

Acronyms

ADWG	Australian Drinking Water Guidelines
CALM	Department of Conservation and Land Management
CAMBA	China-Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
CWS	Clear Water Storage
DEC	Department of Environment and Conservation (this is a new agency that will merge CALM and DoE as of the 1 st of July, 2006)
DEH	Department of the Environment and Heritage (Commonwealth)
DIA	Department of indigenous Affairs
DLI	Department of Land Information
DOC	Dissolved Organic Content
DoE	Department of Environment
DoIR	Department of Industry and Resources
DoW	Department of Water
DRF	Declared Rare Flora
DPI	Department for Planning and Infrastructure
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPA	Environmental Protection Authority
EPA Act	<i>Environmental Protection Act 1986</i>
EPP	Environmental Protection Policy
FESA	Fire and Emergency Services Authority
FPC	Forest Products Commission
G&AWS	Goldfields and Agricultural Water Supply Scheme
IWSS	Integrated Water Supply Scheme
JAMBA	Japan-Australia Migratory Bird Agreement
MCA	Multiple Criteria Analysis
MIEX	Magnetic Ion Exchange
ML/day	Megalitres per day (one million litres per day)
MRS	Metropolitan Region Scheme

NTT	Native Title Tribunal
PDWSA	Public Drinking Water Source Area
QRA	Quantitative Risk Assessment
RPZ	Reservoir Protection Zone
TEC	Threatened Ecological Community
THM	Trihalomethane
WAPC	Western Australian Planning Commission
WTP	Water Treatment Plant

Glossary

Acid Sulphate Soils – acid sulphate soils are naturally occurring soils and sediments containing sulphide minerals, predominantly pyrite (and iron sulphide). When undisturbed below the watertable, these soils are benign and not acidic (potential acid sulphate soils). However, if the soils are drained, excavated or exposed by lowering of the water table, the sulphides will react with oxygen to form sulphuric acid. (EPA, 2005)

Adsorption (in water treatment) – is when specialised adsorbent materials such as activated carbon and ion exchange resins are used to remove certain dissolved contaminants from water. For example, water can be percolated through a bed of carbon granules. Once the carbon is saturated with the contaminants, it needs to be replaced or regenerated by heating to a high temperature. Adsorption can be used when there are blue-green algal blooms, or taste and odour from natural organic matter in the source water.

Alum (Aluminium sulphate) – see **Coagulation and Flocculation**

Best Practice – occurs when a comprehensible, integrated and cooperative approach to the continuous improvement of all facets of an organisation's operations. It is the way leading edge companies manage organisations to deliver world class standards of performance. (DoW, 2006)

Biodiversity – the variety of all life forms, the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part. Biodiversity is not static, but constantly changing. It is increase by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline, and extinction. Biodiversity has two key aspects:

- ▶ Its intrinsic value at the genetic, individual species, and species assemblages levels;
- ▶ Its functional value at the ecosystem level. (EPA, 2005)

Buffer – in relation to potentially polluting activity (for examples, some industries and infrastructure), "the area within which sensitive land uses are prohibited or special measures are necessary to ameliorate the impacts of industry or infrastructure. (EPA, 2005)

Bushland – land on which there is vegetation which is either a remainder of the natural vegetation of the land, or, if altered, is still representative of the structure and floristics of the natural vegetation, and provides the necessary habitat for native fauna. (EPA, 2005)

CAMBA (The China-Australia Migratory Birds Agreement) – an agreement between the Government of Australia and the Government of the People's Republic of China for the protection of migratory birds and their environment. (EPA, 2005)

Catchment – the area of land from which rainfall run-off contributes to a single watercourse, wetland or aquifer. (DoW, 2006)

Catchment Area – for the purpose of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* and the *Country Areas Water Supply Act 1947* means all land over, through or under which any water flows, runs or percolates directly or indirectly into any reservoir erected or used in connection with any water supply or works. The boundaries of a Catchment Area may be proclaimed under these Acts. (EPA, 2005)

Chlorine Buffer Zone – an area surrounding a chlorination facility inside the equal risk contour line for a one chance in a million per year of a fatality.

Clear Water Storage – the first storage tank following a water treatment plant (which includes filtration and disinfection).

Coagulation and Flocculation (in water treatment) – is when a chemical coagulant is added to the water to react with the unwanted particles to form larger particles, called floc. The larger size and weight of the flocs causes them to settle rapidly. Coagulation and flocculation are very effective at removing fine suspended particles that attract and hold bacteria and viruses to their surface. Aluminium sulphate (alum) is a commonly used coagulant.

