

Course Outcomes 4

- Gain an understanding and awareness of the law and approvals for environmental compliance
- Understand rehabilitation and mine closure
- Understand pollution and its prevention
- Manage and minimise waste
- Improve stakeholder management and social performance
- Understand Environmental Management Systems and Sustainability

Sessions – Day 1 5

Introduction
[Session 1] Law 1
Morning Tea
[Session 2] Law 2
Lunch
[Session 3] Mining Approvals
Afternoon Tea
[Session 4] Rehabilitation and Mine Closure

Session Times		
1	9.00	10.30
2	10.40	12.10
3	12.50	2.50
4	3.00	4.30

Sessions – Day 2 6

[Session 5] Pollution Prevention
Morning Tea
[Session 6] Q&A with Jacob King ex DMIRS
Lunch
[Session 7] Stakeholder Management and Social Performance
Afternoon Tea
[Session 8] Environmental Management Systems

Session Times		
1	9.00	10.30
2	10.40	12.10
3	12.50	2.50
4	3.00	4.30

Resources

7

- Hunt on Mining Law of Western Australia Fifth Edition
- Mining Act 1978
- Environmental Protection Act 1986
- Planning and Development Act 2005
- Contaminated Sites Act 2003
- Rights in Water and Irrigation Act 1914
- Aboriginal Heritage Act 1972
- Environment Protection and Biodiversity Conservation Act 1999
- Relationship between State and Commonwealth Law
- LandTrack Systems Wiki

JOHARI WINDOW

8




ICEBREAKER – COMMON GROUND

9


- Take several minutes to find two or three things you all have in common.



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The Environment


Environmental Essentials WA



OUTCOMES 11

You will gain an introduction to the environment as a field of study and why it may be important. You will be able to answer...

- What is the environment?
- Why is the environment important?
- World and Australia situation
- What is Environmental Management?



What is the environment? 12

The environment is everything that isn't me.

- Albert Einstein



What is the *environment*?

13

- Air
- Water
- Soil
- Vegetation
- Oceans
- Terrestrial and marine species
- Humans (You and I)

Outcome 1: What is the environment?

ENVIRONMENT

14

- Life has existed on earth for 3.8 billion years
- Earth well suited for life
 - Water covers $\frac{3}{4}$ of planet
 - Habitable temperature
 - Moderate sunlight
 - Atmosphere provides oxygen and carbon dioxide
 - Soil provides essential minerals for plants

Outcome 2: Why is the environment important?

ENVIRONMENTAL ISSUES

15

What environmental issues concern you most ?

Group task – write post-it notes and place on sheet

Discuss...

Any **Australia** specific issues?
Any applicable to **rest of the world** only?

Outcome 3: World and Australia Situation

EARTH IS A SYSTEM

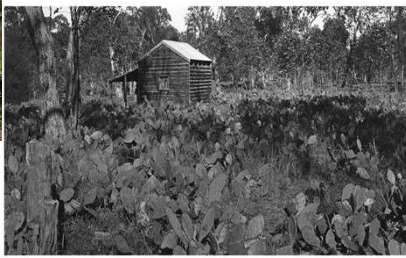
16

- System
 - A set of components that interact and function as a whole
- Global Earth Systems
 - Climate, atmosphere, land, coastal zones, ocean
- Ecosystem
 - A natural system consisting of a community of organisms and its physical environment
- Systems approach to environmental science
 - Helps us understand how human activities effect global environmental parameters

Outcome 3: World and Australia Situation

PRICKLY PEAR

17



Types of prickly pear, 1925

Outcome 3: World and Australia Situation

CANE TOADS

18



Outcome 3: World and Australia Situation



ENVIRONMENTAL DISCIPLINES 20

- Biology
- Ecology
- Geography
- Chemistry
- Geology
- Physics
- Economics
- Sociology
- Demography
- Politics

Outcome 4: What is Environmental Management?

ENVIRONMENTAL MANAGEMENT 21

- Develop without destroying
- Use natural resources wisely
- Prevent pollution
- Preserve nature
- Considering the welfare of future generation
- Repeatable processes

Outcome 4: What is Environmental Management?

You now have a better understanding of ...

- What constitutes the environment
- Why the environment is important
- The world and Australia environmental situation
- What is meant by environmental management
- Why environmental management is important



Environmental Law in WA Part 1

Environmental Essentials WA

Outcomes 2

You will gain a **general understanding** of environmental legislation in WA.

- Definition of environmental law
- Sources of environmental law (and guiding principles)
- Common Law (Trespass, Nuisance and Negligence)
- Key WA and Commonwealth Acts:
 - Mining Act 1978
 - Environmental Protection Act 1986
 - Rights in Water and Irrigation Act 1914
 - Aboriginal Heritage Act 1972 (WA)
 - Planning and Development Act 2005 (WA)
 - Contaminated Sites Act 2003
 - Environment Protection and Biodiversity Conservation Act 1999
 - Relationship between State and Commonwealth Law

What is environmental law? 3

Environmental Law refers to:

- Protecting soil, air, water
- The oceans
- Biodiversity
- Protection of areas of land or ocean (such as in national parks)
- Individual species (such as wildlife conservation laws)
- Particular actions. E.g. environmental impact assessment; remediation of environmental damage caused (contaminated sites laws).

Outcome 1: Definition of Environmental Law

Sources of environmental law

4

- Common law - individual's rights and private property rights
- Statute - Statutes are laws enacted by the State or Federal Parliament.
- Subsidiary legislation - local or specific details of how a statute applies (made by government rather than Parliament)
- Policies and administrative guidelines - not legally binding, but government must give them proper consideration
- International law - international treaties (these do not have direct legal effect in Australia until they are implemented by Commonwealth legislation).

Outcome 2: Sources of Environmental Law (and Guiding Principles)

Guiding Principles of Env. Law

5

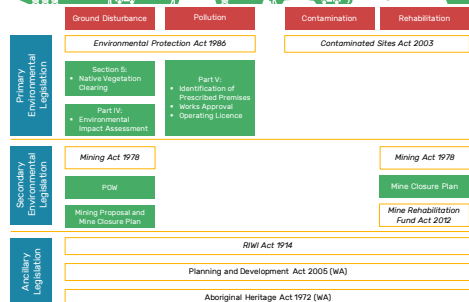
In developing new environmental legislation, law-makers are increasingly adopting a number of internationally recognised principles:

- the precautionary principle
- conservation of biological diversity and ecological integrity
- economic valuation of environmental factors and the polluter pays principle
- ecologically sustainable development and the principle of intergenerational equity
- waste minimisation
- stakeholder participation.

Outcome 4: Key WA and Commonwealth Acts

Environmental Legislation

6



Outcome 3: Common Law (Trespass, Nuisance and Negligence)

Environmental Protection Act 1986

7

- Principal piece of environmental legislation in Western Australia
- Provides for the prevention, control and abatement of environmental pollution
- Provides for the conservation, preservation, protection, enhancement and management of the environment.

Outcome 4: Key WA and Commonwealth Acts

Environmental Protection Act 1986

8

- Projects that are likely to have a significant impact on the environment are subject to a Formal Environmental Impact Assessment (EIA) by the Environmental Protection Authority (EPA).
- The project can be referred to the EPA by either the proponent, other government agencies, non-government organisations or members of the public. The EPA will consider these referrals and determine whether or not a formal assessment is required.
- The ultimate decision as to whether a proposal may be implemented rests with the WA Minister for Environment and other relevant decision-making authorities. The EPA's report is a necessary step in the EIA process, *but the EPA's recommendations are not binding on the Minister.*

Outcome 4: Key WA and Commonwealth Acts

Greenhouse Gas Emissions Environmental Factor Guideline

9

- Designed to guide Government decision making for **major projects** that are assessed by the EPA
- Supports the development of Greenhouse Gas Management plans for proponents which:
 - outline strategies to avoid, reduce, mitigate and offset the project's Scope 1 emissions contributing towards the State's aspiration of net zero emissions by 2050
 - are unique to a proposal's specific circumstances (flexibility)
 - Allow proponents to take account of opportunities at either facility level or across national operations
 - To propose their own timeframes and interim targets
 - Include requirements for periodic public reporting against their targets
 - To account for and align with Commonwealth requirements.

Outcome 4: Key WA and Commonwealth Acts

Key Aspects of GHG Guideline

10

- Projects across Australia are being more closely scrutinised by decision makers and the courts in the context of the Paris Agreement.
- Most relevant to new projects or existing projects going through an expansion phase, which are expected to have over 100,000 tonnes of scope 1 (direct) GHG emissions per year.
- Projects referred to the EPA for assessment may need to include estimates of scope 1, 2 and 3* GHG emissions (annual and total) for the life of the project.
- Projects to which the GHG Guideline applies will need to prepare and implement a GHG Management Plan which demonstrates the proponent's contribution towards the aspiration of net zero emissions by 2050.

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing

11



The clearing of native vegetation in Western Australia is regulated under Part V of the Environmental Protection Act 1986 (EP Act) and the following regulations and notices:

- Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations)
- Environmental Protection (Environmentally Sensitive Areas) Notice 2005 (ESA Notice)

Outcome 4: Key WA and Commonwealth Acts

What is Native Vegetation?

12

'Native vegetation' means all types of indigenous vegetation, including:

- Those found in aquatic and marine environments
- Dead vegetation (unless declared by regulation to be excluded).

Native vegetation does not usually include vegetation that has been intentionally planted unless the planting was required by law, or the vegetation is protected under a conservation covenant or other binding agreement.

Outcome 4: Key WA and Commonwealth Acts

What is Clearing?

13

Clearing means causing substantial damage to native vegetation, including through:

- the killing or removing of native vegetation
- the severing or ringbarking of trunks or stems
- the draining or flooding of land
- the burning of vegetation
- the grazing of stock
- any other activity that kills or damages native vegetation.

Outcome 4: Key WA and Commonwealth Acts

What is Clearing?

14

It is unlawful for any person to cause or allow native vegetation to be cleared unless:

1. the clearing is in accordance with a clearing permit
2. the activity causing the clearing is exempt from the clearing laws:
 - As per Schedule 6 of the EP Act, which apply across WA
 - As per the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 ("the Clearing Regulations"), which apply across WA except in environmentally sensitive areas.

Outcome 4: Key WA and Commonwealth Acts

Clearing Exemptions

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- Exemptions are
 - Clearing for 'low impact or other mineral activities'. Ex: temporary tracks, groundwater drilling
 - Driving vehicles off road
 - 4m wide raised blade clearing (with 100m distance between tracks)
 - Scrap and detect areas of 2 hectares per tenement
 - Clearing for camp sites and storage with a total area of 2 hectares per tenement
 - There is also an exemption that allows clearing of up to 10 hectares per financial year per authority area for clearing regulated under the Mining Act 1978
 - Construction of a water bore and taking water under a Licence granted under the Rights in Water and Irrigation Act 1914.

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing

16

EP Act 1986

- Native Vegetation: *indigenous aquatic or terrestrial vegetation, and includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation*
- Offence to clear native vegetation unless permitted/approved or there is an exemption legislation
- DWER: primary authority responsible for administering the native vegetation clearing provisions
- Area or Purpose Permits
- Permit exempt if there is a Part IV Referral on Assessment. Clearing approved under Part IV referral on assessment and Ministerial Statement

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing

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Mining Act 1978

- DMIRS: delegated authority associated with mining related activities or associated with State Agreements
- Area or Purpose Permits
- Exemptions under Mining Act 1978
 - Clearing for 'exploration' = POW
 - Clearing for 'low impact or other mineral activities'. Ex: temporary tracks, groundwater drilling, clearing less than two hectares for camp sites
 - There is also an exemption that allows clearing of up to 10 hectares per financial year per authority area for clearing regulated under the Mining Act 1978

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing

18

EPBC Act 1999

- If a clearing permit required under EP Act 1986 & proposed clearing will have or is likely to have an impact on a Matter of National Environmental Significance (MNES) = assessed under bilateral agreement
- Bilateral agreement: Between Commonwealth and WA. WA can assess impacts of clearing on relevant MNES while undertaking an EP Act 1986 clearing permit assessment
- Only applies to clearing applications initially referred to the Commonwealth and which the Commonwealth has determined to be a 'controlled action'

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing: Permit

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Two types of Permit (Section 51E of the EP Act 1986):

- Area permit (Form C1)
 - Applied for by an applicant who is the owner of the land, likely to become the land owner
 - Clearing of defined areas specified in the permit
 - Generally approved for a default period of two years
- Purpose permit (Form C2)
 - Applied for by an applicant who is not the owner of the land which will be cleared but has authority under a written law or permission to access the land to conduct the clearing
 - Clearing of different areas from time to time for a purpose specified in the permit
 - Generally approved for a default period of five years.

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing: Permit

20

Mining Act 1978

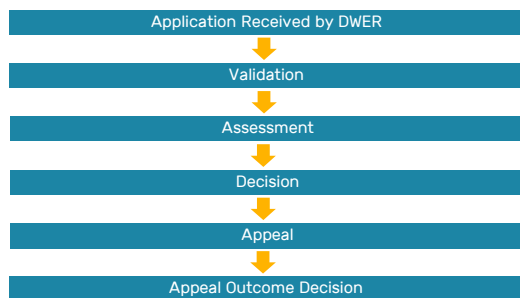
Mineral tenure	Area permit	Purpose Permit
General purpose lease	Applicable	Applicable
Mining lease	Applicable	Applicable
Prospecting licence	Not available	Applicable
Miscellaneous licence	Not available	Applicable
Exploration licence	Not available	Applicable
Retention licence	Not available	Applicable

<https://www.de.wa.gov.au/your-environment/native-vegetation/49-fact-sheets>

Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing: Assessment Process

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Outcome 4: Key WA and Commonwealth Acts

Native Vegetation Clearing: Assessment Criteria 22

Risk-based assessment approach:

- Size
- Location
- Environmental values (see Clearing Principles) within or adjacent to the area
- Purpose of clearing
- Urgency of the application
- Public interest in the application.

10 Clearing Principles - Schedule 5 EP Act 23

- Principle (a) - Native vegetation should not be cleared if it comprises a high level of biological diversity
- Principle (b) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.
- Principle (c) - Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.
- Principle (d) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.
- Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

10 Clearing Principles - Schedule 5 EP Act 24

- Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland
- Principle (g) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
- Principle (i) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water
- Principle (j) - Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

- Projects should be referred and are likely to be assessed under the EPBC Act when there is a potential to have a significant impact on any of the nine Matters of National Environmental Significance (MNES):

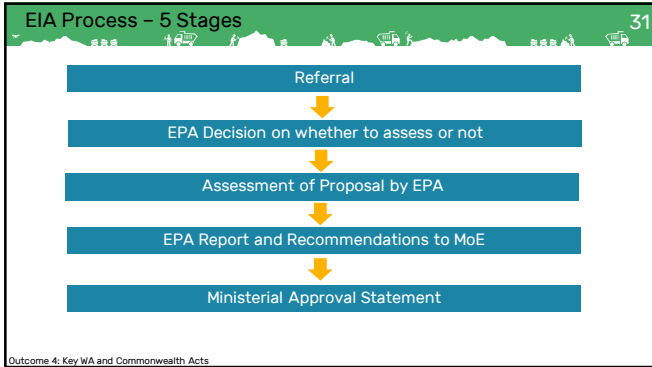
- World Heritage Properties
- Commonwealth Marine Areas
- Great Barrier Reef Marine Park
- National Heritage Places
- Migratory Species
- Nuclear Actions
- Wetlands of International Importance
- Nationally Threatened Species and Ecological Communities
- Water Resource, in relation to coal seam gas and large coal mining development

Australia's natural environment and iconic places are in an overall state of decline and are under increasing threat. The current environmental trajectory is unsustainable.

The EPBC Act is ineffective. It does not enable the Commonwealth to play its role in protecting and conserving environmental matters that are important for the nation. It is not fit to address current or future environmental challenges.

