

Section 9

Glossary of Technical Terms, Acronyms, Symbols and Units

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Glossary of Technical Terms

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

Aboriginal heritage Site – discrete area or concentration of artefactual material, place of past Aboriginal activity, or place of significance to Aboriginal people.

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

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

aggregates – fragments of crushed rock with a defined size specified for use in the construction industry.

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.

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

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).

ambient – relating to conditions outside the active project area.

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

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

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

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.

backfill – material used to fill created void.

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).

bench – a step in the face of a quarry which could be up to 10m high.

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.

biophysical – relating to the biological and physical attributes of the environment.

biota – living components of a habitat.

booster – the components of the explosive train that function to transmit and augment the force and flame from the initiating explosive.

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

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.

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.

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

coarse sand – sand predominantly >0.6mm.

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.

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.

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.

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.

contamination – The degradation of natural water quality as a result of man's activities. There is no implication of any specific limits, since the degree of permissible contamination depends upon the intended end use, or uses, of the water.

contingency procedures – procedures put in place to handle an event considered unlikely to occur.

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

crusher – a component of a processing plant where rock 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.

cyclone – a conical shaped vessel designed to separate particles from a moving stream of either air or water.

decibel – unit expressing difference in power between acoustic signals.

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

ENVIRONMENTAL IMPACT STATEMENT

Section 9 – Glossary of Technical Terms,
Acronyms, Symbols and Units

WEDGEROCK PTY LTD

Karuah South Quarry

Report No. 958/02

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

detonator – a device or small sensitive charge used to detonate an explosive.

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

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

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

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.

environment – a general term for all the conditions (physical, chemical, biological and social) in which an organism or group of organisms (including human beings) exists.

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

ephemeral – lasting only a short time e.g. creek flow.

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 – an 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.

extraction – a term synonymous with quarrying for the recovery of rock from its in-situ location by drilling and blasting and loading/hauling to the processing plant.

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.

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

flow path – the direction followed by seepage (under an embankment or through soil).

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.

front-end loader – a machine used to lift and place quarry products onto a truck.

fugitive emissions – emissions not entering the atmosphere from a stationary vent (stack). Examples of fugitive dust sources include vehicular traffic on unsealed roads, processing equipment, wind erosion of dusty surfaces, etc.

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

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

greenhouse – 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.

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

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

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.

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.

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.

heavy metals – normally trace metals which occur in ore deposits and may be environmentally hazardous.

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

hydraulic gradient – the direction of flow of groundwaters.

hydrocarbon – any organic compound, gaseous, liquid or solid, consisting solely of carbon and hydrogen. Crude oil is essentially a complex mixture of hydrocarbons.

hydrogeology – the study of groundwater.

hydrology – the study of water, particularly its movement in streams or rivers.

igneous – a rock or mineral that solidified from molten or partly molten material.

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 or ground.

infrastructure – the supporting installations and services that supply the needs of a project.

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.

internal drainage – drainage confined to the project area.

intra-generational equity – the present generation should ensure that improved well-being and welfare are accessible to all sectors of society within Australia and that improved welfare within Australia does not result in decreased welfare in other nations.

inversion – weather term for surface defining boundary between two layers of air or different temperatures.

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 local government area.

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.

monitoring – systematic sampling and, if appropriate, sample analysis to record changes over time caused by impacts such as quarrying.

neutral weather conditions – weather conditions that neither particularly exacerbate nor mitigate the dispersal of pollutant emissions (dust, noise etc.) from a Site.

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.

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

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 – 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.

precipitation – natural water phenomena producing quantities of water measurable by standard methods (e.g. rainfall, snow).

processing – the size reduction of rock delivered from the extraction area and separation into final products of different size.

processing plant – a group of equipment used to crush and screen rock to produce marketable products.

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

quarry – a term covering an area of extraction, processing equipment, product stockpiles, roads, offices, workshops and related buildings.

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.

recovery – the difference between the observed water level during the recovery period following pumping and the maximum drawdown when pumping stopped.

regrowth – a forest stand established by natural regeneration after major disturbance of the previous forest canopy by wildfire, windthrow or logging.

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

relief – the variation in landscape elevation over a region.

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 material in a defined area based on preliminary geological information.

respirable dust – dust that is capable of being breathed in.

revegetated – an area that has been planted with trees, bushes and grasses after being disturbed.

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.

sand – sediment comprising particles in 0.063mm to 2mm size range.

sandstone – general term for sedimentary rock with grain size from 0.063mm to 2mm - grains may be minerals or rock fragments.

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.

Silicosis – Silicosis is an irreversible and progressive condition in which healthy lung becomes replaced with areas of fibrosis which results in shortness of breath which may progress into ultimately disabling and potentially fatal cardio respiratory failure. Breathing in respirable crystalline silica at high concentrations causes silicosis.

silica – silicon dioxide (SiO₂).

siliceous – having a high silica (quartz) content.

silt – a classic sediment, most of the particles of which are between 0.063mm and 0.004mm in diameter.

Site – the total area covered by the project, including extraction area, processing plant, tailings storage, waste emplacements, stockpiles, bunds, ponds, etc.

social equity – embraces value concepts of justice and fairness so that the basic needs of all the sectors of society are met and there is a fairer distribution of costs and benefits to improve the well-being and welfare of the community, population or society.

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.

