Section 8

Glossary of Technical Terms, Acronyms, Symbols and Units

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Glossary of Technical Terms

A horizon – the top layer of the soil profile containing decomposed organic materials. Commonly referred to as 'topsoil'.

A-weighted – an electronic filter having the frequency response corresponding approximately to that of human hearing.

acid – substance with a pH less than 7.0; the lower the pH, the higher the corrosive ability of the substance.

acid formation – the process whereby acid is formed by the oxidation of minerals (particularly sulfides) exposed to air and water.

acid rock drainage (ARD) – runoff of acidic water, typically from overburden and/or CHPP rejects following acid formation within the rock.

acid neutralising capacity testing (ANC) – the ability of a substance (e.g. a particular mineral) to neutralise acid.

acidic – having a pH less than 7.0.

acoustic barrier – an earthen mound or constructed fence or similar structure positioned to reduce noise (and potentially visual) impact of mining and processing activities.

acoustic shielding – a natural or artificial structure (e.g. a hill or a barrier) that inhibits the transmission of sound.

acoustics – the science of sound and vibration.

acute – short term (health risk assessment).

adb – air dried basis; a standard or benchmark basis for comparing coal qualities where free moisture is air dried from a crushed sample.

adverse weather conditions (in respect to dust) – conditions, such as high wind, that assist the movement of dust from the source in question towards receptors.

adverse weather conditions (in respect to noise) – conditions, such as temperature inversions or gentle winds (<3m/s) from the source in question towards receptors.

AEMR – Annual Environmental Management Report – to be referred to in the future as an "Annual Review".

Annual Review – a report submitted to the Director-General of DP&I identifying environmental performance for the previous period including activities, monitoring results (with evaluation), compliance, non-compliances and responses, discrepancies between actual and predicted impacts and measures to improve performance over the ensuing reporting period.

aerial survey – survey of a landscape from an aeroplane, typically involving aerial photography, to determine specific characteristics (e.g. mineral potential or land use).

aesthetic significance – an item/area having visual or sensory appeal, landmark qualities and/or creative or technical excellence.

agricultural resources – the land on which agriculture is dependent and the associated water resources (quality and quantity) that are linked to that land.

airblast overpressure – a shock wave from the blast transmitted through the air, normally measured in dB(Linear).

air quality criteria – quantitative relationship between a pollutant's dose, concentration, deposition rate or any other air quality-related factors, and the related effects on receptors, e.g. humans, animals, plants, or materials. Air quality criteria serve as the scientific basis for formulating ambient air quality standards or objectives.

alkaline – having a pH greater than 7.0.

alkalinity – in water analysis a measure of the carbonates, bicarbonates, hydroxides and occasionally the borates, silicates and phosphates in the water.

alluvium – a general term for stream-deposited sediment (sand, silt, gravel, etc.) within stream beds or on floodplains or alluvial fans.

ambient – relating to conditions outside the proposed area of activity.

amenity – the desirability of an area.

amphibians – animals (such as frogs) adapted to live both on land and in water.

anecdotal evidence – informal, oral or written evidence of an event.

Applicant – person, organisation or company proposing to carry out an activity / seeking development consent (i.e. Gloucester Resources Limited).

aquifer – rock or sediment in a formation, group of formations, or part of a formation which is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

aquitard – rock strata, layers or other areal features (generally horizontal, but may be vertical such as a dyke) which prevent the transmission of water flow through them; barrier to flow; impermeable or impervious.

arboreal – pertaining to tree habitats.

archaeology – the scientific study of human history, particularly the relics and cultural remains of the distant past.

artefact – anything made by human workmanship, particularly by previous cultures (such as chipped and modified stones used as tools).

assay – a chemical analysis.

atmospheric stability – a measure of turbulence which determines the rate at which airborne particulates are dispersed as they are transported by the wind.

attenuation – reduction in sound pressure levels between two locations.

Average Recurrence Interval (ARI) – statistical period in years for a design storm event.

auxiliary turn lane – an additional lane approaching an intersection to allow vehicles intending to turn across traffic to wait while allowing through traffic movements to continue uninterrupted.

