gigajoules released per kilogram of coal burned.
Specific Gravity - the weight of a substance compared with the weight of an equal volume of pure water at 4 degrees Celsius. Expressed as a number.

Split -
1. any division or branch of the ventilating current.
2. the workings ventilated by one branch.
3. to divide a pillar by driving one or more roads through it.

Spoil or waste - the overburden or non-ore material removed in gaining access to the ore or mineral material in surface mining.

Squeeze - the settling, without breaking, of the roof and the gradual upheaval of the floor of a mine due to the weight of the overlying strata.

Steaming Coal – coal used to provide heat for steam raising as part of the electricity generation process.

Steeply inclined - deposits and coal seams with a dip of from 0.7 to 1 rad (40 degrees to 60 degrees).

Stemming - the non-combustible material used on top or in front of a charge or explosive to form a seal.

Stonedust – crushed limestone (calcium carbonate) added to coal dust to reduce its potential to explode.

Stonedusting – operation of spraying finely ground limestone or other non-combustible and non-siliceous dust on to coal. The limestone particles mix with the coal dust and reduce the possibility of a coal dust explosion.

Stope – extraction area supported by surrounding pillars of standing rock in hard rock mining.

Stopping – a brick or plaster wall in a cut-through which is used to direct the air flow.

Stress – the sub-surface strata contains three types of stresses generally due to depth, nature of the strata and other geotechnical factors. Strata stresses can be vertical or horizontal (major/minor). Stresses are closely linked to strata support systems.

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.

Stripping - the removal of earth or non-ore rock materials, as required, to gain access to the ore or mineral materials worked; the process of removing overburden or waste material in a surface mining operation.

Stripping ratio - the unit amount of overburden that must be removed to gain access to a similar unit amount of coal or mineral material.

Struck volume – the volume contained in a bucket or tray of a mining machine that is fully contained within its edges, that is, there is no heaping.

Stump/stook – remnant coal pillar left during pillar extraction process.

Sub-bituminous coal – coal of a rank between lignite and bituminous.

Subdrill – the blast hole drilling depth below the design floor.

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.

Sulphur – forms sulphur dioxide during coal combustion.

Sump - the bottom of a shaft, or any other place in a mine, that is used as a collecting point for drainage water.

Sumping - to force the cutter bar of a machine into or under the coal. Also called a sumping cut, or sumping in.

Support - the all-important function of keeping the mine workings open. As a verb, it refers to this function; as a noun it refers to all the equipment and materials--timber, roof bolts, concrete, steel, etc.--that are used to carry out this function.

Surface Mine - a mine in which the ore lies near the surface and can be extracted by removing the covering layers of rock and soil.

Surface Miner – equipment used to continuously strip the minerals from the ground and simultaneously load into trucks.

Suspension – supporting weaker strata by hanging it from stronger, overlying strata by means of roof bolts.

Syncline - a fold in rock in which the strata dips inward from both sides toward the axis. The opposite of anticline. Also commonly known as a swilley.
Tertiary - lateral or panel openings (for example, ramp, crosscut). Also applies to the surface zone through which is considered weak ground, that is, soil.

Thermal Coal – coal that is normally used for the generation of heat for steam raising and other general industry applications. These coals generally do not exhibit any coking properties and therefore would not make coke in a conventional coke oven. However, thermal coals can be used as PCI coals, provided they have levels of ash, moisture, volatile matter and sulphur which make them suitable for the production of blast furnace pig iron.

Through-steel - a system of dust collection from rock or roof drilling. The drill steel is hollow, and a vacuum is applied at the base, pulling the dust through the steel and into a receptacle on the machine.

Timber - a collective term for underground wooden supports.

Timbering - the setting of timber supports in mine workings or shafts for protection against falls from roof, face, or rib.

Timber set - a timber frame to support the roof, sides, and sometimes the floor of mine roadways or shafts.

