

Section 7

Glossary of Terms, Acronyms, Symbols and Units

PREAMBLE

This section provides a glossary of acronyms, symbols and units, and technical terms, used throughout the EIS.

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Technical Terms

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.

acidic – having a pH less than 7.0.

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

acoustics – the science of sound and vibration.

adverse weather conditions (in respect of noise and dust) – conditions, such as high wind, that assist the movement of dust or propagation of noise away from the mine towards receptors.

aerial photographs – photographs of landscape taken from a plane (typically areas several kilometres across) used for the surveying and interpretation of vegetation type, geology, land use, etc.

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

aggregates – fragments of crushed rock with a defined size.

AHD - Australian height datum (in metres).

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

air pollutant – a substance in ambient atmosphere, resulting from the activity of man or from natural processes, causing adverse effects to man and the environment (also called "air contaminant").

air pollution – presence of air pollutants.

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

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.

alluvial – pertaining to material, such as sand or silt, deposited by running water (e.g. a creek or river).

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

ambient – relating to conditions outside the active project area.

ambient air quality – the quality of the ambient air near ground level, expressed as concentrations or deposition rates of air pollutants – also expressed as existing air quality.

ambient 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.

ambient level – existing level of a phenomenon without the influence of the proposal.

amenity – the desirability of an area.

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

aquatic – living in or on water, or concerning water.

ANZECC – Australian and New Zealand Environment and Conservation Council.

aquatic – living in or on water, or concerning water.

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

aquifer – rock or sediment capable of holding and transmitting groundwater.

aquifer recovery – re-entry of groundwater into an aquifer from which water has been removed.

arboreal – tree dwelling.

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).

atmospheric stability – a measure of turbulence which determines the rate at which the effluent is dispersed as it is transported by the wind.

attenuation – reduction in sound pressure levels between two locations.

average annual daily traffic (AADT) – unit of assessment of traffic flow along a road.

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 noise levels - the level of the ambient sound indicated on a sound level meter in the absence of the sound under investigation (e.g. sound from a particular noise source; or sound generated for test purposes).

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.

batter – An engineered slope of soil or rock fill on either side upslope or downslope of a road, embankment or mine waste storage; the sloping banks of cut earth separating different levels in an open cut pit.

bench – a step in the face of a quarry which could be up to 8 m wide.

biological diversity/biodiversity – a concept encompassing the diversity of indigenous species and communities occurring in a given region; biological diversity includes genetic diversity, which is the diversity of genes and genotypes within each species; species diversity, which is the variety of living species; and ecosystem diversity which is the diversity of the different types of communities formed by living organisms and the relations between them.

biota – living components of a habitat.

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

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

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.

bund wall – a man-made earth mound used to visually and acoustically screen nearby receivers.

canopy – the highest vegetation layer of a plant community, in the case of forests, it is formed by the crowns of trees.

catchment – the entire land area from which water (e.g. rainfall) drains to a specific water course or waterbody.

channel – river or irrigation channel, includes bed and bank.

clay – very fine-grained sediment or soil (often defined as having a particle size less than 0.002 mm (2 microns) in diameter).

colonise – to establish a species in an area in which it was not previously found.

community – a combination of plants that are dependent on their environment and influence one another and modify their own environment. They form together, with their common habitat and other associated organisms, an ecosystem, which is also related to neighbouring ecosystems and to the macroclimate of the region.

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compaction – the process of close packing of individual grains in a soil or sediment as a response to pressure.

concentration – the amount of a substance, expressed as mass or volume, in a unit volume of air.

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

concrete aggregate – gravel and sand mix combined with cement and water to make concrete.

concrete products – products manufactured primarily from Portland Cement concrete, these include bricks, blocks, pavers, pipes and box culverts and other precast concrete sections.

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.

consolidation – the process whereby loose or soft sedimentary material (e.g. an alluvial deposit) becomes a compacted, harder sedimentary material (e.g. a sandstone).

conglomerate – a sedimentary rock consisting of sub-rounded rock fragments.

contaminant – a chemical compound or element which has been introduced as a result of human activity. It is noted, however, that some chemical compounds and elements also occur naturally in water and sediments.

cross-section – a two-dimensional diagram of an object presented as if the object had been cut along its length.

crusher – that part of an ore-processing plant where the ore is mechanically crushed into smaller pieces.

crusher fines – material finer than 3mm produced in the crushing plant.

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 track) or underneath the ground.

cumulative – increasing by successive additions.

Decibel (db) – unit expressing difference in power between acoustic signals.

deceleration lane – a lane used for decreasing speed before leaving the road.

deposited dust – relatively large dust particles which settle out – not detrimental to health.

development application - an application to the local council for approval of an activity deemed to require an approval prior to commencement.

dispersibility – a characteristic of soils relating to their structural breakdown in water into individual particles.