B horizon – material located below the A horizon material and above the parent rock. Commonly referred to as 'subsoil'

backfill – material used to fill a created void.

background level – the concentration (deposition) level of a pollutant which must be added to the concentration (deposition) level of the modelled sources in order to obtain a total.

background dust level – dust level in the absence of mining and processing activities.

bank cubic metre (bcm) – a volume of $1m^3$ in the ground prior to disturbance.

baseline data – a body of information collected over time to define specific characteristics of an area (e.g. species occurrence or noise levels) prior to the commencement of an activity (e.g. a mining operation). Baseline data allows any impacts arising from the activity to be identified by comparison with previously existing conditions.

baseline monitoring – monitoring performed prior to the commencement of site activities.

basin – the drainage area of a river and its tributaries or of a groundwater system.

bedrock – unweathered rock lying below the soil and weathering profile.

bench – a step in the face of an open cut pit which could be up to 30 m high.

best management practice – the most effective actions which minimise human impact on the environment.

biodiversity – the full range of living things and the ecosystem in which they live.

biota – living components of a habitat.

blasting – the operation of breaking rock by means of explosives.

bore – a hole, usually of less than 20 cm diameter, sunk into the ground and from which water is pumped.

brackish – a term for water that contains noticeable proportion of salt but far less than sea water.

buffer – a physical barrier / structure or width of land that encloses, partially encloses, or defines a particular environment. A buffer serves to minimise the impacts of non-desirable external influences on the adjoining environment.

bulldozer – an item of tracked mobile earth moving equipment fitted with a front blade and with rear rippers used for pushing and ripping soil and rock.

calorific value – the quantity of heat produced by the complete combustion of a given mass of a fuel, usually expressed in joules per kilogram**.**

catchment – drainage area of a reservoir, river, creek, etc.

catchment area – the area determined by topographic features within which rainfall will contribute to runoff at a particular point.

channel – natural or man-made structure to convey water – displays a bed and bank.

chronic – long term (health risk assessment).

coking coal – a high carbon fuel derived from bituminous coal primarily used for iron and steel production.

coal preparation – the separation of coal into various product streams of different inherent quality by the use of water or wet processes.

coal rank – a ranking system used to determine the metamorphosis of coal by analysing the carbon content, volatile matter, calorific value and moisture content.

coal seam – a layer of coal within the geological strata.

colluvium – unconsolidated soil and angular rock material moved largely by gravity, deposited on lower slopes and/or at the base of a slope.

company-owned land – land either owned or under an agreement to purchase by the Applicant.

compliance monitoring – monitoring to determine whether standards are being complied with.

concrete – mixture of gravel, cement, etc. for use in building.

conductivity – the measurement of the ability of a substance (either a measure of solid, liquid or gas) to transmit electricity; used to determine the amount of salt in a soil sample.

confluence – junction of streams.

conservation – the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations, while maintaining its potential to meet the needs as aspirations of future generations.

contractor – specialist brought in to perform a specific task, such as the construction of mine infrastructure or the excavation (mining) of the open cut pit.

conveyor – a device fitted with an endless rubber belt used for moving materials, e.g. coal from the CHPP to the Rail Load-out Facility.

core – 1. (archaeology) a piece of stone from which flakes have been removed; often show distinctive flake scars indicative of certain production techniques, such as blade or adze production.

2. (geology) rock brought to the surface by drilling for the purpose of geological interpretation.

crown – the portion of a tree above the main trunk, made up of branches, twigs and leaves.

crushing – the mechanical process of reducing rock size usually by pressure or impact.

culvert – large pipe or channel carrying water underneath a structure (e.g. a road or railway line) or underneath the ground.

cumulative – increasing by successive additions.

cut-off drains – drains constructed to divert upslope runoff around disturbed areas.

day time period – the period from 7:00am to 6:00pm Monday to Saturday and 8:00am on Sundays and Public Holidays (where relating to noise).

detection limit – the smallest concentration of a substance that an analytical procedure can accurately and precisely detect.

diamond core – a cylindrical-shaped drilling sample obtained by use of a diamond surfaced drilling bit.

dip – the angle that rock strata make with a horizontal surface measured at right angles to the strike.

dispersion model – a set of mathematical equations relating to the release of air pollutants to the corresponding concentrations in the ambient atmosphere or deposition on surfaces.

dissolved oxygen – the amount of gaseous oxygen dissolved in water and available for a biochemical activity (e.g. breathing in by fish).

distribution of species – the entire area in which a population of a species, subspecies or other taxon is found.

drainage line – a longitudinal depression in the landscape often without a bed or bank that intermittently carries runoff.

drawdown – the difference between the water level observed during pumping and the non-pumping water level (static water level or static head).

drilling – the action of boring holes (usually less than 30 centimetres in diameter) into the ground, typically to establish a water bore to investigate the geology found at depth or to allow explosives to be placed for blasting.

dry sclerophyll – sclerophyll forest with xeromorphic shrubs (shrubs which tolerate dry conditions).

dust – particles of mostly mineral origin generated by erosion of surfaces, the mining and handling of materials, farming etc.