Recommendations include:

- Greater decision making power to States and Territories
- establishing legally enforceable 'national environmental standards' for matters of national environmental significance with a greater emphasis on regional (landscape) level planning
- establishing an independent regulator focused on enforcement and compliance
- reducing reliance on, and reviewing, environmental offsetting arrangements
- greater inclusion of Indigenous peoples' traditional knowledge and views in science processes and decision-making



EIA Process Stage 1- Referral 32

- Any proposal likely to have a significant environmental effect on the environment should be referred to the EPA. Any person may refer a significant proposal to the EPA, except in certain situations:
- Only a proponent may refer a strategic proposal
- Only a proponent or a responsible authority may refer a proposal under an assessed scheme
- A decision-making authority is required to refer a proposal that appears to be a significant proposal.
- Under certain circumstances the EPA may refuse to accept a referral. For example, if the proposal is clearly not a significant proposal or the proposal has previously been referred to the EPA.
- Proponents are encouraged to discuss proposals with staff of the Environmental Services Division of the Department of Water and Environmental Regulation (DWER), relevant decision making authorities, government agencies and stakeholders before referral.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 2- EPA Decision 33

Once the EPA has registered a valid referral, it must determine whether to assess the referral.

Decision to assess

If the EPA decides to assess a proposal, the EPA will also decide on the **level** of assessment, which is the proposal-specific requirements that the EPA determines are necessary to assess the proposal.

Decision not to assess

When the EPA decides not to assess a proposal, it determines that the likely effect on the environment is not so significant as to warrant assessment by the EPA.

Derived proposals

A proponent may request that the EPA declares a referred proposal to be a derived proposal. This means that the proposal was part of a strategic proposal which has already been assessed by the EPA.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 3 - Assessment

34

- Scoping the proponent environmental review (Optional)
- Preparation of additional assessment information (Optional)
- Public review (Optional)
- Preparation of EPA draft assessment report (Optional)
- Decision-making authority not to approve proposal until certain events occur
- Minor or preliminary work
- Changes to proposals during assessment.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 4 - EPA Report

35

- At the completion of the assessment, the EPA prepares a report and recommendations for the Minister for Environment.
- The assessment report sets out what the EPA considers are the key environmental factors identified in the course of the assessment, the EPA's recommendations as to whether or not the proposal may be implemented and the conditions and procedures to which implementation should be subject.
- Where the proposal is a strategic proposal, the EPA will recommend whether or not the future proposals, identified in the strategic proposal, may be implemented.
- Any person may lodge an appeal with the Minister against the content and recommendations in an assessment report.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 5 - EPA Decision and Implementation

36

- The Minister for Environment considers the EPA's report and any public appeals before determining, in consultation with other Ministers, whether the proposal should be allowed to proceed, and if so, under what conditions.
- If the Minister for Environment determines that a proposal may be implemented, a Ministerial Approval Statement is issued under s45(5) of the *Environmental Protection Act 1986*. This sets out the conditions and procedures that the proponent must adhere to during the project implementation.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 5 – EPA Decision and Implementation

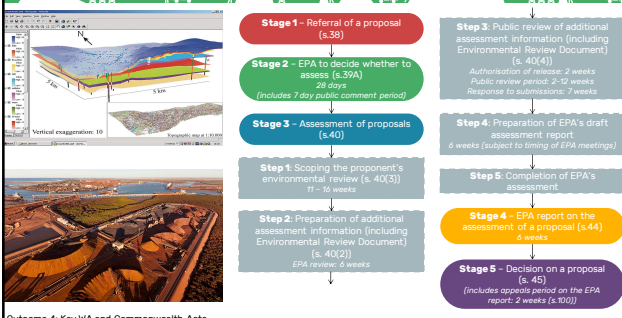
37

- Once a proposal has been approved and a Ministerial Approval Statement is issued, the proponent is required to ensure that implementation of the proposal is carried out in accordance with the implementation conditions, including any Environmental Management Plans required as a condition.
- The DWER monitors compliance with the Ministerial Approval Statements issued under the *Environmental Protection Act 1986*.

Outcome 4: Key WA and Commonwealth Acts

EIA Approvals Time Line

38



Outcome 4: Key WA and Commonwealth Acts

EP Act Part V Works Approvals/Licensing

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- DWER regulates industrial emissions and discharges to the environment via a works approval and licensing process
- The EP Act requires:
 - A works approval to be obtained before constructing a prescribed industrial premises
 - An operating licence to emit or discharge waste, odour, noise, electromagnetic radiation once the prescribed premise is operational
 - Licences and works approvals set conditions for prescribed premises to ensure that potential impacts and risks to the environment are minimised. This is based on a risk-assessment process.
- Occupiers of prescribed premises are required to submit annual reports on compliance with their licence conditions through an Annual Audit Compliance Report (AACR)



Outcome 4: Key WA and Commonwealth Acts

Contaminated Sites Act 2003 Overview

46

- Once classified, a *memorial (restriction)* is placed on Certificate of Title
- DWER determines the category of classification:
 - Report not substantiated
 - Possibly contaminated – investigation required (PCIR)
 - Not contaminated – Unrestricted Use
 - Contaminated – Remediation Required (CRR)
 - Remediated for Restricted Use (RRU)
 - Contaminated – Restricted Use (CRU)
 - Decontaminated.

Outcome 4: Key WA and Commonwealth Acts

Mining Act 1978: Mining Proposal

47

- Proponents identify the potential risks that a mining operation could pose to the environment, how the risks will be treated, establishing appropriate site-specific environmental outcomes
- Monitoring and reporting on the success of these outcomes
- The Mining Act defines a Mining Proposal as
 - In the format required by the guidelines
 - Contains such information as required by the guidelines
 - Contains a Mine Closure Plan



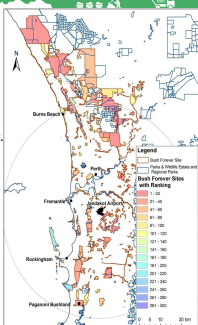
Figure 2: Structure of a Mining Proposal

Outcome 4: Key WA and Commonwealth Acts

Mining Proposal Referral

48

- DMIRS and EPA will confer on whether to refer (off shore criteria not shown)
- Environmentally Sensitive Areas including:
 - Within 500m of World Heritage Property
 - Within 500m of a Bush Forever site
 - Within 500m of a Threatened Ecological Community
 - Within 500m of defined wetlands (including Ramsar wetlands, ANCA wetlands, Conservation category wetlands)
 - Area containing rare flora Area covered by an Environmental Protection Policy.
 - Within 500m of a declared/proposed State Conservation Estate, including National Park, Nature Reserve, Conservation Park, or State Forest and Timber Reserves.
 - Within a Public Drinking Water Source Area.
 - Within 2 kilometres of a declared occupied town site (for Mining Proposals and petroleum Environment Plans only).
 - Hydraulic fracturing exploration and development activities.
 - Activities within the Strategic Assessment for the Perth Peel Region and potentially in conflict with the outcomes of the Strategic Assessment.
 - Area previously or currently subject to formal assessment by the EPA.

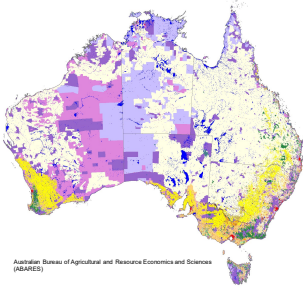


Outcome 4: Key WA and Commonwealth Acts

Planning and Development Act 2005 (WA) Overview

58

Land Use of Australia – December 2018



- Main legislation that governs planning in Western Australia.
- Special control areas can be created to address issues such as landscape values, airport environs, bushfire prone land, flood prone land, industry buffers and special character areas where particular provisions apply.
- Local planning schemes can also include special conservation reserves.
- The EPA may also decide that the scheme is incapable of being made environmentally acceptable.

Outcome 4: Key WA and Commonwealth Acts

Aboriginal Heritage Act 1972 (WA)

59



- Foremost legislation in the protection of Aboriginal heritage within the Western Australia
- The focus of the AH Act is the protection of sites with social and heritage significance.
- Heritage Act protects:
 - *Places*
 - 'All places' that Aborigines used for traditional culture, sacred, ritual or ceremonial sites
 - *Objects*
 - 'All objects, whether natural or artificial ... [that are of] sacred ritual or ceremonial significance to Aboriginal persons used for traditional cultural life'
- Both the *Environmental Protection Act 1986* (EP) Act and the *Aboriginal Heritage Act 1972* (AH Act) have the legal capacity to consider aspects of Aboriginal heritage.

Outcome 4: Key WA and Commonwealth Acts

Aboriginal Heritage Act 1972 (WA)

60



- When considering Aboriginal heritage matters as part of the assessment of a proposal, the EPA will consult with the National Indigenous Australians Agency
- Consent is required from the Minister for Aboriginal Affairs for any activity which will negatively impact Aboriginal heritage sites. Under the AHA, Aboriginal sites of outstanding importance may be declared Protected Areas. The AHA also provides protection for Aboriginal objects.

Outcome 4: Key WA and Commonwealth Acts

Outcomes

61

You will gain a general understanding of environmental legislation in WA.

- Definition of environmental law
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 - Relationship between State and Commonwealth Law

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Environmental Law in WA Part 2

Environmental Essentials WA

Outcomes 2

You will gain a general understanding of environmental legislation in WA.

- Environment Protection and Biodiversity Conservation Act 1999
- EP Act Part V – Works Approvals/Licensing
- Contaminated Sites Act 2003
- Mining Act 1978
- Rights in Water and Irrigation Act 1914
- Planning and Development Act 2005 (WA)
- Aboriginal Heritage Act 1972 (WA)

EIA Process – 5 Stages 3

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graph TD
  A[Referral] --> B[EPA Decision on whether to assess or not]
  B --> C[Assessment of Proposal by EPA]
  C --> D[EPA Report and Recommendations to MoE]
  D --> E[Ministerial Approval Statement]
  
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Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 1- Referral

4

- Any proposal likely to have a significant environmental effect on the environment should be referred to the EPA. Any person may refer a significant proposal to the EPA, except in certain situations:
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- Only a proponent or a responsible authority may refer a proposal under an assessed scheme
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- Proponents are encouraged to discuss proposals with staff of the Environmental Services Division of the Department of Water and Environmental Regulation (DWER), relevant decision making authorities, government agencies and stakeholders before referral.

Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 2- EPA Decision

5

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Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 3 - Assessment

6

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Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 4 – EPA Report 7

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Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 5 – EPA Decision and Implementation 8

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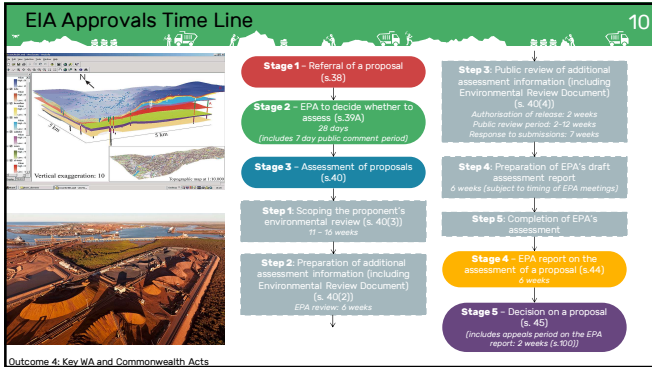


Outcome 4: Key WA and Commonwealth Acts

EIA Process Stage 5 – EPA Decision and Implementation 9

- Once a proposal has been approved and a Ministerial Approval Statement is issued, the proponent is required to ensure that implementation of the proposal is carried out in accordance with the implementation conditions, including any Environmental Management Plans required as a condition.
- The DWER monitors compliance with the Ministerial Approval Statements issued under the *Environmental Protection Act 1986*.

Outcome 4: Key WA and Commonwealth Acts



EP Act Part V Works Approvals/Licencing

- DWER regulates industrial emissions and discharges to the environment via a works approval and licencing process
- The EP Act requires:
 - A works approval to be obtained before constructing a prescribed industrial premises
 - An operating licence to emit or discharge waste, odour, noise, electromagnetic radiation once the prescribed premise is operational
 - Licences and works approvals set conditions for prescribed premises to ensure that potential impacts and risks to the environment are minimised. This is based on a risk-assessment process.
- Occupiers of prescribed premises are required to submit annual reports on compliance with their licence conditions through an Annual Audit Compliance Report (AACR)

Outcome 4: Key WA and Commonwealth Acts

Part V Works Approval/Licencing - Overview

Industrial premises with potential to cause emissions and discharges to air, land or water are known as 'prescribed premises' and trigger regulation under the EP Act. Prescribed premises categories are outlined in Schedule 1 of the [Environmental Protection Regulations 1987](#)

Category number	Description of category	Production or design capacity
1	Cattle feedlot: premises on which the watering and feeding of cattle occurs, being premises — (a) situated less than 100 m from a watercourse; and (b) on which the number of cattle per hectare exceeds 50.	500 animals or more
2	Intensive piggyery: premises on which pigs are fed, watered and housed in pens.	1 000 animals or more
[3, 4 deleted]		
5	Processing or beneficiation of metallic or non-metallic ore: premises on which — (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; or (b) tailings from metallic or non-metallic ore are reprocessed; or (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50 000 tonnes or more per year
6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	50 000 tonnes or more per year
7	Vat or in situ leaching of metal: premises on which metal is extracted from ore with a chemical solution.	5 000 tonnes or more per year
8	Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	5 000 tonnes or more per year

Outcome 4: Key WA and Commonwealth Acts

Environmental Protection Regulations 1987

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- Clean Air (Determination of Air Impurities in Gases Discharged to the Atmosphere) Regulations 1983
- Environmental Protection (Abattoirs) Regulations 2001
- Environmental Protection (Abrasive Blasting) Regulations 1998
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998
- Environmental Protection (Controlled Waste) Regulations 2004
- Environmental Protection (Domestic Solid Fuel Burning Appliances and Firewood Supply) Regulations 1998
- Environmental Protection (Fibre Reinforced Plastics) Regulations 1998
- Environmental Protection Goldfields Residential Areas Sulfur Dioxide Policy and Regulations 2003
- Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992
- Environmental Protection (Metal Coating) Regulations 2001
- Environmental Protection (NEPM-NPI) Regulations 1998
- Environmental Protection (Noise) Regulations 1997
- Environmental Protection (Packaged Fertiliser) Regulations 2010
- Environmental Protection (Petrol) Regulations 1999
- Environmental Protection (Recovery of Vapours from the Transfer of Organic Liquids) Regulations 1995
- Environmental Protection (Rural Landfill) Regulations 2002
- Environmental Protection (Unauthorised Discharges) Regulations 2004
- Noise Abatement (Noise Labelling of Equipment) Regulations (No. 2) 1985

Outcome 4: Key WA and Commonwealth Acts

Contaminated Sites Act 2003 Overview

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Big Picture:

- Primary legislation for assessment and management of contamination
- Takes precedence over all legislative instruments except EP Act 1986
- Key component to mine closure and relinquishment.
- Having a Part V license does not exclude proponent from CS Act requirements
- Is deeming a closure issue and will be need to be undertaken if Mine Closure Plan approved

Noted Elements:

- Protect human health, the environment and environmental values by providing for the identification, recording, management and remediation of contaminated sites in the State of Western Australia.
- Under the Act, land owners, occupiers and polluters must report known or suspected contaminated sites to DWER.
- Contaminated in relation to land, water or a site, means having a substance present in or on that land, water or site at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value.

