

12. Glossary

12.1 Units and Symbols

%	percentage (proportion out of one hundred).
/	per.
µg	micrograms (one millionth of a gram).
µg/L	micrograms per litre; unit commonly used to express the concentration of trace metals in a liquid.
Bq	Becquerel; unit of radioactivity, equal to one transformation per second.
CO ₂ -e	carbon dioxide equivalent.
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.
g	gram.
Gg	gigagram (1,000 tonnes).
GJ	gigajoules.
Gy	gray, the standard unit of physically absorbed, ionising-radiation dose, equivalent to one joule per kilogram.
ha	hectare.
kg	kilogram.
kL	kilolitre.
km	kilometre.
km ²	square kilometre.
kV	kilovolt.
L	litre.
m	metre.
m ²	square metre.
mg	milligrams (one thousandth of a gram).
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; unit commonly used to express the concentration of suspended solids or major ions in a liquid.
mg/m ³	milligrams per cubic metre.
ML	megalitre, one million litres.
ML/day	megalitres per day.
ML/year	megalitres per year.
mm	millimetre.
mm/s	millimetres per second.
Mm ³	million cubic metres.
mSv	millisievert.
Mt	million tonnes.
Mt/year	million tonnes per year.
MW	megawatt.

MWh	megawatt hours.
PJ	petajoules (10^{15} joules).
ppm	parts per million.
s	second.
Sv	sievert. The standard unit of equivalent ionising-radiation dose used for radiation protection purposes. One Sv is equivalent to one joule per kilogram.
t	tonne.
t/day	tonnes per day.
t/m ³	tonnes per cubic metre.
t/yr	tonnes per year.
w/m ²	watts per square metre; measure of solar radiation.

12.2 Glossary Words

acid(ic)	having 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 mined materials, following acid formation within the material.
AGO	Australian Greenhouse Office.
alkaline	having a pH greater than 7.0.
amenity	the desirability of an area.
amphibians	animals (such as frogs) adapted to live both on land and in water.
ANSTO	Australian Nuclear Science and Technology Organisation.
aquatic	living in or on water, or concerning water.
aquifer	a water-bearing layer of sediment or rock.
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).
AS	Australian Standard.
background	the conditions (e.g., noise levels, bird populations) already present in an area before the commencement of a specific activity (e.g., a mining operation).
best practice	a process, technique, or use of technology, equipment or resource that has a proven record of success.
biodiversity	the diversity of different species of plants, animals and micro-organisms, including the genes they contain, in the ecosystem of which they are part.
blasting	detonation of explosive charge in a mine to assist in the removal of hard rock.
bore	a well, usually less than 20 cm diameter, sunk into the ground and from which water is pumped.
bund	an earth, rock, or concrete embankment constructed to prevent the inflow or outflow of liquids or the transmission of noise.

carbon dioxide equivalent	a unit of greenhouse gas emissions calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential. This enables emissions of different gases to be added together and compared with carbon dioxide.
carcinogenic	capable of producing cancer.
catchment	the entire land area from which water (e.g., rainfall) drains to a specific water course or waterbody.
cathode	negatively charged conductor (electrode) used in electrolysis.
channel	river or irrigation channel, includes bed and bank.
clay	a discrete mineral species, belonging to the layered silicate group, of less than 2 microns in diameter.
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 per unit of mass or volume of the medium in which it occurs.
conservative	a prediction, assumption, or measurement that errs on the side of safety.
contingency plan	plan put in place to handle an event considered unlikely to occur.
contractor	specialist brought in to perform a specific task, such as the construction of mine infrastructure or the excavation (mining) of the open pit.
cross-section	a two-dimensional diagram of an object presented as if the object had been cut across its width.
crusher	that part of an ore-processing plant where the ore is mechanically crushed into smaller pieces.
cyclone	a device that generates a vortex to clear particulate matter from air or water.
DBIRD	Department of Business, Industry and Resource Development (now DPIFM).
DCM	Department of the Chief Minister.
density	<ol style="list-style-type: none"> 1. the mass of a substance (e.g., sediment) divided by its volume; water has a density of exactly 1 kilogram per litre; gold has a density of 19.3 kilograms per cubic metre. 2. the coverage of vegetation (e.g., trees) per unit of distance (along a linear transect) or unit of area (in an area transect).
deposition	laying down of particulate material (e.g., sediment in a lake or tailing solids in a tailing storage).
dewater	to remove water from (e.g., a mine pit or an aquifer).
DIP	Department of Infrastructure and Planning (formerly DIPE).
DIPE	Department of Infrastructure, Planning and Environment.
dissolved oxygen	the amount of gaseous oxygen dissolved in water and available for a biochemical activity (e.g., fish respiration).
distribution of species	the entire area in which a population of a species, subspecies or other taxon is found.
diversity of species	the number or relative abundance of species in a defined area.
DNRETA	Department of Natural Resources, Environment and the Arts.
DPC	Darwin Port Corporation.
DPIFM	Department of Primary Industry, Fisheries and Mines (formerly DBIRD).

