

**BHP Billiton Iron Ore Pilbara Expansion
Strategic Proposal
Environmental Scoping Document**
November 2013

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DOCUMENT ABBREVIATIONS

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
AMA	Adaptive Management Approach
AMF	Adaptive Management Framework
CCG	Community Consultative Group
CIA	Cumulative Impact Assessment
DER	Department of Environment Regulation (State)
DMA	Decision Making Authority
DMP	Department of Mines and Petroleum (State)
DoE	Department of the Environment (Commonwealth)
DoW	Department of Water (State)
DPaW	Department of Parks and Wildlife (State)
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority (State)
EP Act	<i>Environmental Protection Act 1986 (State)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
EPHC	Environment Protection and Heritage Council
ESD	Environmental Scoping Document
HSEC	Health, Safety, Environment and Community
HSEMS	Health, Safety and Environmental Management System
IBRA	Interim Biogeographic Regionalisation of Australia
MNES	Matters of National Environmental Significance
NEPM	National Environment Protection Measure
NRM	Natural Resource Management
OEPA	Office of the Environmental Protection Authority
OHP	Ore Handling Plant
OSA	Overburden Storage Areas
PBS	Pilbara Biological Survey
PER	Public Environmental Review
PERSP	Public Environmental Review Strategic Proposal
RMS	Regional Management Strategy
ROM	Run-Of-Mine
SPEA	Strategic Proposal Environmental Assessment
SEP	Stakeholder Engagement Plan

Abbreviation	Meaning
SRE	Short Range Endemic
SSMP	Site Specific Management Plans
TLO	Train Load-Out
WA	Western Australia
WAPC	Western Australian Planning Commission
WC Act	<i>Wildlife Conservation Act 1950 (State)</i>

GLOSSARY

Term	Definition
Asset	A specific component of the biophysical environment which supports one or more environmental and/or social values. Examples include the Karijini National Park and Fortescue Marsh.
Attribute	Quantifiable components that can be monitored, measured or assessed directly. Attributes contribute to environmental or social values. Examples of attributes include the abundance of a species and diversity of a population.
Conceptual modelling	A type of diagram which shows of a set of relationships between factors within a system.
Derived Proposal	A derived proposal is a future proposal which was identified in the strategic proposal, which has been referred to and considered by the EPA, and which is then declared to be a derived proposal.
Environmental Scoping Document	The document that presents the proposed studies and investigations to be carried out as part of the preparation for the SPEA. The results of the studies and investigations outlined in the ESD will be presented in PERSP.
Ecohydrogeological boundary	A boundary that defines the extent of ecological, hydrological and geological interactions relevant to a particular asset.
Environmental Factor	Usually broad working divisions used to compartmentalise the environment for administrative purposes. Some of these definitions may have broad similarities with the ecological definitions at higher levels. Since these factors arise from an administrative need to compartmentalise, they are imposed <i>a priori</i> (before study). At lower levels, they may more closely approach environmental factors, such as within proposal-specific guidelines or approved scoping documents.
Landscape	A spatially heterogeneous area, scaled relative to the process of interest. Within landscapes it is usually possible to define a series of different ecosystems, landforms, habitats and natural or man-made features.
Public Environmental Review Strategic Proposal	The document that outlines the potential impacts of the Strategic Proposal on factors and management strategies to address potential impacts. The PERSP is assessed by the EPA in considering whether the Strategic Proposal is environmentally acceptable.
Leading practice environmental management	Flexible and innovative approaches to developing and implementing environmental management solutions that match site-specific requirements.

Term	Definition
Predictive modelling	A statistical technique used to expand on existing data and predict a greater spatial extent and future states.
Predictive habitat mapping	The use of a predictive model (refer to definition) to map habitat on a regional scale.
Regional scale	At the scale of the region (refer to definition for 'region').
Region	The range, area or scope relevant to a specific asset, value or factor of interest. In the SPEA, the region will vary according to the asset, value or factor being examined, and may include ecohydrogeological boundaries, ecological assets, IBRA regions, species distributions, catchments, watersheds, air sheds.
Significant fauna	Species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed.
Significant flora	Species, subspecies, varieties, hybrids, and ecotypes may be significant for a range of reasons, other than as Declared Rare Flora or Priority flora, and may include the following: <ul style="list-style-type: none"> • A keystone role in a particular habitat for threatened species, or supporting large populations representing a significant proportion of the local regional population of a species; • Relic status; • Anomalous features that indicate a potential new discovery; • Being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); • The presence of restricted subspecies, varieties, or naturally occurring hybrids; • Local endemism/a restricted distribution; and/or • Being poorly reserved.
Strategic Proposal	The proposal for future developments.
Strategic Proposal Environmental Assessment	The assessment process for the Strategic Proposal.
Targeted species	Significant flora and fauna that are considered to be relevant to the Strategic Environmental Assessment.
Value	Any particular benefit of use of the environment that is important for a healthy ecosystem or for public benefit. Values are not quantifiable and cannot be directly monitored, measured or assessed.

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1 INTRODUCTION

1.1 PROPOSAL OVERVIEW

BHP Billiton Iron Ore is seeking a regional strategic environmental assessment for its proposed future mines and associated infrastructure developments in the central Pilbara, in support of its long term growth aspirations.

The Environmental Protection Authority's (EPA's) Strategic and Derived Proposal mechanisms (EPA 2012a) are considered to be the most appropriate method for seeking environmental approval as a means to growing and maintaining production levels into the future, and achieving better environmental outcomes. It is an alternative to the mine-by-mine approach for environmental approvals traditionally used in Western Australia for mining projects.

To initiate the strategic environmental assessment process, BHP Billiton Iron Ore lodged a Strategic Proposal referral document with the EPA on 6 July 2012. Following the public comment period, the EPA announced on 25 July 2012 that it has decided to proceed with the assessment and has set a level of assessment at Public Environmental Review Strategic Proposal (PERSP).

BHP Billiton Iron Ore has been operating in the Pilbara for over 50 years and has a wealth of environmental and social data. Having articulated its future development plans, it is well placed to consider opportunities for environmental management of its proposed operations at a regional scale, as well as individual projects.

BHP Billiton Iron Ore is well placed with both its resources and expertise to submit and support a Strategic Proposal for its proposed future mine and associated infrastructure developments. The Company's goal is to undertake this process in a way that delivers a range of environmental benefits, including seeking improved efficiencies in process and opportunity for broader societal benefits, particularly for those in the Pilbara region and Western Australia.

Commonwealth and State Governments have been seeking 'landscape scale' environmental assessments where possible, and BHP Billiton Iron Ore supports that aspiration. The Company is committed to working closely with the community and other stakeholders to ensure positive regional outcomes are maximised as a result of this approach.

The Company aspires to continually improve its environmental management practices in collaboration with local communities and stakeholders. This is a key driver behind the Company's decision to pursue a Strategic Proposal. The EPA has identified the following benefits of Strategic Proposal assessments:

- The early consideration of environmental issues providing the ability to influence detailed design of future proposals;
- The ability to consider the cumulative impacts of more than one proposal;
- Greater certainty for local communities regarding the maximum extent of cumulative impacts of future developments and greater confidence for proponents of future developments;
- More flexible timeframes for consideration of environmental issues; and
- Potential efficiencies in the approvals process (EPA 2012a).

Further, the EPA suggests that assessment of Strategic Proposals may provide the community with the added advantages of:

- Being consulted at an earlier stage in the planning of future proposals, providing increased opportunity to influence the detailed design of future proposals; and

- Being able to consider the cumulative impacts of more than one proposal rather than dealing with the assessment of individual proposals (EPA 2012a).

Many stakeholders, especially those within the local communities, have been asking for a more comprehensive approach to consultation. The Strategic Proposal will support this by involving communities earlier in the environmental approval process than was possible before. Pilbara residents in particular will have more information and be able to provide more informed comment during the consultation process.

Seeking a Strategic Proposal provides greater certainty for the Pilbara community and allows other stakeholders to conduct much more informed long-term planning for their own organisations and operations in the region.

1.2 PURPOSE OF DOCUMENT

This Environmental Scoping Document (ESD) has been prepared by BHP Billiton Iron Ore to meet the requirements of the *Environmental Protection Act 1986* (EP Act), as described in Section 1.4. Scoping is required as part of the assessment process as it allows early identification of key issues. Figure 1 summarises the key inputs and outputs for the key stages of the Strategic Proposal Environmental Assessment (SPEA).

Specifically this ESD aims to:

- Outline the proposed future mines and infrastructure developments comprising the Strategic Proposal;
- Identify and describe the relevant environmental factors; and
- Detail the scope and timing of studies and investigations to identify and address the potential impacts.

This ESD, including the scope of studies proposed to be undertaken to support the Strategic Proposal, has been prepared in consultation with key regulatory authorities.

As an outcome of the scoping process, the PERSP will then focus on the environmental factors and issues of key significance, and identifying management, mitigation and offsets measures.

1.3 PROPONENT DETAILS

The proponent of this proposal is:

BHP Billiton Iron Ore Pty Ltd

PO Box 7122

Cloisters Square

PERTH WA 6850

Contact Line: 1800 421 077

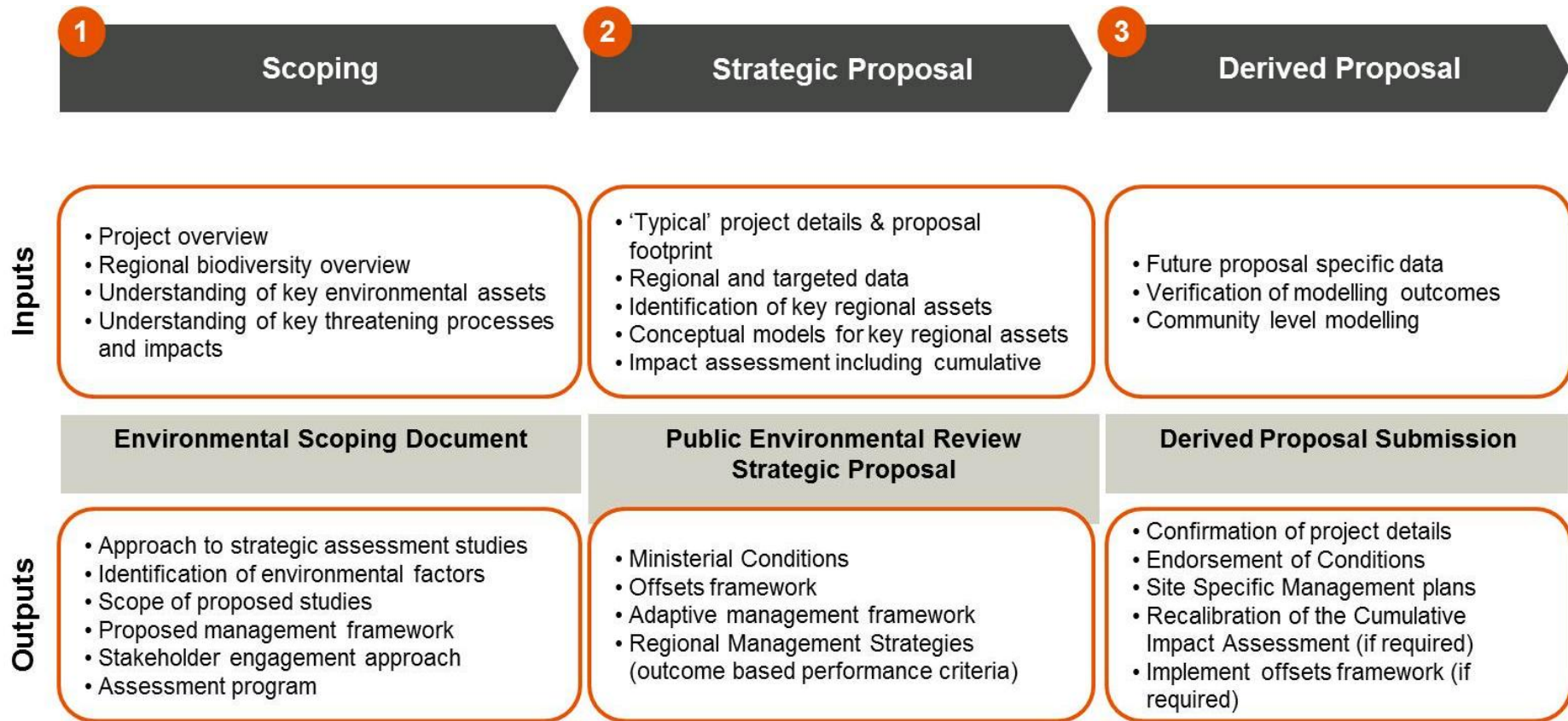


Figure 1 Strategic Proposal Environmental Assessment Process

1.4 STRUCTURE OF DOCUMENT

The remainder of this document is structured as follows:

Section 2: Assessment and Approvals Process: This section provides a description of the process for undertaking a Strategic Proposal under the EP Act, administered by the EPA. This section also provides an overview of the Commonwealth process for a Strategic Assessment under the EPBC Act, administered by the Department of Environment (DoE). The rationale for undertaking a Strategic Environmental Assessment is discussed in Section 2.5.

Section 3: Description of the Strategic Proposal: This section provides an overview of the Proposal components.

Section 4: Existing Environment: This section provides a description of the existing terrestrial and social environments in both a regional and local context.

Section 5: Key Environmental Factors: This section outlines the approach adopted for the scoping phase to identify the key environmental factors associated with the proposal.

Section 6: Management Approach: This section presents BHP Billiton Iron Ore's management approach and describes the hierarchy of control for management of impacts.

Section 7: Proposed Studies: This section outlines the studies and investigations that will be undertaken to inform the Strategic Proposal. These are based on the impacts and level of risk, as per Section 6.

Section 8: Stakeholder Engagement: This section outlines the key stakeholders relevant to the Strategic Proposal and discusses the communication strategy.

Section 9: References: A bibliography of all literature sources cited in this ESD.

2 ASSESSMENT AND APPROVALS PROCESS

2.1 OVERVIEW

This section outlines the concepts and processes of an SPEA, namely the development and assessment of Strategic and Derived Proposals. The SPEA will be undertaken using existing provisions under the EP Act. The approach in undertaking an SPEA is different from a typical assessment process because it occurs in two phases (EPA 2012a). Phase one is the assessment of a Strategic Proposal, which has a regional focus and consists of several separate proposals which individually, or in combination, may have environmental impacts. The Strategic Proposal is outlined in more detail in Section 2.2 of this document. Phase two involves consideration of an individual future proposal (a Derived Proposal). The future proposal must have been considered in the Strategic Proposal and its environmental impacts adequately assessed when the Strategic Proposal was assessed to be able to be declared a Derived Proposal by the EPA.

It is important to note that the assessment is undertaken on the Strategic Proposal. There is no assessment of the Derived Proposal, but verification and validation against the Strategic Proposal is undertaken.

The purpose of the SPEA is to provide a regional scale assessment of potential impacts associated with the Strategic Proposal and to establish acceptable parameters within which Derived Proposals will operate. Figure 2 outlines the focus of the Strategic Proposal and Derived Proposal and the relationship between these two phases.

The SPEA provides the mechanism to identify important environmental values to be conserved and protected, to minimise impacts through design and management and where offset residual impacts remain, apply offsets as appropriate. Figure 3 presents the Strategic Proposal Environmental Assessment Framework, which also includes management actions during operation.

Whilst the SPEA will address and seek approval for only BHP Billiton Iron Ore proposed operations and activities, the cumulative impacts from BHP Billiton Iron Ore operations, other existing operations and reasonable foreseeable operations by other proponents will be considered. In addition, different land uses such as pastoralism will be considered.

Given that the SPEA is considering developments potentially up to and over 50 years in the future, the assessment will be sufficiently robust to address foreseeable change. As part of the SPEA, BHP Billiton Iron Ore will develop a framework of monitoring, auditing, evaluation and adaptive management to assist in addressing potential uncertainty associated with the implementation of the Strategic Proposal over the long term. This may include, but is not necessarily limited to, improved understanding of environmental systems and processes over time and changes to policy, best practice management and State legislation.

Specifically, the scope of the SPEA includes:

- Prediction of likely impacts associated with the Strategic Proposal, including potential cumulative impacts associated with other BHP Billiton Iron Ore and third party operations;
- Development of a management framework to avoid, mitigate, minimise or offset potential impacts; and
- Identification of environmental outcomes (e.g. performance criteria) which will be met both individually at a project-by-project scale and cumulatively with other existing or proposed BHP Billiton Iron Ore operations.