dust deposition – dust particles that settle out from the air – measured in grams per square metre per unit month (g/m^2/month).

dust deposition gauge – instrument set up to record the rate of deposition of dust.

ecology – the relationship between living things and their environment.

ecologically sustainable development (ESD) – using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained and the total quality of life, now and in the future can be increased.

ecosystem – a functional unit of energy transfer and nutrient cycling in a given place. Includes all the relationships within the biotic community and between the biotic components of the system.

effective clearing area – a term relating to the area of low condition vegetation in the proposed impact area that has been adjusted to account for reduced canopy cover according to the BioBanking Assessment Methodology.

elevated concentration – a concentration of an element that substantially exceeds the average crustal abundance of that element.

Elliot trap – a baited cage used in faunal surveys to capture small animals.

emission – a discharge of a substance (e.g. dust) into the environment.

emissions inventory – an information, collection and processing system containing data on emissions of, and sources of, air pollution from both man-made and natural causes.

environmental constraints – limitations on a project by components of the environment.

Environmental Impact Statement (EIS) – a formal description of a project and an assessment of its likely impact on the physical, social and economic environment. It includes an evaluation of alternatives and an overall justification of the project. The EIS is used as a vehicle to facilitate public comment and as the basis for analysing the project with respect to granting approval under relevant legislation.

environmental officer – person at a mine who reviews environmental compliance and coordinates monitoring.

ephemeral – intermittent water flow, not permanent, e.g. a stream that flows only seasonally or after rainfall or a lake that periodically dries out.

epidemiological study – study of the patterns, causes and effects of health and disease conditions in defined populations.

equilibrium – state of balance between opposing forces or effects.

erosion – the wearing away of the land surface (whether natural or artificial) by the action of water, wind and ice.

evaporation – the loss of water as vapour from the surface of a liquid that has a temperature lower than its boiling point.

evapotranspiration – loss of water from a land mass through transpiration from plants and evaporation from the soil.

evening period – the period from 6:00pm to 10:00pm (when relating to noise).

excavate – to dig into natural material or fill using an excavator or other machinery.

excavator – item of earthmoving equipment fitted with a bucket on an articulated boom and used for digging material from a face in front of, or below the machine.

exploration program – a program set up by a company to explore for mineral deposits (typically involving aerial survey, ground survey, drilling and geophysical assessment).

fault – a fracture in rock along which there has been observable displacement.

fauna – a general term for animals (birds, reptiles, marsupials, fish etc.) particularly in a defined area or over a defined time period.

feral – domesticated animals that have become wild.

flood mitigation – measures undertaken to reduce the frequency, extent and impact of floods (such as the construction of levee banks or diversion channels).

flora – a general term for plant, particularly those found in a defined area or characteristic of a defined time period.

fluidity – a value used to determine which blends of coal are optimal for coking purposes.

fluvial – pertaining to or produced by a river.

flyrock – rock that is propelled into the air by the force of an explosion beyond the defined blast envelope. Usually originates from pre-broken material on the surface or upper open blast face.

formation – a large stratigraphic sequence of rock beds (sandstone, shale, limestone, etc.) generally deposited over a distinct geological period.

fragmentation – the extent to which rock is broken into small pieces by primary blasting.

front-end loader – machine used to lift and place soil, earth, rocks, etc. on a construction or mine site.

fugitive emissions – emissions not entering the atmosphere from a stationary vent (stack). Examples of fugitive dust sources include vehicular traffic on unpaved roads, handling of raw materials, wind erosion of dusty surfaces.

geochemical – chemical aspects of the composition on the earth's crust.

geological reserves – the measured total quantity of in-situ resource in a deposit, prior to consideration of mining parameters.

geological time – the time periods over which geological processes such as sedimentation or erosion occur (generally from tens of thousands to hundreds of millions of years).

grader – an item of earthmoving equipment, rubber tyred and fitted with a centrally mounted blade and rippers used to shape and trim the ground surface, particularly unsealed roads

gradient – rate of change of a given variable (such as temperature or elevation) with distance.