Outcome 4: Key WA and Commonwealth Acts

Contaminated Sites Act 2003 Overview

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NEPM ASC provides national framework for assessment of site contamination and recommends that the investigation of contaminated sites be carried out in stages. Only address site characterisation



Guidelines that form Schedule B of the NEPM

- Schedule B1 Guideline on investigation levels for soil and groundwater
- Schedule B2 Guideline on site characterisation
- Schedule B3 Guideline on laboratory analysis of potentially contaminated soils
- Schedule B4 Guideline on site-specific health risk assessment methodology
- Schedule B5a Guideline on ecological risk assessment
- Schedule B5b Guideline on methodology to derive ecological investigation levels in contaminated soils
- Schedule B5c Guideline on ecological investigation levels for arsenic, chromium (III), copper, DDT, lead, naphthalene, nickel and zinc
- Schedule B6 Guideline on the framework for risk-based assessment of groundwater contamination
- Schedule B7 Guideline on derivation of health-based investigation levels
- Schedule B8 Guideline on community engagement and risk communication
- Schedule B9 Guideline on competencies and acceptance of environmental auditors and related professionals

Outcome 4: Key WA and Commonwealth Acts

DWER - Contaminated Sites Guidelines

Contaminated Sites Guidelines	Contaminated Sites Management Series (repealed)
Assessment and management of contaminated sites (2014)	Development of sampling and analysis plans (2001) Community consultation (2006) Potentially contaminating activities, industries and land uses (2004) Assessment levels for soil, sediment and water (2010) Remediation of hydrocarbon contaminated soils in Western Australia (2004) The use of risk assessment in contaminated site assessment (2006) Reporting on site assessments (2001)
Identification, reporting and classification of contaminated sites (2014)	Reporting of known and suspected contaminated sites (2008) Site classification scheme (2008) Certificate of contamination audit scheme (2005)
Use of monitored natural attenuation for groundwater remediation (2014)	Use of monitored natural attenuation for groundwater remediation (2004)
Contaminated site audits—monitoring, conduct and reporting (2014)	Contaminated site audits—guidelines for accreditation, conduct and reporting (2009)
Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (joint publication with DMR) (2009)	Assessment, remediation and management of asbestos-contaminated sites in Western Australia (joint publication with DMR) (2009)
Contaminated sites and the land use planning process (proposed revision)	Contaminated sites and the land use planning process (2006)

Outcome 4: Key WA and Commonwealth Acts

Site Characterisation and Remediation



Site contamination reporting framework

Preliminary site investigation (PSI) consists of a desktop study, a detailed site inspection and interviews with relevant personnel. A PSI may also include limited sampling and analysis. The information is used to develop an initial CSMA. If contamination or sources of contamination (potential areas of concern) are identified, further detailed site investigation is necessary.

Detailed site investigation (DSI) assesses potential or actual contamination through an appropriate sampling and analysis program. Several phases of investigation (including risk assessment) may be required to adequately characterise the site, particularly for complex sites. The CSMA is refined on an iterative basis until there is sufficient information and understanding of the site to devise risk-based strategies to manage the identified risks.

Remedial action plan (RAP) documents the type and extent of remediation required to ensure that the site is suitable for its current or intended future use, and to protect the surrounding environment and land uses. The plan details the clean-up techniques proposed to achieve the remedial objectives and criteria for assessing the effectiveness of the clean-up in the site validation process.

Site remediation and validation (SRV) is the process of cleaning up the site (remediation) and evaluating the effectiveness of the clean-up (validation). Where the remedial objectives are not met, further work may be required such as further remediation, risk assessment or ongoing site management.

Site management plan (SMP) documents ongoing management of the site if this is required, such as long term monitoring and assessment of residual contamination. The SMP may require periodic revision and updating to ensure it remains relevant over time. A relevant stakeholder, such as the land owner or body corporate, must assume responsibility for maintaining and implementing the SMP.

Outcome 4: Key WA and Commonwealth Acts

- Once classified, a *memorial (restriction)* is placed on Certificate of Title
- DWER determines the category of classification:
 - Report not substantiated
 - Possibly contaminated – investigation required (PCIR)
 - Not contaminated – Unrestricted Use
 - Contaminated – Remediation Required (CRR)
 - Remediated for Restricted Use (RRU)
 - Contaminated – Restricted Use (CRU)
 - Decontaminated.



Outcome 4: Key WA and Commonwealth Acts

Aboriginal Heritage Act 1972 (WA)

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- Foremost legislation in the protection of Aboriginal heritage within the Western Australia
- The focus of the AH Act is the protection of sites with social and heritage significance.
- Heritage Act protects:
 - *Places*
 - 'All places' that Aborigines used for traditional culture, sacred, ritual or ceremonial sites
 - *Objects*
 - 'All objects, whether natural or artificial ... [that are of] sacred ritual or ceremonial significance to Aboriginal persons used for traditional cultural life'
- Both the *Environmental Protection Act 1986 (EP) Act* and the *Aboriginal Heritage Act 1972 (AH Act)* have the legal capacity to consider aspects of Aboriginal heritage.

Outcome 4: Key WA and Commonwealth Acts

Aboriginal Heritage Act 1972 (WA)

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- When considering Aboriginal heritage matters as part of the assessment of a proposal, the EPA will consult with the National Indigenous Australians Agency
- Consent is required from the Minister for Aboriginal Affairs for any activity which will negatively impact Aboriginal heritage sites. Under the AHA, Aboriginal sites of outstanding importance may be declared Protected Areas. The AHA also provides protection for Aboriginal objects.

Outcome 4: Key WA and Commonwealth Acts

Outcomes

33

You will gain a general understanding of environmental legislation in WA.

- Definition of environmental law
- Sources of environmental law (and guiding principles)
- Common Law (Trespass, Nuisance and Negligence)
- Key WA and Commonwealth Acts:
 - Mining Act 1978
 - Environmental Protection Act 1986
 - Rights in Water and Irrigation Act 1914
 - Aboriginal Heritage Act 1972 (WA)
 - Planning and Development Act 2005 (WA)
 - Contaminated Sites Act 2003
 - Environment Protection and Biodiversity Conservation Act 1999
 - Relationship between State and Commonwealth Law



Environmental Approvals (Mining)

Environmental Essentials WA

OUTCOMES 2

You will gain an understanding of the various approvals required for mining in Western Australia. In particular...

- Programme of Work
- Mining Proposal:
 - Overview and structure
 - Mining Proposal requirements and guidelines
 - Mine Closure Plan requirements and guidelines.

DMIRS' OVERALL ENVIRONMENTAL OBJECTIVE 3

Resource industry activities are designed, operated, closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed environmental outcomes and end land-uses without unacceptable liability to the State.

DMIRS' ENVIRONMENTAL OBJECTIVE 4


Table 1: Objectives for environmental factors

Factor	Objective
Biodiversity	To maintain representation, diversity, viability and ecological function at the species, population and community level.
Water Resources	To maintain the hydrological regimes, quality and quantity of groundwater and surface water to the extent that existing and potential uses, including ecosystem maintenance, are protected.
Land and Soils	To maintain the quality of land and soils so that environmental values are protected.
Rehabilitation and Mine Closure	Mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the State.

PROGRAMME OF WORK APPLICATIONS 5

PoW-S

- Online application process
- Intersects proposed activities with environmental and culturally significant data layers and highlights all potential impacts.
- Proponents can then make adjustments to their proposed activities to avoid impacting sensitive areas.
- Environmental concerns have to be identified before submission. Once submitted, they cannot be amended.
- **Incomplete applications will be rejected**



Outcome 1: Programme of Work

PoW APPLICATIONS - ENVIRONMENTALLY SENSITIVE AREAS (ESA) 6


- Environmentally Sensitive Areas are defined in Regulation 6 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- Clearing for exploration purposes is exempt from requiring a clearing permit, provided it is not within an Environmentally Sensitive Area (ESA), and is conducted under an authority granted under the *Mining Act 1978* (e.g. an approved Programme of Work)
- Proposals taking place in an ESA requires Native Vegetation Clearing Permit (Clearing Permit)
- Clearing Permit system administered by Department of Water and Environmental Regulation (DWER) not DMIRS

Outcome 1: Programme of Work

PoW APPLICATIONS - ENVIRONMENTALLY SENSITIVE AREAS (ESA) 7

- Application for proposed mining activities will need to include:
 - ✓ Type of ESA
 - ✓ Clearing Permit submission number and lodgement date
- Note: If your proposed activities involve the clearing of Native Vegetation within an ESA, and no Clearing Permit has yet been lodged with DWER Native Vegetation Assessment Branch, you will be unable to proceed with the lodgement process any further.

The Clearing Permit System Map can assist those intending to clear to determine whether an area is an ESA and its type.



Outcome 1: Programme of Work

PoW APPLICATIONS - ENVIRONMENTALLY SENSITIVE AREAS (ESAs) 8



Outcome 1: Programme of Work

PoW APPLICATIONS - ESAs 9

February 2019 - July 2020

In February 2019 the WA government announced its Plan for Our Parks initiative

Plan for our Parks includes at least seven new national parks one of them being the proposed Helena Aurora National Park

The Department of Biodiversity, Conservation and Attractions (DBCA) is implementing the WA government's Plan for our Parks

During 2019, this included consultation with those directly affected by the proposal - Traditional Owners, neighbours, mining tenement holders, conservation groups, stakeholders and defining the boundaries of each proposed national park.


During 2020 - the next step for the proposed Helena Aurora National Park is the DBCA and Traditional Owners negotiating and developing an Indigenous Land Use Agreement (ILUA).

The Traditional Owners submitted their Native Title claim applications in December 2017. Their MarriKupya Gibeerle Native Title claim was accepted for registration in March 2019 and they are currently going through the process of Determination. The Traditional Owners have indicated their support for the proposed Helena Aurora National Park.

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PoW - ENVIRONMENTAL INFORMATION REQUIRED 10


- Description of existing landforms, environment and vegetation:
 - Do activities require the clearing of native vegetation?
 - Do activities occur in ESAs?
 - Do activities occur on isolated hills/ranges in the MidWest or Yilgarn (Banded Iron Formations)? E.g. Helena and Aurora Range (Bungalbin)



Outcome 1: Programme of Work

PoW - ENVIRONMENTAL INFORMATION REQUIRED 11

- Description of disturbance to the beds and/or banks of a watercourse
- Safety procedures for fibrous minerals, e.g. asbestos
- Radiation Management Plan – in the event that radioactive material is inadvertently found
- Consideration of *Rights in Water and Irrigation (RIWI) Act 1914*



Outcome 1: Programme of Work

MINIMISING DISTURBANCE - BEST PRACTICE 12

- Raised blade during clearing
- Use of existing tracks
- Excavations (sumps, costeans, etc.) appropriately ramped to allow fauna egress



Outcome 1: Programme of Work

MINIMISING DISTURBANCE - BEST PRACTICE 13

- Avoiding significant vegetation (large trees and dense patches of vegetation)
- Leaving stands of vegetation or corridors within areas of clearing
- Topsoil and vegetation stockpiled separately for use in rehabilitation
- Use of liners and drip trays under rigs to minimise risk of hydrocarbon spillage
- Appropriate storage of hydrocarbons (if being used on site).
- Use of sumps of appropriate size to contain all water and sediment encountered during drilling (sump to be located away from significant vegetation and watercourses)
- Use of machinery to minimise impacts (e.g. excavator instead of bulldozer, wheeled machinery instead of tracked, specialist drill rig etc.)
- Vehicle hygiene maintained to prevent the spread of plant pathogens (e.g. *Phytophthora* sp.) and/or invasive species where required.

Outcome 1: Programme of Work

MINIMISING DISTURBANCE - BEST PRACTICE 14

Disturbance	Rehabilitation	If No, please provide reasons in the Comments section		
		Yes	No	NA
<input type="checkbox"/> Scraping, Detecting, Dry Blowing	• Windrows, stockpiles and dumps levelled off.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Samples	• Removed from surface of pad and buried. <i>Not required if material is non-hostile, similar colour to surrounds and not within DBCA Managed Land or a water reserve.</i> • Sample bags/bag farm removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Drill Holes	• Plugged 400mm below ground level. • Backfilled above plug and mounded. • Drill spoil removed or scarified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Drill Pads	• Topsoil and vegetation re-spread. Unless blade clean-up. • Scarified if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Alluvial Wet Plant	• Infrastructure removed. • Tailings rehabilitated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Contees, Trenches, Sumps, Test Pits	• Backfilled and mounded. • Topsoil/vegetation re-spread.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Completing a checklist of these practices on the online application is required to make them legally binding

Outcome 1: Programme of Work

MINIMISING DISTURBANCE - BEST PRACTICE 15

<input type="checkbox"/> Access Tracks, Gidelines	• Access closed off. • Topsoil and vegetation re-spread, unless blade clean-up. • Scarified if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Campsite	• Concrete pads removed or broken and buried. • Other infrastructure removed. • Topsoil and vegetation re-spread. • Scarified if required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> All Projects	• Surface water drainage lines reinstated. • Erosion control implemented. • Survey pegs and marker tape removed. • Rubbish and temporary infrastructure removed. • Cut & fill pads/tracks re-profiled to original slope. • Pads revegetated with local provenance species. • Weeds/invasive species present? • Hydrocarbon spills/contaminated material removed and disposed of appropriately.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Completing a checklist of these practices on the online application is required to make them legally binding

Outcome 1: Programme of Work

WHAT IS YOUR EXPERIENCE IN PoW APPLICATIONS? 16

- Discuss

Outcome 1: Programme of Work

MINING PROPOSALS 17

DMIRS' principal environmental regulatory objective:
Resource industry activities are designed, operated, closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed environmental outcomes and end land-uses without unacceptable liability to the State.

Mining Proposal Guidance –
How to prepare in accordance with Part 1 of the Statutory Guidelines for Mining Proposals

Version 1.1
November 2018 | Revised 2021

DMIRS' principal environmental regulatory objective:
Resource industry activities are designed, operated, closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed environmental outcomes and end land-uses without unacceptable liability to the State.

Mining Proposals should:

- Identify the potential risks that a mining operation could pose to the environment throughout the life of the mine
- Explain how the risks will be assessed and mitigated
- Declare appropriate site-specific environmental outcomes
- and the monitoring and reporting on the success of these outcomes.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 18

General official information


- Endorsed by a tenement holder(s) or a senior representative, authorised by the tenement holder(s), such as a Registered Manager or Company Director.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 19

Environmental Group Site

- Grouping of individual tenements that make up a particular operation for reporting on as a single entity
- It will have one Mining Proposal, one Mine Closure Plan and one Annual Environmental Report (AER).



Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 20

Activity Details


- Accurately and concisely record the individual activities for which the proponent is seeking approval and the area within which the activities will occur.
- This includes any amendments to previously approved or new activities/areas proposed for the EGS.
- The scope and scale of the proposed activities form the basis of the approved activities of a Mining Proposal.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 21

Activity Details - Disturbance envelope

A flexible approach can be used to broadly define the maximum area within which the activities will be located (a disturbance envelope).




Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 22

Activity Details - Spatial Information

- A Mining Proposal must include digital spatial data for the activity envelope within which all activities will occur.



Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 23

Activity Details - Mine Activity Types

- A Mining Proposal must include digital spatial data for the activity envelope within which all activities will occur.
- See Table 2 Mining Proposal Guidelines

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 24

Activity Details - Site Plan

- To explain how the mine site will be laid out and function
- Provides additional context to the activity details and risk assessment.
- Multiple plans can be provided to show detail at a sufficient scale.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 25

Activity Details –Design details for significant engineered structures

- Proposed facilities with tailings storage facilities (TSFs) and significant geotechnical design, such as a heap leach facility, large evaporation pond/storage pond, significant surface water diversion structure or high waste dumps, the proposal must include detailed design reports.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 26

Legislative Framework

- List of all relevant environmental approvals and statutory requirements that will affect the environmental management of the mining project.
- As far as practicable, DMP will not duplicate assessment of any component of an activity that also requires approval from another regulatory agency
- It is recommended that the relevant legislation and approvals are placed in a table highlighting the environmental factor applicable to that particular piece of legislation.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 27

Legislative Framework

Relevant legislation	Environmental factor regulated/affected	Relevant approval/requirement and status of relevant approval
Environmental Protection and Biodiversity Conservation Act 1999	Biodiversity impacts to Lipohia coxallata (Mulleeflow) and Lycopodium latifolium (Small Green Starke)	Conservation action – listed threatened species, Tholer assessment.
Environmental Protection Act 1986 (Part IV)	Key environmental factors ¹ regulated under Part IV: <ul style="list-style-type: none"> Flora and vegetation Terrestrial fauna Terrestrial environmental quality Inland waters 	Ministerial approval issued under Part IV of the Environmental Protection Act 1986. Conditions set in Ministerial Statement.
Environmental Protection Act 1986 (Part V) Prescribed premises categories: <ul style="list-style-type: none"> (5) Processing or beneficiation of metallic or non-metallic ore (6) Mine dewatering (17) Screening etc. of material (21) Chemical Manufacturing (40) Metals Smelting or Refining (45) Sewage facility (64) Class II or III putrescible landfill site (84) Electric power generation 	Water Resources (pollution) Landforms	Works approval and licence/ registration under Part V issued.
Rights in Water and Irrigation Act 1914	Water resources	SC licence to take 0.5ML/ year of groundwater within the Gullfields Groundwater Management Area 200 licence to construct 8 bores within the Gullfields Groundwater Management Area
Aboriginal Heritage Act 1972	Aboriginal heritage ²	Section 18 Consent to certain uses issued.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 28

Stakeholder Engagement

- The term stakeholders, includes both internal and external parties who are likely to affect, be affected by, or to have an interest in the proposed mining activities.
- Proponents must demonstrate that effective and appropriate engagement has been undertaken leading up to the submission of the Mining Proposal and that this will continue to be undertaken throughout the mine life.
- Stakeholders must be provided with sufficient information to make an informed assessment of the possible consequences of the activity on the function, interest or activities of the stakeholder and a reasonable period of time must be provided for the consultation process.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 29

Baseline Environmental Data

As per the *Statutory Guidelines for Mining Proposals* the mining proposal must describe the existing environment in which the site is located, including any natural (biological/physical) values and sensitivities and heritage areas that may be affected by the activities. This section must include a description of the baseline data covering the below environmental aspects as well as analysis and interpretation of the baseline data.