Focus of Strategic Proposal and Derived Proposal

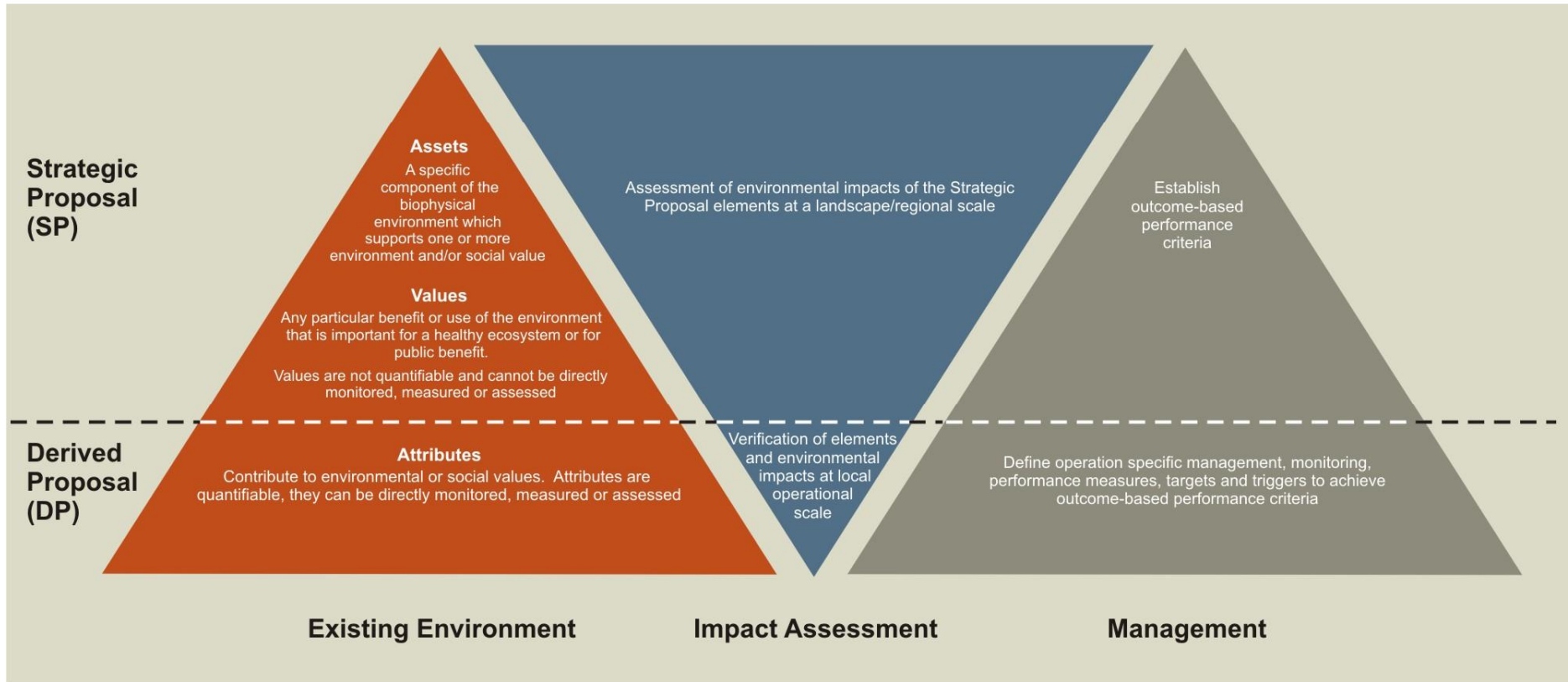


Figure 2 Focus of the Strategic Proposal and Derived Proposals

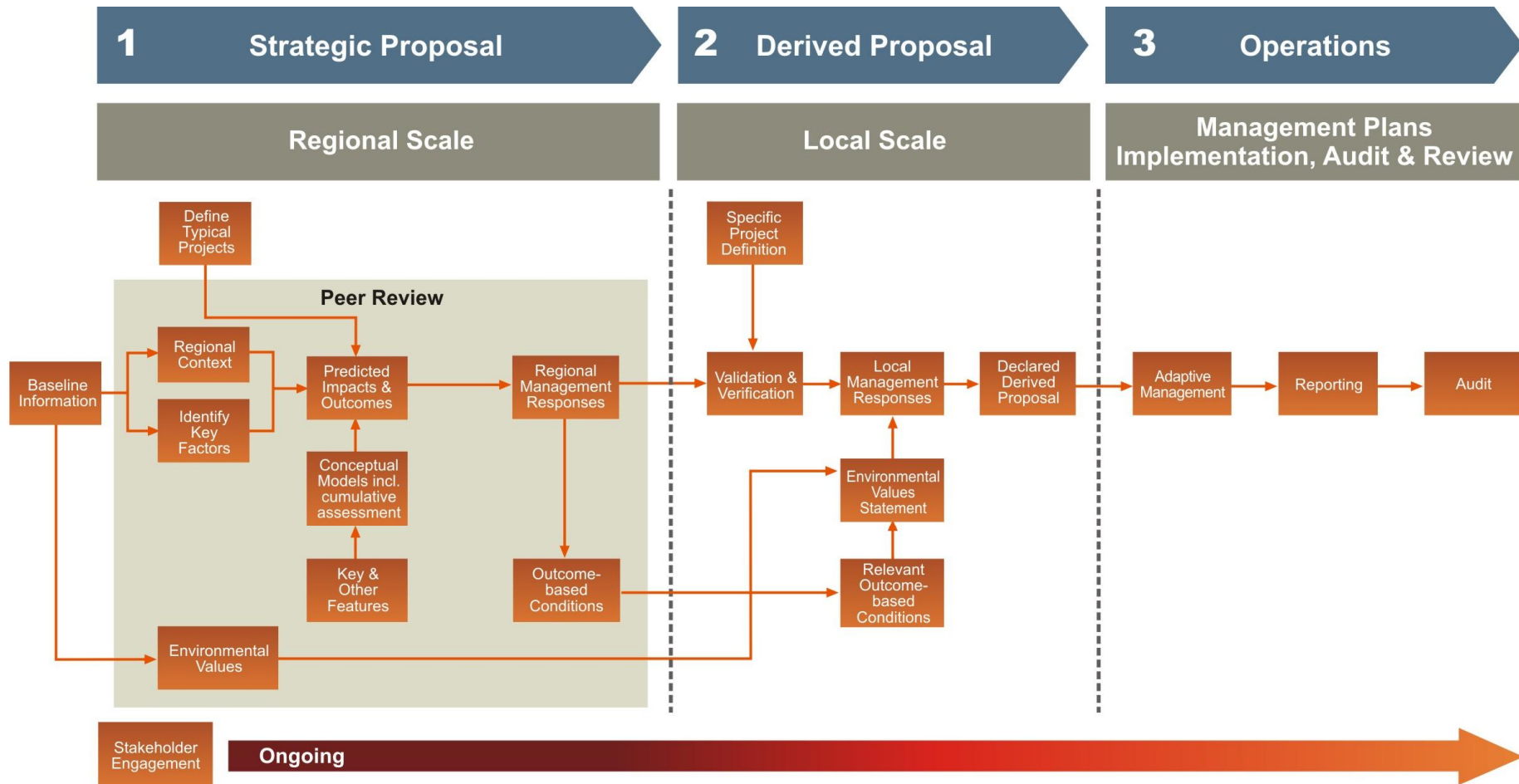


Figure 3 Strategic Proposal Environmental Assessment Framework

2.2 THE STRATEGIC PROPOSAL

The Strategic Proposal, as outlined in Section 3, relates to a series of proposed mining operations and associated infrastructure. BHP Billiton Iron Ore is moving to a standardised approach over all its existing and future mining operations and there will therefore be commonalities between the operations comprising the Strategic Proposal.

Key characteristics of future mining operations and characteristics 'typical' to Pilbara iron ore mining projects (which could be mines, rail, camps or other infrastructure) will form the basis for consideration of impacts and risks. Taking this approach to the assessment will allow potential impacts and risks to be identified with sufficient detail to enable a robust strategic assessment, based on both individual site profiles and BHP Billiton Iron Ore's advanced understanding of its business from nearly 50 years of operation in the Pilbara.

A 'typical' BHP Billiton Iron Ore Pilbara mine is an open cut operation. Excavation of the mine pit is undertaken by blasting and removal by excavators and haul trucks. Subject to the size of the mine, it would have one or more ore handling plants (which include crushers), ore and overburden storage areas and train load-out facilities. The mine includes a range of non-processing infrastructure including accommodation, transport, power, water and waste management. More information can be found in Section 3.

Specifically, the 'typical' mine description will likely include:

- A generic production rate;
- Identification and conceptual layouts of key plant and infrastructure including crushers, screeners, OHP, train load out facilities, rail loops, and workshops, etc;
- Typical pit cross sections;
- Process flow diagrams;
- Typical rail and culvert cross sections;
- Generic accommodation camp conceptual layout; and
- Conceptual overburden storage area and tailings dam layouts.

The Strategic Proposal will assess the environmental impacts and issues of proposed operations and provide overall environmental conditions and management strategies for development.

Assessment of the Strategic Proposal will follow the process of a Public Environmental Review (PER) as set out in Schedule 3 of the *Environmental Impact Assessment (Part IV Division 1 and 2) Administrative Procedures* (Government of Western Australia 2012). The PER process includes the preparation of an ESD (this document), which will be submitted to the EPA and made publicly available for four weeks. The ESD, once approved, forms the basis for the SPEA and the development of the PERSP. Figure 4 outlines the process and refers to the specific provisions of the EP Act which apply to each part of the process.

The Cumulative Impact Assessment (Chapter 7) and Adaptive Management Approach (Chapter 7) are likely to be key drivers of the structure of the PERSP, within which the key environmental factors will be addressed. For each of the environmental factors identified in the SPEA (Chapter 7), the SPEA will detail at a regional or local (where appropriate) scale:

- The existing environment;
- Regulatory regimes which apply;
- Predictions of potential impacts;
- Desired outcomes; and
- Proposed management approaches.

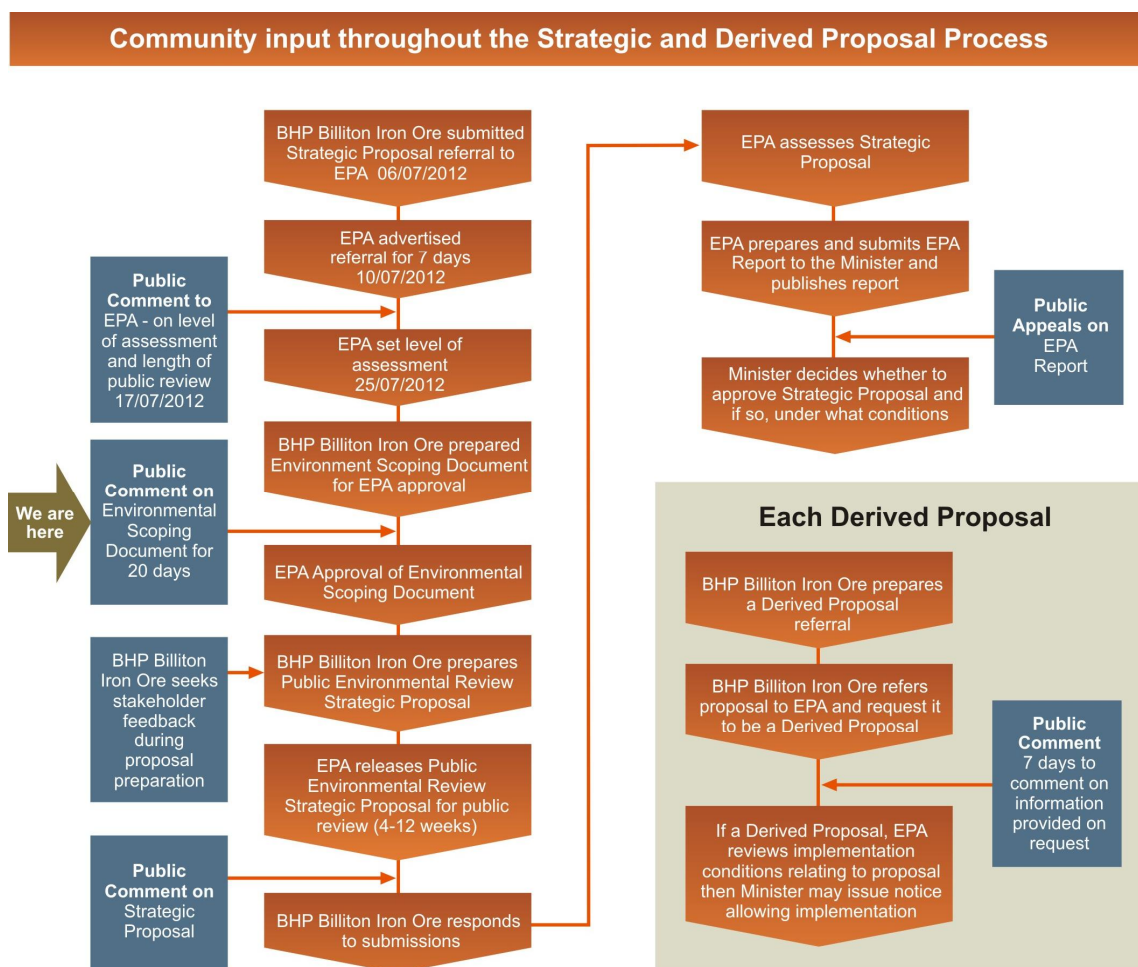


Figure 4 State Strategic Proposal Assessment Process

BHP Billiton Iron Ore will consult with decision making authorities throughout the development of the PERSP, particularly relating to key technical methodologies, results, peer reviewers and proposed management responses. BHP Billiton Iron Ore will agree key milestones with decision making authorities specific to their area of focus.

A response to the submissions on the PERSP and supplementary information incorporating additional information and proposal amendments where necessary will be prepared by BHP Billiton Iron Ore and submitted to the EPA. The EPA then assesses the Strategic Proposal.

In assessing a Strategic Proposal, the EPA should be able to reasonably conclude at an appropriately high level that future significant proposals could be implemented without significant deleterious impacts on the environment. Sufficient detail should be available to allow the EPA to conclude that:

1. The Strategic Proposal does not contain obvious fatal flaws.
2. Significant deleterious impacts at the population level on important components of the biota are not likely. This explicitly recognises that there may be deleterious impacts to individual organisms, but they should not be likely to have an impact on the long term viability of the population.
3. The Strategic Proposal contains sufficient information for the EPA to make reasonably informed decisions about points 1 and 2 above.
4. The Strategic Proposal identifies any work required in a Derived Proposal to provide additional, more detailed information about potential impacts to a level that allows for the development of environmental management programs and plans for their proper

management. The work required should be framed in the form of proposed draft conditions.

5. The work specified in proposed conditions set under point 4 above specifies to what end or for what purpose that work is to be performed, and proposed conditions in point 4 above specify by whom the work should be done and by when.

Following the EPA's assessment of the PERSP, the EPA reports to the Minister for Environment (the Minister) on:

1. The key environmental factors identified during the assessment;
2. Whether or not the future proposals, identified in the Strategic Proposal, may be implemented; and
3. Any conditions which should apply to those future proposals, if they are subsequently referred to the EPA and declared to be Derived Proposals.

As with other proposals, any person may appeal to the Minister if they disagree with the content of, or any recommendations in, the EPA's report (EPA 2012a).

After determining any appeal, the Minister consults with other relevant decision making authorities for the purposes of deciding whether the Strategic Proposal and future proposals it is comprised of, identified in the PERSP, may be implemented. The Minister also consults on any conditions which will apply to the implementation of the future proposals (EPA 2012a).

If the Minister and relevant decision-making authorities decide that the future proposals may be implemented, with or without conditions, the Minister publishes a "Strategic Proposal Ministerial statement". However it is not until after the EPA has declared a future proposal, identified in the Strategic Proposal, to be a Derived Proposal that the future proposal can be implemented in whole or in part (EPA 2012a).

2.3 THE DERIVED PROPOSAL

The purpose of the SPEA is to consider the environmental impacts of a future proposal, or group of future proposals, comprising the Strategic Proposal. A Strategic Proposal does not of itself lead to the implementation of an actual project. Following issue of the Strategic Proposal Ministerial statement, any developments proposed to be undertaken within the scope of the Strategic Proposal are to be referred to the EPA along with a request that it be declared a Derived Proposal.

Figure 3 outlines a framework showing the relationship between the Strategic and Derived Proposals.

It is expected that BHP Billiton Iron Ore would refer the future proposals identified in the Strategic Proposal over a period of time to the EPA and request that the EPA declare each to be a Derived Proposal. For the EPA to be able to determine that a future proposal is a Derived Proposal, the EPA must be satisfied that the future proposal was identified in the Strategic Proposal and that the Strategic Proposal Ministerial statement provides that the future proposal may be implemented.

The scope of individual Derived Proposals includes:

- Validation and verification of predicted impacts assessed for the Strategic Proposal;
- Establishment of management requirements to be implemented in order to meet environmental outcomes established in the PERSP and Ministerial conditions; and
- Establishment of monitoring and compliance reporting protocols.

The EPA requires proponents to consult with the community and relevant decision making authorities on the proposal and any subsequent plans required by conditions, before referral to the EPA (EPA 2012a). The information submitted to the EPA by the proponent is also to demonstrate how the community and decision making authority concerns are identified and addressed in the referred proposal and plans.

After receipt of the referral and a request for it to be declared a Derived Proposal, the referral is advertised for public comment.

After considering public comment and the proposal documentation, the EPA then decides whether or not to declare the referred proposal to be a Derived Proposal.

The EPA may refuse to declare the referred proposal to be a Derived Proposal if it considers that:

- The environmental issues raised by the referred proposal were not adequately assessed as defined within this ESD;
- There is significant new or additional information that justifies the reassessment of the issues raised by the referred proposal; or
- There has been a significant change in the relevant environmental factors since the PERSP was assessed.

If the EPA declares the referred proposal to be a Derived Proposal, there is no further assessment of that proposal and a notice will be issued by the Minister. The declared Derived Proposal will be subject to the relevant conditions of the Strategic Proposal Ministerial Statement, as outlined in the notice from the Minister. The EPA has an opportunity to recommend changes to the conditions to the Minister, prior to the notice being issued.

There are no appeal provisions relating to the EPA's decision to declare a Derived Proposal, to refuse a declaration, or its determination as to whether or not to inquire into conditions (EPA 2012a). There is also no appeal in relation to the Minister's notice which specifies the coming into effect of the Strategic Proposal Ministerial statement and any conditions which relate to the Derived Proposal.

If the EPA inquires into the conditions which apply to the Derived Proposal there is no appeal in respect of the EPA's report to the Minister, however the proponent can appeal any conditions which are set following that inquiry.