Tipple - originally the place where the mine cars were tipped and emptied of their coal, and still used in that same sense, although now more generally applied to the surface structures of a mine, including the preparation plant and loading tracks.

TKPH, TMPH - stands for ton kilometre per hour or ton mile per hour, a unit for measuring the amount of work a tyre is undertaking. All tyres are limited to a maximum TKPH. The higher a TKPH, the shorter the tyre life.

Toe - a remnant of rock left unbroken at the foot of the quarry face by an unsatisfactory blast. The lower point of a vertical or near vertical working face.

Ton - a short or net ton is equal to 2,000 pounds; a long or British ton is 2,240 pounds; a metric tonne is approximately 2,205 pounds.

Top - a mine roof; same as back.

Torque wrench - a wrench that indicates, as on a dial, the amount of torque (in units of foot-pounds) exerted in tightening a bolt.

Tractor - a piece of equipment that pulls trailers, skids, or personnel carriers. Also used for supplies.

Trailing Cable - heavily insulated electrical cable used to bring power to an electrically operated machine, such as a shuttle car. The cable trails along the ground from a plug-in power point to the machine.

Tram - used in connection with moving self-propelled mining equipment. A traming motor may refer to an electric locomotive used for hauling loaded trips or it may refer to the motor in a cutting machine that supplies the power for moving or traming the machine. Also the act of moving a machine.

Transfer - a vertical or inclined connection between two or more levels and used as an ore pass.

Transfer point - location in the materials handling system, either haulage or hoisting, where bulk material is transferred between conveyances. Normally in the form of a chute. Often the direction of material flow changes through a transfer point.

Trip - a train of mine cars. One cycle of a haulage route.

Troughing Idlers - the idlers, located on the upper framework of a belt conveyor, which support the loaded belt. They are so mounted that the loaded belt forms a trough in the direction of travel, which reduces spillage and increases the carrying capacity of a belt for a given width.

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

Ultimate Analysis - precise determination, by chemical means, of the elements and compounds in coal.

Undercut - to cut below or undermine the coal face by chopping away the coal by pick or mining machine. In some locales, the terms undermine or under hole are used.

Underground mine - also known as a deep mine. Usually located several hundred metres below the earth’s surface, an underground mine’s ore is removed mechanically and transferred to the surface.

Underground Station - an enlargement of an entry, drift, or level at a shaft at which cages stop to receive and discharge cars, personnel, and material. An underground station is any location where stationary electrical equipment is installed. This includes pump rooms, compressor rooms, hoist rooms, battery-charging rooms, etc.

Under-manager – a position holding responsibilities defined by law. An under-manager is usually the person in charge of underground mining operations on a shift and is next in authority under a manager or deputy manager. Requiring a 2nd class certificate of competency or certificate or services.

Universal Coal Cutter/Undercutter - a type of coal cutting machine which is designed to make horizontal cuts in a coal face at any point between the bottom and top, or to make shearing cuts at any point between the two ribs of the place. The cutter bar can be twisted to make cuts at any angle to the horizontal or vertical.

Upcast Shaft - a shaft through which air leaves the mine. Usually contains gases, dust, or moisture heat.

Valuation -
1. the act or process of valuing or of estimating the value or worth.
2. appraisal.

Velocity – the speed of a body, for example, a conveyer belt or ventilation air measured in metres/second.

Ventilation - the provision, by means of fans, of a directed flow of fresh and return air along all underground roadways, traveling roads, workings, and service parts.
Violation - the breaking of any state or federal mining law.

Virgin - unworked; untouched; often said of areas where there has been no coal mining.

Void - a general term for pore space or other re-openings in rock. In addition to pore space, the term includes vesicles, solution cavities, or any openings either primary or secondary.

Volatile Matter - the percentage of coal that is lost as gases when coal is incinerated under standard conditions. Mostly hydrocarbons of coal.

W

W strap – a flat steel plate used as a cross roof support and is held in position by roof bolts.