This section must cover the following environmental aspects:

- climate;
- landscape;
- materials characterisation;
 - soils
 - geochemical and physical characteristics of subsurface materials and mining waste
- biodiversity;
- hydrology (including surface water and groundwater);
- heritage; and
- environmental threats.

Where environmental surveys or analysis has been undertaken, the findings must be summarised in the mining proposal and all relevant technical reports must be attached as appendices.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 30

Environmental Risk Management

- A risk assessment consistent with the requirements of this section of the guidelines, including details of pre and post-treated risk
- A description of the risk assessment criteria used as part of the risk assessment (see example Appendix J)
- Detail and evaluation of the environmental risks including their sources, potential events, likelihood, consequence and risk analysis methods used to determine these levels
- A demonstration that the environmental impacts and risks are reduced to 'As Low as Reasonably Practicable' (ALARP) by applying environmental practices and technologies (treatments) best suited to the site characteristics, activity and location.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 31

Environmental Outcomes and Reporting

Outline the site specific environmental outcomes relevant to the environmental factors that may be impacted by the proposed activity:

- Environmental performance criteria against each outcome to enable the outcomes to be measured, and to define limits for monitoring and environmental reporting.
- The outcomes, performance criteria and monitoring must be outlined in a table.
- It is the proponent's responsibility to monitor mine site performance against the performance criteria specified in the Mining Proposal. Any breach of a performance criterion, or an incident which has caused, or has the potential to cause significant environmental harm, must be reported to DMP in accordance with specified timeframes.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 32

Environmental Outcomes and Reporting

Broad examples of environmental outcomes, performance criteria and monitoring

Environmental Factor	DMP Objective	Risk Pathways	Environmental Outcome	Performance Criteria ²¹	Monitoring
Biodiversity/Flora/ Fauna/ Ecosystem	To maintain representation, diversity, viability and ecological function at the species, population and community level.	Clearing and loss of habitat, dewatering, invasive pest introduction, pit lakes.	No impact to vegetation beyond the mine disturbance boundary.	No clearing beyond mine disturbance boundary.	Quarterly survey of disturbance areas.
			Native fauna impacts minimised within mine disturbance boundary and avoided outside of mine disturbance boundary.	No death of native fauna of conservation significance through entrapment in mine facilities.	Daily TSF and evaporation pond checks. Daly checks of all open trenches.

Outcome 2: Mining Proposal

MINING PROPOSAL CONTENTS 33

Environmental Management System

Proponents are required to have and maintain an EMS to ensure that environmental impacts are minimised. The EMS is a system of practices and procedures relating to:

- The identification and assessment of the risk of environmental harm occurring as a result of the carrying out of mining operations.
- The implementation of reasonably practicable measures to avoid or minimise the risk of such environmental harm occurring or reduce such environmental harm if it occurs.
- EMS to be maintained and implemented throughout the life of the project.
- A separate EMS is not required for each individual Environmental Group Site.
- If a certified ISO 14001 EMS is to be implemented, no further information is required in the EMS section of the Mining Proposal other than a commitment that this will be implemented.

Outcome 2: Mining Proposal

MINING PROPOSALS 34

GREENHOUSE GASES ARE NOT DISCUSSED IN GUIDELINES

- No specific reference to Greenhouse Gas emissions or energy use
- Mine Activity Type – onsite energy generation may be included in “Plant”
- No objective for air included
- Air quality listed within Environmental Threats and other factors (S.8.6)
- DMP expects the Mining Proposal to include baseline data for noise or air quality only in circumstances where these factors may impact on the other environmental factors listed in Table 1 (e.g. noise impacts on native fauna, dust impacts on native vegetation).

Outcome 2: Mining Proposal

DISCUSSION: MINING PROPOSAL APPLICATIONS IN PRACTICE 35

How are applications handled in your company (re: environmental management)? How can it be done more efficiently and effectively?

Think P.R.O.C.E.S.S

- Personnel – Who is involved?
- Resources – What factors are in place to accomplish task?
- Obstacles – Any barriers, blockers and problems (define)?
- Communication – Interpersonal, interdepartmental or regulatory information consistently shared to required parties?
- Efficiency – Is what is to be achieved in alignment with resources expended?
- Systemised – Is the process documented and standardised?
- Successful – Does it work? Why does(n't) it work? Improvements?

- Strategic POW lodgement
- Strategic Exploration Planning
- How do we mitigate issues identified?

Outcome 2: Mining Proposal

DMIRS APPROVALS TIMEFRAMES 36

Stop the clock

DMIRS's approval performance measures exclude the time taken by processes outside DMIRS's control. When an application process is outside DMIRS's control (i.e. with the proponent or another agency), the time taken during this process is not included when calculating DMIRS's approval performance. In effect, the 'clock is stopped'. The clock is started again when DMIRS receives agency advice or information from the proponent. Stop the clock events and dates are recorded on DMIRS's online lodgement and approval tracking system.

Examples of external agency processes outside DMIRS's control include objections under the Mining Act 1978 lodged in the Warden's Court and other State government assessment processes under the Environmental Protection Act 1986 or the Aboriginal Heritage Act 1972.

The clock is also stopped for the time taken by a proponent to provide additional information required to complete an application, or respond to a query to finalise an assessment process.

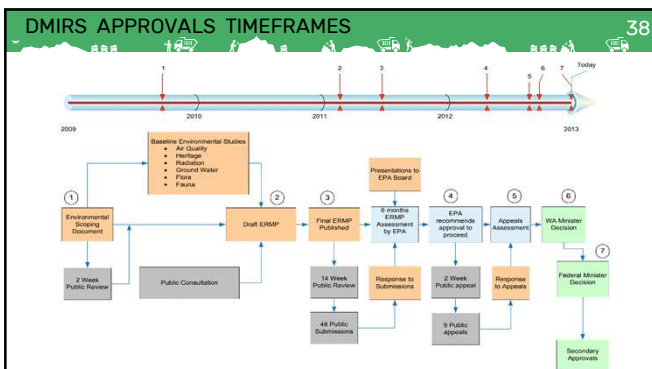
This “stop the clock” approach applies to assessment of other environmental approvals, including Programmes of Work and Mining Proposals, which both have a target assessment timeframe of 30 business days – 100 days is typical

Outcome 2: Mining Proposal

DMIRS APPROVALS TIMEFRAMES 37

https://www.dmp.wa.gov.au/Documents/Investors/Approvals_Report_Q4_2021.pdf

Outcome 2: Mining Proposal



EARLY REGULATOR CONTACT 39

If you have to take just one thing away...

Contact DMIRS (and DWER) prior to application: They are there to facilitate (within the law), not to block and resist applications.

Early contact:

- builds relationships
- clarifies requirements for applications
- saves time (and money) in the long run.

Outcome 2: Mining Proposal

SUMMARY

40


Discussed the various approvals required for mining in Western Australia. In particular...

- Programme of Work
- Mining Proposal:
 - Overview and structure
 - Mining Proposal requirements and guidelines



Mine Rehabilitation and Closure


Environmental Essentials WA



OUTCOMES 2


You will gain an understanding of the processes involved in mine rehabilitation and best practice closure planning. In particular...

- Successful rehabilitation criteria
- Mine Rehabilitation
- Mine Rehabilitation Fund (intent and issues)
- Annual Environmental Reporting
- Mine Closure Good Practice



DMIRS' ENVIRONMENTAL OBJECTIVE FOR REHAB & CLOSURE 3

Mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the State.



REHABILITATION 4

Definition
 The Society for Ecological Restoration (SER) says that rehabilitation is:
 ‘...the process of assisting the **recovery** of an ecosystem that has been damaged, degraded or destroyed.’
 ‘...creation of a **self-supporting** ecosystem that is **resilient**...’

- Specific indicators are selected to help evaluate whether these targets, goals and objectives are being met as a result of the interventions.

Outcome 1: Successful Rehabilitation Criteria

REHABILITATION – RECOVERY WHEEL(SER,2004) 5

- Common indicators only
- Scoring based on informal or formal monitoring indicators for the project
- Indicators should be identified at the outset of the project to provide ecologically meaningful information attributes being evaluated.

Outcome 1: Successful Rehabilitation Criteria

Rehabilitation – Wolves in Yellowstone 6

WOLVES KEEP YELLOWSTONE IN BALANCE

IN THE 1920s, government policy allowed the extermination of Yellowstone's gray wolf – the apex predator – triggering an ecosystem collapse known as trophic cascades.

IN 1995 – through use of the Endangered Species Act – the reintroduction of the gray wolf began. The impact is dramatic.

ELK populations exploded, causing severe overgrazing of riparian regions needed by beavers and fish, stream bank erosion, and fish mortality.

COYOTE populations increased, leading to a decline in pronghorn and bison.


BEAVER populations increased, leading to a decline in stream bank erosion and fish mortality.

ANTelope populations increased, leading to a decline in stream bank erosion and fish mortality.

FOX populations increased, leading to a decline in stream bank erosion and fish mortality.

Outcome 2: What successful rehabilitation might look like

From Western Five to Lake Kepwari 13



- Rare WA rehabilitation success story
- Best practice
- Mine closed in 1996
- Relinquished 220 hectares in total, 120 hectares of which is revegetated land around the lake
- Government has invested over \$5 million

<https://resources/index.php/2020/12/09/world-class-wa-rehab-transforms-old-coal-mine-into-aquatic-playground/>

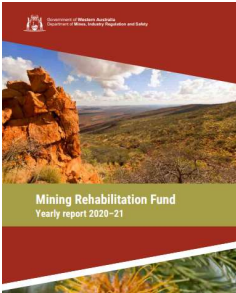
MINE REHABILITATION FUND 14

- The MRF Act allows for monies owed for rehabilitation work on abandoned sites to be recovered through the Courts from those responsible.
- Fund created to enhance the State's capacity to manage and rehabilitate abandoned mines to lead to better environmental and community safety outcomes.
- Money in the fund is available to rehabilitate abandoned mines across the State in circumstances where the tenement holder/operator has failed to meet rehabilitation obligations and efforts to recover funds from the holder/operator have been unsuccessful.
- All tenement holders operating on Mining Act 1978 (Mining Act) tenure are required to report disturbance data and contribute annually to the fund.
- The Rehabilitation Liability Estimate (RLE) Calculator assists tenement holders to estimate their rehabilitation liability and the associated MRF levy under a variety of scenarios.

MRF estimate works out to approximately \$30,000 per hectare of tenement activity

Outcome 2: Mine Rehabilitation


MINE REHABILITATION FUND 15



https://www.dmp.wa.gov.au/Documents/Environment/MRF_Yearly_Report-2020%28%9321.pdf

COMMON ISSUES IN MRF REPORTING - Exploration and prospecting 16

- Each report must account for all of the work that you have done so far under the Programme of Work (PoW).
- If you have approval to do exploration or prospecting (meaning, a Programme of Work has been approved) but you haven't yet started work, you will still need to lodge an MRF report.
- Work that does not involve disturbing the ground (like detecting) does not count as an 'activity'.



Outcome 3: Mine Rehabilitation Fund (Intent and Issues)

COMMON ISSUES IN MRF REPORTING 17

Reporting Period

- Required to report any disturbance on the surface of the tenement, whether or not you have undertaken any activity during the current reporting period. This means that, if you have not done any work during this reporting period but have disturbed the land previously, you would normally report the same as you did in the previous period (except for exploration and prospective activity as mentioned previously).

Essentially – you report the footprint of the activity as it exists on the day that you assessed it.

Outcome 3: Mine Rehabilitation Fund (Intent and Issues)

COMMON ISSUES IN MRF REPORTING 18

'Rehabilitation' v 'Land under Rehabilitation'

- A mining activity cannot be considered as 'rehabilitated' unless all of the closure obligations in the mining proposal have been met and signed off by an appropriate officer within the Environmental Compliance Branch.
- A mining activity cannot be considered as 'land under rehabilitation' until all required earthworks have been completed in accordance with closure obligations and you have commenced work toward revegetation and monitoring. If you provide an Annual Environmental Report to the department, this would be consistent with having completed Stage 1 (i.e. Stage 2 rehabilitation has commenced).

Outcome 3: Mine Rehabilitation Fund (Intent and Issues)

Common Issues in MRF Reporting 19

'Historical' or 'Legacy' mining activities or infrastructure

- When you purchase a tenement from another party, you effectively **inherit all of their rights and obligations** as if you, yourself, had held that tenement from the time it was granted.
- If a disturbance pre-dates the grant of the tenement (for example, old workings, roads or infrastructure), you would not normally need to include them in your report **unless you have disturbed them or used them yourself.**

Outcome 3: Mine Rehabilitation Fund (Intent and Issues)

ANNUAL ENVIRONMENTAL REPORT 20

- A condition requiring the submission of an AER is imposed on the tenement following the approval of a mining proposal
- Document the activities which have occurred over the reporting period specific to the tenement or group site
- Online AER submission currently requires all activity on mining tenure to be reported, including exploration
- This satisfies the reporting requirements under the PoW and a separate report is not required.

FIGURE 1: AER Reporting Period

Outcome 4: Annual Environmental Reporting

Annual Environmental Report 21

Objectives

- To concisely document the major mining activities for the reporting year and proposed activities for the following year.
- To enable the Department to understand operator environmental management and rehabilitation activities for the reporting year and proposed activities and developments in the following year.
- To encourage operators to conduct an environmental analysis of the project.
- To assist operators in self regulation, i.e. to monitor and report on their own environmental compliance and performance.
- Encourage operators to be prepared for mine closure through reviewing the status of rehabilitation and mine closure planning on an annual basis.
- To provide basic information to the Department about the extent of mining operations in the State and the standard of environmental management and mine closure planning being achieved.

Outcome 4: Annual Environmental Reporting

Annual Environmental Report 22

Report Content


- Report Details – name, site details, reporting period, contact person
- Review Tenements – will auto-populate based on tenement groupings
- Environmental Group Site – the individual tenements for the purposes of further distinguishing the operations which make up a particular Project. Includes: site summary, materials balance, closure plan, site plan, etc.
- Mining Activities – exploration activity, ore processed, waste moved, operational status
- Area of Activity – per tenement voids, dump, haul road workshop etc., survey method e.g. GPS
- Compliance – compliance with env. approvals, document env. Incidents
- Rehabilitation and Closure Planning
- Future work – description of the mining activities, env. management and rehabilitation proposed for the following year

Outcome 4: Annual Environmental Reporting

Mine Closure 23

The 4 Tenets of Mine Closure

- Safety
- Stability
- Non-polluting
- Sustainability



Outcome 5: Mine Closure Good Practice

Mine Closure – Status in WA 24

Mine Closure in Western Australia

- 2015 MCP Guidelines released
- Size of MCP documents have increased
- Greater number of MCPs submitted since the requirement for MCPs in Mining Proposals
- Many consultants have emerged providing support to industry
- Mines are not actually closed:
 - Care and Maintenance
 - Close-up shop or abandon the site (Ellendale)
 - Sell to another company who may or may not understand the risk.

Outcome 5: Mine Closure Good Practice

Mine Closure – Status in WA 25

Status of Mine Closure in Western Australia

- Mine footprints growing
- Stakeholder knowledge and expectations increasing
- Minimal investment in closure related R&D
- The real cost to close not fully understood
- Closure planning governance developing
- Divestment of liability at closure still happening
- Benchmarking required to improve understanding.