2.4 COMMONWEALTH STRATEGIC ASSESSMENT ENVIRONMENTAL ASSESSMENT PROCESS

In addition to assessment under the EP Act, BHP Billiton Iron Ore is also undertaking a separate Strategic Assessment under the Commonwealth EPBC Act. As with the Strategic Environmental Assessment, BHP Billiton Iron Ore has voluntarily entered into a Strategic Assessment Agreement under Section 146 of the EPBC Act with the Commonwealth Minister for the Environment. The agreement can be located at www.bhpbilliton.com. As the Commonwealth process will be independent of the State process, no further discussion regarding assessment under the EPBC Act is provided within this document.

2.5 JUSTIFICATION FOR STRATEGIC PROPOSAL ENVIRONMENTAL ASSESSMENT APPROACH

BHP Billiton Iron Ore is well placed with both its resources and expertise to undertake a SPEA for its future mine and associated infrastructure developments. BHP Billiton Iron Ore's goal is to undertake this process in a way that delivers a range of environmental benefits and leads to improved efficiencies and community benefits for everyone involved, particularly those in the Pilbara region.

Commonwealth and State environmental agencies and authorities have been seeking 'regional scale' environmental assessments where possible (EPA 2012a), and BHP Billiton Iron Ore supports that aspiration.

BHP Billiton Iron Ore is working with the State and Commonwealth environmental agencies to establish the benchmark on how the environmental studies to support a strategic environmental assessment may be undertaken. BHP Billiton Iron Ore is committed to working closely with the

community and other stakeholders to ensure positive regional outcomes are maximised as a result of this approach.

The SPEA is expected to provide increased certainty for the planned growth of operations, associated rail (including triplication of the mainline), and infrastructure in the Central and Eastern Pilbara. The SPEA will provide the strategic certainty to allow long term planning at a regional scale. Individual components will subsequently require approval via a Derived Proposal.

A SPEA allows for a more holistic, integrated and regional environmental understanding compared to that provided by the traditional fragmented, project-by-project approach to approvals. Other benefits include:

- Better environmental outcomes;
- Greater certainty for local communities regarding long term management approach and commitments;
- Early consideration of environmental issues providing the ability to influence detailed design;
- Improved ability to consider cumulative impacts;
- More flexible timeframes for consideration of environmental issues;
- Streamlined monitoring, environmental management and mitigation measures;
- Certainty for future works; and
- Realisation of efficiencies and innovations for the approvals process, reducing the approvals workload for regulators and the wider community.

2.6 SCHEDULE FOR ASSESSMENT

An indicative schedule for the assessment and approvals for the Strategic Proposal is summarised in Table 1. This table outlines some of the key activities and timing for the assessment and approval process. The strategic proposal schedule considers the EPA's *Environmental Assessment Guideline 6: Timelines for Environmental Impact Assessment of Proposals* (EPA 2010a).

Table 1 Strategic Proposal Schedule

Stage of Process	Timing
Stakeholder engagement program	July 2010 – ongoing
BHP Billiton Iron Ore Referral of the Pilbara Iron Ore Expansion Strategic Proposal	July 2012
Environmental Scoping Document of Pilbara Iron Ore Expansion Strategic Proposal approved by the Environmental Protection Authority (EPA)	Q3 2013
Submission of Public Environmental Review Strategic Proposal (PERSP)	Q4 2014
Public Review of PERSP	Q1 2015
BHP Billiton Iron Ore addresses public submissions	Q3 2015
EPA submits EPA report to the Minister and publishes the EPA report	Q4 2015

2.7 PROJECT TEAM

BHP Billiton Iron Ore has made a significant corporate commitment and investment to achieve positive environmental outcomes as part of the Strategic Proposal assessment process. A dedicated Strategic Assessment approvals team is in place to coordinate inputs from specialists from across the company and externally, undertake stakeholder and community consultation and prepare the environmental documents as required by legislation.

Supporting studies have been undertaken by BHP Billiton Iron Ore internal specialists and a wide consultancy base. For over 10 years, BHP Billiton Iron Ore has completed more than 350 individually commissioned environmental studies within the Strategic Proposal area.

2.8 PEER REVIEW PROCESS

BHP Billiton Iron Ore is committed to providing excellent environmental outcomes as part of the SPEA process. To this end, BHP Billiton Iron Ore proposes to engage peer reviewers to provide specialist scientific expertise and intellectual rigour on the content of the SPEA documentation.

Technical specialists will be engaged throughout the development and preparation of SPEA documentation.

3 DESCRIPTION OF THE STRATEGIC PROPOSAL

3.1 OVERVIEW

The development and expansion of a number of new and existing mining operations and associated infrastructure will be required to achieve BHP Billiton Iron Ore's export targets. The Strategic Proposal groups these proposed future developments around a series of nominal infrastructure hubs, collectively termed 'operations'. This approach will facilitate efficient processing and transportation of ore. These future operations and existing projects are identified in Figure 5.

It should be noted that while the Jinidi Iron Ore Project is identified in Figure 5, it was referred to the EPA for separate assessment in 2011 and is not part of the Strategic Proposal. In addition, existing operations such as Mt Whaleback/Newman, Jimblebar, Mining Area C and Yandi have also been identified on Figure 5. Future expansions of these operations not covered by existing approvals are included within the scope of the Strategic Proposal.

At this scoping stage, detailed engineering has not yet been undertaken for all of the elements of the Strategic Proposal. Elements of the Proposal will typically include infrastructure used in Pilbara iron ore operations including crushers, conveyors, ore-handling and screening plants, stockpiles and train load-out facilities, rail loops, workshops, warehousing, concrete batching plants, administration facilities, refuelling facilities, laydown and storage areas, power and water distribution infrastructure, waste disposal, wastewater treatment, dangerous goods and hazardous materials storage facilities, water treatment facilities and surface water management infrastructure. Beneficiation facilities with associated tailings dams may also be proposed for some operations. Road and rail networks to access these operations and allow the transportation of ore will also be required.

A range of related supporting infrastructure will also be required which may service any number of operations including, but not limited to, worker accommodation, water and gas pipelines, powerlines, access roads, telecommunications, airports or helipads and water bores.

Transport of ore from a number of the proposed future operations will require the construction of rail spurs linking the operations to the Newman to Port Hedland rail line. These are shown conceptually on Figure 5. Similar to current operations, conveyors may also be used to link adjacent operations or different tenements within operations.

The alignments of these rail corridors as shown in Figure 5 are conceptual only, and may change in the future in response to orebody knowledge, processing design and size of plants, commercial agreements with other parties, and/or technology change. A conceptual rail spur linking the proposed Rocklea operations to BHP Billiton Iron Ore's rail network (existing or proposed) has not been identified. Development of any future rail corridors will seek to avoid impacts on areas of high environmental value and conservation estate.

The Strategic Proposal also encompasses potential capacity upgrades of the Newman to Port Hedland rail line, from the Newman rail hub to the 26 km chainage mark near Port Hedland. This mark represents the boundary of the proposed BHP Billiton Iron Ore Outer Harbour development rail spur (the Western rail spur) connection to the Newman to Port Hedland mainline (approved in Ministerial Statement 890). Collectively, these operations and associated infrastructure broadly define the scope of the Strategic Proposal. Further detail regarding components of the Strategic Proposal will be provided through the assessment process, with the referrals for subsequent Derived Proposals including identification and detail in respect of the activities and infrastructure requirements for subject operations.

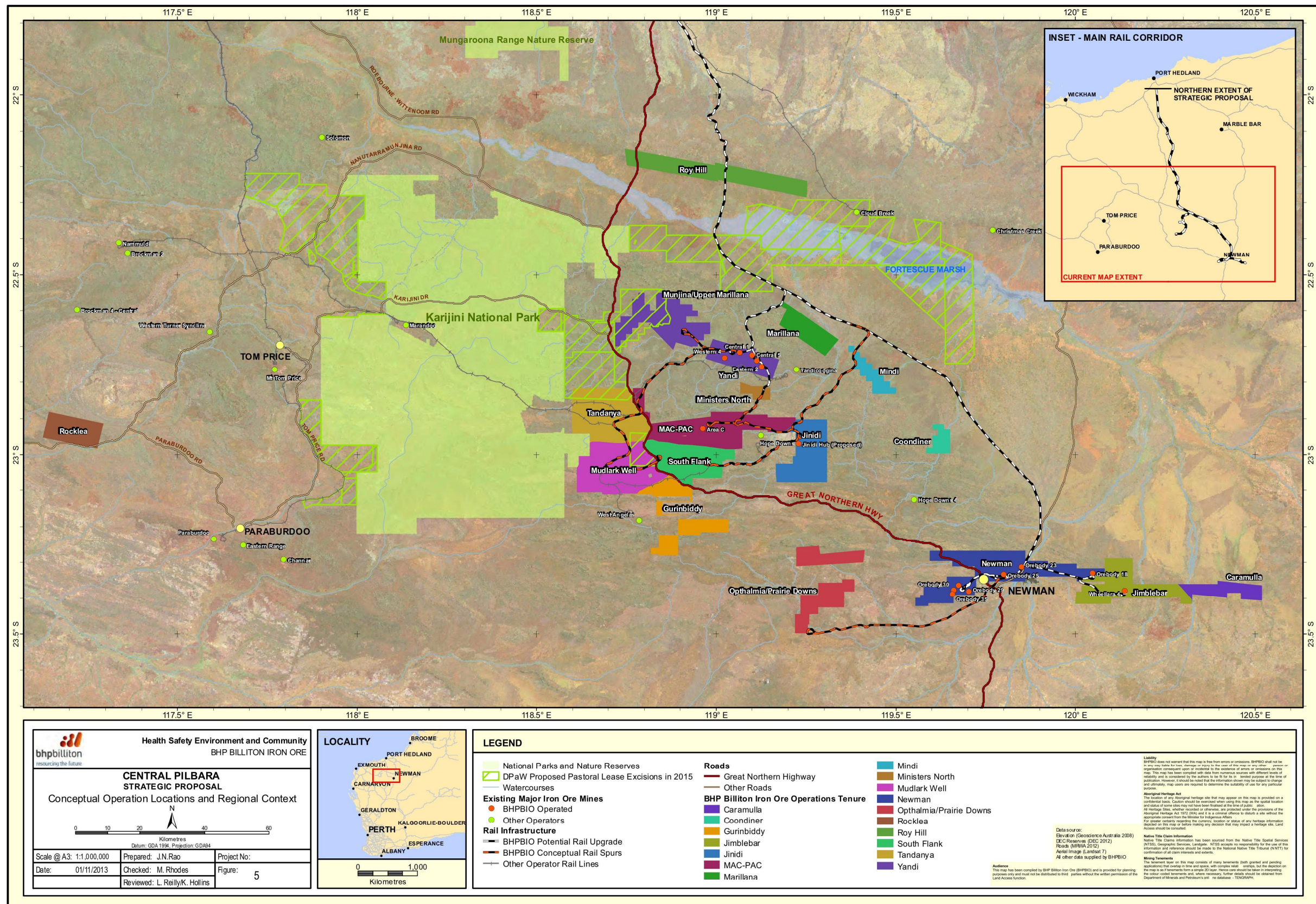


Figure 5 Conceptual Operation Locations and Regional Context

The PERSP will contain a description that is sufficiently defined to clearly encompass and enable future derived proposals to be submitted and declared. Furthermore, in the cases where developments have been further refined from the broader tenement boundary, this level of definition will be shown.

No specific timeframe is to apply to this Strategic Proposal. Operations will be progressively developed over at least 50 years.

3.2 OTHER RELATED PROJECTS

The Strategic Proposal specifically excludes:

- Existing BHP Billiton Iron Ore mining operations and infrastructure;
- Future development of BHP Billiton Iron Ore northern Pilbara operations at Yarrie and Goldsworthy and associated infrastructure;
- The currently referred Jinidi Iron Ore Project; and
- Development and operations at Port Hedland.

Assessment of issues resulting from the export of iron ore, including cumulative impacts for landside and marine activities at Port Hedland, have been fully identified and recently assessed as part of the BHP Billiton Iron Ore Proposed Outer Harbour Development Public Environmental Review. The Outer Harbour Development is approved under Ministerial Statement 890. As consideration of these matters has already occurred, they are beyond the scope of the Strategic Proposal.

The Strategic Proposal will consider existing and reasonably foreseeable projects in the region as part of any assessment of cumulative effects.

BHP Billiton Iron Ore is aware that there are several external scientific studies and investigations underway or proposed within the Pilbara which are relevant to the Strategic Proposal. These include studies by DoW, Department of Parks and Wildlife (DPaW) and CSIRO. BHP Billiton Iron Ore is currently liaising on a number of these studies and will continue to do so during preparation of the PERSP. Where practical and relevant, BHP Billiton Iron Ore will seek to align the PERSP approaches and outcomes with these studies.

3.3 LOCATION AND LAND USE

The Strategic Proposal comprises new mines centred around a number of new mining operations located in the Pilbara region of Western Australia (Figure 5).

The Strategic Proposal area is located within the local government Shire of East Pilbara, Shire of Ashburton and Town of Port Hedland, with proposed mining operations clustered around the existing BHP Billiton Iron Ore operations and additional greenfield sites in the Pilbara region.

3.4 DESCRIPTION OF THE STRATEGIC PROPOSAL

The proposed operations will be typical of existing open-cut iron ore mines operating throughout the Pilbara region (Section 2.2) and will involve mining, crushing and screening, train loading and transport of iron ore to port facilities for export.

3.4.1 MINING PROCESS

The mining process of the proposed operations would follow conventional open cut iron ore mining methods used in the Pilbara region: drill and blast of the ore body followed by load and haul of the blasted ore and overburden from open-cut pits (Figure 6).

Ore bodies would be strategically drilled for blasting, with the number of drill holes and quantity and type of explosives used determined by the geology of the target blast area.

Following blasting, the broken ore and overburden would be loaded into haul trucks using excavators or front end loaders and subsequently transported to relevant locations around the mine site area. Ore destined for primary crushing within the Ore Handling Plant (OHP) may be transported to run-of-mine (ROM) pads strategically located around the open pit. Overburden would either be relocated within the pit to be used as in-fill or removed from the pit area to out-of-pit Overburden Storage Areas (OSA's).

Ore would be processed within the OHP, which would consist of separate crushing, scalping screening and product screening facilities. Ore would be transferred between the buildings on a series of conveyors. The product output of the OHP would be tailored to market requirements, and may include lump or fines or both. The lump and/or fines product would be stored in stockpiles prior to train loadout. The OHP would be fitted with an independent dust collection system.

Some ore may be classified as 'low grade' due to a higher Alumina content, and may be transported to low grade ore stockpiles for beneficiation. The beneficiation process may involve washing the low grade ore to remove excessive Alumina to achieve customer specifications. Tailings material generated by this process would be stored in tailings storage facilities. Other process flows for beneficiation are currently under study, and may also be implemented in the future developments.

Dewatering of pits ahead of mining may also be required, dependent on their depth to groundwater. This would be achieved through abstraction of groundwater from dewatering bores, with abstracted water subsequently used for activities such as dust suppression, mine water supply and environmental purposes.

3.4.2 RAIL INFRASTRUCTURE

The proposed operations would utilise both the existing rail network as well as new spur lines and potential additional parallel expansions to the existing alignments to transport processed ore to port facilities for export. Processed ore would be conveyed from the mine site's OHP to ore stockpiles for subsequent loading onto train cars located on a rail loop. Additional rail spurs to existing BHP Billiton Iron Ore rail lines would be required to complete the rail network from the proposed mine's TLO facility. Expansion of the existing rail network may be required to increase transport capacity.

3.4.3 NON PROCESS INFRASTRUCTURE

A wide range of non-process infrastructure would be required for the proposed operation and would include, but not be limited to, power and water supply distribution infrastructure (including some on-site diesel generators), accommodation camps and camp facilities, workshops, administration facilities, roads and laydown and storage areas for communications infrastructure, airstrips, fuel and explosives storage.