Compatible with conditions – (in relation to land use in PDWSA priority areas) means the land use is likely to be accepted as not likely to harm the drinking water source, provided best environmental management practices are used. This may result in the application of 'specific conditions' (via the planning or environmental approval processes) that must be complied with to ensure the water quality objective of the priority areas is maintained. (DoE, 2004)

Compulsory acquisition / land resumption – the compulsory acquisition (or 'resumption') of land for public works. The provision of the *Water Legislation Amendment (Competition Policy) Act 2005* replaces the powers of the Water Corporation to compulsorily acquire land under the *Water Agencies (Powers) Act 1984* with provisions under the *Water Services Licensing Act 1995* that brings the power under the close supervision of the Minister. It is intended that powers available under the *Land Administration Act 1997* to acquire land will be delegated to the Minister for Water Resources, who will then be able to sub-delegate the power to the Corporation.

Conceptual Locations – (in relation to Mundaring WTP site selection process) these locations are broad areas that need further investigation at a conceptual level, but for which no specific sites have been currently identified.

Condition (in relation to vegetation) – a rating given to vegetation to categorise disturbance related to human activities. This rating refers to the degree of change in the structure, density and species present in vegetation in relation to undisturbed vegetation of the same type. (EPA, 2005)

Conservation estate – land under the care and control of the Conservation Commission and managed by CALM. This includes National Parks, Nature Reserves, Conservation Parks and s5(1)(g) or s5(1)(h) *Conservation and Land Management Act 1984* reserves. (EPA, 2005)

Contaminated – in relation to land or underground water, means that a substance is present in, on or under that land or in that underground water, at a concentration that

presents, or has the potential to present, a risk of harm to human health or any environmental value. (DoE, 2006)

Criteria – numerical values or narrative statements that serve as benchmarks to determine whether a more detailed assessment of environmental quality or a management response is required. (EPA, 2005)

Critical Environmental Assets – these are the most important environmental assets in the State that should be protected and conserved. (EPA, 2005)

Dieback – see *Phytophthora dieback*

Disinfection (in water treatment) – is the process used to kill any harmful micro-organisms, such as bacteria, viruses and protozoa which may be present in the source water and preventing them from regrowing in the water distribution system. The most widely used disinfection systems in Australia are chlorination, chloramination (chlorine and ammonia), ozonation and ultraviolet radiation.

DRF (Declared Rare Flora) – species protected under the *Wildlife Conservation Act 1950*, as identified in the current listing. (EPA, 2005)

Ecological Community – a naturally occurring biological assemblage that occurs in a particular type of habitat. The scale at which ecological communities are defined will often depend on the level of detail in the information source. (EPA, 2005)

Ecological Linkage – a network of native vegetation that maintains some ecological functions of natural areas and counters the effects of habitat fragmentation. (EPA, 2005)

Ecosystem – a dynamic complex of plant, animal, fungal and micro organism communities and the associated non-living environment interacting as an ecological unit. Non-living factors include climate, atmosphere and the geosphere. (EPA, 2005)

Ecosystem functions, ecosystem processes – interconnected processes that sustain the biodiversity typical of a given ecosystem, and drive the self-directed development of that ecosystem. Such processes involve all components of ecosystems, living and non-living. (EPA, 2005)

Edge Effects – the deterioration of the health of natural areas near the interface with developed or cleared areas. The edges of natural areas are prone to weed infestation, pests and diseases, exposure to the weather, altered drainage and watertable regimes, trampling and other impacts. (EPA, 2005)

Embodied Energy – is the sum of all the energy inputs into a product. For building materials this includes extraction of materials, processing, transport and manufacture.

Environment – living things, their physical, biological and social surroundings, and interactions between all of these. The social surroundings of man are his aesthetic, cultural, economic and social surroundings to the extent that those surroundings directly affect or are affected by his physical or biological surroundings. (EPA, 2005)

Environmental Impact Assessment – an orderly and systematic process for evaluating a scheme or a proposal, including its alternatives where relevant, and its

effect on the environment, including the mitigation and management of those effects. (EPA, 2005)

Environmental offset – any environmentally beneficial activities undertaken to counterbalance an environmental impact or harm, with the aim of achieving a ‘no net environmental loss’ or ‘net environmental benefit’ outcome. (EPA, 2005)

Environmental Value – means:

- ▶ A beneficial use of the environment (including social and economic values that derive from the environment); or
- ▶ An ecosystem health condition. (EPA, 2005)

Fauna – animal species (EPA, 2005)

Fauna assemblage – a collection of animal species inhabiting a particular area. (EPA, 2005)

Filtration (in water treatment) – occurs as water passes through filters that help remove even smaller particles. Conventional filters are made of sand, gravel and coal. Unwanted particles in the water are too large to pass through the gaps between the filter medium particles. There is also some **adsorption**, or physically binding of dissolved contaminants to filter medium particles. Periodically the filters are backwashed to remove collected contaminants from the filter bed. Development of new synthetic materials has led to a new range of filter materials where water is filtered through tiny holes (pores) in synthetic membrane walls. The smaller the pore size, the more unwanted material is held by the membrane as the water passes through. Microfiltration, ultrafiltration, nanofiltration and reverse osmosis are emerging technologies.

Flocculation – see **Coagulation and Flocculation**

Flood fringe – a term used in Western Australia to mean the portion of the **floodplain** outside the **floodway** where, for the purposes of flood management, some development may occur. The area generally covered by still or very slow moving waters during the 100-year flood. (EPA, 2005)

Floodplain- the extent of the land near a waterway that may be flooded. (EPA, 2005)

Floodway – a term used in Western Australia to mean the portion of the **floodplain** where no development or filling should occur as this area is expected to carry the main flood. (EPA, 2005)

Flora – all the vascular plant taxa (including species, subspecies, varieties, hybrids and ecotypes) in a given area or epoch. (EPA, 2005)

Fluoridation (in water treatment) – is when fluoride is added to the water supply to reduce dental cavities in the population served. Required in large towns in Western Australia by the *Fluoridation of Public Water Supplies Act 1966*

Foreshore buffer – the area along each side of a water body that is managed primarily to protect the ecological and hydrological values of the water body. (EPA, 2005)

Fringing vegetation, riparian vegetation – the vegetation adjacent to a water body and directly dependent on the proximity of the water body. Fringing vegetation can include both wetland and dryland vegetation. Fringing vegetation helps to maintain the integrity of the water body by providing habitat for many aquatic and terrestrial species, stabilising the water body banks, dissipating water energy, providing ecological corridors, and limiting the export of sediment and nutrients. (EPA, 2005)

Habitats – the environment in which an organism or group of organisms live. (DoW, 2006)

Impact (environmental) – the effect that a human-caused or natural activity has on living organisms and their non-living environment that can either be adverse or beneficial. (EPA, 2005)

Indirect impact – impact that occurs as a secondary or tertiary effect of a development or action. (EPA, 2005)

JAMBA (the Japan- Australia Migratory Birds Agreement) – is an agreement between the Government of Japan and the Government of Australia for the protection of migratory birds in danger of extinction and their environment. (EPA, 2005)

Land Degradation – the decline in the condition or quality of the land as a consequence of human activities. For the purposes of the *Soil and Land Conservation Act 1945* land degradation includes:

- ▶ soil erosion, salinity, eutrophication and flooding; and
- ▶ the removal or deterioration of natural or introduced vegetation,

That may be detrimental to the present or future use of the land. (EPA, 2005)

Land Use – the active or passive use to which the land is put by its owner, lessee, manager or occupier. (EPA, 2005)

Landform – a combination of slope and elevation producing a particular shape and form of the land surface. (EPA, 2005)

Landscape – the appearance of the land whether natural or altered, including its shape, texture and colours. (EPA, 2005)

Multiple Criteria Analysis (MCA) – is a process or a tool that is used to make a decision by comparing different options or alternatives. Sets of criteria are compared to determine the option with the ‘best’ outcome.

Native Title – the rights and interests of Aboriginal and Torres Strait Islander people in land and water according to their traditional laws and customs, that are recognised under Australian law. (NTT, 2006)

Native Vegetation – indigenous aquatic or terrestrial vegetation, including most dead vegetation, but does not include vegetation in a plantation, nor, for the purposes of Division 2 Part V of the EPA, 2005 Act, most vegetation that was intentionally sown, planted or propagated. (EPA, 2005)

Offsets (environmental) – any environmentally beneficial activities undertaken to counterbalance an environmental impact or harm, with the aim of achieving a ‘no net loss’ or ‘net environmental benefit’ outcome. (EPA, 2005)

Oxidation (in water treatment) – with strongly reactive chemicals such as oxygen, ozone, chlorine, chlorine dioxide, potassium permanganate etc, is used to remove dissolved contaminants such as iron and manganese, algal toxins, taste and odour causing organic compounds, micro-organisms and traces of pesticide.