Greenhouse effect – the heating of the earth's surface because outgoing long-wavelength radiation from the earth is absorbed and re-emitted by the carbon dioxide and water vapour in the lower atmosphere and eventually returns to the surface.

ground vibration – oscillatory motion of the ground caused by the passage of seismic waves originating from a blast (or other force).

groundwater – the water contained in interconnected pores located below the water table in an unconfined aquifer or located in a confined aquifer.

groundwater dependent ecosystems – ecosystems that use groundwater as part of survival, and can potentially include wetlands, vegetation, springs, base flows, cave ecosystems, river pools and hanging swamps.

groundwater depression – localised lowering of the regional water table.

habitat – the place where an organism normally lives; can be described by their floristic and physical characteristics.

haul road – road used in a mine for haulage of ore and waste rock and for general site access.

haultruck – a truck specifically designed for hauling and tipping soil or rock within the mine or similar situation.

hazard quotient – ratio of concentration to the ambient air guideline value (health risk assessment).

head (hydraulic head) – energy contained in a water mass, produced by elevation, pressure or velocity.

heavy metals – normally trace metals which occur in ore deposits which, depending on their concentration may be environmentally hazardous e.g. copper, lead and zinc.

heavy vehicle – a motor vehicle or trailer that has a gross vehicle mass greater than 4.5 tonnes. Also includes motor vehicles with seats for more than 12 adults.

heritage – the things of value which are inherited.

highwall – the unexcavated face of overburden and coal or ore in an open cut mine.

hydraulic conductivity (k) – the rate of flow of water in an aquifer through a cross section of unit area under a unit hydraulic gradient, at the prevailing temperature. Usually expressed in units of metres per second or metres per day.

hydraulic gradient – the direction of flow of groundwater.

in situ – a term used to distinguish material (e.g. rocks, minerals, fossils, etc.) found in its original position of formation, deposition, or growth, as opposed to transported material.

indigenous – belonging to, or found naturally in, a particular environment.

infiltration – the process of surface water soaking into the soil.

inflow – flow directed into a particular feature, such as an open cut pit.

Infrasound – sound below the audible range (<20Hz).

inter-generational equity – the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

interbedded – two or more types of sedimentary rock deposited alternately to build up a sequence.

interburden – rock strata in between recoverable coal seams.

inherent ash - part of the ash content of a coal that is structurally part of the coal itself and cannot be separated from it by any mechanical means.

inversion – generally used in meteorology with respect to an increase of temperature with height in contrast with the usual decrease of temperature with height in the troposphere. An inversion layer is distinguished by its large stability, which limits the turbulence and therefore the dispersion of pollutants.

land condition – the present (compared with the historical) capacity of the land to support vegetation or agriculture).

landform – a specific feature of a landscape (such as a hill) or the general shape of the land.

light vehicle – a vehicle that has a gross vehicle mass of 4.5 tonnes or less.

Local Environmental Plan (LEP) – a plan developed by a council to control development in part or all of their local government area.

loose cubic metre (lcm) – a volume of $1m^3$ of material following disturbance and bulking effects. 1bcm generally yields approximately 1:2 – 1:3 lcm.

low loader – a trailer which has a relatively low carrying deck and used to transport large items of equipment such as bulldozers or scrapers.

metamorphic rock – rock type such as shale which has changed to a rock type such as slate and phyllite by earth forces (heat, pressure, fluids, etc.).

mine water – all water used in mining and processing.

mitigation measures – measures employed to reduce (mitigate) an impact (such as the construction of a noise barrier to reduce sound emissions).

mobile equipment – wheeled or tracked self propelled equipment such as trucks, front-end loaders, and bulldozers.

monitoring – the regular measurement of components of the environment to establish environmental standards are being met.

morbidity – the rate of incidence of disease or health implication.

mortality – a measure of deaths within a population due to specific cause.

National Park – an area set aside for the protection of flora and fauna and for public recreation.

net acid-generation (NAG) testing – experimental determination of the potential of a material (e.g. overburden or coal reject) to generate acid upon exposure to air and water.

net acid-producing potential (NAPP) – potential of a material (e.g. overburden or coal reject) to generate acid upon exposure to air and water.

neutral – neither acidic nor basic (e.g. a pH equal to 7.0).

neutral – atmospheric conditions (re. air pollution) are the intermediate between stable and unstable conditions. These conditions are associated with windy days or when cloud cover inhibits strong surface heating from the sun.

night-time period – the period from 10:00pm to 7:00pm Monday to Saturday and 10:00pm to 8:00am on Sundays and Public Holidays (when relating to noise).

noise contours – theoretical lines connecting points of equal noise value.

non-combustible residue – dust residue that cannot be burnt (i.e. free of organic litter).

offset strategy – a method of providing for disturbance of native vegetation attributable to the project through additional or compensatory measures.

open cut mining – mining carried out on, and by excavating, the earth's surface but does not include underground mining.

overburden – in the mining context refers to non-economic material to be removed to allow access to the resource.

overburden emplacement – structure to hold rock, formed by the placement of overburden and interburden materials in a random and/or structured manner.

particulate matter – small solid or liquid particles suspended in or falling through the atmosphere - sometimes expressed by the term particulates.