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.

stemming – the process of filling the empty part of a charge case, such as a blasthole or well, with an inert stemming material (sand, gravel, or clay) to retain the products of the detonation of an explosive charge in an enclosed space.

stockpile – a pile used to store material (such as soil and quarry products).

stormwater – surface water runoff reaching stream channels immediately after rainfall.

subcatchment – a smaller area within a catchment drained by one or more tributaries of the main waterbody.

subsoil – surface material comprising the B and C Horizons of soil with distinct profiles; often having brighter colours and higher clay contrasts.

sulphate – a bivalent negative ion of sulphur and oxygen (SO₄).

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

suspended solids – solids held in suspension by the turbulent flow of a fluid.

sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their needs.

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

topography – the physical relief and contour of a region.

topographic maps – maps that show the variation in elevation of a landscape.

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 waterbody and expressed in terms of mass per unit of volume (e.g. milligrams per litre).

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

tubestock – tree seedlings supplied with roots enclosed in soil.

unconfined aquifer – a permeable formation only partly filled with water overlying a relatively impermeable layer. It contains water which is not subjected to any pressure other than its own weight.

unconsolidated – loose or soft, not compacted (particularly soil or sediment).

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.

washing plant – a plant designed to wash unwanted sized materials from product.

water quality – degree of the lack of contamination 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.

water table – the upper limit of the saturated zone within a rock mass, generally at atmospheric pressure. It is characteristic of unconfined aquifers.

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.

wetland – a low-lying area regularly inundated or permanently covered by shallow water.

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.

Glossary of Acronyms

AEMR – Annual Environmental Management Report

AEP – Annual Exceedance Probability

AHD – Australian Height Datum (in metres)

AHIMS – Aboriginal Heritage Information Management System

AHIP – Aboriginal Heritage Impact Permit

ALS – Australian Laboratory Services

ANZECC – Australian and New Zealand Environment and Conservation Council

APZ – Asset Protection Zone

AQMS – air quality monitoring stations

AS – Australian Standard

BALs – Bush Fire Attack Levels

BAM – Biodiversity Assessment Method

BCF – Biodiversity Conservation Fund

BC Act – *Biodiversity Conservation Act 2016*

BDAR – Biodiversity Development Assessment Report

BOM – Bureau of Meteorology

BSA – Biodiversity Stewardship Agreement

CEEC – Critically Endangered Ecological Community

CL+W – Department of Industry – Crown Lands and Water

CWD – clean water diversion

DCP – Development Control Plan

DECCW – Department of Environment, Climate Change and Water

DES – Department of Environment and Science

DoP – Department of Planning

DoEE – Department of Environment and Energy

DPE – Department of Planning and Environment

DRG – Division of Resources and Geoscience

EC – electrical conductivity

EIS – Environmental Impact Statement

ENM – Environmental Noise Model

EPA – Environment Protection Authority

EP&A Act – *Environmental Planning and Assessment Act 1979*

EPBC Act – *Environment Protection and Biodiversity Conservation Act 1999*

EPL – environment protection licence

ESD – ecologically sustainable development

GDEs – Groundwater Dependent Ecosystems

GHG – greenhouse gas

GSEs – Groundwater Sensitive Ecosystems

HRP – Hunter Regional Plan 2036

HVAS – high volume air sampler

ICAG – Ironstone Community Action Group

LALC – Local Aboriginal Land Council

LEP – Local Environmental Plan

LGA – Local Government Area

LULUCF – Land Use Land Use Change and Forestry

MIC – Maximum Instantaneous Charge

NHMRC – National Health and Medical Research Council

NNTT – National Native Title Tribunal

NP&W Act – *National Parks and Wildlife Act 1974*



NPI – Noise Policy for Industry

OEH – Office of Environment and Heritage

PA – Project Approval

PADs – Potential Archaeological Deposits

PCTs – Plant Community Types

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

PNTLs – project noise trigger levels

POEO Act – *Protection of the Environment Operations Act 1997*

PPV – Peak particle velocity

RAPs – Registered Aboriginal Parties

RBL – rating background noise level

RFS – Rural Fire Service

RMS – Roads and Maritime Services

RWC – R.W. Corkery & Co. Pty Limited

SCSC – Specialist Consultant Studies Compendium

SEARs – Secretary's Environmental Assessment Requirements

SEIFA – Socio-economic Indexes for Areas

SEPP – State Environmental Planning Policy

SIA – Social Impact Assessment

SILO – Scientific Information for Land Owners

SSD - State Significant Development

swl – standing water level

TARP – Trigger Action Response Plan

TDS – total dissolved solids expressed in mg/L

TEC - Threatened Ecological Community

TEOM – Tapered Element Oscillating Microbalance dust sampling unit

TSP – total suspended particulates

TTPP – Transport Planning Partnership Pty Ltd

VLAMP – Voluntary Land Acquisition and Mitigation Policy

WM Act – *Water Management Act 2000*

WSP – Water Sharing Plan

Glossary of Symbols and Units

% – percentage

< – less than

≤ – less than or equal to

> – greater than

≥ – greater than or equal to

~ – approximately

°C – degrees Celsius

cm – centimetre (unit of measure)

dB – decibel, unit used to express sound intensity

dB(A) – the unit of measurement of sound pressure level heard by the human ear, expressed in “A” scale

ha - hectare

kg – kilogram (weight measure)

kL – kilolitre (thousand litres)

km – kilometre (= 1 000 metres)

L – litre

L/s – litres per second

L/t – litres per tonne

LEP – Local Environmental Plan

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

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_{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

mm – millimetres

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

Mtpa – million tonnes per annum

t – tonnes

tpa – tonnes per annum

µg/m³ – micrograms per cubic metre

µS/cm – micro siemens per centimetre

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