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

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

diversion bank – an earth bank constructed to divert water away from disturbed areas.

drainage line – a passage along which water concentrates and flows towards a stream, drainage plain or swamp intermittently during or following rain.

drainage structures – artificial structures to control and direct drainage and prevent erosion or flooding.

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

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

dust suppressant – any substance used to prevent dust disturbance.



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, it includes all the relationships within the biotic community and between the biotic components of the system.

electrical conductivity (EC) – the ability of a substance (either solid, liquid or gas) to transmit electricity.

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

emission factor – an expression for the rate at which a pollutant is generated as a result of some activity, divided by the level of that activity.

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. 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.

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

erodibility – the tendency of soil, earth or rock to erode.

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.

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

excavator – item of earth moving equipment fitted with a bucket on an articulated boom and used for digging material from a face in front of, or below the machine. An excavator would be used around the perimeter of the lakes.

exotic – introduced or foreign, not native.

face – sub-vertical quarry feature generally forming limits of benches.

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

fill – material imported and emplaced to raise the general surface level of a site.

fines – material such as clay or silt sized particles.

fire regime – the history of fire at a particular place expressed in terms of frequency, intensity and season of occurrence; may relate to wildfires or prescribed burning.

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

fly rock - rock that is propelled into the air by the force of an explosion. Usually comes from pre-broken material on the surface or upper open face.

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

geotechnical – technical or engineering aspects relating to soil, rock and other materials.

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.

groundcover – vegetation that grows close to the ground (such as grasses and herbs) providing protection from erosion.

groundwater – all waters occurring below the land surface; the upper surface of the soils saturated by groundwater in any particular area is called the water table.

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groundwater depression – localised lowering of the regional water table.

groundwater discharge – a low place in the landscape that intersects a groundwater aquifer, allowing it to discharge to the surface.

ground vibration – oscillatory motion of the ground caused by the passage of seismic waves originating from a blast.

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

haul road – road used in a quarry for haulage of rock from the active face to the crusher and for general site access.

heritage – the things of value which are inherited.

heritage significance – of aesthetic, historic, scientific, cultural, social, archaeological, natural or aesthetic value for past, present or future generations.

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 (see also exotic).

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

inflow – flow directed into a particular feature, such as a lake or a mine pit.

infrastructure – the necessary buildings, roads and equipment associated with a quarrying operation.

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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.

intermittent – flows periodically, irregularly.

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.

invertebrates – commonly, animals without a backbone (jellyfish, worms, molluscs, etc.).

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

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

mammal – animal of the class mammalia, distinguished by the presence of hair and mammary glands.

migratory – passing, usually predictably (based on aquatic species), from one region or climate to another, for purposes of feeding, breeding, or other biological purposes.

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

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

noxious – introduced species considered to be harmful to native species or to the habitat of native species.

overburden – subsoil and decomposed rock overlying the main rock body that is not suitable for use in the final product.

overburden emplacement – the area set aside for disposal of low grade or waste rock materials encountered during mining.



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

perimeter – outer boundary.

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 core drilled specifically for the monitoring of groundwater levels and water quality.

point source – a single activity that causes the release of a pollutant plume from a stationary vent. Large smoke-stack emissions are modelled as a single point source.

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.

population – a group of organisms all of the same species occupying a particular area.

porous – containing voids, pores, interstices or other openings which may or may not be interconnected.

potable – water suitable for human consumption.

precautionary principle – a principle of ESD which states that decisions about any proposed development should be guided by careful management to avoid serious and irreversible damage to the environment.

processing plant – a group of equipment used to clean and grade sand.

progressive rehabilitation – rehabilitation of mine or disturbed areas as soon as practicable after they are released during the life of the mine.

raw feed – material from the active extraction area – of a size suitable for processing.

recharge – the addition of water to an aquifer, directly from the surface, indirectly from the unsaturated zone, or by discharge from overlying or underlying aquifer systems.

recolonise – the process of animal and plant species re-establishing themselves in a disturbed area.

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

remnant bushland – native bushland remaining after widespread clearing has taken place.

reptiles – cold-blooded vertebrates, including lizards, snakes, turtles, and crocodiles.

resilient – able to survive disturbance.

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

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

riparian – pertaining to or situated on the bank of a river or creek.

ripping – breaking up of ground with a bulldozer using an action similar to a rake.