pavement deformation – the change in road surface from the intended construction profile. This may include corrugations, depressions, wheel rutting or shoving.

peak airblast – the maximum level of the airborne shockwave resulting from the detonation of explosives.

peak particle velocity (ppv) – a measure of ground vibration reported in millimetres per second (mm/sec).

permeability – a material property relating to the ability of the material to transmit water.

pH – a measure of the degree of acidity or alkalinity of a solution; expressed numerically (logarithmically) on a scale of 1 to 14, on which 1 is most acid, 7 is neutral acid, and 14 is most basic (alkaline).

piezometer – a bore drilled specifically for the monitoring of groundwater levels and/or water quality.

piezometric surface – water table surface.

pit water – water inflow into the open cut pit from incident rainfall or groundwater seepage from pit walls.

ply – a layer of coal separated by non-coal materials within a coal seam.

pollution – the alteration of air, soil, or water as a result of human activities such that it is less suitable for any purpose for which it could be used in its natural state.

porosity – the percentage of a solid material that consists of voids and areas of space, or the ratio, expressed as a percentage of the volume of the pores or interfaces of a substance to the total volume of the mass. A measure of its ability to hold liquid.

precautionary principle – the principle that, if a threat of serious or irreversible environmental damage exists, lack of full scientific certainty that the damage will occur should not be used as a reason to postpone measures to prevent that environmental damage.

privately-owned residence – an occupied dwelling not owned or under an option to purchase by the Applicant or another resource company, or the subject of a purchase or lease agreement with the Applicant or by any other resource company – referred to as receptors when considered with the predicted noise and/or air quality impacts.

pump test – the systematic pumping of water from a bore to test the response of water bearing strata.

quality assurance – procedures built into a sampling and analytical program to maintain the quality of the results obtained.

Rating Background Level – the overall single-figure background noise level representing each assessment period (day / evening / night) over the whole monitoring period.

Receptor – A privately-owned residence, community facility or enterprise at which noise and/or air quality is predicted as a result of modelling of the Proposal.

rehabilitation – the preparation of a final landform after mining and related activities and its stabilisation with grasses, trees and shrubs.

rejects – material generated in the CHPP comprising a mixture of high ash coal and non-coal materials such as sedimentary rock and clay.

remnant woodland – native woodland

resource – an estimate of potentially usable coal in a defined area based on preliminary information.

Resource company-owned residence – an occupied dwelling owned or under an option to purchase by the Applicant or another resource company, or the subject of a purchase or lease agreement with the Applicant or by any other resource company.

revegetation – replacement of vegetation, principally grasses and legumes on areas disturbed by mining activities.

riparian – pertaining to a river or stream bank.

RMax – Known as Mean Maximum Vitrinite Reflectance. A measurement of the reflectance of the vitrinite as a means to rank coal from its lowest form (Peat) to highest form (Anthracite).

routine monitoring – monitoring performed on a regular basis, with the same observations and tests conducted each time.

runoff – that portion of the rainfall falling on a catchment area that flows from the catchment past a specified point.

run-of-mine (ROM) – coal or overburden as loaded directly from the open cut pit(s).

saline – water with elevated salt concentrations. For the purpose of the Rocky Hill Coal Project, saline water refers to water with an electrical conductivity typically in excess of >2 500µS/cm and rarely exceeding 7 500µS/cm.

salinity – the total content of dissolved solids in groundwater, commonly expressed as parts of dissolved solids per million parts of solution, or milligrams of dissolved solids per litre of solution (mg/L);

sampling period – range of time over which samples are taken.

seam – layer of coal.

sedimentation – process or rate of depositing of sediment.

seismic survey – geophysical survey method used to map sub-surface geology.

sequence (geological) – layers of (predominantly) sedimentary rocks sourced from a common geological environment or period.

silt trap – structure designed to trap silt and sediment close it its source.

Site – the total area covered by the Proposal, including the open cut pits and CHPP.

social capital – the expected collective or economic benefits derived from the preferential treatment and cooperation between individuals and groups.

social cohesion – the bonds and relationships people have with their family, friends and the wider community.

social infrastructure – community facilities, services and networks which help individuals, families, groups and communities meet their social needs, maximise their potential for development and enhance community wellbeing.

sodic – having a high sodium content.

solastalgia – distress produced by environmental change impacting on people while they are directly connected to their home environment.

sight distance – the distance along the road visible to the driver. It is measured along the normal travelled path of a roadway from the driver's location (such as at an intersection) to a specified height above the roadway when the view is unobstructed by traffic.

species – a taxonomic grouping of organisms that are able to interbreed with each other but not with members of other species.