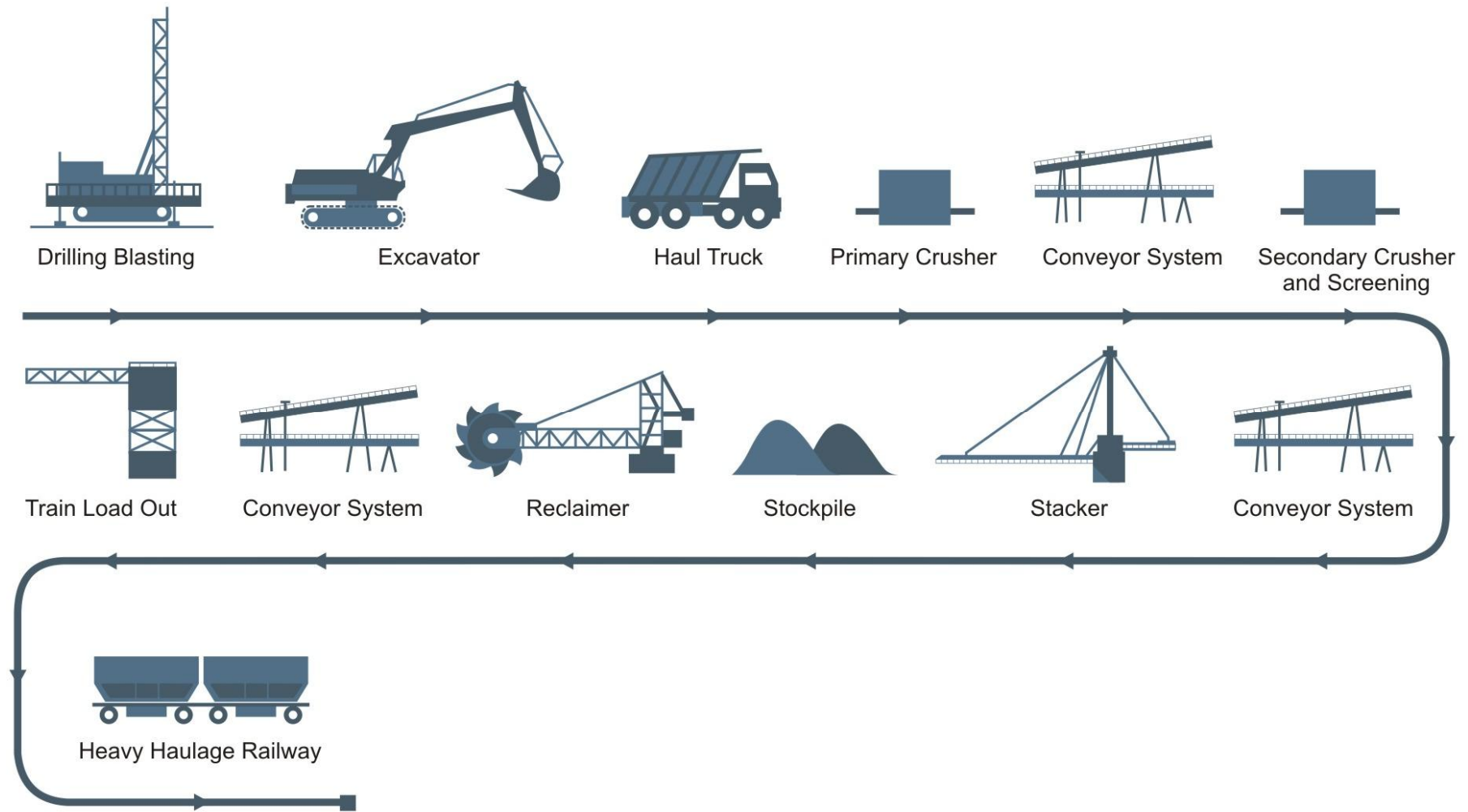


Figure 6 Typical Iron Ore Mining Process

4 EXISTING ENVIRONMENT

4.1 OVERVIEW

The Interim Biogeographic Regionalisation of Australia (IBRA) recognises 85 distinct bioregions (Environment Australia 2010) on the basis of their climate, geology, landform, native vegetation and species information. The Strategic Proposal area lies wholly within the Pilbara Bioregion, an area of approximately 178,500 km² within the Pilbara Craton. It comprises extensive coastal plains that give way to inland ranges comprising some of the earth's oldest rock formations and important mineral deposits. Geological, altitudinal and climatic diversity is potentially related to the high level of observed species diversity and endemism across the Pilbara Bioregion, which has subsequently been recognized as one of Australia's 15 biodiversity hotspots (SEWPaC 2009). Climate is described as sub-Eremean (Beard 1990): being subtropical, semi-arid with rainfall normally totalling 250 mm to 350 mm annually. Higher averages occur on the upland plateaux of the Hamersley and Chichester Ranges, while cyclones episodically result in extreme precipitation and flooding events.

BHP Billiton Iron Ore recognises the significance of the Pilbara Bioregion, and that it contains a range of significant environmental and social values that are to be protected and managed in accordance with legislative requirements.

This section provides a description of the existing terrestrial and social environments in both a regional and local context.

4.2 PHYSICAL SETTING

The Pilbara Craton is characterised in the north by Archaean granite-greenstone terranes, shales, siltstones and sandstones (Tille 2006). The northern Hamersley basin dominates the southern portion of the Craton, and is typified by Archaean basalts, shales, sandstones, conglomerates, tuffs and carbonates. Further south, the Hamersley Range comprises late Archaean to Proterozoic banded-iron formations, shales, dolerites, carbonates, cherts and rhyolites. The northeast and southeast comprise variously aged sandstones while the tertiary drainages, including the Fortescue Valley, consist of tertiary deposits of calcrete and ferruginous pisolites (Tille 2006).

The physiography of the Pilbara Bioregion is dominated by rugged hills, ridges and dissected plateaux associated with the Hamersley and Chichester Ranges, which separate the lower plains and drainage valleys of the Fortescue and De Grey River catchments (Tille 2006). The ranges are bound by long stony footslopes and plains, while the Chichester Plateau also supports stony gilgai plains. Coastal plains are bordered by extensive intertidal mudflats. Ranges, hills and stony plains are characterised by red loams and sands of varying depths. Cracking clays can be found on basaltic plateaux and non-cracking-clays on the granitic plains. Alluvial and coastal plains are dominated by deep red loams and deep red sands respectively (Tille 2006).

4.3 BIOLOGICAL SETTING

The Pilbara Bioregion is composed of four subregions: the Hamersley, Fortescue Plains, Chichester and Roebourne. The Bioregion is characterised by biodiversity levels that are considered to be amongst the richest in the world. In recognition of this high diversity and

associated high levels of endemism, the Pilbara was nominated as one of 15 places of significant biodiversity in a national context (Department of Sustainability, Environment, Water, Population and Communities 2009). This distinct heterogeneity is related to its' transitional location between the Eyrean (central desert) and southern Torresian (tropical) bioclimatic regions, and to the range of geological, altitudinal and climatic elements that influence the region. The combination of geophysical factors yields a high diversity of floral and faunal habitats occupied by biological communities of similarly high diversity, but also by high levels of regional endemism.

The physiographic features underlying the habitats of the Pilbara region broadly encompass:

- The high central and eastern rocky ranges, hill-slopes and gorges of the Hamersley and Chichester Plateaux;
- The northwest to southeast trending broad alluvial valley of the Fortescue Plain; and
- The extensive western and northern coastal plains, flats and steppes.

The biological communities of the Pilbara Bioregion remain poorly understood despite large volumes of survey work associated with Environmental Impact Assessment (EIA) over the past two decades. The area is known to support populations of various threatened and endangered flora and vertebrate fauna species, arid zone populations of more characteristically mesic species and relatively high numbers of species that are endemic to the Bioregion (McKenzie et al 2002). It is also considered that ecosystems including associated with major wetland and drainage landforms such as the Fortescue valley and Millstream wetlands support highly diverse, endemic communities, while the gorges associated with the Hamersley and Chichester Ranges are recognized as significant refugia for many taxa during drought, wildfire and other disturbances. The region also supports a diverse range of short range endemic (SRE) invertebrate and subterranean invertebrate species (both stygofauna and troglifauna) that have only come to light relatively recently. Specific attributes associated with the flora and fauna introduced above are discussed in the context of the current environmental landscape in the Pilbara in the following subsections.

Over the last decade, BHP Billiton Iron Ore has completed over 350 individually commissioned environmental studies within the Strategic Proposal area. Survey results from this period are currently being reviewed, standardised and consolidated. This information will inform the Strategic Proposal.

4.3.1 FLORA AND VEGETATION

The flora and vegetation of the Pilbara Bioregion is broadly dominated by *Acacia* shrublands over *Triodia* grasslands, although Eucalypts are also a conspicuous element of the vegetation (Van Vreeswyck et al 2004). However, the distribution of vegetation types as well as levels of diversity and endemism reflects the complexity of the available habitats. The predominant vegetation formations of the Chichester and Hamersley plateaux are tree and shrub steppe (hummock grassland) communities with emergent Eucalypts and *Acacia* shrubs over *Triodia* hummock grasses. Mulga (*Acacia aneura*) communities occur in valleys and short bunch grasslands occur on alluvial plains (Van Vreeswyck et al 2004). The granitic sand plains of the Chichester subregion are vegetated with shrub steppe of *Acacia inaequilatera*. In the south-west of the Hamersley subregion, a sparse shrub steppe of snakewood occupies drainage flood plains and heavy clay soils. The river deltas of the Roebourne sub-region support a mosaic unit of bunch grasslands mixed with spinifex, while bare tidal mud flats and areas of mangrove are interspersed along much of the coastline (Van Vreeswyck et al 2004). The major rivers support sclerophyll woodlands of coolabah (*Eucalyptus victrix*) and river red gum (*E. camaldulensis*). A mosaic of savanna with snakewood and kanji bush is also found on the coast between the Fortescue and Robe Rivers. The north side of the Fortescue Plain is characterised by patches of short bunch grassland and groved mulga. The extensive Fortescue salt marsh supports halophytic low shrublands of saltbush, bluebush and samphire. To the east of the Roy Hill homestead there is an area of coolabah trees over bunch grassland (Van Vreeswyck et al 2004).

It should be noted that whilst the Pilbara Bioregion is already considered to be a centre of significant diversity and endemism, substantial taxonomic work is ongoing and the numbers of

both newly found and formally described flora species will continue to increase with continuing survey work. In 2008 for example, Maslin and van Leeuwin (2008) completed the descriptions of 12 new *Acacia* species, bringing the total in the Pilbara to 188 species. Similarly, a number of new species, some of which are endemic to the Pilbara have also been described within the Fabaceae (Davis and Hurter 2013), Solanaceae (Davis and Hurter 2012), Malvaceae (Barker 2007) and the Lamiaceae (Rye 2007).

4.3.2 VERTEBRATE FAUNA

Three biogeographical components are recognisable in the vertebrate fauna of the Pilbara Bioregion. As for the flora and vegetation, these originate from the Torresian and Eyrean biotas, and also comprise a significant endemic component. The avifauna of the region while rich, is considered to be seasonally variable and relatively ubiquitous across the landscape. There do not appear to be any major changes in the avifauna composition that can be related to the onset of European habitation of the region. In contrast, the mammalian fauna has declined during the 150 years since European colonisation with the remaining taxa being dominated by species with mean adult body weights of less than 35 g (McKenzie and Burbidge 2002). Twelve mammal species of the 41 originally occurring in the Pilbara are now regionally extinct and a further two persist only on coastal islands (Gibson and MacKenzie 2009). Herpetofauna composition at the regional scale appears to have persisted despite changes associated with European settlement, including pastoralism, changed fire regimes, weeds, introduced animals, mining and infrastructure (Doughty et al 2011).

The generally uniform nature of avifauna distributions across the habitats of the Pilbara potentially indicates that the intrusion of European activities into the environment is likely to have little effect on birds. However, Burbidge et al (2010) highlighted the importance of human impacts on particularly sensitive areas of riparian vegetation, while simultaneously noting that this habitat is one of the least spatially extensive available. The decline in mammalian diversity is a significant factor commonly attributed to the arrival of Europeans and the subsequent influence of their activities. There remains however, the possibility that known conservation significant mammal species may persist, as evidenced by the relatively recent re-emergence of the Short-tailed Mouse *Leggadina lakedownensis*. Additionally, it is possible that new species may be found where only one was thought to occur, as appears to be the case with two informally known species of *Planigale*, one of which may be restricted to rocky breakaways. There also appears to be little evidence that the broader herpetofauna population might be impacted by increasing levels of human activity. However, much recent taxonomic work has identified a multitude of new species in groups including geckos and skinks, many of which occupy far smaller areas of distribution than was attributed to the polytypic taxa from which they have been extracted. In the case of both mammals and herpetofauna, their persistence likely depends on the maintenance of the full range of habitats known from the Pilbara, as well as those critical habitats that may function as refugia during periods of adverse conditions.

4.3.3 SUBTERRANEAN FAUNA

Subterranean fauna comprise two groups stygofauna and troglifauna which are composed primarily of invertebrates. Stygofauna are inhabitants of deep groundwater habitats, while the latter live in subterranean voids above the water table (Department of Environment and Conservation 2013). The significance of these two groups to EIA in Western Australia derives largely from their occupation of habitats that in many instances are highly likely to be disjunct from neighbouring habitats as well as being restricted in their spatial extents. Additionally and possibly most importantly, it has only recently become apparent that these faunas occur in the habitats of the inland Pilbara (EPA 2003a). The core issues surrounding subterranean fauna in Western Australia include the relative paucity of knowledge with regard to the taxonomy of the group as a whole as well as its varied components. It is widely accepted that 'these biotas constitute uniquely important features of Australian biology' (Playford 2001). However, taxonomic and ecological research relating to subterranean fauna is in only its early stages and the assessment of impacts on the habitats and communities is necessarily founded on a risk-based approach.

By way of example, prior to the Pilbara Biological Survey (PBS) completed by the Department of Environment and Conservation between 2002 and 2012 about 40 species of stygofauna had

been documented from the Pilbara. The PBS sampled over 500 bore sites and 20 wetland springs representing a cross section of the Pilbara's major geological features and groundwater. Subsequent to the survey, the number of identified (putative) species rose to 350, and the total population is considered likely to exceed 550 taxa. New species of stygofauna recorded during the PBS included (Department of Environment and Conservation 2013):

- 73 ostracods;
- Two gastropods;
- Four isopods;
- 18 syncarids;
- One polychaete;
- 44 mostly new copepods, including one that belongs to a new family that has previously been found only on Barrow Island; and
- 11 oligochaetes.

Similarly, troglifauna were first documented in the mainland Pilbara only in the early 2000s, and the number of taxa may reasonably be expected to climb steadily as more habitat areas are sampled. In this context, sampling in the Red Hill area has shown that virtually every mesa is a geological isolate that harbours unique or near unique suites of troglifauna species (EPA 2011). This work and associated studies being conducted by institutional researchers, consultants to the EIA process and independent workers are therefore likely to continue to document species that have not previously been seen or described for the foreseeable future.

4.3.4 SHORT RANGE ENDEMIC FAUNA

Under the EIA process in Western Australia, SREs are defined as surface dwelling invertebrates with naturally small distributions that may also comprise discontinuous or fragmented habitats (EPA 2009a). SRE fauna taxa typically display characteristic ecological and life-history traits, including (Harvey 2002):

- Poor dispersal powers;
- Confinement to fragmented habitats;
- Often highly seasonal activity patterns; and
- Low reproductive capacity.

SRE habitats can occur in all bioregions of Western Australia and include Vine thickets, boulder piles, isolated hills, discrete landforms such as palaeodrainage basins and refugia including gorges, gullies and high altitude hilltops and freshwater habitats. These areas typically offer relictual habitats that moderate the climatic extremes associated with aridification of Australia subsequently to the Miocene. Given their potential to be restricted to small, disjunct or sensitive habitats, SRE fauna are considered to be subject to heightened risk of changes in conservation status and local extinctions than other more widely distributed taxa. There is a reasonable likelihood that historic impacts to such fauna associated with European activities such as pastoralism may be exacerbated by increasing and cumulative impacts arising from the resources industry. Key threatening processes for SRE fauna are considered to include:

- Clearing of native vegetation (habitat removal);
- Changes to fire regimes;
- Introduction and/or spread of weeds and soil pathogens;
- Fragmentation and subdivision of habitats; and
- Changes to surface hydrology.

A summary statement on the current understanding of short-range endemism amongst major terrestrial and aquatic fauna in an Australian context is included in Appendix 2 of EPA Guidance Statement 20 (EPA 2009a). In summary, the primary taxonomic groups currently

considered to be of significance to the EIA process in Western Australia include millipedes, scorpions and pseudoscorpions, terrestrial snails, and trapdoor or mygalomorph spiders. However, as is the case with subterranean fauna, the assessment of impacts to individual taxa that are known to or may harbour SREs is currently compromised by a lack of taxonomic and ecological resolution as well as the cryptic nature of many putative SRE taxa. EIA in the context of SREs is therefore also necessarily based on risk-based factors including assessment of impacts to specific habitats or isolates identified as having a reasonable possibility of supporting relevant fauna. It should be noted that significant gains in the assessment of potential SRE taxa are being attained through genetic bar-coding of targeted invertebrate fauna groups, which permits the distribution at least of genetic linkages between taxa to be more accurately assessed.

4.4 CURRENT LAND USE

All of the proposed future operations covered under the Strategic Proposal are located on mining tenure for which BHP Billiton Iron Ore is the Manager and Agent. Some of these proposed future operations occur partly within the BHP Billiton Iron Ore-managed Marillana and Ethel Gorge pastoral leases. Infrastructure (e.g. rail, roads) outside existing mining tenure would be located on miscellaneous licences.

The current use of lands surrounding the proposed mines and associated infrastructure is predominantly for mineral exploration, iron ore mining and dry land agriculture, specifically pastoralism, cattle grazing and rangelands.

Conservation lands amount to less than 10% of the total area of the Bioregion, with the major reserves being Karijini and Millstream-Chichester National Parks. These Parks are supplemented by lesser conservation estates such as Cane River and Meentheena Conservation Parks. Wetlands of National significance include the permanent pools of Millstream and Karijini National Parks and the Fortescue Marsh.

4.5 SOCIAL SETTING

The social and economic development of the Pilbara Region has been driven by pastoral enterprises, followed by the discovery of vast deposits of iron ore in the region. More recent discoveries of oil, gas and other mineral resources have further boosted the Pilbara economy and population growth.

The majority of the population is located in the western third of the region, which includes the towns of Port Hedland, Karratha, Newman, Tom Price, Paraburdoo, Roebourne, Wickham, Dampier and Onslow.

The nearest regional centre to the Strategic Proposal area is the town of Newman, which provides accommodation and services for many existing mine employees and contractors. Community infrastructure at Newman includes medical and hospital facilities, banks, an airport, post office, sporting facilities and schools.

The Australian Bureau of Statistics (ABS) 2011 Census data shows that the population of the Pilbara Region was 59,894 and the population in the Newman area was 9,087 (ABS 2011). The data indicates the Pilbara Region had positive growth rates from 2006 to 2011 (i.e. 46%). Newman also experienced positive growth in the five years from 2006 to 2011 (approximately 77%), significantly higher than the whole of WA (12.5%) and the national growth rate (8.3%) (ABS 2011). Beyond compliance driven commitments, BHP Billiton Iron Ore has various programs in place to support and enable opportunities for communities in the region.