Phytophthora dieback – is a disease caused by a microscopic soil-borne water mould, *Phytophthora cinnamomi*, that kills many plants in the Southwest Australia.

Priority Fauna – conservation significant animal species listed by CALM’s Threatened Species Consultative Committee but which are not currently listed under s14(2)(ba) *Wildlife Conservation Act 1950* as Specially Protected Fauna. (EPA, 2005)

Priority Flora – plant taxa that are under consideration as threatened flora but are in need of further survey to adequately determine their status, or are adequately known but require monitoring to ensure that their security does not decline. Priority Flora lists are maintained by CALM. (EPA, 2005)

Public Drinking Water Source Areas (PDWSA) – areas proclaimed by legislation to protect drinking water source catchments. They include:

- ▶ **Catchment Areas** (proclaimed under the surface water catchments of dams under the *metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*);
- ▶ **Water Reserves** (declared over potential surface water and groundwater catchments or existing groundwater public drinking water sources under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*). (EPA, 2005)

There are three levels of priority classification of PDWSAs:

- ▶ **Priority One (P1)** source protection areas are managed to ensure there is no degradation of the water source. They cover land normally owned by the State where the provision of the highest quality drinking water is the prime land use value.
- ▶ **Priority Two (P2)** source protection areas are defined to ensure that there is no increased risk of water source contamination/pollution. P2 areas are declared over land where low intensity development (such as rural) already exists. Protection of public water supply sources is a high priority in these areas.
- ▶ **Priority Three (P3)** source protection areas are defined to manage the risk of pollution to the water source from catchment activities. P3 areas are declared over land where water supply sources need to co-exist with other land uses such as residential, commercial and light industrial development. Land uses considered to have significant pollution potential are nonetheless opposed or constrained.

(DoE, 2004)

Quantitative Risk Assessment (QRA) – estimates the risk associated with the operation of a facility, calculates the likely frequency, and gauges the severity of an

incident for a range of distances from the facility. It produces a map of equal risk contour lines around the facility, e.g. one in a million chance per year of a fatality resulting from an incident at the facility.

Ramsar Convention – the Ramsar Convention on Wetlands, signed in Ramsar, Iran in 1971, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. (EPA, 2005)

Reserve – Any land reserved for a public purpose. (EPA, 2005)

Reservoir Protection Zone (RPZ) – RPZs (or ‘prohibited zones’) consist of a statutory 2 kilometre wide buffer area around the top water level of storage reservoirs in the Perth water supply area. RPZ apply over Crown land and prohibit public access to prevent contamination (physical, chemical and biological) of the source water. (DoE, 2004)

Riparian Vegetation – see **Fringing Vegetation**

Risk – the likelihood that specific effects harmful to man and the environment will occur within a specified period or in specified circumstances. (EPA, 2005)

Individual risk of a fatality is the chance (likelihood or probability) per year that any one member of the general public will be killed as a result of exposure to an activity. (EPA, 2005)

Societal Risk – is a measure of the chance of a number of people being killed as a result of an accident. (EPA, 2005)

Salinisation, salinity – accumulation of salts in soil and water causing problems for the natural environment, agriculture and the built environment. (EPA, 2005)

Sedimentation (in the environment) – the process by which sediment is deposited, for example, in waterways. Sediments include sand, clay, silt, pebbles and organic material carried and deposited by water or wind. Sedimentation is a serious environmental issue that reduces water quality and biodiversity and may increase the likelihood of flooding. (EPA, 2005)

Sedimentation (in water treatment) – is when heavy particles settle to the bottom of standing water due to gravity. This takes place in reservoirs when sediment-laden flowing rivers run into large and comparatively still water bodies. Both inorganic and organic particles may settle out. However, some unwanted particles are slow to settle or are non-settling.