Outcome 5: Mine Closure Good Practice

Mine Closure – Conceptual to Detailed 26

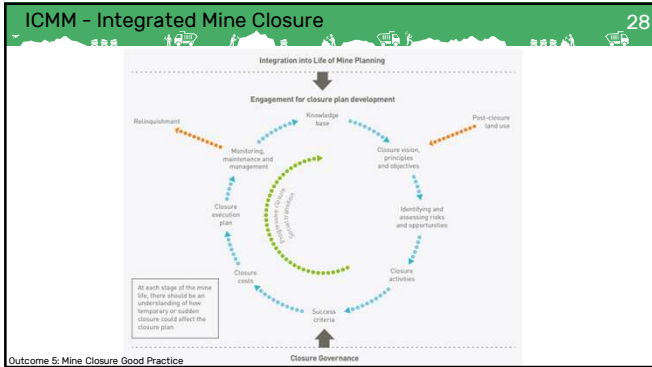
Figure 2 Integrating stages of mining and mine closure planning (adapted from IFRS 2006, ICMA 2008)

Outcome 5: Mine Closure Good Practice

Mine Closure Plan Contents 27

- The 2010 amendments to the Mining Act require a Mine Closure Plan to be submitted to DMP for assessment and approval as part of Mining Proposal applications.
- DMP's Draft Guidelines for Preparing Mine Closure Plans 2019, available on the DMP website:
 - Project Summary
 - Closure obligations and commitments
 - Stakeholder engagement
 - Baseline closure data and analysis
 - Closure risk assessment
 - Post mining land use and closure objectives
 - Closure outcomes; closure criteria and closure performance indicators
 - Closure Implementation
 - Closure Monitoring and Maintenance
 - Financial Provisioning for Closure
 - Management of Information and Data

Outcome 5: Mine Closure Good Practice





Mine Closure Completion Guidelines 30

Department of Mines, Industry Regulation and Safety

GUIDELINES

Mine Closure Completion Guideline -

For demonstrating completion of mine closure in accordance with an approved Mine Closure Plan

Version 1.0 November 2021

Outcome 5: Mine Closure Good Practice

- First released by DMIRS February 2020
- Updated November 2021
- Provides guidance on demonstrating completion of the agreed closure obligations and environmental conditions as outlined in their Mine Closure Plan

<https://www.dmp.wa.gov.au/Documents/Environment/REC-EC-237D.pdf>

DMIRS' ENVIRONMENTAL OBJECTIVE 31

Mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the State.

Good practice example: <https://www.yancoal.com.au/page/en/sustainability/>

OUTCOMES 32

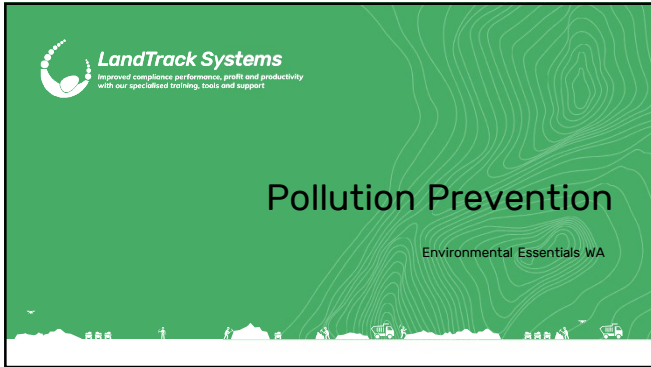
You will now have an understanding of the processes involved in mine rehabilitation and best practice closure planning. In particular...

- Successful Rehabilitation Criteria
- Mine Rehabilitation
- Mine Rehabilitation Fund (intent and issues)
- Annual Environmental Reporting
- Mine Closure Good Practice

LandTrack Systems
Improved compliance performance, profit and productivity
with our specialised training, tools and support

Pollution Prevention

Environmental Essentials WA




OUTCOMES 2

You will gain a general overview of pollution, their impacts and how they can be controlled and managed. In particular:

- What is Pollution?
- What is Pollution Prevention?
- Types, sources, control and mitigation of:
 - Air Pollution
 - Water Pollution
 - Noise Pollution
 - Light Pollution
- What is waste?
- Understand why waste should be managed
- Identify the various waste types and classification
- Identify best practices in waste management in mining
- Be familiar with new waste avoidance concepts.

RELEVANCE TO WA INDUSTRIES 3

- *Environmental Protection Regulations 1987*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*
- Includes discharges to: Soil, surface water, groundwater, air, stormwater drains, vessels or receptacles which are connected to the environment, any other place that has direct connectivity to the environment (for example road surfaces, forecourts, carparks or hardstands).
- Materials burning (causing visible smoke)



Outcome 1: What is pollution?

WORKS APPROVAL AND LICENCING 4

Works Approval and Licence (*Environmental Protection Act 1986 Part V*)

Certain facilities and activities with potential to cause emissions and discharges to air, land and water are classified under Part V of the *Environmental Protection Act* as “prescribed premises” and require an approval to construct the facility (Works Approval) and licensing (Prescribed Premises Licence – Licence to Operate) to then operate the facility. Schedule 1 of the *Environmental Protection Regulations 1987* list 89 categories of prescribed premise, each with a trigger threshold.

Outcomes 5 & 6: Works Approval and Licence


ENVIRONMENTAL PROTECTION REGULATIONS 1987 5

- Clean Air (*Determination of Air Impurities in Gases Discharged to the Atmosphere*) Regulations 1983
- Environmental Protection (*Abattoirs*) Regulations 2001
- Environmental Protection (*Abrasive Blasting*) Regulations 1998
- Environmental Protection (*Clearing of Native Vegetation*) Regulations 2004
- Environmental Protection (*Concrete Batching and Cement Product Manufacturing*) Regulations 1998
- Environmental Protection (*Controlled Waste*) Regulations 2004
- Environmental Protection (*Domestic Solid Fuel Burning Appliances and Firewood Supply*) Regulations 1998
- Environmental Protection (*Fibre Reinforced Plastics*) Regulations 1998
- Environmental Protection (*Goldfields Residential Areas Sulfur Dioxide Policy and Regulations*) 2003
- Environmental Protection (*Kwinana*) (*Atmospheric Wastes*) Regulations 1992
- Environmental Protection (*Metal Coating*) Regulations 1998
- Environmental Protection (*NEPM-NPI*) Regulations 1998
- Environmental Protection (*Noise*) Regulations 1997
- Environmental Protection (*Packaged Fertiliser*) Regulations 2010
- Environmental Protection (*Petrol*) Regulations 1999
- Environmental Protection (*Recovery of Vapours from the Transfer of Organic Liquids*) Regulations 1995
- Environmental Protection (*Rural Landfill*) Regulations 2002
- Environmental Protection (*Unauthorised Discharges*) Regulations 2004
- Noise Abatement (*Noise Labelling of Equipment*) Regulations (No. 2) 1985

Outcomes 5 & 6: Works Approval and Licence

WHAT IS POLLUTION? 6

- The introduction of contaminants into the natural environment that cause adverse change.
- Direct or indirect alteration of the environment
- Can take the form of chemical substances, or energy, such as noise, heat, light or electromagnetic radiation.
- The components of pollution, can be either foreign substances/energies or naturally occurring contaminants
- Can be point source (from a single source) or non-point source pollution (multiple sources).



Outcome 1: What is pollution?

POLLUTION PREVENTION 7

- Practice that reduces, eliminates, or prevents pollution at its source, also known as "source reduction"
- Fundamentally different and more desirable than recycling, treatment and disposal




Outcome 2: What is pollution prevention?

AIR POLLUTION 8

Chemical additions to the atmosphere by natural events or human activities in high enough concentrations to be harmful

Two categories

- **Primary Air Pollutant**
 - Harmful substance that is emitted directly into the atmosphere
- **Secondary Air Pollutant**
 - Harmful substance formed in the atmosphere when a primary air pollutant reacts with substances normally found in the atmosphere or with other air pollutants



Outcome 3: Types, Sources, Control and Mitigation of Air Pollution

CHARACTERISTICS OF MAIN AIR POLLUTANTS 9

Pollutant	Composition	Primary or Secondary	Characteristics
Particulate matter			
Dust	Variable	Primary	Solid particles
Lead	Pb	Primary	Solid particles
Sulfuric acid	H ₂ SO ₄	Secondary	Liquid droplets
Nitrogen oxides			
Nitrogen dioxide	NO ₂	Primary	Reddish-brown gas
Sulfur oxides			
Sulfur dioxide	SO ₂	Primary	Colorless gas with strong odor
Carbon oxides			
Carbon monoxide	CO	Primary	Colorless, odorless gas
Carbon dioxide*	CO ₂	Primary	Colorless, odorless gas
Hydrocarbons			
Methane	CH ₄	Primary	Colorless, odorless gas
Benzene	C ₆ H ₆	Primary	Liquid with sweet smell
	O ₃	Secondary	Pale blue gas with acrid odor
Ozone			
Air toxics			
Chlorine	Cl ₂	Primary	Yellow-green gas

Outcome 3: Types, Sources, Control and Mitigation of Air Pollution

Particulate Matter 10

Human hair (70 μm diameter)

PM 10 (10 μm) PM 2.5 (2.5 μm)

Outcome 3: Types, Sources, Control and Mitigation of Air Pollution

SOURCES AND EFFECTS OF AIR POLLUTION 11

Pollutant	Source	Effects
Particulate	Industries, electric power plants, motor vehicles, construction, agriculture	Aggravates respiratory illnesses; long-term exposure may cause increased incidence of chronic conditions such as bronchitis; linked to heart disease; suppresses immune system; some particles, such as heavy metals and organic chemicals, may cause cancer or other tissue damage
Nitrogen oxides	Motor vehicles, industries, heavily fertilized farmland	Irritate respiratory tract; aggravate respiratory conditions such as asthma and chronic bronchitis
Sulfur oxides	Electric power plants and other industries	Irritate respiratory tract; same effects as particulates
Carbon monoxide	Motor vehicles, industries, fireplaces	Reduces blood's ability to transport oxygen; headache and fatigue at lower levels; mental impairment or death at high levels
Ozone	Formed in atmosphere (secondary air pollutant)	Irritates eyes; irritates respiratory tract; produces chest discomfort; aggravates respiratory conditions such as asthma and chronic bronchitis

- CO₂ and hydrocarbons contribute to climate change

Outcome 3: Types, Sources, Control and Mitigation of Air Pollution

MITIGATING AIR POLLUTION 12

- Banning certain substances outright (CFCs, sulphur)
- Enforcement of emissions limits through legislation
- Reduce emissions through technology
- Alter constituents of emissions at stack (outputs)

Electrostatic precipitator: Dirty gas (smoke) in, Electrode (negative charge), Precipitator wall (positive charge), Dust falls off wall into collector, Clean gas out.

Scrubber: Dirty gas in, Liquid (water) in, Entrainment separator, Polluted liquid (sludge) out, Clean gas out.

Outcome 3: Types, Sources, Control and Mitigation of Air Pollution

WATER POLLUTION 13

- Any physical or chemical change in water (including lakes, rivers, oceans, aquifers and groundwater) that adversely affects the health of humans and other organisms.
- Water ...the universal solvent.

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

WATER 14

EARTH'S FRESHWATER RESOURCES

- 70% of freshwater is locked up as ice or permanent snow cover.
- 30% is stored underground as groundwater, soil moisture, swamp water or permafrost.
- 0.3% is found in lakes and rivers.

GLOBAL WATER WITHDRAWALS

- 69% Irrigation
- 15% Electric
- 8% Domestic
- 7% Manufacturing
- 1% Livestock

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

WATER 15

DIRECT WATER USE

The average person needs between 0.5 and 1.5 gallons of water per day to survive in a moderate climate.

The minimum amount of water needed for drinking, cooking, bathing and sanitation is 19 gallons.

The average person living in the U.S. uses 65-78 gallons of water per day.

The average person in the Netherlands uses 27 gallons.

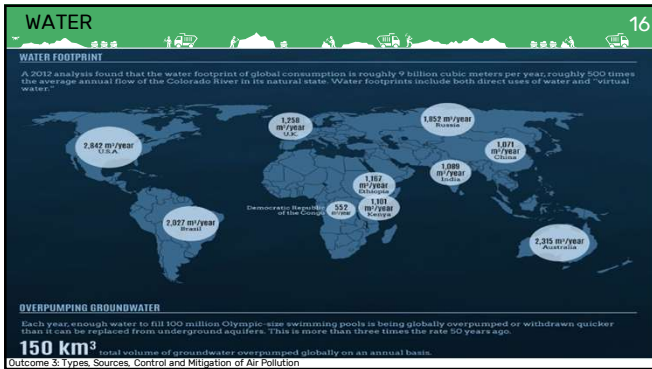
The average person in the Republic of the Congo, Africa, uses 1.7 gallons per day.

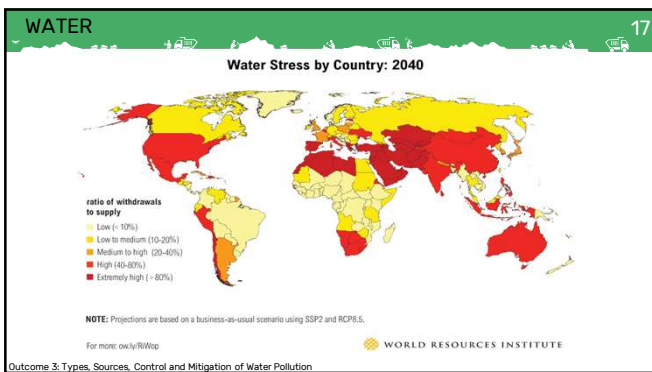
VIRTUAL WATER

According to the Pacific Institute, "virtual water" is water we consume indirectly. This is the water required to produce the food we eat, clothes we wear and the goods we use.

- 650 gallons: The water footprint of a cotton shirt includes the water for growing the cotton, processing and drying the fabric, and finishing the shirt. The amount of water required to produce and process 650 gallons of water is needed to produce one shirt.
- 139 gallons: Water is required for a coffee cup of coffee.
- 29 gallons: Water is required for a 100-gram chocolate bar.
- 67 gallons: Water is required for a 100-gram glass of orange juice.
- 13 gallons: Water is required for a 100-gram chocolate bar.
- 449 gallons: Water is required for a 100-gram chocolate bar.
- 2,036 gallons: Water is required for the 100-gram of beef.

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution





SOURCES AND EFFECTS OF WATER POLLUTION

18

Pollutant	Source	Effects
Bacteria and viruses (E. coli)	Sewage; Human and animal waste	Skin issues; illness/death from hepatitis, typhoid, and cholera if water is ingested
Oxygen demanding chemicals (Organic debris & waste + aerobic bacteria)	Sewage, feedlots, paper milling, food processing	Eutrophication; algal blooms; ecosystem degradation
Inorganic Contaminants (Heavy Metals, Ammonia, nitrogen, phosphorous)	Surface runoff, industrial effluent, household cleansers	Illness; death; ecosystem degradation; Eutrophication; algal blooms
Nitrates, Phosphates	Sewage, manure, agricultural fertilizer and landscaping runoff	Eutrophication; algal blooms
Organic chemicals (Oil, Gasoline, Plastics, Pesticides, Solvents, detergents)	Industrial effluent; household cleansers, runoff from farms and yards	Oil smothering; ecosystem degradation
Sediment	Water (and wind) Erosion	Toxin transport to waterway; turbidity, suffocation, smothering.
Heat/Thermal	Power plants, industrial processes	Ecosystem degradation; increased algal blooming – reducing oxygen
Solid waste	Anthropogenic (i.e. man)	Human and aquatic organism health; aesthetics

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

EUTROPHICATION

The diagram illustrates the process of eutrophication in six stages:

1. First, the fertilizer is applied on the land.
2. Then the fertilizer is transported to a lake by an underground river.
3. Then it gets washed away by the rain and absorbed into the soil.
4. The fertilizer causes overgrowth of aquatic plants and algae in the lake.
5. This means the sunlight cannot reach the bottom of the lake, so algae dies.
6. The bacteria decomposes the algae, taking up all the oxygen, making the lake anoxic.

This causes other organisms in the lake to die.

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

TURBIDITY

The diagram illustrates the effects of turbidity on an ecosystem:

- Increased turbidity and nutrients lead to reduced sunlight entering streams, which causes shading of phytoplankton and reduced visibility.
- Bank recovery and deposition of suspended matter lead to reduced sediment and carbon cycling, and a loss of macrophytes.
- Shading of phytoplankton leads to habitat modification and diverse aquatic biota.
- Bank recovery leads to diverse aquatic biota.
- Bank recovery leads to diverse aquatic biota.