4.6 ENVIRONMENTAL ASSETS

The central Pilbara region supports a number of assets with high environmental or social values. Examples of such assets in proximity to operations proposed under the Strategic Proposal are Karijini National Park, Coondewanna Flats, Ethel Gorge and Fortescue Marsh. An evaluation will be undertaken as part of the PERSP to identify the key environmental assets

within the region. Criteria for assessment may include statutory requirements, policy context, conservation estate status, uniqueness and amenity. Such key assets will be important in the development of the management framework for the Strategic Proposal.

4.7 NATIVE TITLE GROUPS AND ABORIGINAL COMMUNITIES

BHP Billiton Iron Ore has relationships with the native title groups and Aboriginal communities that are impacted either directly or indirectly by its operations across the Pilbara. Consultation regarding the SPEA will be undertaken with the various native title groups whose land is subject to the geographical scope of the SPEA. Consultation will also be undertaken with Aboriginal communities that are in relative proximity to the geographical scope of the SPEA.

4.8 HERITAGE

The EPA's objective for heritage is to ensure that historical and cultural associations are not adversely affected. This objective is supported by the EPA's Guidance Statement No. 41: Assessment of Aboriginal Heritage (EPA 2004a).

BHP Billiton Iron Ore manages and protects Aboriginal heritage in compliance with the WA Aboriginal Heritage Act 1972. Potential impacts to heritage sites associated with the Strategic Environmental Assessment will continue to be managed through BHP Billiton Iron Ore's internal heritage management processes. These processes are based on guidelines drafted by the Department of Indigenous Affairs and include measures to identify significant heritage sites during planning phases to avoid or minimise potential heritage impacts. If any heritage site cannot practically be avoided, BHP Billiton Iron Ore will consult with the relevant Indigenous group and seek consent from the Minister under Section 18 of the Aboriginal Heritage Act 1972.

BHP Billiton Iron Ore has conducted large scale archaeological and ethnographic surveys to identify places of cultural significance. Those surveys are ongoing and undertaken with participation by the relevant Traditional Owners of the area. The engagement of the relevant Traditional Owner groups is guided by Heritage Protocols between the groups and BHP Billiton Iron Ore.

In preparing the PERSP, BHP Billiton Iron Ore will draw on this large body of work to provide regional heritage and ethnographic context relevant to the Strategic Proposal. The PERSP will outline the process arrangements for considering heritage impacts from future projects. BHP Billiton Iron Ore will consult with relevant native title groups as to how such information will be presented in the PERSP.

5 KEY ENVIRONMENTAL FACTORS AND PRINCIPLES

5.1 KEY AND OTHER ENVIRONMENTAL FACTORS

In 2010, the EPA published a list of environmental Factors and associated environmental Objectives to assist proponents preparing an ESD and PERSP (EPA 2010b). This list of Factors and Objectives has recently been reviewed and revised by the EPA (2013). This recent revision has been incorporated and considered within this document.

A regional understanding of environmental assets, values and attributes is required to ensure a sound foundation for the assessment of impacts. The environmental factors relevant to the proposal have been identified on the basis of BHP Billiton Iron Ore's operational experience in the Pilbara, the results of regional environmental studies and monitoring, the findings of previous environmental impact assessments and consultation with government stakeholders.

Section 44 of the EP Act read in conjunction with Section 40B requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the Strategic Proposal and the conditions and procedures, if any, to which the proposal should be subject. For the purpose of this document, BHP Billiton Iron Ore has considered that the key factors will be those requiring conditioning under any Ministerial Statement for the Strategic Proposal. As such, these factors will relate to both environmental elements and management controls.

5.1.1 KEY PRELIMINARY ENVIRONMENTAL FACTORS

In considering the key factors relevant to both a typical Pilbara iron ore mining operation and in relation to the regional context of this proposal, BHP Billiton Iron Ore undertook a preliminary, high level assessment to examine the sensitivity of factors potentially impacted by the proposal and potential magnitude of impacts. This assessment is represented conceptually in Figure 7.

Flora and vegetation and terrestrial fauna are recognised as potentially having a higher level of sensitivity and greater potential impact from future operations. The sensitivity and magnitude will vary from site to site. The nature of potential impacts are primarily related to project footprints, however the assessment will consider relevant indirect impacts. Specifically, significant species and habitats will be the factors which will require a greater level of control.

The importance of water in the Pilbara environment is reflected by a higher sensitivity. Impacts are potentially both direct and indirect and may potentially extend beyond project footprints.

Following from the above, the factors which may potentially require conditioning will be:

- Flora and vegetation;
- Terrestrial fauna;
- Hydrological processes; and
- Inland water environmental quality.

Those factors with low sensitivity and low magnitude of impact are typically managed using standard management practices for construction and operational phases of the project, for example air quality and amenity (including noise and visual amenity). This is consistent with BHP Billiton Iron Ore's operational experience in the Pilbara and our existing approval requirements.

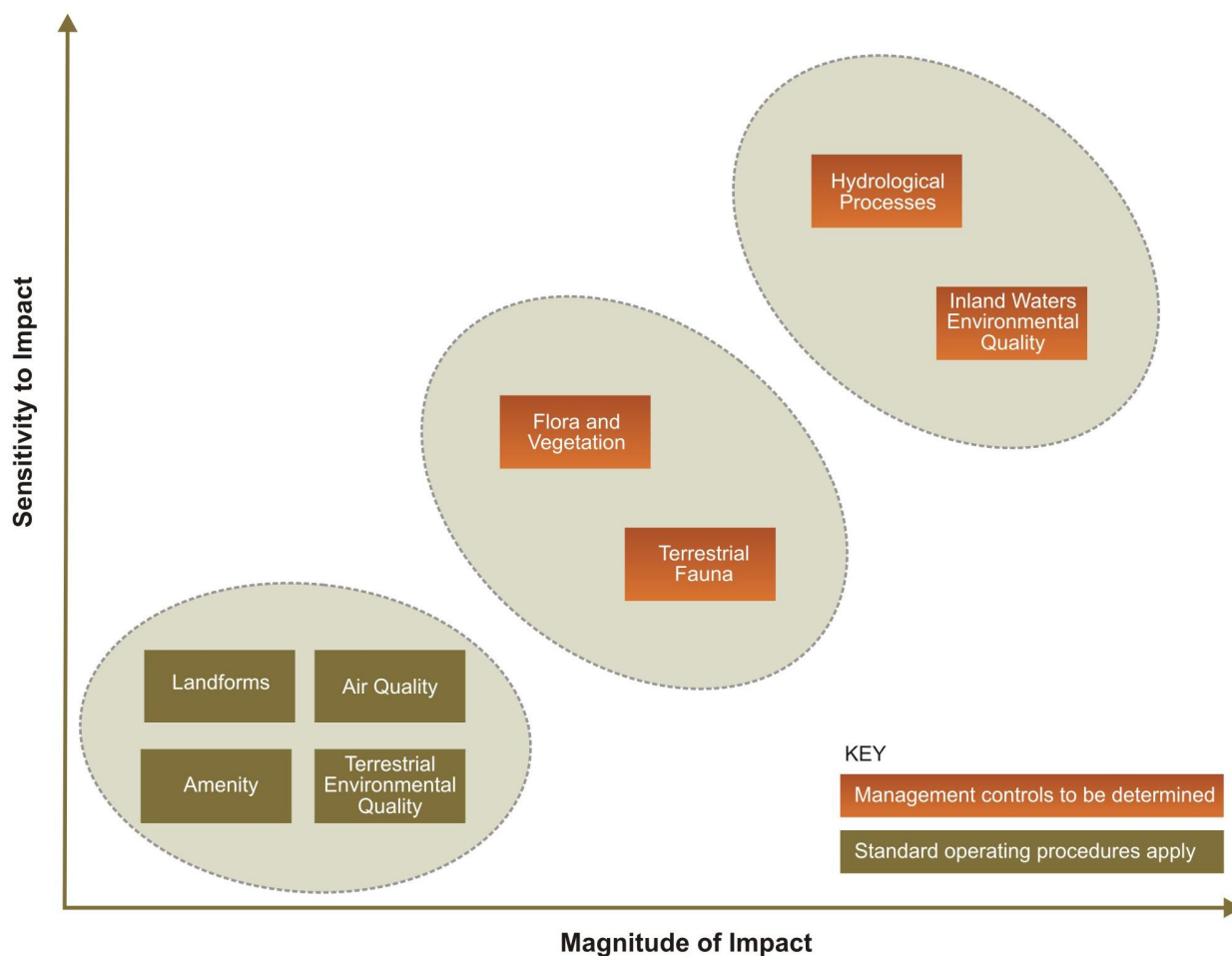


Figure 7 Sensitivity and Magnitude of Potential Impacts on Factors

BHP Billiton Iron Ore recognises that potential social impacts from its operations must also be carefully managed and monitored and has established separate mechanisms outside the environmental approvals process to address these issues. These factors include human health, amenity, and heritage (refer Section 4.8). Social impacts will continue to be the subject of focused management, especially in towns including Newman and Port Hedland. BHP Billiton is committed to the ongoing improvement of the current standard management practices for social impacts.

A preliminary, high level assessment investigated management controls in terms of potential conservation effectiveness and the length of time over which they could be sustained (Figure 8). This Figure groups controls using the hierarchy of Avoid, Mitigate and Offset. Where avoidance is not possible in implementing an operation proposal, closure and offsets may offer the greatest control benefit and would also typically be conditioned as part of proposal approval. However, although avoidance of impact is generally preferred, this does not guarantee the protection of the environmental asset in perpetuity. For this reason, offsets may present a more sustainable outcome in terms of long term conservation effectiveness, in some instances. A range of potential environmental outcomes can be achieved by each management control.

Please note that Figure 8 is conceptual and not exhaustive. Other mitigation and management controls exist, including standard management approaches. All mitigation and management options will be assessed for effectiveness in the PERSP and at the derived proposal stage.

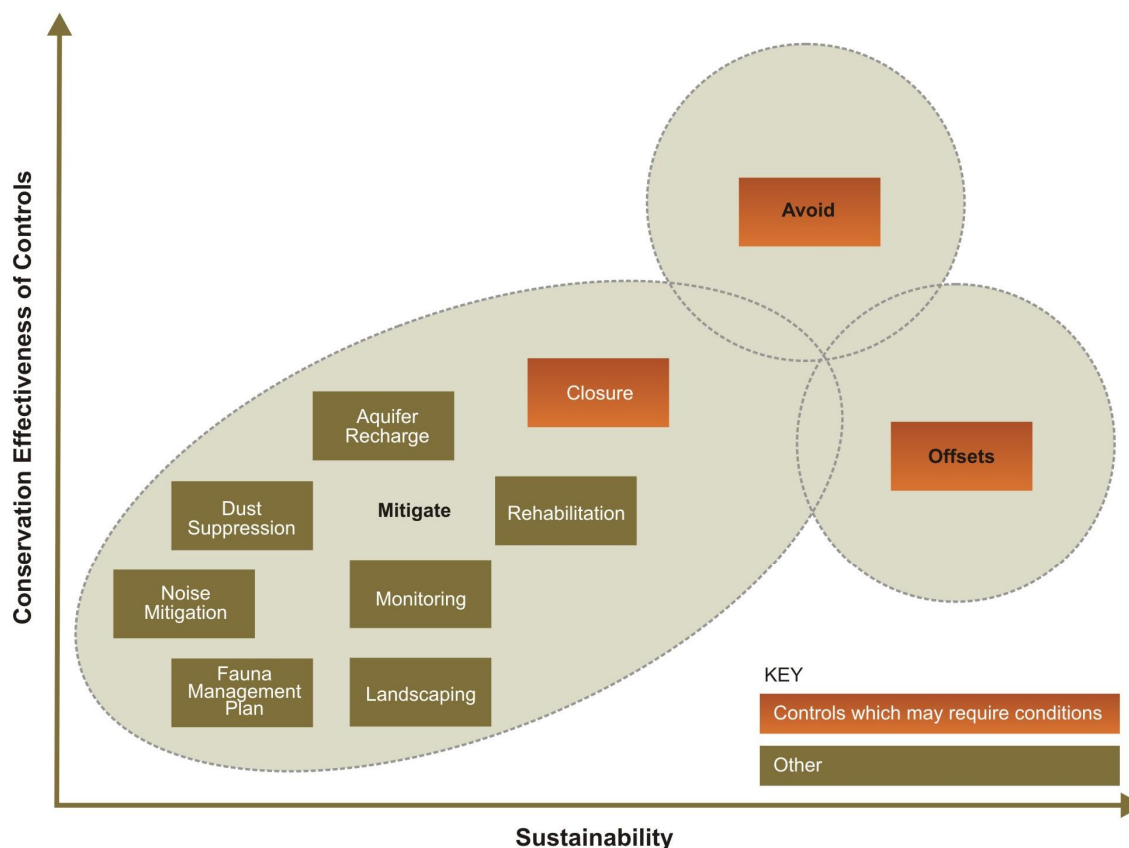


Figure 8 Long Term Conservation Effectiveness of Management Controls

Following from the above, the controls which may potentially require conditioning by the EPA will be:

- Avoidance;
- Closure; and
- Offsets.

In order to validate the key environmental factors relevant to the Strategic Proposal, BHP Billiton Iron Ore has undertaken a review of other iron ore mines in the Pilbara region assessed by the EPA during the past five years. This review included an analysis of environmental factors addressed via proponent commitments, Ministerial conditions and public submissions.

These analyses confirmed the preliminary key environmental factors requiring detailed consideration in the Strategic Proposal are:

- Flora and vegetation;
- Terrestrial fauna (with a focus on vertebrates);
- Hydrological processes
- Inland waters environmental quality (with a focus on both surface water and groundwater);
- Rehabilitation and closure; and
- Residual Impacts and Risk Management Measures (Offsets).

The key environmental factors identified through the analysis are consistent with BHP Billiton Iron Ore's operational experience in the Pilbara, the results of regional environmental studies and monitoring, the findings of previous impact assessments in the Pilbara, and consultation with government stakeholders. Short range endemic fauna and subterranean fauna have been

included as key preliminary environmental factors and their significance at the Strategic Proposal level will be assessed in the PERSP.

5.1.2 OTHER FACTORS

Other factors which are not considered to be significant at the Strategic Proposal level but which will still be assessed include:

- Terrestrial Environment Quality;
- Landforms;
- Air quality; and
- Amenity.

5.1.3 EPA DETERMINATION ON REFERRAL

The outcome of the assessment of key and other factors completed by BHP Billiton Iron Ore summarised above is consistent with the referral determination decision published by the EPA in July 2012.

The EPA's determination on the Strategic Proposal referral was that the preliminary environmental factors were water (surface and groundwater); flora and vegetation; fauna and habitat; rehabilitation and closure; and air and greenhouse gas emissions. The EPA also identified cumulative and regional scale impacts to water resources, air quality and biodiversity values as the potential significant impacts associated with the proposal if not assessed and managed appropriately.

Although EPA's revised guide to environmental impact assessment principles, factors and objectives no longer lists greenhouse gas emissions as a factor, it is important to note BHP Billiton has a corporate Climate Change Position that will continue to be implemented. This policy is a multifaceted approach to tackling climate change across its business, which aims to:

- Understand emissions from the full life cycle of the products the BHP Billiton Group produces;
- Improve the management of energy and greenhouse gas emissions across the business;
- Support the development of low emissions technology and encourage emissions abatement by employees and local communities; and
- Use technical capacity and experience to assist government and other stakeholders to design effective and equitable climate change policies, such as emissions trading.

5.2 PRINCIPLES

The EPA is required to have regard for the principles set out in Section 4A of the EP Act in its assessment of the Strategic Proposal and report to the Minister for Environment. BHP Billiton Iron Ore will assess the following principles, as outlined in the EPA's *Position Statement No. 7: Principles of Environmental Protection* (EPA 2004b), in relation to the Strategic Proposal:

- a) The precautionary principle;
- b) Intergenerational equity;
- c) Conservation of biological diversity and ecological integrity;
- d) Improved valuation, pricing and incentive mechanisms; and
- e) Waste minimisation.

6 MANAGEMENT APPROACH

6.1 HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT OVERVIEW

BHP Billiton has developed and implemented a Health, Safety and Environmental Management System (HSEMS) for its operations that is certified to Australian/New Zealand Standard ISO 14001. The HSEMS describes the organisational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental objectives at all BHP Billiton sites. The principal components of the HSEMS include:

- Planning;
- Implementation and operation;
- Monitoring and corrective action; and
- Management review.

BHP Billiton has developed a Company Charter for its operations. The Company Charter is a guiding resource for maintaining an emphasis on Health, Safety, Environment and Community (HSEC) and clarifying a broader commitment to aspects of sustainability including biodiversity, human rights, ethical business practices and economic contributions at all BHP Billiton Iron Ore sites. To interpret and support the Company Charter, BHP Billiton Iron Ore has developed a series of Group Level Documents. The Group Level Documents, such as Management Standards, form the basis for the development and application of management systems at all levels of BHP Billiton's operations.

6.2 RISK MANAGEMENT

Risk management is integral to mitigating HSEC impacts at BHP Billiton's sites. BHP Billiton Iron Ore has developed a risk assessment system that is implemented at its Pilbara operations. and will inform the assessment of environmental factors through the SPEA.

For the purpose of this assessment, BHP Billiton Iron Ore will develop as part of the PERSP a tailored risk assessment approach to account for the strategic nature of the proposal. The PERSP will contain a qualitative risk assessment that specifically addresses uncertainty associated with impact predictions. The qualitative risk assessment will inform the quantum of the residual impact.

This quantum will be validated and refined with a quantitative risk assessment conducted at the Derived Proposal stage.

6.3 ADAPTIVE MANAGEMENT APPROACH

Adaptive management is a structured, iterative process of decision making with the capacity to gradually reduce uncertainty through information, including from monitoring (Figure 9). It offers transparency and accountability to decision making and resource prioritisation, while providing a formal framework for learning and improving management.