drilling	the action of boring holes (usually less than 30 centimetres in diameter and up to several hundred metres deep) into the ground, typically to establish a water bore or to investigate the geology found at depth.
ecology	the science dealing with the relationships between organisms and their environments.
ecosystem	an interacting system of animals, plants, other organisms and non-living parts of the environment.
emission	a discharge of a substance (e.g., dust) into the environment.
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 planning	planning (e.g., of a mining operation) that places emphasis on the possible environmental impacts of a development.
ephemeral	not permanent, e.g., a stream that flows only seasonally or after rainfall or a lake that periodically dries out.
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.
excavators	vehicles used to excavate holes and move soil, earth, or rocks.
exotic	introduced to a particular environment (see also introduced).
extinction	when the entire population of a species (across the world) has died out.
failure	(of wall) structural collapse or breach.
fault	major fracture of the earth's crust caused by the relative movement of the rock masses on either side.
fauna	a general term for animals (birds, reptiles, marsupials, fish, etc.), particularly in a defined area or over a defined time period.
feasibility study	a preliminary technical and economic study to assess the viability of a project.
feed	material being fed into a process.
filterable metal	dissolved metal able to pass through a filter, normally having a pore size of 0.45 micron.
flocculant	chemical substance added to a flotation process to aid flocculation.
flood plain	a low-lying plain adjacent to a river subject to occasional or frequent flooding and formed by sediment deposition during flooding episodes.
flora	a general term for plants, particularly those found in a defined area or characteristic of a defined time period.
flowsheet	1. diagram representing the sequence of events and decision-making logic of a particular process. 2. the series of steps within the processing plant by which metals are recovered from ore.
fluvial	relating to, or formed by, a stream or river.
food chain	the assemblage of organisms of various energy (trophic) levels linked by the transfer of food energy.
foraging	searching for food over a wide area.
formation	a large stratigraphic sequence of rock beds (sandstone, shale, limestone, etc.) generally deposited over a distinct geological period (e.g., during a glacial period).
fugitive	noise, dust, or light that has escaped into the environment (e.g., from a mine site).

gangue	a mineral without economic value that is part of an ore deposit; quartz, calcite, and fluorite are common gangue minerals.
general arrangement	plan of the project area, including pit, tailing storage, process plant, etc.
geochemistry	the study of the chemical composition of the earth or of the chemical interaction of elements, molecules, or particles derived from the earth.
geotechnical	a term currently employed to cover the fields of soil mechanics, rock mechanics, and engineering geology.
grade	the concentration of metal, e.g., copper, either in an individual rock sample or averaged over a specified volume of rock.
grader	vehicle used to smooth a soil or rock surface.
gradient	rate of change of a given variable (such as temperature or elevation) with distance.
gravel	sedimentary particles or rock fragments generally between 2 and 10 mm in size.
greenhouse gases	carbon dioxide, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons and sulfur hexafluoride.
grinding	a process used to reduce the particulate size of a mine rock or soil, typically occurs after crushing.
ground vibration	vibration transmitted through the ground following blasting.
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 discharge	discharge of groundwater into rivers, streams or open pits.
guar	drought-tolerant herb grown for forage and for its seed which yields a gum used as a thickening agent or sizing material.
habitat	the particular local environment occupied by an organism.
haul trucks	heavy vehicles used for the transportation of ore or waste rock.
heavy metals	generally used to describe the following metals: arsenic, iron, manganese, silver, mercury, chromium, lead, zinc, copper, nickel, selenium and cadmium.
herpetofauna	the population of reptiles and amphibians inhabiting a specific area.
highest order predator	an organism that is not consumed, but consumes other organisms, which in turn consume organisms lower in the food chain.
hydrology	the study of water, particularly its movement in streams, rivers, or underground.
hydroxides	an oxide compound derived from water by the replacement of one of the hydrogen atoms by another atom or group (e.g., sodium hydroxide, NaOH).
hypothesis	a supposition put forward in explanation of observed facts.
indicator	any physical, chemical, or biological characteristic of the environment used to assess (i.e., indicate) environmental condition.
indigenous	belonging to, or found naturally in, a particular environment (see also exotic).
inflow	flow directed into a particular feature, such as a lake or a mine pit.
infrastructure	the supporting installations and services that supply the needs of a project.
introduced	see exotic.
intruded	geological term for (igneous) rock formed by the injection of molten magma up into the earth's crust and its subsequent cooling and crystallisation.