species diversity – a measure of the number of different species in a given area.

spontaneous combustion – spontaneous ignition of some or all of a combustible material such as stockpiled coal or coal rejects.

stable – atmospheric conditions (re. air pollution) describe conditions where plumes do not disperse well.

stakeholder – person, group or organisation or company with an interest in an activity or outcome.

stockpile – a pile used to store material (such as ROM coal or soil) for future use.

storage capacity – the maximum volume of liquid able to be retained in a dam.

stormwater – surface water runoff immediately after rainfall.

stratigraphy – the succession and age of strata of rock and unconsolidated material.

stream gauging – determination of water level and velocity in a stream or river for the purpose of calculating the volume of flow.

stream order – defined by the Strahler steam order used to define stream size based upon a hierarchy of tributaries.

- **first order streams** – the smallest streams in a drainage network that have no tributary streams.
- **second order streams** – two first order streams unite to form a second order stream.
- **third order streams** – have second and first order streams as tributaries.
- **fourth, fifth, sixth, etc. orders** – reflect a similar approach to second or third order streams.

As the order of the stream increases, the discharge increases, the gradient decreases and the channel dimensions increase to accommodate discharge.

strike – a measure used to define the orientation of a geological feature, such as a sedimentary layer or fault line.

stygofauna – aquatic invertebrates living within the groundwater systems. This includes 'obligate stygofauna' that represent endemic species that relate to particular regions or ecosystems only.

Study Area – a defined area for the purposes of a specific area of environmental study.

Study Locality – A general area surrounding the 'Study Area' encompassing any important surrounding features.

sub-catchment – a smaller area within a catchment drained by one or more.

subsoil – the layer of soil lying below the topsoil; usually contains less organic matter and is less fertile but is essential for retention of moisture for plant growth. Also referred to as the 'B Horizon'.

surface waters – all water flowing over, or contained on, a landscape (e.g. runoff, streams, etc.).

surge bin – a bin to store coal until required for transfer to an alternative location such as the train load-out bin.

survey transect – a path along which one records and counts occurrences of the phenomenon of study (e.g. plants).

suspended solids – analytical term applicable to water samples referring to material recoverable from the sample by filtration.

swelling number – The resulting number of a test to determine is coal is suitable for production of coke based upon a cross-sectional profile of heated coal.

temperature inversion – an increase in air temperature with height (see inversion).

terrestrial – of or relating to the land, as distinct from air or water.

thermal coal – coal used in generating electricity.

threatened species – a species specified in Part 1 or 4 of Schedule 1, Part 1 of Schedule 1A or Part 1 of Schedule 2 of the TSC Act 1995 or listed in the categories as defined in Section 179 of the EPBC Act 1999.

topography – the physical relief and contour of a region.

topsoil – the surface layer soil profile containing the main percentage of organic material. Also referred to as the 'A Horizon'.

total suspended particulates (TSP) – the mass of all particulate matter suspended in air.

total suspended solids – a common measure used to determine concentrations of fine materials present in water.

train load-out bin – metal storage bin which receives and stores coal prior to loading into train wagons.

transect – a line across a study area along which observations are made and changes can be observed (e.g. changes in vegetation).

transmissivity – the rate at which groundwater is transmitted at a specific hydraulic gradient through a rock mass of a specified width.

tributary – a stream or river that flows into a larger river or lake.

tubestock – tree seedlings supplied with roots enclosed in soil.

turbidity – the optical property of water that prevents light from being transmitted. Caused by the presence of very fine suspended matter such as clay or organic matter.

unity – less than one (health risk assessment).

unstable – atmospheric conditions (re. air pollution) describe conditions where plumes disperse rapidly.

vehicle movement – a one-way trip.

vibration – oscillating movement.

visual amenity – attractiveness to the eye.

vitrinite – a type of coal displaying a shiny glass like material originating from the plant cellular structure such as trees roots and stems created during the coalification of plant materials.

volatile content – The component of coal, except for moisture, which are liberated at high temperature in the absence of air.

V steps – the presentation of the reflectance determination based upon Rmax measurements. Vitrinite values are generally between 0.6 (V_6) to 1.7 (V_{17}).

water quality criteria – generally refers to numeric levels specified for key water quality variables, such as electrical conductivity or pH, which can be measured to determine the suitability of water for human consumption, supporting aquatic life, etc.

watercourse – stream or river invariably with running water.

weed – any plant (in particular an herbaceous one) that survives in an area where it is harmful or troublesome to the desired land use.

wildlife corridor – a strip of vegetation that has a design purpose of allowing animals to pass from one area to another and acting as an undisturbed area for wildlife preservation.

wind direction – the direction from which the wind, averaged over a certain period of time, is blowing.

wind rose – diagrammatic representation of wind direction, strength, and frequency of occurrence over a specified period.

yield – (of a water bore) - the amount of water actually withdrawn.