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

saline – water with high salt concentration.

scalps – the material removed by screening the raw feed prior to presenting it to the crushers. This material is a combination of fine material from the blast (where used) and decomposed material.

sediment basin – a small excavation designed to trap the coarse material washed from disturbed areas.

sedimentation – process or rate of depositing of sediment.

seepage – Emergence of subsurface flow at the ground surface.

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soil erosion hazard – the susceptibility of an area of land to erosion and includes rainfall erosivity, slope, soil erodibility and cover.

solubility – the ability of a substance (such as copper) to dissolve in a solvent (such as water); solubility depends on such factors as temperature and pH.

source – the place where pollutants are emitted into the atmosphere.

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.

stockpile – a pile used to store material (such as low-grade ore) for future use.

subsoil – the layer of soil lying below the topsoil; usually contains less organic matter and is less fertile.

substrate – an underlying layer (e.g. of sediment under water).

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

surge stockpile – a stockpile of semi-processed rock used to feed later stages of the process often used to compensate for variations in feed rate of a plant.

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

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

topography – the physical relief and contour of a region.

topsoil – the upper layer of soil, usually containing more organic material and nutrients than the subsoil beneath it.

total suspended solids – a common measure used to determine suspended solids concentrations in a water body and expressed in terms of mass per unit of volume (e.g. milligrams per litre).

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

Tube stock – tree seedlings supplied with roots enclosed in soil.

understorey – the layer of forest vegetation between the overstorey (or canopy) and the ground layer.

vehicle movement – a one-way trip.

visual amenity – attractiveness to the eye.

water chemistry – the interaction of the chemical constituents (dissolved metals, suspended particles, etc.) of water.

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

watercourse – stream or river, 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 erosion – wearing away of exposed soil, earth, or rock surfaces by the abrasive action of wind-blown particles (e.g. grains of sand).

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

yield – (of a water bore) 1) the capacity of the bore to produce water. 2) the amount of water actually withdrawn.



Acronyms, Symbols and Units

~ – approximately.

°C – degrees Celsius.

µg/m³ – micrograms per cubic metre.

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

% – percentage.

< – less than.

≤ – less than or equal to.

> – greater than.

≥ – greater than or equal to.

\$M – million dollars.

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

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

'000t – multiples of one thousand tonnes.

AHD – Australian Height Data (in metres).

AADT – Average Annual Daily Traffic.

ABS - Australian Bureau of Statistics

AHD – Australian Height Data; in metres above mean sea level.

AIS – Agricultural Impact Statement.

ANZECC – Australian and New Zealand Environment and Conservation Council.

AS – Australian Standard.

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

cm – centimetre (unit of measure).

DoE – Department of the Environment (Commonwealth)

DP&E – Department of Planning & Environment (NSW).

DPI – Department of Primary Industries.

dB – decibel, unit used to express sound intensity.

dB(A) – decibels, A-weighted scale; 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.

DTIRIS – Department of Trade & Investment, Regional Infrastructure & Services (NSW)

EC – see electrical conductivity.

EIS – Environmental Impact Statement.

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

EPA – Environment Protection Authority (NSW).

ESD – Ecologically Sustainable Development.

kg – kilogram (weight measure).

kL – kilolitre (thousand litre).

km – kilometre (= 1 000 metres).

L – litre.

L/s – litres per second.

L/t – litres per tonne.

LEP – Local Environmental Plan.

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

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

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L_{Aeq} – the L_{Aeq} is the “equal energy” average noise levels, and is used in some instances for the assessment of traffic noise effects or the risk of hearing impairment due to noise exposures.

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.

m – metre.

m AHD – metres Australian Height Datum.

M – million.

m² – square metre.

m³ – cubic metre.

mg – milligram (weight unit).

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

ML – megalitre.

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

Mtpa – million tonnes per annum.

NHMRC – National Health and Medical Research Council.

NOW – NSW Office of Water.

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

NPA – National Parks Association.

NPWS – National Parks and Wildlife Service (NSW).

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OASFS – Office of Agricultural Sustainability and Food Security (NSW)

OEH – Office of Environment and Heritage (NSW)

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 acidic, 7 is neutral acid, and 14 is most basic (alkaline).

PM₁₀ – particulate matter <10µm in diameter.

SEPP – State Environmental Planning Policy.

SRLUP – Strategic Regional Land Use Policy.

swl – standing water level.

t – tonnes.

TDS – total dissolved solids expressed in mg/L

t/m³ – tonnes per cubic metre.

tpa – tonnes per annum.

tpd – tonnes per day

tph – tonnes per hour.

µg/m³ – micrograms per cubic metre.

µm – micron (1 micron=0.001 millimetre).

µS/cm – micro siemens per centimetre.

V – volt.

w/v – weight per volume.



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