invertebrates	commonly, animals without a backbone (jellyfish, worms, molluscs, etc.).
irrigation	the artificial flooding of agricultural land to promote cultivation.
LAeq	the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.
landform	a specific feature of a landscape (such as a hill) or the general shape of the land.
leach	dissolution and removal of a soluble substance from a soil or a rock, e.g., the leaching of salt (by water) from a soil or the leaching of gold (by cyanide) from a rock.
leachate	the fluid in which a leached substance is dissolved or transported.
lift	each separate layer placed in the construction of an embankment or waste rock emplacement.
lithology	the description of rocks on the basis of colour, mineralogical composition, and grain size.
load	the amount of a substance discharged into a body of water (e.g., salt or sediment); usually expressed as mass over a specified time (e.g., tonnes per year).
macropods	marsupials belonging to the family Macropodidae, which includes kangaroos, wallabies, tree kangaroos, pademelons, and several others.
mean	average; the sum of the data divided by the number of data points.
mean annual rainfall	the average amount of rain that falls each year.
median	the middle value of a set of numbers arranged in order of magnitude (or the mean of the middle two numbers).
metallurgical	pertaining to metals, particularly their extraction from ore.
microchiropteran	one of two suborders of bats in the world.
microhabitat	a habitat peculiar to a small area, particularly an area distinct from that surrounding it (e.g., a decaying log in a grazing paddock).
mill	ore processing plant.
mine materials	material removed during excavation of the mine pit (e.g., topsoil, waste rock, or ore).
mine waste	by-products of mining operations with no economic value.
mine water	all water used in mining and processing (for dust suppression, in leach tanks, etc.).
mineralisation	the occurrence of metals or ore-bearing minerals within a rock sequence.
MMP	Mining Management Plan.
model	a mathematical simulation of a natural system (such as the variation of particulate levels within a lake) used to predict how the system will change with time, particularly where external changes have been imposed upon it (such as from mining operations).
monitoring	systematic sampling and, if appropriate, sample analysis to record changes over time caused by impacts such as mining.
multi-element geochemical signature	a suite of elements in geochemical concentrations above local background values in soils (or other surface materials) indicating the presence of mineralisation.
mutagenic	capable of inducing genetic mutations.
native	see indigenous.
natural	existing in, or formed by, nature (generally excludes anything obviously modified by human beings).

natural degradation	deterioration occurring due to natural circumstances (such as extreme weather conditions).
natural succession	natural replacement of an animal or plant species with another in the same habitat.
neutral	neither acidic nor basic (e.g., pH equal to 7.0).
nitrate	NO ³⁻ , nitrogen compound commonly found in waterbodies and used by plants and algae as a nutrient.
NOI	Notice of Intent.
non-combustible residue	dust residue that cannot be burnt (i.e., free of organic litter).
NORM	naturally occurring radioactive material.
noxious	introduced species considered to be harmful to native species or to the habitat of native species.
nutrient status	state of nutrient (nitrogen and phosphorus) concentration of a waterbody.
nutrients	generally refers to nitrogen and phosphorus, which are essential for biological growth.
OEH	Office of Environment and Heritage.
open pit	large hole excavated in an open-cut mining operation to remove the ore.
operations	mining and ore processing activities.
operations phase	that period of the mining project, after construction and prior to decommissioning, during which pit excavation and metal extraction takes place.
order of magnitude	an approximate 10-fold difference between two numbers (e.g., 21 and 230) is one order of magnitude; an approximate 100-fold difference is two orders of magnitude (e.g., 21 and 2,150), etc.
ore	a mineral or mixture of minerals containing a metal in sufficient amounts for its extraction to be profitable.
ore processing	the mechanical and chemical process by which a metal is extracted from an ore.
orebody	a solid mass of ore (both high and low grade) that is geologically distinct from the rock that surrounds it and that is commercially extractable.
overburden	material that overlies a deposit of ore.
oxidation	the process by which an element or compound undergoes a chemical reaction involving the removal of electrons; often involves reaction with oxygen to form an oxide (e.g., the rusting of iron).
PAC	Project Assessment Committee.
particle size distribution	the relative proportions of particles (e.g., in a sediment) that fall within specific size categories.
passive	performing a function without electrical or mechanical action or movement (e.g., a jar-and-funnel rain gauge).
PAWC	Northern Territory Power and Water Corporation.
perimeter	outer boundary.
permeability	the ability of a rock or soil to allow fluid to pass through it.
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 and 14 is most basic (alkaline).
piezometer	a small-diameter cased bore used to measure groundwater levels.
pit	see open pit.