Waste - that rock or mineral that must be removed from a mine to keep the mining scheme practical, but which has no value.

Water gauge (standard U-tube) - instrument that measures differential pressures in height of water.

Water infusion – a process whereby water is re-introduced into the coal to minimise dust production during cutting. Water is normally drained as a by-product of gas drainage.

Web – the depth of coal that is cut by a shearer drum from the longwall face on each traverse.

Wedge - a piece of wood tapering to a thin edge and used for tightening in conventional timbering.

Weight – the mass of material being handled. A solid block of material used to apply tension to a conveyor belt.

Wheel tractor-scraper - A piece of heavy equipment used for earthmoving. The rear part has a vertically moveable hopper (also known as the bowl) with a sharp horizontal front edge. The hopper can be hydraulically lowered and raised. When the hopper is lowered, the front edge cuts into the soil or clay like a cheese plane and fills the hopper. When the hopper is full, it is raised and closed with a vertical blade (known as the apron). The scraper can transport its load to the fill area where the blade is raised; the back panel of the hopper, or the ejector, is hydraulically pushed forward and the soil or clay load tumbles out. Then the empty scraper returns to the cut site and repeats the cycle. Scrapers can be very efficient on short hauls where the cut-and-fill areas are close together and have sufficient length to fill the hopper. The bigger scrapers have two engines (tandem powered), one driving the front wheels, one driving the rear wheels. Two scrapers can work together in a push-pull fashion but this requires a long cut area.

An auger scraper is a standard scraper with a vertically-mounted rotating auger inside the scraper bowl to lift the material away from the cutting edge of the scraper while loading. It allows the scraper to load faster in certain materials. An elevating scraper is similar to the auger scraper except that it has a horizontally-mounted rotating set of bars inside the scraper bowl. The same model of standard scraper can be fitted as an auger or elevating scraper.

White damp - carbon monoxide (CO). A gas that may be present in the afterdamp of a gas- or coal-dust explosion, or in the gases given off by a mine fire; also one of the constituents of the gases produced by blasting. Rarely found in mines under other circumstances. It is absorbed by the haemoglobin of the blood to the exclusion of oxygen. One-tenth of 1% (.001) may be fatal in 10 minutes.

Width - the thickness of a lode measured at right angles to the dip.

Windrow – the berm of material on the edge of dumps for trucks to back to when dumping overburden.

Winning - the excavation, loading, and removal of coal or ore from the ground; winning follows development.

Winze - secondary or tertiary vertical or near-vertical opening sunk from a point inside a mine for the purpose of connecting with a lower level or of exploring the ground for a limited depth below a level.

Wire rope - a steel wire rope used for winding in shafts and underground haulages. Wire ropes are made from medium carbon steels. Various constructions of wire rope are designated by the number of strands in the rope and the number of wires in each strand. The following are some common terms encountered: airplane strand; cable-laid rope; cane rope; elevator rope; extra-flexible hoisting rope; flat rope; flattened-strand rope; guy rope; guy strand; hand rope; haulage rope; hauser; hoisting rope; lang lay rope; lay; left lay rope; left twist; non-spinning rope; regular lay; reverse-laid rope; rheostat rope; right lay; right twist; running rope; special flexible hoisting rope; standing rope; towing hauser; transmission rope.

Working - when a coal seam is being squeezed by pressure from roof and floor, it emits creaking noises and is said to be working. This often serves as a warning to the miners that additional support is needed.

Working face - any place in a mine where material is extracted during a mining cycle.

Working Place - from the outbye side of the last open crosscut to the face.

Workings - the entire system of openings in a mine for the purpose of exploitation.

Working Section - the working section is the physical area of the mine where mining activities are currently taking place. For example, in an open-pit coal mine, the working section is the area between the coal face and the point where the trucks depart with their loads. In an underground coal mine, the working section is the area between the face and the point where the coal is loaded onto belts or rail cars.