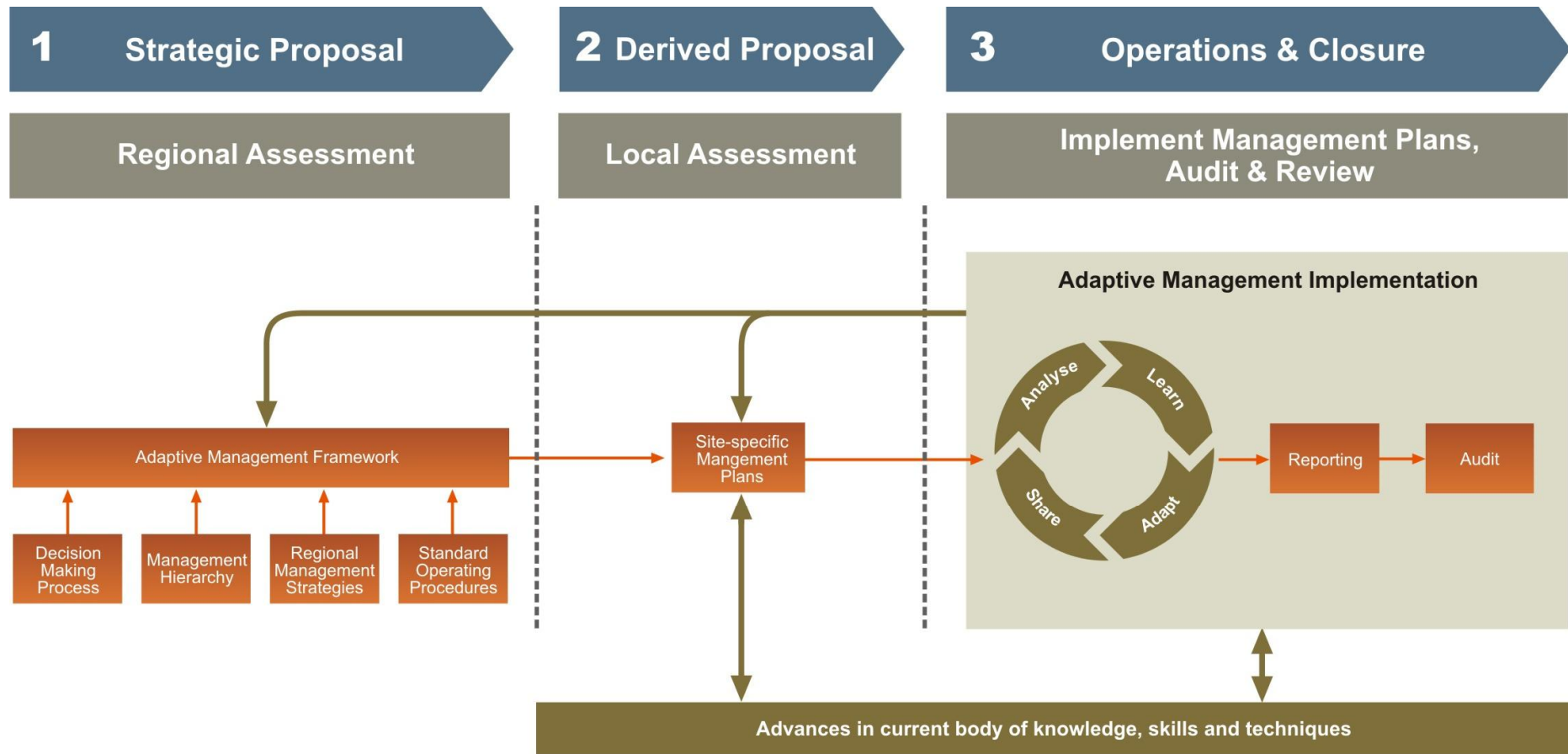


Figure 9 Adaptive Management Approach

In order to review the extent of cumulative impacts and identify whether conservation objectives are being met, an Adaptive Management Approach (AMA) to adapt monitoring, reporting and management to prevailing environmental conditions will be implemented. This AMA will determine whether the management applied is relevant and effective, and that environmental outcomes are being achieved or exceeded. Allowance will also be made under the process to apply a contingency response, where monitoring identifies a conservation objective that is not being met.

BHP Billiton Iron Ore will apply an AMA to inform management decisions and audit, report and implement change where required. This approach will allow for best practice environmental management to be implemented in evolving political, social and natural environments. The AMA will provide flexibility in the management approach to allow for conservation significance changes (e.g. new species are listed), new technologies are developed, and as our understanding of assets, values, species, threatening processes and impacts (e.g. climate change) increases.

At the Strategic Proposal stage, the AMA will comprise of an Adaptive Management Framework (AMF), with the following key components:

- Management hierarchy;
- Regional Management Strategies;
- Standard operating procedures; and
- Adaptive management decision-making process.

The Derived Proposal and Operations stages provide opportunities for consideration, application and regulator assessment of the validity and effectiveness of the AMA. Closure Plans will be developed where relevant, with review and update occurring throughout the Operations phase to ensure BHP Billiton Iron Ore continue to manage closure liabilities, risks and regulatory requirements related to closure.

6.3.1 MANAGEMENT HIERARCHY

An integral component of the AMF approach is application of the management hierarchy. BHP Billiton Iron Ore will manage environmental impacts associated with the Strategic Proposal in accordance with the guiding principles outlined in the WA Environmental Offsets Policy (Government of Western Australia 2011) (Figure 10). In accordance with the statement, *avoidance* of environmental impact is paramount in BHP Billiton Iron Ore's environmental management hierarchy. If impacts are unavoidable, the principle of *mitigation* of environmental harm will be adhered to, with mitigation measures put in place to achieve the best possible environmental outcome.

If the above management principles are followed and residual environmental impact remains or continues to occur, BHP Billiton will investigate opportunities to *offset* impacts to achieve a net benefit to the environment. It is important to note that offsets do not reduce the actual impacts of a development but may change the net effect of a proposal on the environment because of the reparation or 'environmental gain' achieved through those actions. They should be distinguished from 'mitigation', which refers to the range of actions that can be undertaken to reduce the level of impacts of a development and typically undertaken on-site (Department of the Environment and Water Resources 2007). Additional information on potential offsets is provided in Section 6.3.1.3.

Hierarchy of Control for Impact Avoidance and Mitigation

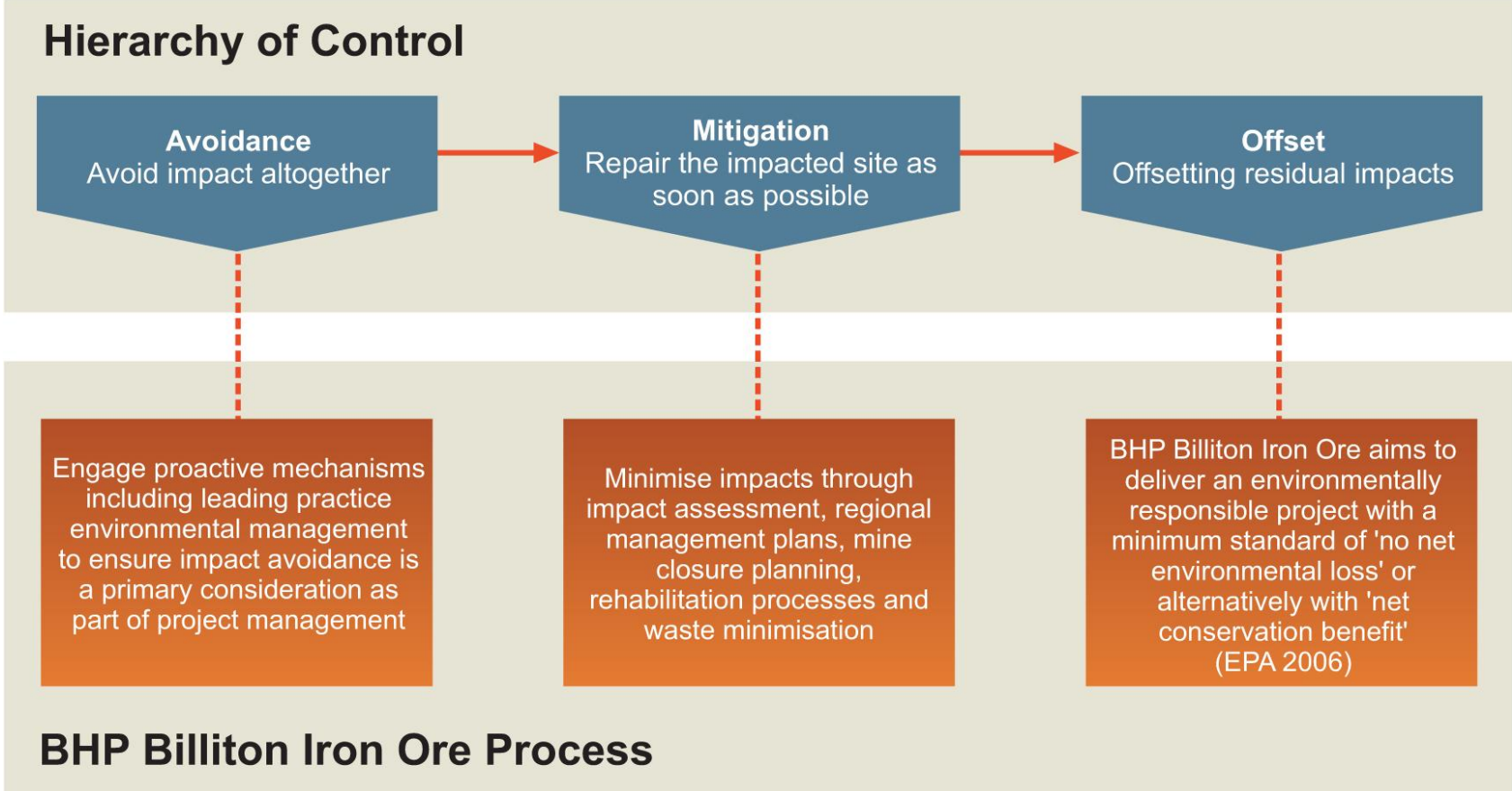


Figure 10 Management Hierarchy

6.3.1.1 AVOIDANCE

BHP Billiton Iron Ore will engage proactive mechanisms to ensure impact avoidance is a primary consideration as part of project management. Where possible, future projects will apply the EPA principle of the conservation of biological diversity and ecological integrity and a regional biodiversity assessment, and baseline survey results will be overlain with infrastructure footprints, to avoid impacts. Examples to avoid include:

- Identified Indigenous heritage sites;
- Direct impacts to Declared Rare Flora;
- Impacts on Threatened and Priority Ecological Communities;
- Minimise impacts to fauna protected under the State Wildlife Conservation Act 1950 (WC Act) and EPBC Act;
- Impacts on Threatened and Priority Flora or listed fauna;
- Impacts to the DPaW Conservation Estate;
- Significant impacts on Priority Ecological Communities;
- Significant impacts on Matters of National Environmental Significance; and
- Changing conservation status.

6.3.1.2 MITIGATION

Mitigation should only be applied to a development where it can deliver long-term conservation outcomes. For example, the retention of vegetation on a development site should only be considered as an appropriate mitigation measure where it can be shown that it will provide environmental values in the long-term (Department of the Environment and Water Resources 2007).

BHP will mitigate adverse impacts on the environment through impact assessment, regional management plans and giving consideration to guidance such as Guidance Statement No. 33: Environmental Guidance for Planning and Development (EPA 2008a). The precautionary principle, the principle of intergenerational equity and of waste minimisation will apply.

BHP will also seek to mitigate impacts through the mine closure planning and rehabilitation process. Closure requirements will be considered during all design stages. Where possible, OSAs will be designed to blend into the natural environment and will be limited to the maximum height of the surrounding environment where possible. Ridgeline preservation will be considered as part of visual impact planning.

Additionally, BHP Billiton Iron Ore will use processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts. Where possible, identified impacts will be eliminated over time to achieve the principles of ecologically sustainable development.

6.3.1.3 OFFSET

In recognition that there may be potential residual impacts associated with development of future proposals, BHP Billiton Iron Ore will develop an Offsets Strategy which will form part of the PERSP submission. The intent of the Offsets Strategy will be to define an approach to identifying appropriate strategic offsets that is consistent with the intent of both State (Western Australian Offsets Policy 2011, Draft Environmental Assessment Guideline for Environmental Offsets 2012) and Commonwealth (*Environmental Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy 2012) offsets guidelines.

It is expected that the Offsets Strategy will address:

- Identification of regional conservation outcomes;
- Identification of the types of offsets applicable to the Strategic Proposal;
- Identification of a process to confirm the need for environmental offsets;
- Details of a decision mechanism to identify appropriate offsets for future proposals. This will include governance arrangements; and
- An adaptive management process which will include audit, reporting and continual improvement in relationship to the effectiveness of the Offsets Strategy and offsets implementation.

6.3.2 REGIONAL MANAGEMENT STRATEGIES

An integral component of the AMF approach is Regional Management Strategies (RMSs). RMSs will be prepared for the following factors: hydrological processes, inland waters environmental quality, flora and vegetation, terrestrial fauna, rehabilitation and closure and air quality (including greenhouse gases). The preliminary key factor residual impacts and risk management measures will be addressed by the offsets strategy. RMSs may also be prepared for noise. RMSs will provide overarching objectives, principles, applicable legislation/policies and options to avoid, mitigate or offset significant impacts. RMSs will provide regulators and stakeholders with confidence that BHP Billiton has the necessary processes in place to effectively manage impacts.

Specifically, the RMSs will include:

- Outcome-based management objectives;
- Key values and threatening processes;
- Overarching management principles (for example, Ecologically Sustainable Development), policies, strategies, guidelines, standards and procedures;
- Suite of management options (“management toolbox”);
- Decision-making process that will be used for the selection of management options at the Derived Proposal stage;
- Mechanisms for adapting to change; and
- Linkages between other aspects of the Strategic Proposal framework (e.g. Offsets Strategy).

The RMSs will be used to inform the development of site specific management plans (SSMP) at the Derived Proposal stage (if they are required). The RMSs and the SSMPs will be audited and updated as required.

6.3.3 STANDARD OPERATING PROCEDURES

BHP Billiton Iron Ore has in place a series of standard operating procedures that prescribe the manner in which specific activities may be undertaken. Consistent application of these standard operating procedures ensures conformance with regulatory and organisational requirements and improves the efficiency and effectiveness with which activities are undertaken.

6.4 APPLICABLE LEGISLATION

The EP Act is the main governing legislation relevant to environmental protection in WA. The EP Act provides for the establishment of the EPA and is the main statute under which the WA environmental approvals processes are conducted. The proposed Project would also be subject to the requirements of the WA *Iron Ore (Mount Newman) Agreement Act 1964*.

Additional legislation and policies applicable to environmental aspects of the Strategic Assessment are listed in Appendix A.

Key Applicable Legislation

- *Aboriginal Heritage Act 1972;*
- *Agriculture and Related Resources Protection Act 1976;*
- *Bush Fires Act 1954;*
- *Conservation and Land Management Act 1984;*
- *Country Areas Water Supply Act 1947;*
- *Dangerous Goods Safety Act 2004;*
- *Dangerous Goods Safety (Explosives) Regulations 2007;*
- *Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007;*
- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Environmental Protection Act 1986;*
- *Environmental Protection (Noise) Regulations 1997;*
- *Rights in Water and Irrigation Act 1914;*
- *Road Traffic Act 1974;*
- *Mine Safety and Inspections Act 1994;*
- *Mining Act 1978;* and
- *Wildlife Conservation Act 1950.*

7 PROPOSED STUDIES

7.1 OVERVIEW

This section outlines the approach to the environmental studies as determined from the environmental assessment framework (outlined in Section 5). Together with the EPA Guidance, this section outlines the approach to the assessment of regional and cumulative impacts associated with the Strategic Proposal.

7.1.1 APPROACH TO STUDIES FOR THE STRATEGIC PROPOSAL

This section describes the approach to the provision of baseline and impact information for inclusion in the PERSP to enable an assessment of regional and cumulative impacts. BHP Billiton Iron Ore will provide relevant environmental information, including details on survey effort and focus, which supports modelling and other predictions, at appropriate times during the assessment.

Over 10 years, BHP Billiton Iron Ore has completed more than 350 individually commissioned environmental studies within the Strategic Proposal area. Relevant survey results from this period are currently being reviewed, standardised and consolidated. This information will inform the Strategic Proposal. The scientific surveys, mining feasibility studies, environmental impact assessment documentation, monitoring and management will be based upon the best available knowledge and will be guided by community and stakeholder engagement.

The steps for the baseline studies, impact assessment and management planning are as follows:

Identification of existing information - A desktop review will be undertaken to identify and collate relevant reports and studies that have been undertaken on a local and regional scale. The review will include an assessment of methodology, findings and data to determine the relevance and useability of the information for the PERSP. Current baseline environment information will be provided in a spatial context for the PERSP study area and confirm areas of biodiversity or social significance.

Regional studies - A number of studies have been completed on a local and regional scale that will be collated and summarised to provide the base for the PERSP as described in Section 7.2. The spatial and temporal extent of regional impact assessment studies will be determined in consultation with regulators.

BHP Billiton Iron Ore's corporate databases, data from government databases and other scientifically robust data have been and will continue to be used to develop predictive distribution maps of key significant flora and fauna species (i.e. Matters' of National Environmental Significant (MNES), other species determined through consultation with the DPaW and EPA). Other proponents data will be used where it is publicly available. Modelling will be a key tool to determine areas of high conservation value for terrestrial fauna, flora and vegetation.

Assessment of the gaps - Following the compilation and assessment of the existing information and the regional studies, an assessment will be undertaken to focus future studies. This spatial assessment will overlay regional studies information, the assets and values with future proposals.