pit water	water inflow into the pit from incident rainfall or groundwater seepage from pit walls.
plant site	the site of the ore-processing plant.
plutonic	coarse-grained igneous rock which has solidified far beneath the earth's surface.
PM ₁₀	the fraction of dust with a particle size of 10 µm or less; a health indicator for the fine particles of respirable dust capable of being inhaled into the lungs.
PM _{2.5}	the fraction of dust with a particle size of 2.5 µm or less; a health indicator for the very fine particles of respirable dust capable of deep penetration into the lungs and alveoli.
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.
potable water	water of quality suitable for human consumption.
precipitation	1. the process of changing from a dissolved compound into a solid, insoluble compound. 2. rain, hail and snow.
process method	method used to extract metals from ore.
process plant	where the extraction of metals from the mined ore occurs.
process reagents	the chemicals and solutions used in the process method.
process water	water used during the processing of ore.
progeny	the isotopes or elements formed by the nuclei of radionuclides during radioactive decay; also known as 'decay chain products' and 'daughter products'.
progressive rehabilitation	rehabilitation of mined or disturbed areas as soon as practicable after they are released during the life of the mine.
project area	the total area covered by the project, including pit, processing plant, tailing storage, waste emplacements, stockpiles, bunds, dams, etc.
prospective	potentially containing an economic ore deposit.
PWC	Parks and Wildlife Commission.
PWCNT	Parks and Wildlife Commission Northern Territory.
quality control	procedures built into a sampling and analytical program to maintain the quality of the results obtained.
quantify	to determine the quantity or amount of a component in a substance.
quarry	an open pit from which construction materials are excavated.
radius	distance from the centre of a circle to its perimeter.
rainfall events	periods of rainfall.
reagents	chemicals used as part of an industrial process.
receptor	a designated place at which an impact may occur (e.g., a dwelling).
recessionary flow	the volume of water that passes a given point in a given period of time at the end of the wet season.
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.
refining	to bring to pure state.
regrowth	natural regeneration of vegetation following clearing, fire, etc.

rehabilitation	the restoration of a landscape and especially the vegetation following its disturbance.
remobilisation (of sediment)	resuspension of deposited sediment.
replicate samples	samples taken as close to each other in time and space as possible to test analytical accuracy.
reprotoxic	capable of causing reproductive impairment in adults and developmental impairment or death in a foetus.
reptiles	cold-blooded vertebrates, including lizards, snakes, turtles, and crocodiles.
reserve	commercially extractable minerals.
residual environmental impacts	impacts from an activity (e.g., mining) that remain after management and mitigation measures.
residue	see tailing.
resource	minerals in the ground, but not necessarily commercially extractable.
revegetated	an area that has been planted with trees, bushes and grasses after being disturbed.
richness (of fauna or flora)	a measure of the number of species in a given area or assemblage.
riparian	pertaining to, or situated on the bank of, a body of water, especially a water course such as a river.
river system	a river and its tributaries draining a catchment.
RL	relative level.
ROM	run-of-mine; see run-of-mine ore stockpile.
routine monitoring	monitoring performed on a regular basis, with the same observations and tests conducted each time.
run of mine (ROM) ore stockpile	the stockpile of freshly mined ore used to feed the mill and process plant.
runon	that portion of precipitation (rain, hail and snow) that can potentially flow across a specific area as water.
runoff	that portion of precipitation (rain, hail and snow) that flows from a specific area as water.
SAG	semi-autogenous grinding.
sampling period	range of time over which samples are taken.
sand	siliceous group of particles within the size range 63 μm to 2 mm.
scree	small, loose rocks that gather on a slope and often at the base of cliffs.
sediment load	see load.
sediment transport	the movement of sediment particles by the action of water, wind or gravity.
sedimentary rocks	rocks resulting from the consolidation of loose sediment that has accumulated in layers.
seepage	1. subsurface movement of water. 2. emergence of subsurface flow at the ground surface.
seismic risk	the possibility of earth movement (e.g., an earthquake).
sequence (geological)	layers of (predominantly) sedimentary rocks sourced from a common geological environment or period.
sheet flow	runoff that is of substantial lateral extent and relatively uniform depth (rather than concentrated in channels).