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

WATER QUALITY ASSESSMENT CHARACTERISTICS


- Physical Characteristics – flow, temperature, colour, light, sediment suspended in the water
- Chemical Characteristics –dissolved oxygen, acidity (pH), salinity, nutrients and other contaminants
- Biological Characteristics –bacteria, algae, other organisms

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

WATER QUALITY TESTING PARAMETERS 22	
Parameter	Significance
Total Phosphorous	Locally, P is limiting, algae/pollution issues
Total Kjeldahl Nitrogen (TKN)	Too much leads to over productivity
Ammonia	Too much can cause fish kills
Nitrites/Nitrates	Inorganic, directly available, form of N
Faecal Coliform	Health hazard, beach closings
Total Suspended Solids (TSS)	Binds to nutrients, too much = low DO concentration
Orthophosphate	Inorganic, directly available, form of P
Chlorophyll a	Can indicate level or productivity
Water Temperature	High temps can cause fish/aquatic life death
Water Depth	Important when looking for other factors
Dissolved Oxygen (DO) Concentration	Range necessity for fish/aquatic life health
Hydrogen Ion Concentration (pH)	pH should be in balance for optimal health
Conductivity	Can indicate levels of heavy metals, salt & nutrients

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

- | MITIGATING GENERAL INDUSTRY WATER POLLUTION 23 | |
|--|--|
| <ul style="list-style-type: none"> Industrial wastewater disposal/management options in order of preference: <ul style="list-style-type: none"> Banning/controlling the manufacture and use of harmful or misused chemicals (e.g. TBT) Reduce wastewater quantity through technology Recycle the wastewater from flushing/cooling (where practical) Reuse the wastewater (generally after treatment) for a beneficial purpose (either onsite or on a neighbouring property) such as growing crops, gardens or turf. Treat and discharge to sewer (if available) Treat and discharge wastewater to soakage or lined evaporation pit (where practical) Treat and discharge to drains or watercourses, meeting licence limits. | |
- Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

MINE WASTEWATER 24	
<ul style="list-style-type: none"> Water is essential for mining operations: <ul style="list-style-type: none"> Processing – wet grinding, washing, flotation, leaching, etc. Utilities – cooling water, pollution control, etc. Dust suppression Transportation – pumping tailings and products Cleaning equipment, etc. In general, the lower the grade of ore, the more water intensive the mining process to extract the ore. 	
	

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

MINE WASTEWATER TREATMENT 25

Category	Examples	Application
Neutralization	lime or limestone addition	acid rock drainage
Passive treatment	wetland systems	polishing
Metals removal	sulfide precipitation, biological filters, fluidized bed reactor	metal recovery - saleable product
Metals removal	hydroxide precipitation (HDS process), coagulation-flocculation, clarification	metal removal; arsenic removal
Membranes	microfiltration, ion exchange, reverse osmosis	water reuse; metals removal
Biological treatment	Fixed film or suspended	Nitrogen removal, selenium removal, bioleaching
Evaporators and concentrators	brine concentrators, crystallizers	zero liquid discharge
Dewatering	clarifiers, dissolved air flotation	volume reduction of tailings
Filtration and thickening	pressure filters, paste thickeners	volume reduction of tailings
Cyanide treatment	alkaline chlorination, hydrogen peroxide process	gold mine effluent

Outcome 3: Types, Sources, Control and Mitigation of Water Pollution

SOUND v NOISE 26

- From a physics standpoint, *noise* is indistinguishable from *sound*, as both are vibrations through a medium, such as air or water.
- The difference arises in how the brain *receives and perceives* a sound.
- Noise is unwanted sound judged to be unpleasant, loud or disruptive to hearing, or a particular activity.

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

NOISE POLLUTION 27

- Noise is broadly defined in the Environmental Protection Act 1986 ("the EP Act") as a vibration of any frequency, whether transmitted through air or any other physical medium.
- Noise pollution, also known as environmental noise or sound pollution, is the propagation of noise with negative impacts on the activity of human or animal life.

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

SOURCES OF NOISE 28

- Road traffic e.g. moving trucks, automobiles, buses, especially those with modified silencer system
- Industrial (power plants, stone crushing, metal workshops, cabinet making)
- Machinery (generator sets, compressors, air conditioning units, boilers, pumps, motors)
- Construction and roadworks
- Aircrafts and ship engines
- Community noise e.g. radio/TV, loudspeakers, pool houses and alarms
- Animals (birds)
- Places of entertainment, including night clubs, loud speaker, amplifier, musical instrument

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

NOISE EFFECTS 29

- Hearing Loss (Including Occupational Hearing Loss)
- Stress
- High Blood Pressure
- Sleep Loss
- Distraction
- Disorientation
- Productivity Loss
- Irritability
- Headache
- Annoyance
- Interference with Communications

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

MARINE ANIMAL RECEPTORS 30



Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

MEASURING NOISE 31

- Sound energy travels in waves and is measured in frequency and amplitude
- Amplitude measures how forceful the wave is - measured in decibels or dBA of sound pressure (logarithmic)
- The number of pressure variations per second is called the *frequency*
- The more sound pressure a sound has, the less time it takes to cause damage.
- A sound at 85 dBA may take as long as 8 hours to cause permanent damage, while a sound at 100 dBA can begin damage after only 30 minutes of listening (depends on distance)

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

NOISE OFFENCE 32

As per the EP Act it is an offence to:

- emit an *unreasonable* emission of noise
- cause pollution (including noise pollution)
- use equipment on any premises in such a way as to emit an unreasonable noise
- own or drive a vehicle or vessel that does not comply with the prescribed noise standard for that class of vehicle
- own or install any equipment that, when operated, can exceed the noise limit
- manufacture, sell, supply, assemble, distribute or store any equipment or vehicle which, when operated under prescribed test conditions, exceeds the relevant noise limit for that equipment or vehicle.

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

EXEMPTIONS 33

- Some farm vehicles
- Construction sites, at certain times of the day
- Equipment operated on residential premises (including musical instruments) at certain times of the day
- Bell-ringing and calls to worship at certain times of the day
- Community activities including: - spectators at organised sporting activities
- Public meetings and processions
- Religious activities
- Recreational and educational activities associated with schools and other premises used for educational purposes
- Agricultural shows, fairs, fetes, exhibitions and like events.

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

NOISE ABATEMENT 34

Hierarchy of Control

Apply the highest level of control proportional to the risk level.
Apply lower value controls until long-term controls are implemented.

Most Effective

Least Effective

- Alter the project considerably
- Choose not to use the equipment or machine
- Change the equipment or tool (use hydraulic rather than compressed air)
- Improved technology
- Reduce emissions escape at source (plant room, louvres, panels, screens)
- Reduce exposure at receptor (barriers, walls, vegetation)
- Designated zones
- Designated timing of emissions
- Procedures and training
- Noise emissions testing
- Use of ear protection

Outcome 3: Types, Sources, Control and Mitigation of Noise Pollution

LIGHT POLLUTION 35

Definition
Light pollution is excessive, misdirected, or obtrusive artificial (usually outdoor) light.

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT POLLUTION EFFECTS 36

- Affects ecosystems
- Alteration of circadian rhythm
- Aesthetics of the night sky

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT POLLUTION EFFECTS 37

- Researchers have already identified harmful impacts on a shocking array of non-urban species including bats, insects, plants, fish, turtles, marine invertebrates including corals, and even primates
- The damaging effects of coastal light on threatened turtle species are perhaps the most commonly known
- *Commonwealth Government Light Pollution Guidelines for Marine Turtles, Seabirds and Migratory Shorebirds*

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT IMPACTS ON TURTLES 38




[Light pollution - DCCEE](#)

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT IMPACTS ON TURTLES 39

SOLUTIONS

LED lights are less disruptive to sea-turtle hatchlings and more energy efficient than conventional lighting sources.



Turtle eye receptors are sensitive to different intensity and wavelengths of light with ultra violet, blue, or green spectrum being the most disruptive. The sea turtle friendly LED lights offer a safe and effective solution for people and the environment.

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT POLLUTION MITIGATION AND MANAGEMENT 40

Light Emission Monitoring

- Demonstrate your lighting has not significantly increased ambient light levels over and above levels existing prior to development.
- Manage installed lighting to mitigate light spill on projects located in close proximity to species or ecosystems sensitive to ambient lighting.

Lighting Audit or Mitigation

- Demonstrate that installed lighting is appropriate and compliant with lighting commitments.
- Reduce lighting output and associated cost on your project effectively and without compromising stringent HES standards and employee safety.

Potential Light Emission Modelling

- Assess the ecological risk posed by project lighting in areas containing sensitive receptors.
- Assess the environmental risk posed by additional project lighting for existing projects which plan to expand, or add infrastructure, in areas containing sensitive receptors.

Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

LIGHT POLLUTION MITIGATION AND MANAGEMENT 41

• [Position Statement - Dark Sky and Astrotourism \(www.wa.gov.au\)](http://www.wa.gov.au)



5.6 Development

Development approval

In considering applications for development approval, decision-makers should ensure lighting and dust management is consistent with the dark sky principles. These measures may be demonstrated through a lighting management plan and dust/construction management plan approved as part of the application by the decision-maker, or as a condition of approval. For most proposals, a basic lighting management plan and/or dust/construction management plan will be sufficient. Lighting and dust management plans should be consistent with this policy, Australian standards, DMER Guidelines and include:

- a map/plan
- lighting selection, location and illuminance values
- potential light emission recipients, including the possible impact on any protected wildlife species
- mitigation measures
- maintenance/monitoring/reporting.


Outcome 3: Types, Sources, Control and Mitigation of Light Pollution

WHAT IS WASTE? 42


- Residual product that is not the primary goal of production
- A material, substance, or by-product) eliminated or discarded as no longer useful or required after the completion of a process
- Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities.
- If the residual product is reused or recycled or recovered in some way, the process will no longer be considered as waste.

Outcome 1: Define Waste


WASTE CLASSIFICATION (origin and type) 46

 **Fishery Wastes**

- Wastes generated due to fishery activities. These are extensively found in coastal & estuarine areas.

 **Radioactive Wastes**

- Waste containing radioactive materials. Usually these are byproducts of nuclear processes. Sometimes industries that are not directly involved in nuclear activities, may also produce some radioactive wastes, e.g. radio-isotopes, chemical sludge etc.

 **E-Wastes**

- Electronic wastes generated from any modern establishments. They may be described as discarded electrical or electronic devices. Some electronic scrap components, such as CRTs, may contain contaminants such as Pb, Cd, Be or brominated flame retardants.

Outcome 3: Identify the various waste types and classifications

WASTE AVOIDANCE AND RESOURCE RECOVERY ACT 2007 47

An Act to –

- provide for waste avoidance and resource recovery; and
- establish the Waste Authority; and
- establish a container deposit scheme; and
- provide for waste services by local governments; and
- provide for levies on waste; and
- repeal the *Environmental Protection (Landfill) Levy Act 1998*
- provide for related and consequential matters.

Outcome 3: Identify the various waste types and classifications

WASTE AVOIDANCE AND RESOURCE RECOVERY ACT 2007 48

Object of this Act

- 1) The primary objects of this Act are to contribute to sustainability, and the protection of human health and the environment, in Western Australia and the move towards a waste-free society by –
 - a) promoting the most efficient use of resources, including resource recovery and waste avoidance; and
 - b) reducing environmental harm, including pollution through waste; and
 - c) the consideration of resource management options against the following hierarchy –
 - i. avoidance of unnecessary resource consumption
 - ii. resource recovery (including reuse, reprocessing, recycling and energy recovery);
 - iii. disposal.

Outcome 3: Identify the various waste types and classifications

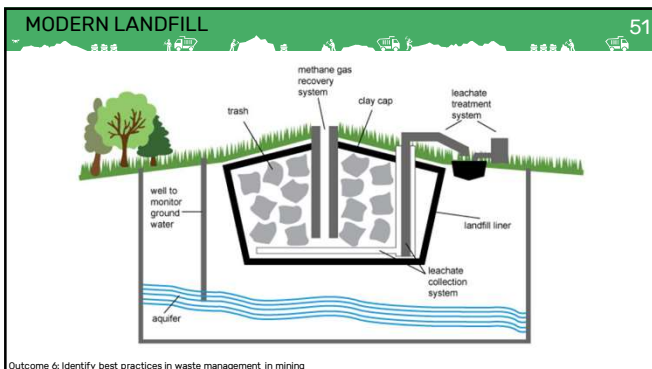


LANDFILL DISPOSAL

50

- NIMBY syndrome
- Space and land zoning requirements
- Strict regulatory restrictions and high environmental and economic costs
- Items barely decompose in a modern landfill
- Landfills face capacity restrictions

Outcome 6: Identify best practices in waste management in mining



LANDFILL EMISSIONS 52

The diagram illustrates a landfill site receiving waste from various sources: FOOD, PAPER, PLASTIC, FUEL (HOUSEHOLD APPLIANCES), METALS, TIRE, CERAMIC, POLYSTYRENE, GLASS, and LIQUID (HAZARDOUS). The waste is shown in a landfill site with a liner. Emissions of CARBON DIOXIDE (CO₂) and METHANE (CH₄) are shown rising from the site. A note states: "Emissions are reduced by burning waste." A circular arrow labeled "WASTEWATER TREATMENT" is also shown.

Outcome 6: Identify best practices in waste management in mining

LANDFILL CLASSES 53

The Waste Avoidance and Resource Recovery Act 2007 defines waste as matter whether useful or useless, which is discharged onto the environment or matter which is prohibited by the regulations to be waste. Below are the criteria to be applied in determining classification of wastes for acceptance to landfills licensed or registered in Western Australia in accordance with Part V of the Environmental Protection Act 1986.

Landfill classes and waste types				
Class I— Inert landfill Clean Fill Type 1 Inert Waste Contaminated solid wastes meeting waste acceptance criteria specified for Class I landfills Type 2 Inert Waste Type 3 Inert Waste Type 1 Special Waste	Class II— Putrescible landfill Clean Fill Type 1 Inert Waste Putrescible Wastes Contaminated solid wastes meeting waste acceptance criteria specified for Class II landfills Type 2 Inert Waste Type 1 and Type 2 Special Wastes	Class III— Putrescible landfill Clean Fill Type 1 Inert Waste Putrescible Wastes Contaminated solid wastes meeting waste acceptance criteria specified for Class II or Class III landfills Type 2 Inert Waste Type 1 and Type 2 Special Wastes	Class IV— Secure landfill Clean Fill Type 1 Inert Waste Putrescible Wastes Contaminated solid wastes meeting waste acceptance criteria specified for Class II, Class III or Class IV landfills Type 2 Inert Waste Type 1 and Type 2 Special Wastes	Class V— Intractable landfill Intractable and other wastes in accordance with the approvals for the site

Outcome 6: Identify best practices in waste management in mining

TREATMENT - INCINERATION 54

- Works by burning wastes under heat
- Reduces waste substantially
- Waste must be segregated – what goes in comes out (Dioxins and furans)
- Ash is hazardous in most cases
- Emissions must be controlled
- Medical wastes are commonly incinerated

Outcome 6: Identify best practices in waste management in mining

TREATMENT 55

- Composting
- Settling ponds
- Wastewater Treatment Facilities
- Resource Recovery (AKA Waste-to-Energy): Waste is burned to produce energy. Preferred to landfilling – reduces bulk of municipal waste to ash and provides energy. Strict regulatory restrictions and high economic costs and stringent environmental regulations:

Kwinana

- 10 years
- \$698 million
- 16 lawyers
- 36 MW capacity

Outcome 6: Identify best practices in waste management in mining

RECOVERY 56

Avertas Energy waste-to-energy facility
A practical solution for the recovery and reuse of waste with the generation of energy

ABOUT AVERTAS ENERGY

- Australia's first industrial waste-to-energy facility
- Located in Kwinana, Western Australia
- Long-term waste supply agreement with the City of Kwinana
- First and best technology used in its commercial sector
- Certified Recycle, Reuse & Recover

WASTE-TO-ENERGY PROCESS

- Waste collection**
- Waste arrives at facility**
- Waste mixing** Mixed by crane to ensure a homogeneous waste supply
- Energy recovery** Waste enters a boiler for combustion and regulates energy is recovered to create heat
- Recycle and reuse** The non-plant ash, slag and a residual residue where metals are removed for recycling, the ash is then stored for re-use as construction materials
- Electricity production** The heat produces steam which produces electricity and generates electricity
- Air quality control** Gases are treated to remove pollutants, the treated clean air exits the stack and the recovered pollutants are stored

ENVIRONMENTAL AND ECONOMIC BENEFITS

- 400,000 tonnes of residential, commercial, and industrial waste diverted from open landfill annually
- 25% of Perth's post-recycling rubbish
- >400,000 tonnes of CO₂ emissions reduced annually
- 85,000 tonnes of low-carbon
- >36MW of reliable baseload energy to be exported to the grid
- >50,000 household electricity needs
- 800+ jobs created in WA through construction
- 60 full-time positions once operational

RECYCLE 57

- Taking a product at the end of its useful life and using all or part of it to make another product
- Benefits: Saves energy, natural resources, and landfill space, reduces pollution, creates jobs and useful products
- Requires collection, processing, remanufacturing and purchase (Close the Loop!)
- EPA (USA) estimates 75% of household waste is recyclable.