Identification of impacts - Cumulative Impact Assessment (CIA) will be undertaken as described in Section 7.2.2. For factors where CIA is not the most appropriate assessment tool,

alternative impact assessment methodology is described for each factor in Sections 7.2.3 and 7.2.4.

Management approach - Outcome based management objectives will be established within an AMF (Section 6.3) to protect assets and values and indicate how the EPA's objectives will be met. The monitoring will demonstrate the required protection of assets and values and compliance with the agreed performance criteria. Regional Management Strategies will be developed for the following preliminary key factors: hydrological processes, inland waters environmental quality, flora and vegetation, terrestrial fauna, and rehabilitation and closure (Section 6.3.2). Standard operating procedures will provide for the management of other impacts that are less significant at the level of the Strategic Proposal.

BHP Billiton Iron Ore's management approach is further described in Section 6 of this document.

7.2 PROPOSED SCOPE OF STUDIES TO BE UNDERTAKEN FOR THE STRATEGIC ASSESSMENT

7.2.1 BASELINE STUDIES AND ENVIRONMENTAL IMPACT ASSESSMENT STUDIES

Numerous reports, data, scientific information and anecdotal information is available relating to the Pilbara. BHP Billiton Iron Ore's corporate databases, scientific reports, data from government databases and other scientifically robust data will be compiled as part of the regional baseline studies commissioned by BHP Billiton Iron Ore for the PERSP. Other proponents' data will be used where publicly available.

A gap analysis has been undertaken of existing BHP Billiton Iron Ore's studies as part of the environmental impact assessment process. Studies have been commissioned to meet certain scopes of work. The scope of works for the PERSP is identified in Section 7.2.2.to 7.2.4.

7.2.2 CUMULATIVE IMPACT ASSESSMENT

The CIA will consider existing and reasonably foreseeable projects in the region (BHP Billiton Iron Ore and other proponents' projects). BHP Billiton Iron Ore is well placed to undertake a CIA. BHP Billiton Iron Ore has been operating in the Pilbara for over 40 years, and has a significant amount of ecological, hydrogeological, air quality, noise and geochemical data. Other proponent's data will be used where it is publicly available.

A gap analysis will be undertaken by comparing the location and extent of existing information with the scope of the Strategic Proposal. Where gaps are required to be addressed for assessment purposes, predictive environmental modelling will be used. Other tools will be considered where appropriate.

CIA inputs for future operations will largely be based on 'typical' mining operations. The CIA will be used as one of a suite of tools to inform management priorities and measures, notably the Regional Management Strategies (refer Section 6.3.2).

The 'Region' to be considered by the CIA will vary in accordance with the asset/factor/species of interest. Ecohydrogeology boundaries will be used; IBRA regions, species distributions, catchments, watersheds and airsheds will be applied as relevant. Guided by the location of tenements however, the primary focus of the assessment will be on the eastern Hamersley and central Fortescue IBRA subregions and the BHP Billiton Iron Ore rail corridor to Port Hedland. This area includes a number of existing and proposed DPaW managed conservation reserves.

The methodology will be leading practice, peer-reviewed and involve the following:

- Assessment at regional, asset, community and species levels;
- Assessment of the impacts of mining and non-mining threatening processes;
- Quantitative, semi-quantitative and qualitative analyses based on data availability;
- Application of cause-effect pathways:

- Synergist/Integrated approaches, where knowledge permits (that is, the interaction of impacts will be considered; Figure 11);
- Alternative approaches where cause-effect pathways are not understood (e.g. CIAs may be undertaken on the key values of ecosystem health (e.g. water quality, habitat) separately);
- Conceptual models to underpin approach;
- Scenario testing for temporal scales and threatening processes (including climate change);
- Tolerance and resilience of sensitive receptors or use of appropriate thresholds/limits where available and/or where responsiveness of sensitive receptors is unknown (as defined by current science, regulations and expert opinion);
- Predictive modelling;
- Identification of the magnitude of potential impacts, with definition of the associated level of uncertainty; and
- Recommended approaches to address uncertainty (e.g. priority research and monitoring).

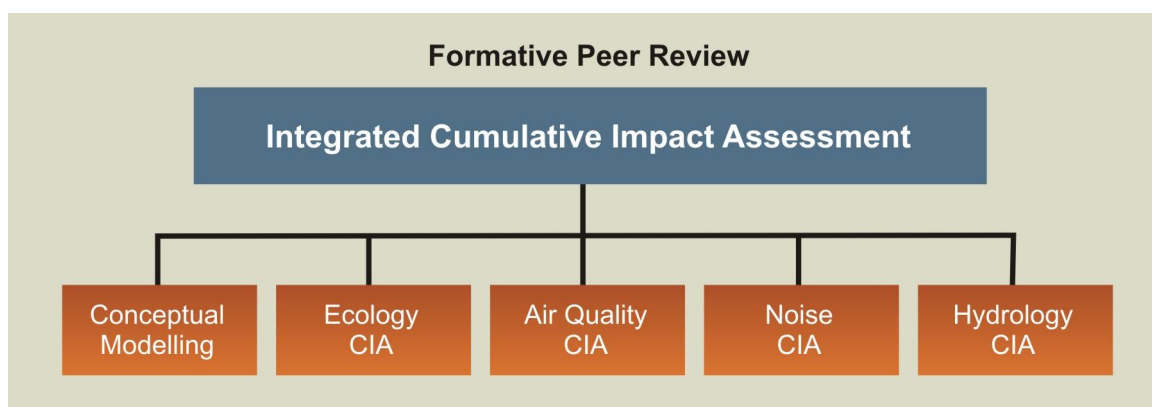


Figure 11 Integrated CIA Approach

BHP Billiton Iron Ore will seek to align with current research that is being undertaken in the field of CIA, and leverage of the lessons learned from recent projects in this field. This will include the Department of Water's Cumulative Impacts for Water in Mining project.

Key outputs of the CIA will include:

- Literature review, including data consolidation and data and gap analysis;
- CIA framework(s);
- Regional conceptual model(s) (for key species);
- Regional level CIA(s) (for key species);
- Asset level conceptual model(s);
- Asset level CIA (case study);
- Interpretation of the results in relation to environmental outcomes;
- Inputs for Regional Management Strategies; and
- Future opportunities to improve CIA.

BHP Billiton Iron Ore's AMF (refer Section 6.3) will be applied to address the uncertainty associated with the CIA. The process will be iterative; a continual improvement model will be

applied. It is proposed the CIA undertaken for the Strategic Proposal will be calibrated and validated at the Derived Proposal stage via the input of additional site-specific data. This iterative process will continue throughout the life of operations via the input of site-specific monitoring data.

An effective Governance framework will be applied to provide confidence around the success of the CIA. This will include consultation with decision-making authorities (DMAs) and the community. Relevant experts will provide Peer Review throughout the assessment process.

7.2.3 KEY PRELIMINARY FACTORS

The following tables (Table 2 to Table 7) summarises the policy context that will be followed and proposed studies scope for the key preliminary EPA Factors. These tables should be read in conjunction with Section 6 and the introductory text of Section 7. The objectives for the SPEA are the EPA objectives as published in EPA (2013).

Table 2 Policy Context and Proposed Studies for Flora and Vegetation

Flora and Vegetation		
	EPA Objective (EPA 2013)	To maintain representation, diversity, viability and ecological function at the species, population and community level.
Policy and Guidance Context	Cwlth	<ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999;</i> • <i>Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities 2012); and</i> • <i>Approved Conservation Advice for relevant species (Threatened Species Scientific Committee 2008a; 2008b).</i>
	State	<ul style="list-style-type: none"> • <i>Environmental Protection Act 1986;</i> • <i>Conservation and Land Management Act 1984;</i> • <i>Wildlife Conservation Act 1950;</i> • <i>Agriculture and Related Resources Protection Act 1976;</i> • <i>Bush Fires Act 1954;</i> • <i>Land Administration Act 1997;</i> • <i>WA Environmental Offsets Policy (Government of Western Australia 2011);</i> • <i>Position Statement No. 2: Environmental Protection of Native Vegetation (EPA 2000a);</i> • <i>Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002);</i> • <i>Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c);</i> • <i>Position Statement No. 9: Environmental Offsets (EPA 2006a);</i> • <i>Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b);</i> • <i>Guidance Statement No. 19: Environmental Offsets-Biodiversity (EPA 2008b);</i> • <i>Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2004d);</i>

		<ul style="list-style-type: none"> National Strategy for the Conservation of Australia's Biological Diversity (Department of the Environment, Sport and Territories 1996); and Managing Groundwater Dependent Ecosystems of the Pilbara (DoW 2011a).
Scope of Proposed Investigations/Assessments	Evaluate existing environment	<ul style="list-style-type: none"> Describe the methodologies used and provide an overview of the results of baseline flora and vegetation assessments undertaken by BHP Billiton Iron Ore and others in the region (where relevant and available), to consolidate the information provided by historical datasets for use in the impact assessment; Develop a vegetation map across BHP Billiton Iron Ore tenure within the region to spatially consolidate historical datasets and help to assess the significance of vegetation associations and potential impact; Identify relevant significant flora species, communities and groundwater dependent ecosystems (vegetation), including wetlands, within the region to help identify areas of significance and potential impact; Undertake predictive habitat mapping for targeted species to inform the assessment of impacts to biodiversity at a regional scale. The associated levels of uncertainty for this map will be identified; and Use predictive modelling to map patterns of biodiversity (e.g. hotspots) and identify levels of conservation significance throughout the Pilbara, to help address current information gaps and to inform the assessment of impacts to biodiversity at a regional scale. The associated levels of uncertainty for this map will be identified.
	Assess potential impacts	<ul style="list-style-type: none"> Assess against EPA Objective and policy context; and Undertake an assessment of the regional context and extent of impacts based on indicative footprints and regional vegetation mapping, predictive habitat mapping and predictive biodiversity mapping (as described above), including an assessment of the cumulative impacts.
	Establish outcomes of management	<ul style="list-style-type: none"> Establish outcome-based management objectives for flora and vegetation; Define AMA including the Management Hierarchy (Figure 9); and Develop the Biodiversity Regional Management Strategy (Section 6.3.2).

Table 3 Policy Context and Proposed Studies for Terrestrial Fauna

Terrestrial Fauna	
EPA Objective (EPA 2013)	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Cwlth	<ul style="list-style-type: none"> <i>Environment Protection and Biodiversity Conservation Act 1999</i>; <i>Environment Protection and Biodiversity Conservation Act 1999</i> Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities 2012); Approved Conservation Advice for relevant species (Threatened Species Scientific Committee 2008c; 2008d); Threat Abatement Plans for relevant species (Department of the Environment, Water, Heritage and the Arts 2006; 2008a; 2008b; 2008c);

Policy and Guidance Context		<ul style="list-style-type: none"> • Survey guidelines for relevant species (Department of the Environment, Water, Heritage and the Arts 2010; Department of Sustainability, Environment, Water, Population and Communities 2011a; 2011b); and • Night Parrot (<i>Pezoporus occidentalis</i>) Interim Recovery Plan for Western Australia 1996 to 1998 (Blyth, J. 1996).
	State	<ul style="list-style-type: none"> • <i>Environmental Protection Act 1986</i>; • <i>Wildlife Conservation Act 1950</i>; • WA Environmental Offsets Policy (Government of Western Australia 2011); • Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002); • Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); • Position Statement No. 9: Environmental Offsets (EPA 2006a); • Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b); • Guidance Statement No. 19: Environmental Offsets-Biodiversity (EPA 2008b); • Guidance Statement No. 20: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA 2009a); • Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004e); and • Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA and Department of Environment and Conservation 2010).
Scope of Proposed Investigations/Assessments	Evaluate existing environment	<p>Vertebrate fauna</p> <ul style="list-style-type: none"> • Describe the methodologies used and provide an overview of the results of baseline fauna assessments undertaken by BHP Billiton Iron Ore and others in the region (where relevant and available), to consolidate the information provided by historical datasets for use in the impact assessment; • Identify relevant significant fauna species within the region to help identify areas of significance and potential impact; • Develop a distribution map for terrestrial vertebrate fauna across BHP Billiton Iron Ore tenure within the region to spatially consolidate historical datasets and help to assess potential impact; • Undertake predictive habitat mapping for targeted species to inform the assessment of impacts to biodiversity at a regional scale. The associated levels of uncertainty for this map will be identified; and • Use predictive modelling to map patterns of biodiversity and identify levels of conservation significance throughout the Pilbara, to help address current information gaps and to inform the assessment of impacts to biodiversity at a regional scale. The associated levels of uncertainty for this map will be identified.

Scope of Proposed Investigations/Assessments		<p>Short range endemic fauna</p> <ul style="list-style-type: none"> Describe the methodologies used and provide an overview of the results of baseline fauna assessments for SRE fauna undertaken by BHP Billiton Iron Ore and others in the region (where relevant and available), to consolidate the information provided by historical datasets for use in the impact assessment; Develop a distribution map for targeted short range endemic fauna across BHP Billiton Iron Ore tenure within the region to spatially consolidate historical datasets and help to assess potential impact; Correlate biophysical parameters with known short range endemic fauna species records and habitat distributions in the region, to inform habitat mapping; Develop a habitat map for SRE fauna habitats across BHP Billiton Iron Ore tenure within the region to spatially consolidate historical datasets and help to assess potential impact; and Undertake predictive habitat mapping for SRE fauna habitats to inform the assessment of impacts to biodiversity at a regional scale. The associated levels of uncertainty for this map will be identified.
	Assess potential impacts	<p>Vertebrate fauna</p> <ul style="list-style-type: none"> Assess against EPA Objective and policy context; and Undertake an assessment of the regional context and extent of impacts based on indicative footprints, habitat mapping and predictive biodiversity mapping (as described above), including an assessment of the cumulative impacts. <p>Short range endemic fauna</p> <ul style="list-style-type: none"> Assess against EPA Objective and policy context; and Undertake an assessment of the regional context and extent of impacts based on indicative footprints and habitat mapping (as described above), including an assessment of the cumulative impacts.
	Establish outcomes of management	<ul style="list-style-type: none"> Establish outcome-based management objectives for terrestrial fauna; Define AMA including the Management Hierarchy (Figure 9); and Develop the Biodiversity Regional Management Strategy (Section 6.3.2).

Table 4 Policy Context and Proposed Studies for Subterranean Fauna

Subterranean Fauna	
EPA Objective (EPA 2013)	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Policy Context	Cwlth <ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999</i>; and • <i>Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy</i> (Department of Sustainability, Environment, Water, Population and Communities 2012).
	State <ul style="list-style-type: none"> • <i>Environmental Protection Act 1986</i>; • <i>Rights in Water and Irrigation Act 1914</i>; • <i>Country Areas Water Supply Act 1947</i>; • <i>Wildlife Conservation Act 1950</i>; • Guidance Statement No. 54: Consideration of Subterranean Fauna in Groundwater Caves during Environmental Impact Assessment in Western Australia (EPA 2003a); and • Draft Guidance Statement No. 54a: Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (EPA 2007a).
Scope of Proposed Investigations/Assessments	Evaluate existing environment <ul style="list-style-type: none"> • Describe the methodologies used and provide an overview of the results of baseline studies for subterranean fauna undertaken by BHP Billiton Iron Ore and others in the region (where relevant and available), to consolidate the information provided by historical datasets for use in the impact assessment; • Correlate biophysical and geological parameters with known subterranean fauna species records and habitat distributions in the region, to inform habitat mapping; and • Develop a habitat map of broad subterranean fauna habitats within the region to spatially consolidate historical datasets and help to assess potential impact.
	Assess potential impacts <ul style="list-style-type: none"> • Assess against EPA Objective and policy context; and • Undertake an assessment of the regional context and extent of impacts based on indicative footprints and habitat mapping (as described above), including an assessment of the cumulative impacts.
	Establish outcomes of management <ul style="list-style-type: none"> • Establish outcome-based management objectives for subterranean fauna; • Define AMA including the Management Hierarchy (Figure 9); • Develop the Biodiversity Regional Management Strategy (Section 6.3.2); and • Develop the Water Regional Management Strategy (Section 6.3.2).