Glossary of Acronyms, Symbols and Units

~ – approximately.

° – degrees.

°C – degrees Celsius.

°C/100 m – degrees Celsius per 100m.

µg/g – micrograms per gram.

µg/L – micrograms per litre.

µg/m^3 – micrograms per cubic metre.

µm – micron, one millionth of a metre (one thousandth of a millimetre).

µS/cm – microsiemens per centimetre; a measure of electrical conductivity.

% – percentage.

$M – million dollars.

3-D – three dimensional.

24-hour air quality standard – value of an air quality variable not to be exceeded when averaged over 24 hours.

72-hour rainstorm – total rainfall recorded over a 72-hour period.

100 year flood limit – predicted extent of a 1 in 100 year flood occurrence.

< – less than.

≤ – less than or equal to.

> – greater than.

≥ – greater than or equal to.

95% exceedance – a value that is exceeded by 95% of sample values.

AADT – Average Annual Daily Traffic.

ABS – Australian Bureau of Statistics.

ADO – Automotive Diesel Oil.

AEP – Annual Exceedance Probability.

AGV – air guideline value

AHD – Australian Height Datum; in metres (similar to metres above mean sea level).

AHIMS – Aboriginal Heritage Information Management System.

ANC – see acid-neutralising capacity.

ANFO – mixture of ammonium nitrate and fuel oil (diesel) used as an explosive.

ANZECC – Australian and New Zealand Environment and Conservation Council.

ARD – acid rock drainage.

ARI – average recurrence interval.

ARTC – Australian Rail and Track Corporation

AS – Australian Standard.

A-Scale – a sound level measurement scale. It discriminates against low frequencies and approximates the human ear.

bcm – bank cubic metre – a volume of 1m^3 in the ground prior to disturbance.

BOM – Bureau of Meteorology.

Ca – calcium.

Cd – cadmium.

CEC – Cation Exchange Capacity.

cm – centimetre (unit of length) = 0.01 metre.

CM – coarse matter.

CO_2 – carbon dioxide

CO_2-e – carbon dioxide equivalent.

CSIRO – Commonwealth Scientific and Industrial Research Organisation.

D% – dispersion percentage.

dB – decibel. The unit used to express sound intensity.

dB(A) – decibels, A-weighted scale. The unit used for most measurements of environmental noise. The scale is based upon typical responses of the human ear to sounds of different frequencies.

dB(Linear) – the measurement of sound pressure level in which the amplitudes of the sound signal, though all frequencies of the signal, are treated equally, i.e. not weighted.

DCS – distributed control system.

DECCW – Department of Environment, Climate Change and Water (NSW) Now OEH.

DGRs – Director-General's Requirements.

DMR – Department of Mineral Resources (now Division of Resources and Energy [DRE]).

DP&I – Department of Planning and Infrastructure (NSW).

DP – Deposited Plan.

DPI – Department of Primary Industries (NSW)

dS/cm – deciSiemens per centimetre; a measure of electrical conductivity.

EC - electrical conductivity.

EIS – Environmental Impact Statement.

ENM – Environmental Noise Model.

EPA – Environment Protection Authority (NSW).

EP&A Act – Environmental Planning and Assessment Act 1979 (NSW).

EP&A Regulation – Environmental Assessment and Planning Regulation 2000.

EPL – Environment Protection Licence.

ESD – Ecologically Sustainable Development.

EL – Exploration Licence.

Fe – iron.

FP – fine particle.

g – gram (= 0.001 kilogram).

g/m^2/month – grams per square metre per month unit for deposited dust.

GHG – greenhouse gas.

GWh – gigawatt hours.

GWMA – Groundwater management Area.

ha – hectare (100 m x 100 m).

ha/year – hectares per year.

Hg – mercury.

HQ – hazard quotient (health risk assessment).

HRA – health risk assessment.

HVAS – High Volume Air Sampler.

HVCCC – Hunter Valley Coal Chain Coordinator

Hz – Hertz – a unit of frequency.

ID – Identification

INP – Industrial Noise Policy.

K – potassium.

kg – kilogram (weight measure).

kg/day – kilograms per day.

kg/ha – kilograms/hectare

kg/minute – kilograms per minute.

kL – kilolitre (thousand litre).

km – kilometre (= 1 000 metres).

km^2 – square kilometres.

km/hr – kilometres per hour.

kV – thousand volts (Electrical Potential Unit).

kVA – kilovolt amps.

kVh – kilowatt hours.

kW – thousand watts (energy unit).

lcm – loose cubic metres.