silt	a sediment with particles finer than sand and coarser than clay, i.e., 2 to 63 μm .
site-specific	an observation that is particular to one site.
slurry	mixture of fluid and solid (e.g., tailing water and solids).
soak	a small area where the water table has intersected the ground surface.
soda ash	sodium carbonate.
solubilisation	the process of dissolving.
solvents	organic liquids that will dissolve solids (e.g., benzene or toluene).
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.
spigot	a tap for controlling the flow of liquid from a pipe.
standing water	water that is pooled and still.
station	a specific location established for repeated sampling, gauging, weather measurements, etc.
stockpile	a pile used to store material (such as low-grade ore) for future use.
stockpiled	stored in a stockpile.
storage capacity	the maximum volume of liquid able to be retained in a structure or container (e.g., a reservoir or lake).
stream gauging	determination of water level and velocity in a stream or river for the purpose of calculating the volume of flow.
stripping	removal of vegetation and topsoil.
sub-aerial	exposed to the air.
sub-aqueous	below the surface of water.
subsistence	farming where produce is consumed by farmer and family leaving no surplus for marketing.
substrate	an underlying layer (e.g., of sediment under water).
sumps	pits sunk to collect water.
supernatant	the layer of water above settled solids.
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.
tailing	by-product of the metal extraction process consisting of crushed rock from which the metal has been extracted (the solid fraction or portion) and a liquid fraction or portion composed of water and residual chemicals used in the extraction process.
tailing storage facility (TSF)	a storage facility for tailing.
TDS	total dissolved solids.
temperature inversion	an atmospheric phenomenon in which air temperature increases with height over a particular interval.
tenure (of land)	terms of holding or authority of ownership.
terrestrial	pertaining to land.
throughput	quantity of material (ore, chemicals, etc.) moving through a system (e.g., an ore-processing plant).
tissue	cellular fabric of which animals or plants are made.
topography	physical relief and contour of a region.

topsoil	upper layer of soil, usually containing more organic material and nutrients than the subsoil beneath it.
total metal	total mass of filterable and non-filterable metal in a sample.
total suspended particulate matter (TSP)	mass of all suspended particulates (see TSS).
total suspended solids (TSS)	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).
toxic	poisonous to a specific organism, sometimes resulting in death.
toxicant	a substance that is poisonous.
toxicity	effect of any substance that produces a harmful effect on living organisms; described as acute (short term) or chronic (long term).
transect	a line across a study area along which observations are made and changes can be observed (e.g., changes in vegetation).
transport	movement (e.g., of sediment) via a medium such as river water.
tributary	a stream or river that flows into a larger river or lake.
TSP	see total suspended particulate matter.
TSS	see total suspended solids.
turbidity	the optical property of water that prevents light from being transmitted; turbidity or muddiness is caused by the presence of very fine suspended matter such as clay or organic matter.
understorey	the smaller species of plants that form neither the canopy nor the ground cover.
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation.
upper limits	the higher values within a defined range.
variable	not constant, subject to change (e.g., temperature, rainfall or population).
vegetated	covered with plants.
velocity	speed in a given direction.
vibration	oscillating movement.
wash thickener	a structure used to both wash and thicken slurries.
waste emplacement	structure to hold waste rock, formed by the placement of waste rock in stacked layers (typically 7 to 10 m thick), engineered in such a way as to maximise stability and minimise erosion.
waste oils	old oils and lubricants retrieved from machinery.
waste rock	uneconomic rock extracted from the ground during a mining operation to gain access to the ore.
water balance	the sum of the inputs and outputs and changes in storage levels of water in a given locality.
water chemistry	the interaction of the chemical constituents (dissolved metals, suspended particles, etc.) of water.
water column	the body of water overlying the bed of a stream, lake, swamp, or ocean.
water hardness	the concentration in water of certain mineral salts (particularly calcium carbonate, CaCO ₃); generally a function of calcium and magnesium concentrations.
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 surface of the groundwater, below which soil and rock are saturated.
watercourse	stream or river, running water.
watershed	area of land that catches precipitation and drains into a waterbody such as a river.
weathering	the insitu physical disintegration and chemical decomposition of rock materials at or near the earth's surface.
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.
worst-case scenario	a sequence of events likely to result in the worst-case effects on the environment.
yield	(of a water bore). <ol style="list-style-type: none">1. the capacity of the bore to produce water.2. the amount of water actually withdrawn.