Outcome 5: Understand the importance of segregation and storage

SEGREGATION AND STORAGE 58

Organic
Food scraps, garden waste, grass clippings, leaves, twigs, branches, garden furniture, garden hoses, garden tools, garden equipment, garden ornaments, garden furniture, garden hoses, garden tools, garden equipment, garden ornaments.

Paper
Newspapers, magazines, books, office paper, cardboard boxes, paper bags, paper cups, paper plates, paper napkins, paper towels, paper tissues, paper napkins, paper towels, paper tissues.

Plastic
Plastic bottles, plastic containers, plastic bags, plastic wrap, plastic toys, plastic furniture, plastic garden furniture, plastic garden hoses, plastic garden tools, plastic garden equipment, plastic garden ornaments.

Mixed
Food packaging, household appliances, household furniture, household equipment, household ornaments, household furniture, household hoses, household tools, household equipment, household ornaments.

Glass
Glass bottles, glass containers, glass jars, glass cups, glass plates, glass napkins, glass towels, glass tissues, glass napkins, glass towels, glass tissues.

Metal
Metal cans, metal containers, metal cans, metal containers, metal cans, metal containers, metal cans, metal containers, metal cans, metal containers, metal cans, metal containers.

E-waste
Mobile phones, laptops, tablets, smart TVs, smart speakers, smart home devices, smart home equipment, smart home ornaments, smart home furniture, smart home hoses, smart home tools, smart home equipment, smart home ornaments.

Sanitary
Used toilet paper, used paper towels, used paper napkins, used paper tissues, used paper napkins, used paper towels, used paper napkins, used paper tissues, used paper napkins, used paper towels, used paper napkins, used paper tissues.

Outcome 5: Understand the importance of segregation and storage

SEGREGATION AND STORAGE 59

Cardboard & Paper Recycling
CLEANAWAY 13 13 39

General Waste
CLEANAWAY 13 13 39

Commingled Recycling
CLEANAWAY 13 13 39

Food Recycling
CLEANAWAY 13 13 39

Outcome 5: Understand the importance of segregation and storage

SEGREGATION AND STORAGE 60

Batteries

Household Cleaners & Tubes

Printer Cartridges

Outcome 5: Understand the importance of segregation and storage

WASTE LEGISLATION 61

- Waste Avoidance and Resource Recovery Act 2007
- Environmental Protection (Controlled Waste) Regulations 2004
- EP Act Part V Licence

Outcome 7: Understand the Australian Waste Avoidance and Recovery Strategy

BEST PRACTICE WASTE MANAGEMENT IN MINING 62

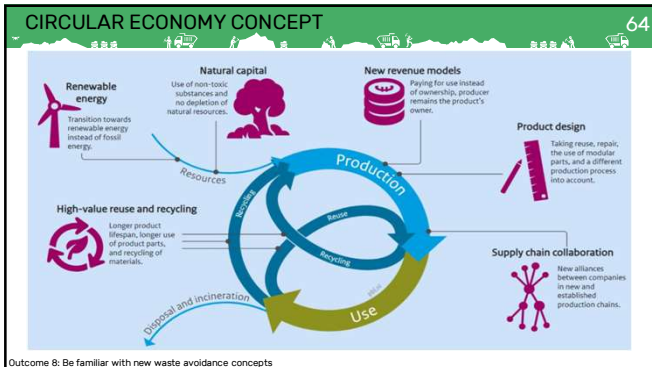
- Waste Management Plan:
 - Waste types and where waste is generated, stored, handled, treated or disposed
 - How will success be measured and monitored
- Ascertain the nature of the waste – and the correct classification
- Waste segregation
- Responsible disposal
- Sustainable procurement (recycled and recyclable materials)
- Recovering solvents, metals or oil and re-using them for a secondary purpose
- Recyclable construction wastes will be collected separately and reused or recycled
- Reverse logistics
- Vegetation wastes stockpiled safely to be used in on-site landscaping. Topsoil from disturbed areas will be stored for use in future rehabilitation activities on-site.

Outcome 6: Identify best practices in waste management in mining

CLOSING THE LOOP CONCEPT 63

- In nature there is no waste
- Zero Waste
- Cradle to cradle design – Life Cycle Analysis
- Extended Producer Responsibility (EPR) or Product Stewardship
- Product components are recyclable or biodegradable.

Outcome 8: Be familiar with new waste avoidance concepts



CIRCULAR ECONOMY EXAMPLE 65

SmartCrusher

- Today's concrete and cement industry emits about three times as much CO2 as all aircraft combined
- Every kilogram of cement produces approx. one kilogram of CO2 emissions
- Crushed pieces of concrete previously could only be used as low-grade gravel replacements
- SmartCrusher can separate the unused cement stone from the concrete rubble and produces residual flows of good quality sand and gravel.
- The cement stone can be used directly in concrete production (Freement) – reducing virgin cement production and CO2 emissions
- Sand and gravel could be used without the need for mining
- The revenue model shows that the investment can be recouped within 1.5 years and that the price of concrete is halved (without yet factoring price of carbon emissions)

Outcome 8: Be familiar with new waste avoidance concepts

OUTCOMES 66

You now have a general overview of pollution, their impacts and how they can be controlled and managed. In particular:

- What is pollution?
- What is Pollution Prevention?
- Types, sources, control and mitigation of:
 - Air Pollution
 - Water Pollution
 - Noise Pollution
 - Light Pollution
- What is waste?
- Understand why waste should be managed
- Identify the various waste types and classification
- Identify best practices in waste management in mining
- Be familiar with new waste avoidance concepts.

Stakeholder Management & Social Performance

Environmental Essentials WA

Outcomes 2

Participants should be able to:

- Define the term 'stakeholder'
- Describe the importance of stakeholder management and engagement
- Identify the key components of stakeholder management
- Create a stakeholder register
- Assess and classify stakeholders according to their levels of power/influence and their varying levels of interest
- Develop a Stakeholder Communication Plan
- Identify the principles of stakeholder engagement
- Understand the importance of social performance
- Understand the elements of ISO 26000



Benefits of stakeholder management 4

INCREASE THE SUPPORT AND MINIMISE THE NEGATIVE IMPACTS OF THE STAKEHOLDERS

- Minimises disruption
- Reduced delays (regulatory and community)
- Displays compliance with regulations. E.G. 2016 Mining Proposal Guidelines Appendix I – Developing a Stakeholder Engagement Strategy
- Stakeholder support usually results in government support
- Support throughout project life
- Shows good corporate social responsibility
- Increased shareholder value

Outcome 2: Understand the importance of stakeholder management and engagement

What do stakeholders want? 5

- Knowledge of the project/issue
- Clarity (timing and activities) on the proposed works
- How they might be affected by the proposed project
- Respect
- Truth


THEY WANT THEIR **FEARS** ALLAYED

Outcome 3: Identify the key components of stakeholder management

What do stakeholders fear? 6

Changes or threats to:

- Livelihood
- Personal health
- Threats to cultural or racial identity
- Threats to community culture or history
- Recreational activity
- Property values
- Economic vitality
- Environmental degradation
- Inconvenience



Outcome 4: Identify the key components of stakeholder management

Stakeholder management components 7

Four main steps:

- Identify stakeholders
- Assess and classify their interest and influence
- Develop a Stakeholder Communication Plan
- Engage and influence stakeholders.

Outcome 3: Identify the key components of stakeholder management

Stakeholder identification 8


- Determine who your stakeholders are
- Document relevant information regarding their interests, independence, interdependence, influence, and potential impact on project success
- Identification conducted using research, interviews, brainstorming, regulatory bodies, checklists, past experience, and historical information
- Stakeholders identified are captured in a Stakeholder Register
- Stakeholder identification is a continuous process which happens until the project ends

Outcome 4: Create a stakeholder register

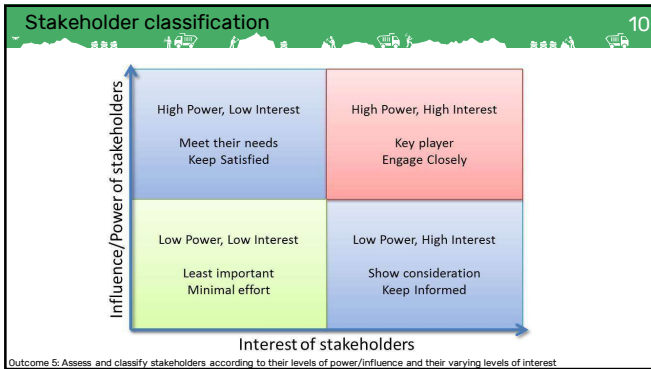
Brainstorming 9

Try to find the answers to the following questions during a brainstorming session:

- Who is directly involved with the project?
- Who is indirectly involved with the project?
- Who may be affected by the project?
- Who may be affected by the project's outcome?
- Who gains or loses from the project's success?
- Who wants project to be completed successfully and who doesn't?
- Who are the suppliers?
- Who are the end users of the project?
- Who are the competitors?
- Who are the shareholders?
- Is any local community impacted by the project or its outcome?
- Who has the authority to influence the project or its outcome?
- Who has the authority to make the project succeed?
- Who can make your project fail?



Outcome 4: Create a stakeholder register



Stakeholder classification 11

Develop a categorised list of the members of the stakeholder community.

Ask:

- How will they be affected by the project?
- Will they be openly supportive, negative or ambivalent?
- What are their expectations and how can these be managed?
- Who and what might be a key influencer on a stakeholder's view of the project?
- What are the top motivations for each stakeholder group or individual?
- Who would be the best person to engage with this stakeholder?

Outcome 5: Assess and classify stakeholders according to their levels of power/influence and their varying levels of interest

Stakeholder communication plan 12

- **Who** will we be communicated with?
- **What** is our form of communication and what are we giving them?
- **When** will we be communicating with them? How often?
- **Where** will we meet with them?
- **Why** are we communicating this to them – do we want it to elicit action?
- Requires different approaches for stakeholders that support the project v stakeholders that are opposed.

WHO WILL BE RESPONSIBLE FOR IMPLEMENTING THE COMMUNICATION PLAN AND FOR SENDING EACH PIECE OF COMMUNICATION?

Outcome 6: Develop a Stakeholder Communication Plan

Stakeholder communication plan benefits 13

- Preparedness and anticipation of the needs of stakeholders
- Keeping strong, succinct lines of communication going throughout a project is key to ensuring it runs smoothly
- Regular cadence contributes to the stakeholders' feeling of confidence in you and the project
- Sharing, ownership and accountability
- Adaptive and agile plan to account for new stakeholders, shifting goals, new phases of the project, etc.

[Stakeholder communication plan template](#)

Outcome 6: Develop a Stakeholder Communication Plan

Engagement and influence 14

IAP2 Spectrum of Public Participation

Outcome 7: Identify the principles of stakeholder engagement

Engagement and influence - inform 15

IAP2 Spectrum of Public Participation

Public Participation Goal	Promise to the Public	Example Techniques
To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	We will keep you informed	<ul style="list-style-type: none"> • Fact sheets • Web sites • Open houses

Inform


Outcome 7: Identify the principles of stakeholder engagement

Engagement and influence - consult 16

IAP2 Spectrum of Public Participation →

Public Participation Goal	Promise to the Public	Example Techniques
To obtain public feedback on analysis, alternatives and/or decisions	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision	<ul style="list-style-type: none"> Public comment Focus groups Surveys Public meetings

Consult




Outcome 7. Identify the principles of stakeholder engagement

Engagement and influence - involve 17

IAP2 Spectrum of Public Participation →

Public Participation Goal	Promise to the Public	Example Techniques
To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision	<ul style="list-style-type: none"> Workshops Deliberate polling

Involve




Outcome 7. Identify the principles of stakeholder engagement

Engagement and influence - collaborate 18

IAP2 Spectrum of Public Participation →

Public Participation Goal	Promise to the Public	Example Techniques
To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible	<ul style="list-style-type: none"> Citizen advisory committees Consensus building Participatory decision-making

Collaborate




Outcome 7. Identify the principles of stakeholder engagement

Engagement and influence - empower 19

IAP2 Spectrum of Public Participation →

Public Participation Goal	Promise to the Public	Example Techniques
To place final decision-making in the hands of the public	We will implement what you decide	<ul style="list-style-type: none"> • Citizen juries • Ballots • Delegated decision

Empower



Outcome 7. Identify the principles of stakeholder engagement

Principles of Stakeholder Engagement 20

- Communication – must be open, accessible, clearly defined, two-way and appropriate
- Transparency – process and outcomes of community and stakeholder engagement should, wherever possible, be made open and transparent, agreed upon and documented
- Collaboration – a cooperative and collaborative approach to seek mutually beneficial outcomes
- Inclusiveness – identifying and involving communities and stakeholders early and throughout the process, in an appropriate manner
- Integrity – should establish and foster mutual trust and respect.

In Mining Proposal Guidelines 2016 – adapted from the Ministerial Council on Mineral and Petroleum Resources (MCMR) Principles for Engagement with Communities and Stakeholders (2005)

Outcome 7. Identify the principles of stakeholder engagement

Barriers To Successful Engagement 21

- Contested or divided community (highly likely)
- Time
- Community may have limited literacy
- Cultural barriers
- 'Hard to reach groups' (youth, elderly or socially excluded groups)
- Cost

Outcome 7. Identify the principles of stakeholder engagement

Communication Strategies 22


Stakeholder engagement should:

- Include leaders of different stakeholder groups (e.g. community, workers, stockholders), and also seek to involve the broader population to ensure fairness and to obtain different viewpoints
- Emphasize two-way communication (listen to your stakeholders, as well as explaining yourself to them)
- Keep a realistic and positive tone
- Under promise and over deliver
- NOT be used mainly as a vehicle for publicity or photo opportunities

Outcome 7. Identify the principles of stakeholder engagement

Engagement and Influence 23

• Key Elements in Trust and Credibility (in stressful situations)



Outcome 7. Identify the principles of stakeholder engagement Source: Centre for Risk Communication 1997

CCDRA 24

Compassion and Caring Determines Risk Acceptability

- Begin with a statement of compassion and understanding.
- Offer a brief, simply stated, “sound bite” conclusion statement.
- State no more than two succinct pieces of data that support your conclusion.
- Repeat your brief conclusion (in a slightly different way), and ask if you have made yourself clear – don’t assume.
- Agree on an action step, e.g. such as a follow-up phone call or email in a couple of days or weeks. Stakeholders are less worried when their concerns are not being ignored or rejected and an action step is in place – no matter how simple or trivial the action might seem.

Outcome 7. Identify the principles of stakeholder engagement

Supplementary stakeholder management strategies 25

- Crisis scenario and communication planning
- Accident and emergency situation support
- Crisis scenario preparation and exercises
- Perception and opinion research
- Community outreach programmes
- Stakeholder participation plans
- Media relations strategies
- Public relations programme
- Conflict and dispute resolution

Outcome 7. Identify the principles of stakeholder engagement

Scenario - Nirvana Lithium 26

- Proposed mine in the Whicher Range between Busselton and Margaret River
- Approximately 20 kilometres south of Busselton
- Threatened species : Ironstone Pixie Mop and Ironstone Grevillea
- Sheep and livestock farms common in the area
- Community sentiment to the mine is mixed
- Farmers oppose the project
- MR Wine growers association oppose the project
- Elder from the Noongar Boodjar Aboriginal group (traditional owners) support the project. He said "We're yet to go through a formal negotiation process for approving the mine on our land, but if that happens we will be looking for benefits of some kind – jobs and some long-term, meaningful investment from the companies for the benefit of our community."