L – litre.

L/day – litres per day.

L/s – litres per second.

L/t – litres per tonne.

L_{A10} – sound level exceeded 10 per cent of the sampling time.

L_{A90} – sound level exceeded 90 per cent of the sampling time.

L_{Aeq} – the L_{Aeq} is the energy average of the varying noise over the sample period and is equivalent to the level of a certain noise which contains the same energy as the varying environment. It is a common measure of environmental and traffic noise.

$L_{Aeq\ 1\ hour}$ – the "equal energy" average noise level over 60 minutes – used for assessing impacts of motor vehicles.

$L_{Aeq\ T}$ – sound level of continuous noise which emits the same energy as the fluctuation sound over a given time period (T).

L_{Amax} – the absolute maximum noise level measured in a given time interval.

L_{AN} – the A-weighted sound pressure level exceeded by N% of a given measured period.

LALC – Local Aboriginal Land Council.

LEP – Local Environmental Plan.

LDP – Licensed Discharge Point.

lcm – loose cubic metres.

LGA – Local Government Area

LPG – liquid petroleum gas.

m – metre.

m AHD – metres Australian Height Datum.

M – million.

m^2 – square metre.

m^3 – cubic metre.

m^3pa – cubic metres per annum.

mg – milligram (weight unit).

Mcm – million cubic metres.

Mbcm – million bank cubic metres.

Mlcm – million loose cubic metres.

MLpa – megalitres per annum.

Mg – magnesium.

mg/kg – milligrams per kilogram; unit commonly used to express the concentration of metal (such as copper) in a rock or sediment; is equal to parts per million.

mg/L – milligrams per litre (parts per million).

MIC – Maximum Instantaneous Charge.

ML – Megalitre (1 million litres) – typically of water.

ML/a – megalitres per annum.

ML/day – megalitres per day.

ML/year – megalitres per year.

mm – millimetre (= 0.001 metres).

Mm^3 – million cubic metres.

mm/day – millimetres per day.

mm/month – millimetres per month.

mm/s – millimetres per second.

Mn – manganese.

MOP – Mining Operations Plan.

MR – Main Road.

MREMP – mining, rehabilitation and environmental management plan.

m/s – metres per second.

m^3/s – cubic metre per second.

Mt – million tonnes (metric tonne = 1 000 kg).

Mtpa – million tonnes per annum.

MW – megawatt.

Na – sodium.

NAG – net acid generation.

NAPP – net acid-producing potential.

NATA – National Association of Testing Authorities.

NEPC – National Environment Protection Council

NEPM – National Environment Protection Measures

NFR – non-filterable residue of suspended solids.

NHMRC – National Health and Medical Research Council.

NO – nitrogen oxide.

NO_2 – nitrogen dioxide.

NO_x – nitrous oxides.

NP&W Act – National Parks and Wildlife Act 1974 (NSW).

NTU – Nephelometric turbidity units.

O_3 – ozone.

PAD – Potential Archaeological Deposit.

Pb – lead.

pH – measurement indicating whether water or soil is acid or alkaline.

PLC – Programmable Logic Controller

PM_{10} – particulate matter <10μm in diameter.

$PM_{2.5}$ - particulate matter <2.5μm in diameter.

PPD – Patched Point Dataset.

ppm – parts per million.

PVS – peak vector sum.

RH – relative humidity.

ROM – Run-of-Mine.

RMS – Roads and Maritime Services

RTA – Roads and Traffic Authority (NSW) – now RMS.

SEPP – State Environmental Planning Policy.

SG – specific gravity.

SR – Shire Road.

SWL – standing water level.

t – tonnes.

TAPM – The Air Pollution Model.

TDS – total dissolved solids – expressed in mg/l.

TEOM – Tapered Element Oscillating Microbalance dust sampling unit.

t/m^3 – tonnes per cubic metre.

tpa – tonnes per annum.

tpd – tonnes per day.

tph – tonnes per hour.

TSC Act – Threatened Species Conservation Act 1995 (NSW).

TSP – Total Suspended Particulate.

$\mu g/m^3$ – micrograms per cubic metre.

μm – micron (1 micron=0.001 millimetre).

μPa – micropascals**.**

μS/cm – microsiemens per centimetre.

V – volt.

V:H – vertical to horizontal ratio.

WHO – World Health Organisation.

w/v – weight per volume.

WSP – Water Sharing Plan.

Zn – zinc.

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