Sensitive land use – a land use sensitive to emissions from industry and infrastructure. Sensitive land uses include residential development, hospitals, hotels, motels, hostels, caravan parks, schools, nursing homes, child care facilities, shopping centres, playgrounds and some public buildings. (EPA, 2005)

Significant Fauna – include but are not necessarily limited to species protected by international agreements or treaties (for example, JAMBA and CAMBA migratory bird agreements), Specially protected Fauna, Priority Fauna, short range endemic species,

species with declining populations or declining distributions, species at the extremes of their range, isolated outlying populations and undescribed species. (EPA, 2005)

Significant Flora – includes but is not limited to flora with any of the following characteristics:

- ▶ Declared Rare Flora or Priority Flora;
- ▶ Keystone role in a particular habitat for threatened species, or supporting large populations representing a significant proportion of the local regional population of a species;
- ▶ Relic status;
- ▶ Anomalous features that indicate a potential new discovery;
- ▶ Representative of the range of a species including the extremes of the range, recently discovered range extensions, or isolated outliers of the main range;
- ▶ A restricted subspecies, variety or naturally occurring hybrid;
- ▶ Local endemism or a restricted distribution.

Significance may apply at any level (for example, local, regional, national and international). (EPA, 2005)

Significant habitat – habitat that provides resources (breeding, resting and feeding), connectivity or habitat area for a species or community that is important for its survival. (EPA, 2005)

Significant vegetation – includes but is not limited to native vegetation with any of the following characteristics:

- ▶ A **threatened ecological community**;
- ▶ Below a **threshold** level;
- ▶ Scarcity;
- ▶ Unusual species;
- ▶ Novel combination of species;
- ▶ A refuge;
- ▶ Key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species;
- ▶ Representative of the range of a vegetation unit including a good example in prime habitat, or the extremes of the range, recently discovered range extensions, or isolated outliers of the main range;
- ▶ A restricted distribution.

Significance may apply at any level (for example, local, regional, national and international). (EPA, 2005)

Specially Protected Fauna – animal species listed under s14(2)(ba) *Wildlife Conservation Act 1950* and published in the latest Wildlife Conservation (Specially Protected Fauna) Notice in the Western Australian Government Gazette. (EPA, 2005)

Stabilisation (in water treatment) – of pH is a process to avoid water supplies becoming too acidic or alkaline (which can dissolve or react with materials, such as pipelines and plumbing, that the water contacts). For example a common sign of corrosion of copper pipes is a bluish stain where a tap drips onto a basin. To prevent corrosion while maintaining an optimal pH for the disinfectant residual, many water are dose with lime or carbon dioxide.

Stakeholder – any organisation, government entity, group or individual that has an interest in a particular issue. (EPA, 2005)

Stormwater – is water flowing over ground surfaces and in natural streams and drains as a direct result of rainfall over a catchment. (EPA, 2005)

Supernatant – liquid near the surface above sediments, filter residuals or precipitates. The supernatant may still contain some dissolved compounds.

Surface Water – water flowing or held in streams, rivers and other wetlands on the surface of the landscape. (EPA, 2005)

Sustainability, Sustainable development – meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. (EPA, 2005)

Taxa (singular taxon) – a taxonomic group. Depending on context, this maybe a species of their subdivisions (subspecies, varieties etc), genus or higher group. (EPA, 2005)

Threat – the likely severity of a potential impact on the environmental value(s) of a natural resource asset from either a naturally occurring phenomenon or human activity. (EPA, 2005)

Threatened ecological community –

- ▶ An ecological community listed, designated or declared under a Western Australian law or a law of the Commonwealth as threatened, endangered or vulnerable; or
- ▶ An ecological community listed on CALM's threatened ecological communities database. (EPA, 2005)

Threatened species – threatened species can be used in a broad sense to describe all or any species whose conservation status is considered insecure. It includes species in the 'extinct' 'critically endangered', 'endangered', 'vulnerable', 'rare' and 'data deficient' categories. (EPA, 2005)

Triple Bottom Line – demonstrates how business moves toward sustainability by achieving three interlinked goals of economic prosperity, environmental protection and social equity. (DoE, 2006)

Vegetation – the combinations of plant species within a given area, and the nature and extent of each combination. (EPA, 2005)

Visual Amenity – visual landscape character that is valued by the community. Protection of the visual amenity of the surrounding environment is important to the sense of well-being and quality of life of the community. (EPA, 2005)

Wetland – an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary. (EPA, 2005)

Wetland management category – the management category assigned to a wetland based on the evaluation of its attributes, functions and values. It provides guidance on the nature of management and protection the wetland should be afforded. The categories that have been used on the Swan Coastal Plain in Western Australia are **conservation, resource enhancement** and **multiple use**. (EPA, 2005)

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All terms without a reference were defined by Water Corporation and GHD Pty Ltd specialists.