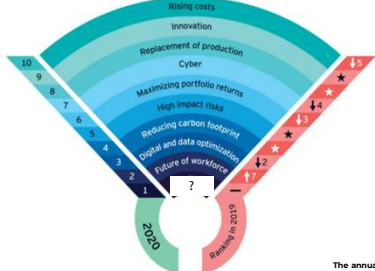


- Create a Stakeholder Comm. Plan using the template
- Determine what level of public participation you would employ for each major group and why.

Outcome 8. Develop a Stakeholder Communication Plan

RISKS TO THE MINING INDUSTRY 27

What is the number one risk facing mining and metals in 2020?



Outcome 8. Understand the importance of social performance

The annual EY Top 10 business risks and opportunities — 2021

RISKS TO THE MINING INDUSTRY 28

"We expect the issue to become even more important as stakeholders broaden and develop a stronger voice. Local communities will have greater expectations around how miners respect Indigenous rights and native title. National communities may push for a return to resource nationalism, with increased debate around who miners sell to and for what purpose."

The annual EY Top 10 business risks and opportunities – 2021

Outcome 8: Understand the importance of social performance

IMPROVING SOCIAL PERFORMANCE 29

- Competitive advantage: Strengthens an organization's value proposition vis-à-vis competitors.
- Public trust and strong reputation: Reputation building that establishes a good relationship with companies, governments, the media, suppliers, peers, customers and the community
- Ability to attract and retain workers or members, customers, clients or users
- Maintenance of employees' morale, commitment and productivity
- Positive stakeholder relationships: Harmonizing the views of investors, owners, donors, sponsors and the financial community
- Better decision making, knowledge of risks, and risk management
- Employee safety, loyalty, and morale
- Bottom-line savings from increased efficiency of resource allocation, decreased waste, and reuse of by-products
- Reliability and fairness in transactions, fair trade, and absence of corruption
- Long-term viability through sustainable natural resources and environmental services.

Outcome 8: Understand the importance of social performance

GAINING SOCIAL LICENSE 30

Source: On Common Ground Consultants (2003)

Outcome 8: Understand the importance of social performance

ISO 26000 Guidance on Social Responsibility 34

Outcome 9: Understand the elements of ISO 26000

Disaster Management 35

EPA, Nyrstar investigate PFAS contamination in groundwater beneath Port Pirie smelter

Bird deaths continue in Esperance

April 11, 2007 - 11:06am

Birds are still dying of lead poisoning in the West Australian port town of Esperance, amid continued health concerns for local residents. Nearly 4,000 birds died earlier this year sparking an investigation into the lead source, which proved to be lead carbonate moved through the town by a mining company for export.


A WA Department of Environment and Conservation spokesman said nearly 20 birds had been found dead in the last three weeks.

- No matter how innocent you are, media will not care.
- Own it
- Traditional media – record everything yourself. Everything
- Every phone call, every press conference
- Never lose your cool
- Coordinate the media messaging, traditional and online
- Control the narratives through your own social media channels
- More and earlier messaging through your channels
- Stay consistent with messaging. Media matches social media
- Online: Stick to the messages
- Don't feed the trolls

Outcomes 36

Participants should be able to:

- Define the term 'stakeholder'
- Describe the importance of stakeholder management and engagement
- Identify the key components of stakeholder management
- Create a stakeholder register
- Assess and classify stakeholders according to their levels of power/influence and their varying levels of interest
- Develop a Stakeholder Communication Plan
- Identify the principles of stakeholder engagement
- Understand the importance of social performance
- Understand the elements of ISO 26000



Environmental Management Systems (EMS)

Environmental Essentials WA


OUTCOMES 2

Participants should be able to:

- Understand what is an Environmental Management System (EMS)
- Understand why an EMS is of benefit
- Understand the Plan-Do-Check-Act activities within the EMS
- Determine environmental aspects and impacts
- Identify the key documentation and records within an EMS
- Recognise the necessary attributes and skills required to successfully implement an EMS
- Be aware of the movement toward sustainability

EMS DEFINITIONS 3

An environmental management system is a framework that helps a company achieve its environmental goals and helps organizations identify, manage, monitor and control their environmental issues in a "holistic" manner. (ISO14001:2015)



Outcome 1: Understand what is an Environmental Management System (EMS)

EMS DEFINITIONS 4

- A communication mechanism to assist people in an organization to behave in a consistent manner that reduces the risks to the organization.
- An environmental management system brings together the people, policies, plans, review processes, and procedures used to manage environmental issues at a facility or in an organization.

Outcome 2: Understand why an EMS is of benefit

WHY HAVE AN EMS? 5

Demonstrate compliance with statutory and regulatory requirements	Improvements in overall environmental performance and compliance	RISK MITIGATION
Increase leadership involvement and engagement of employees	Provide a framework for using pollution prevention practices to meet EMS objectives	
Improve company reputation and confidence of stakeholders through strategic communication	Positive image on environmental issues which attracts new customers and business partners	
Achieve strategic business goals by incorporating environmental issues into business management	Encourage better environmental performance by integrating suppliers into business systems	
Provide a competitive and financial advantage through improved efficiencies and reduced costs	Improves efficient use of scarce environmental management resources	

Outcome 2: Understand why an EMS is of benefit

WHAT IS AN EMS? 6

Environmental

- Addresses environmental impacts
- Facilitates environmental compliance
- Broadens environmental responsibilities to all whose work can have a significant impact on the environment.

Outcome 1: Understand what is an Environmental Management System (EMS)

WHAT IS AN EMS? 7

Management

- Must have commitment of top managers
- EMS owned by Environmental Manager or other designate
- Must be consistent with other management systems

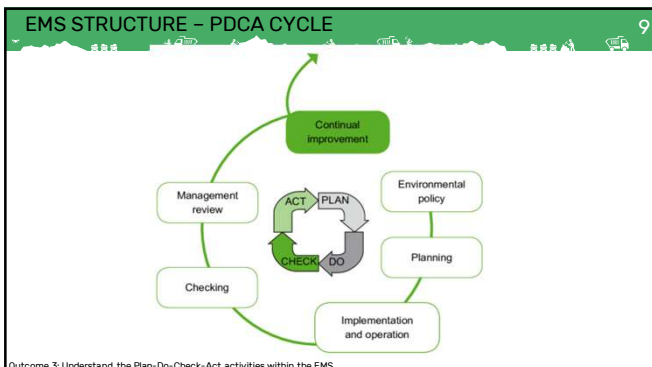
Outcome 1: Understand what is an Environmental Management System (EMS)

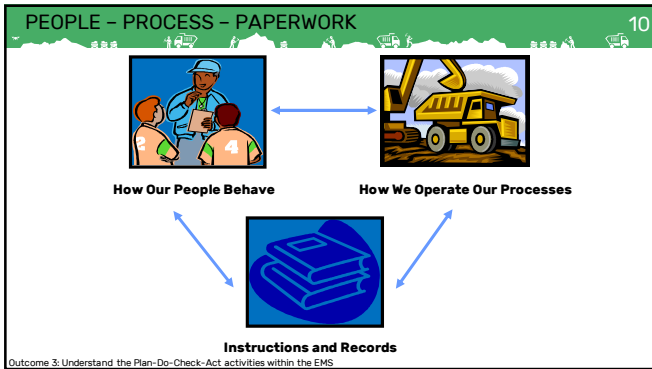
WHAT IS AN EMS? 8

System

- Formal structure
- Consistent communication
- Addresses policies, procedures and programs
- While ISO 14001:2015 describes requirements for an environmental management system, it does not include specific environmental performance criteria.

Outcome 1: Understand what is an Environmental Management System (EMS)





- PLAN** 11
- Put together an EMS team
 - Establish the state of play
 - Define your scope
 - Preparation of a policy statement
 - Identify aspects and impacts from facility activities, products, and services
 - Review legal requirements
 - Create an aspects register
 - Set objectives and targets
 - Establish formal EMS program
 - Conduct a system gap analysis
 - Identify resources required (i.e. training needs, technical equipment, software)
 - Create environmental management programs
- Outcome 3. Understand the Plan-Do-Check-Act activities within the EMS

- ENVIRONMENTAL POLICY** 12
- Issue a policy statement signed by facility manager
 - At a minimum, commit to:
 - Environmental compliance
 - Continual improvement
 - Pollution prevention
 - Identifies EMS framework
 - Publicly available
- Outcome 3. Understand the Plan-Do-Check-Act activities within the EMS


DO 13

- Define roles and responsibilities
- Implement environmental programs
- Provide EMS training
- Establish internal and external communication mechanisms
- Establish a document control system
- Establish operational controls
- Integrate with or establish emergency preparedness procedures

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

CHECK 14

- Conduct periodic monitoring of environmental performance
- Identify root causes of findings and conduct corrective and preventive actions
- Maintain environmental records
- Conduct periodic EMS audit



Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

ACT 15

- Conduct periodic senior management review of EMS
- Assess audit results
- Provide feedback into the system and revise parts of the EMS as needed

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

ENVIRONMENTAL ASPECTS AND IMPACTS 16

- An *environmental aspect* is the part of an activity, product, or service that interacts with the environment. An aspect can be thought of as the actual or potential "cause" of an environmental impact.
- A *significant environmental aspect* is an environmental aspect that has or can have a significant environmental impact.
 - Aspects can be regulated or unregulated.
- An *environmental impact* is a change to the environment, either adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services (one or more environmental aspects).

Outcome 4: Determine environmental aspects and impacts

ENVIRONMENTAL ASPECTS AND IMPACTS 17

ACTIVITY/SERVICE	ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACT
Tank cleaning	<ul style="list-style-type: none"> • Wastewater generation • Hazardous tank residue waste generation • Abrasive medium use • Water consumption • Power use 	<ul style="list-style-type: none"> • Potential contamination of soil, groundwater and or surface water • Air pollution • Terrestrial pollution • Solid waste generation • Resource use
Fuel Storage	Potential leakage or loss of containment	<ul style="list-style-type: none"> • Contamination of soil, groundwater and or surface water

Outcome 4: Determine environmental aspects and impacts

IDENTIFYING ENVIRONMENTAL ASPECTS AND IMPACTS 18

Identifying Aspects and Impacts

- Assemble a list of activities, products, and services
- Characterize activities, products, and services
- Interviews with research and field staff (what are they doing, are they using hazardous materials, etc.)
- What are your location's hazardous material purchases (review inventories)
- Hazardous waste records
- Records from emergency planning, accident reports, emergency incidents
- Water and energy consumption records

Outcome 4: Determine environmental aspects and impacts

DOCUMENTATION AND RECORD KEEPING 19

Examples of relevant documents:

- Environmental policy statement
- Mission statements
- Aspect Register (Environmental Risk Register)
- Legal Register
- SOPs and position descriptions
- Incidents
- Monitoring Records
- Environmental Management Plans
- Regulatory Submissions
- Training materials

Outcome 5: Identify the key documentation and records within an EMS

RECORDS 20

- Records are a special type of document in an EMS
- Provide verification of things that have happened (proof)
- Records cannot be updated. New records are created
- Records must be maintained to demonstrate conformance to EMS requirements and the results achieved
- Procedures must be maintained for the identification, storage, protection, retrieval, retention and disposal of environmental records
- Records need to be:
 - accessible
 - legible
 - identifiable
 - traceable to the activity, services or product involved.

Outcome 5: Identify the key documentation and records within an EMS

CHECKING 21

Procedures will be established for monitoring the EMS and correcting deviations. Requirements for procedures cover:

- Monitoring and measurement
- Evaluation of compliance
- Non-conformance and corrective and preventive action
- Control of records
- EMS audits
- Regular management review to ensure sustained improvement in environmental performance and compliance with changing regulation

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

MONITORING AND MEASUREMENT

22

- Develop procedures to regularly monitor and measure key operations and activities with significant environmental impacts
- Record information tracking performance, relevant operational controls and conformance with the organization's objectives and targets
- Calibrate and maintain monitoring equipment and retain associated records
- Assess legal compliance
- Evaluate the system on compliance to the ISO or your particular standard.

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

NON-CONFORMANCE AND CORRECTIVE ACTIONS

23

- Establish and maintain procedures for
- Investigating non-conformance
 - Taking action to mitigate impacts
 - Initiating and completing appropriate corrective and preventive actions
 - Recording any changes resulting from corrective actions
 - Review the effectiveness of actions taken

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

CONTINUAL IMPROVEMENT

24

- Business and EMS can continue to evolve and be effective
- Be agile and proactive in changing business environments
- Ensure that environmental considerations are always factored into business decisions
- Improve environmental performance and outcomes.

Outcome 3: Understand the Plan-Do-Check-Act activities within the EMS

KEY IMPLEMENTATION FACTORS 25

- Establish clear strategic direction
- Set achievable yet challenging targets
- Champion the process
- Establish a cross functional team: environmental, safety, quality, procurement, materials handling, human resources, port planning, and maintenance
- Allow for stakeholder participation
- Provide the necessary education and buy-in

Outcome 6: Recognise the necessary attributes and skills required to successfully implement an EMS

KEY IMPLEMENTATION FACTORS 26

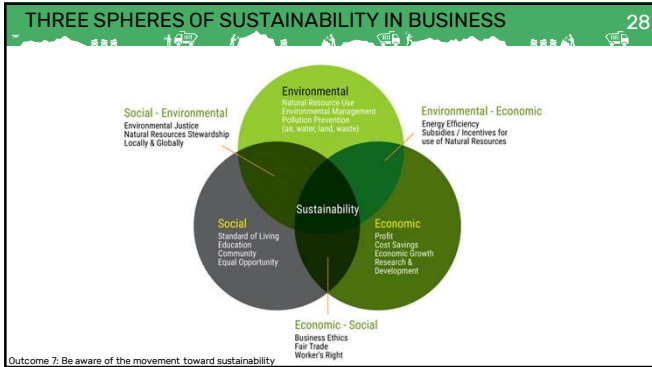
- Formulate decision making tools to assist the decision making process
- Empowerment of workforce –remove obstacles, encourage participation and idea sharing
- Recognise and reward short term wins
- Consolidate short term wins into larger wins (follow through)
- Evolution not revolution
- Be proactive in decision making rather than reactive.

Outcome 6: Recognise the necessary attributes and skills required to successfully implement an EMS

PERSONAL ATTRIBUTES TO ENABLE EMS IMPLEMENTATION 27

- Communication skills
- Access to top management
- Be politically savvy
- Influencing skills
- Ability to negotiate and have a facilitative approach
- Enthusiasm and energy
- Project management skills
- Training expertise
- Process/systems knowledge
- Patience and persistence

Outcome 6: Recognise the necessary attributes and skills required to successfully implement an EMS





- ### SUSTAINABILITY MANAGEMENT GUIDANCE
- ISO 26000:2010 – Guidance on social responsibility
 - Not a standard
 - Assists organizations in contributing to world sustainable development goals
 - Encourages companies to go beyond legal compliance
 - Promotes common understanding in the field of social responsibility
 - Advisable that an organization takes into consideration societal, environmental, legal, cultural, political and organizational diversity, as well as differences in economic conditions, while being consistent with international norms of behaviour
- Outcome 7: Be aware of the movement toward sustainability

EVENT SUSTAINABILITY MANAGEMENT SYSTEMS 31

- ISO 20121 – Standard for improving the sustainability of event related activities, products and services
- Created in 2012
- Financial success
- Social responsibility
- Reduced environmental footprint
- Sustainability policy is a requirement
- Designed to address sustainability throughout the entire event management cycle

Outcome 7: Be aware of the movement toward sustainability

OUTCOMES 32

Participants should now:

- Understand what is an Environmental Management System (EMS)
- Understand why an EMS is of benefit
- Understand the PDCA activities within the EMS
- Determine environmental aspects and impacts
- Identify the key documentation and records within an EMS
- Recognise the necessary attributes and skills required to successfully implement an EMS
- Be aware of the movement toward sustainability

Thank you for your participation

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