Table 5 Policy Context and Proposed Studies for Hydrological Processes and Inland Waters Environmental Quality (with a Focus on Surface Water and Groundwater)

Hydrological Processes and Inland Waters Environmental Quality	
EPA Objective (EPA 2013)	<p>To maintain the hydrological regimes of surface water so that existing and potential uses, including ecosystem maintenance, are protected; and</p> <p>To maintain the quality of groundwater and surface water, sediment and/or biota so that the environmental values, both ecological and social, are protected.</p>
Policy and Guidance Context	<p>Cwlth</p> <ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999;</i> • <i>Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities 2012); and</i> • National Water Initiative (Signed on 25 June 2004).
	<p>State</p> <ul style="list-style-type: none"> • <i>Environmental Protection Act 1986;</i> • <i>Rights in Water and Irrigation Act 1914;</i> • <i>Country Areas Water Supply Act 1947;</i> • <i>Agriculture and Related Resources Protection Act 1976;</i> • <i>Water Agencies (Powers) Act 1984;</i> • Iron Ore (Marillana Creek) Agreement 1991; • Position Statement No. 4: Environmental Protection of Wetlands (EPA 2004f); • Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); • Position Statement No. 8: Environmental Protection in Natural Resource Management (EPA 2005); • Pilbara Groundwater Allocation Plan (Draft). Water Resource Allocation and Planning Report series (DoW 2012a); • Groundwater-dependent ecosystems: guideline for assessing licences in the Pilbara, Appendix B. In: Pilbara Groundwater Allocation Plan (DoW 2012a); • Pilbara Water in Mining Guideline (DoW 2009); • Draft guidance for environmental and water assessment relating to mining operations in the Fortescue Marsh Area (DoW, Department of Environment and Conservation & OEPA 2011); • Water Quality Protection Guidelines for Mining and Mineral Processing (Water and Rivers Commission 1999); • Guidelines for Preparing Mine Closure Plans (DMP & EPA 2011); • Hydrogeological Investigations of Pilbara Groundwater Resources. Managing Groundwater Dependent Ecosystems of the Pilbara (DoW 2011b); • Western Australian Water in Mining Guideline (Draft) (DoW 2012b);

		<ul style="list-style-type: none"> • Mine Void Water Resource Issues in Western Australia (Johnson & Wright 2003); • Leading practice sustainable development program for the mining industry. Water Management (DRET 2008); and • Environmental water policy for Western Australia, Department of Water (DoW in prep).
Scope of Proposed Investigations/Assessments	Evaluate existing environment	Surface water <ul style="list-style-type: none"> • Compile the methodologies used and provide an overview of the results of baseline surface water studies including background literature, climatic, stream flow and water quality and flow monitoring data undertaken by BHP Billiton Iron Ore and others in the region (where available); • Identify primary water flow paths; • Describe methodology and complete a hydrological surface water and ground water evaluation and modelling study to understand potential surface water systems in the region; • Develop a map of surface water assets occurring in the region to inform the development of the CIA; and • Develop conceptual surface water and environmental interface models for key environmental asset types in the region to inform the development of the CIA.
		Groundwater <ul style="list-style-type: none"> • Compile the methodologies used and provide an overview of the results of baseline groundwater studies including hydrogeological, quantity and quality information based on available drilling and pump test programs, and any other hydrogeological and/ or monitoring information undertaken by BHP Billiton Iron Ore and others (where available), to characterise groundwater systems and surface water and groundwater dependent interfaces; • Develop conceptual groundwater and environmental interface models for key environmental asset types in the region to inform the development of the CIA; and • Characterise key aquifers in the region to inform the development of the CIA.
	Assess potential impacts	Surface water <ul style="list-style-type: none"> • Assess against EPA Objectives and policy context; and • Undertake an assessment of the regional context and risk of predicted impacts on key surface water resources and surface water dependent environmental assets including an assessment of the cumulative impacts.
		Groundwater <ul style="list-style-type: none"> • Assess against EPA Objectives and policy context; and • Undertake an assessment of the regional catchment context and risk of predicted impacts (for example pit lakes) on groundwater resources and groundwater dependent environmental assets, including an assessment of the cumulative impacts of the Strategic Proposal with other approved developments in the region.

	<p>Establish outcomes of management</p>	<ul style="list-style-type: none"> • Establish outcome-based management objectives for surface water and groundwater; • Define AMA including the Management Hierarchy (Figure 9); and • Develop the Water Regional Management Strategy (to include Central Pilbara, Northern Pilbara and Eastern Pilbara Water Management Strategies; Section 6.3.2).
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Table 6 Policy Context and Proposed Studies for Rehabilitation and Closure

Rehabilitation and Closure		
	<p>EPA Objective (EPA 2013)</p>	<p>To ensure that premises can be closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.</p>
<p>Policy and Guidance Context</p>	<p>Cwlth</p>	<ul style="list-style-type: none"> • Leading Practice Sustainable Development Program for the Mining Industry (DITR 2006); and • National Strategy for Ecologically Sustainable Development (Department of Sustainability, Environment, Water, Population and Communities 1992).
	<p>State</p>	<ul style="list-style-type: none"> • <i>Environmental Protection Act 1986</i>; • <i>Conservation and Land Management Act 1984</i>; • <i>Agriculture and Related Resources Protection Act 1976</i>; • Guidelines for Preparing Mine Closure Plans (Department of Mines and Petroleum (DMP) & EPA 2011); • Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); • Position Statement No. 6: Towards Sustainability (EPA 2004g); • Position Statement No. 8: Environmental Protection in Natural Resource Management (EPA 2005); • Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b); • Guidelines for the Safe Design and Operating Standards for Tailings Storage (Department of Minerals and Energy 1999); and • Western Australian State Sustainability Strategy (Government of Western Australia 2003).
<p>Scope of Proposed Investigations/Assessments</p>	<p>Evaluate existing environment</p>	<ul style="list-style-type: none"> • Outline of closure and rehabilitation research and monitoring programs undertaken by BHP Billiton Iron Ore in the region.
	<p>Assess potential impacts</p>	<ul style="list-style-type: none"> • Assess risks against EPA Objective and policy context; and • Undertake an assessment of the regional context and risk of predicted impacts (for example, pit lakes) of closure and rehabilitation methods, including an assessment of the cumulative impacts of the Strategic Proposal with other approved developments in the region.

	<p>Establish outcomes of management</p>	<ul style="list-style-type: none"> Establish outcome-based management objectives for rehabilitation and closure; Define AMA including the Management Hierarchy (Figure 9); and Develop the Rehabilitation and Closure Regional Management Strategy (Section 6.3.2).
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Table 7 Policy Context and Proposed Studies for Residual Impacts and Risk Management (Offsets)

Residual Impacts and Risk Management Measures		
	<p>EPA Objective (EPA 2013)</p>	<p>To counterbalance any significant residual environmental impacts and risks through the application of offsets.</p>
<p>Policy and Guidance Context</p>	<p>Cwllth</p>	<ul style="list-style-type: none"> <i>Environment Protection and Biodiversity Conservation Act 1999</i>; and <i>Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy</i> (Department of Sustainability, Environment, Water, Population and Communities 2012).
	<p>State</p>	<ul style="list-style-type: none"> <i>Environmental Protection Act 1986</i>; <i>Conservation and Land Management Act 1984</i>; <i>WA Government Environmental Offset Policy 2011</i>; <i>Draft Environmental Assessment Guideline for Environmental Offsets</i> (EPA 2012b); Environmental Protection Bulletin No. 1: <i>Environmental Offsets – Biodiversity</i> (EPA 2010c); Guidance Statement No. 55: <i>Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process</i> (EPA 2003b); EPA Position Statement 9 (Environmental Offsets); and EPA Guidance 19 (Environmental Offsets – Biodiversity).
<p>Scope of Proposed Investigations/Assessments</p>	<p>Evaluate existing environment</p>	<ul style="list-style-type: none"> Consolidate flora, vegetation and habitat mapping detailed in Flora and Vegetation and Terrestrial Fauna scopes.
	<p>Assess potential impacts</p>	<ul style="list-style-type: none"> Undertake an assessment of the regional context and extent of impacts based on indicative footprints and regional vegetation and habitat mapping including an assessment of the cumulative impacts; Assess the residual impacts following the implementation of management strategies outlines in Section 6; and Assess risks against EPA Objective and policy context.
	<p>Establish outcomes of management</p>	<ul style="list-style-type: none"> Establish outcome-based management objectives for offsets; Define AMA including the Management Hierarchy (Figure 9); and Develop the Offsets Strategy (Section 6.3.1.3).

7.2.4 OTHER FACTORS

The following tables (Table 8 to Table 10) summarises the policy context and proposed studies scope for other EPA Factors. These tables should be read in conjunction with the introductory text in Section 6 and all of Section 7.

Table 8 Policy Context and Proposed Studies for Terrestrial Environmental Quality and Landforms

Terrestrial Environmental Quality and Landforms	
EPA Objective (EPA 2013)	<p>To maintain the quality of land and soils so that the environment values, both ecological and social, are protected; and</p> <p>To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.</p>
Policy and Guidance Context	<p>Cwlth</p> <ul style="list-style-type: none"> Leading Practice Sustainable Development Program for the Mining Industry (DITR 2006); and Leading Practice Sustainable Development Program for the Mining Industry - Managing Acid and Metalliferous Drainage (DITR 2007).
	<p>State</p> <ul style="list-style-type: none"> <i>Environmental Protection Act 1986;</i> <i>Conservation and Land Management Act 1984;</i> <i>Agriculture and Related Resources Protection Act 1976;</i> Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); Position Statement No. 8: Environmental Protection in Natural Resource Management (EPA 2005); and Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b).
Scope of Proposed Investigations/Assessments	<p>Evaluate existing environment</p> <ul style="list-style-type: none"> Describe methodologies used and provide an overview of results of baseline studies on soil types, topography and geochemistry, taking into consideration of acid and metalliferous drainage risk, waste characterisation and erosion modelling, undertaken by BHP Billiton Iron Ore and others in the region (where available).
	<p>Assess potential impacts</p> <ul style="list-style-type: none"> Assess against EPA Objective and policy context; Assessment of the potential impacts associated with soil and geochemistry that are to be managed throughout the life of the Strategic Proposal; and Undertake Landscape and Visual Impact Assessment to assess potential impacts on landforms.
	<p>Establish outcomes of management</p> <ul style="list-style-type: none"> Establish outcome-based management objectives for terrestrial environmental quality and landforms; Define AMA including the Management Hierarchy (Figure 9); and Develop the Rehabilitation and Closure Regional Management Strategy (Section 6.3.2).

Table 9 Policy Context and Proposed Studies for Air Quality

Air Quality		
EPA Objective (EPA 2013)		To maintain air quality for the protection of the environment and human health and amenity.
Policy and Guidance Context	Cwlth	<ul style="list-style-type: none"> • <i>Clean Energy Act 2011</i>; • <i>Energy Efficiency Opportunities Act 2006</i>; • Guidelines for Air Quality (World Health Organisation 2005); • National Environment Protection Measure (NEPM) for Ambient Air Quality (as varied) August 2003 (National Environment Protection Council 1998); • NEPM: Air Toxics December 2004; • NEPM: National Pollutant Inventory [as varied] November 2008; and • NEPM: Diesel Vehicle Emissions June 2001.
	State	<ul style="list-style-type: none"> • <i>Environmental Protection Act 1986</i>; • Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); and • Guidance Statement No. 18: Prevention of Air Quality Impacts from Land Development Sites (EPA 2000b).
Scope of Proposed Investigations/Assessments	Evaluate existing environment	<ul style="list-style-type: none"> • Complete a desktop study to review existing air quality information available within the region; and • Identify sensitive receptors in the region.
	Assess potential impacts	<ul style="list-style-type: none"> • Assess against EPA Objective and policy context; and • Undertake an assessment of the regional context and extent of predicted impacts of air emissions, including an assessment of cumulative impacts.
	Establish outcomes of management	<ul style="list-style-type: none"> • Establish outcome-based management objectives for air quality; • Define AMA including the Management Hierarchy (Figure 9); and • Develop a Regional Management Strategy which includes air quality (Section 6.3.2).

Table 10 Policy Context and Proposed Studies for Amenity (with a Focus on Noise and Visual Amenity)

Amenity		
EPA Objective (EPA 2013)		To ensure that impacts to amenity are reduced as low as reasonably practicable.
	Cwlth	<ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999</i>.
	State	<ul style="list-style-type: none"> • <i>Environmental Protection Act 1986</i>; • <i>Environmental Protection (Noise) Regulations 1997</i>; • <i>Mining Act 1978</i>; • Draft Guidance Statement No. 8: Environmental Noise (EPA 2007b);

Policy and Guidance Context		<ul style="list-style-type: none"> • State Planning Policy No. 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning (Western Australian Planning Commission (WAPC) 2009); • State Planning Policy No. 2: Environment and Natural Resource Policy for Western Australia (WAPC 2003); • Position Statement No. 5: Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004c); • Shire of East Pilbara Local Planning Strategy; • Shire of East Pilbara Town Planning Scheme; and • Town of Port Hedland Town Planning Scheme.
Scope of Proposed Investigations/Assessments	Evaluate existing environment	<p>Noise</p> <ul style="list-style-type: none"> • Complete a desktop study to review existing noise information available within the region including baseline conditions; and • Identify sensitive receptors in the region.
		<p>Visual Amenity</p> <ul style="list-style-type: none"> • Describe the methodologies used and provide an overview of results of baseline studies on the visual landscape undertaken by BHP Billiton Iron Ore and others (where available); and • Identify locally or regionally significant landforms within the region.
	Assess potential impacts	<p>Noise</p> <ul style="list-style-type: none"> • Assess against EPA Objective and policy context; and • Undertake an assessment of the regional context and extent of predicted impacts on the auditory environment, including an assessment of cumulative impacts.
		<p>Visual Amenity</p> <ul style="list-style-type: none"> • Assess against EPA Objective and policy context; • Assess potential impacts on visual amenity of the local area in accordance with Visual Landscape Planning in Western Australia (Department of Planning and Infrastructure 2007) or relevant standards at the time of proposal; and • Assess cumulative impacts of the Strategic Proposal on regional landscape character.
	Establish outcomes of management	<ul style="list-style-type: none"> • Establish outcome-based management objectives for noise and visual amenity; • Define AMA including the Management Hierarchy (Figure 9); and • Develop a Regional Management Strategy that includes noise (Section 6.3.2).

8 STAKEHOLDER ENGAGEMENT

8.1 OVERVIEW

BHP Billiton Iron Ore is committed to engaging regularly, openly and honestly with people affected by their operations, and taking their views and concerns into account in decision making. Further, BHP Billiton Iron Ore aspires to continually improve its environmental management practices in collaboration with its stakeholders and local communities.

BHP Billiton Iron Ore has established relationships and ongoing engagement mechanisms that enable regular dialogue with stakeholders interested in or potentially impacted by existing and future operations in the Central Pilbara. Recent community research suggests that stakeholders and the community generally perceive BHP Billiton Iron Ore staff as being accessible and are satisfied with the level of communication (BHP Billiton Iron Ore 2013a; 2013b). Therefore, the stakeholder engagement program is designed to utilise and build on existing engagement and communication practices for the purposes of the SPEA process.

8.1.1 GOALS FOR STAKEHOLDER ENGAGEMENT

To facilitate the delivery of the Strategic Proposal BHP Billiton's goals for strategic engagement include:

- Develop, maintain and/or improve relationships between BHP Billiton Iron Ore and its stakeholders;
- Ensure the forum for public debate on the SPEA is well informed;
- Support the smooth running of the assessment process by providing opportunity for stakeholder input into SPEA, including where appropriate, a chance to help make and carry out key decisions; and
- Provide an informed basis for BHP Billiton Iron Ore business decisions.

Specific objectives and evaluation mechanisms have been developed to track and monitor progress towards meeting these goals.

8.1.2 STAKEHOLDER ENGAGEMENT PLAN

BHP Billiton Iron Ore has developed a comprehensive Stakeholder Engagement Plan (SEP) to support appropriate stakeholder engagement for the SPEA (BHP Billiton Iron Ore 2012).

The SEP includes an initial stakeholder identification, analysis and issues mapping, based on BHP Billiton's local knowledge of the stakeholder environment and its past consultation programs. It also articulates the detail of the stakeholder engagement program and the specific communication and consultation techniques that will be used over the course of the SPEA.

The SEP will be periodically updated throughout the SPEA to reflect emerging stakeholders and issues and to respond to feedback from stakeholders about the engagement process. The SEP will be formally reviewed and updated annually to reflect maturities in stakeholder management, engagement practices and learnings.

8.2 SUMMARY OF ENGAGEMENT UNDERTAKEN

BHP Billiton has undertaken a targeted program of engagement to inform the preparation of this ESD. The engagement activities and outcomes are shown in Table 11, together with the

BHP Billiton Iron Ore's response and cross-reference to additional information included in this document.

8.3 ENGAGEMENT PROGRAM

8.3.1 OPPORTUNITIES FOR STAKEHOLDER AND PUBLIC INPUT

BHP Billiton Iron Ore will provide opportunities and forums to inform stakeholders and the local community about what is being proposed, provide clarification and answer any questions. BHP Billiton Iron Ore will also conduct a consultation program to seek input and feedback from stakeholders and Pilbara communities when preparing its Strategic Proposal and future Derived Proposals, and as part of undertaking the required environmental studies and management plans. In addition, there are a number of formal opportunities provided by the EPA for public input into the assessment process and BHP Billiton will actively promote these opportunities to its stakeholders.

BHP Billiton Iron Ore has established relationships with key stakeholders and a range of mechanisms already in place to support communication and consultation. The key mechanisms that will be used to support consultation on the SPEA are:

- Presentations to Community Consultative Groups in Newman and Port Hedland;
- Regular briefings to local governments;
- Meetings with other local organisations and groups;
- Distribution of community newsletters and SPEA information materials;
- Community offices in Newman and Port Hedland;
- Meetings with Traditional Owners; and
- Community relations staff servicing Newman and Port Hedland.

The timing of consultation with stakeholders will be linked to the key opportunities for public input at milestones in the SPEA process, as shown earlier in Figure 4.

There will be multiple opportunities for stakeholders to discuss and influence the Company's Strategic Proposal as it develops. The results of all stakeholder engagement and consultation will be reported to the SPEA project team and governing body, to inform decision making for the SPEA. The resultant decisions will also be fed back to stakeholders using established communication channels, so that they can see how their input has been considered in decision making.

BHP Billiton Iron Ore has been part of the Pilbara community for more than four decades and recognises that the regional population will change over time, as will the views of stakeholders. Therefore the Company's stakeholder engagement framework applies a responsive approach to stakeholder engagement to meet the changing needs of the Company and its stakeholders.

Following the SPEA process, BHP Billiton Iron Ore's will continue to engage with the Pilbara community on a regular and ongoing basis during the Derived Proposal process. This will enable the Company to identify emerging issues early and allows for effective management, mitigation or mutually beneficial opportunities to be addressed. By proactively managing the risks and opportunities associated with the preferred investment alternative in consultation with stakeholders, the Company is well positioned to maintain its social licence to operate and strengthen partnerships and relationships.

Table 11 Summary of Engagement Outcomes

Stakeholder	Engagement Activity and Date	Purpose of Engagement	Issues or Concerns Raised	BHP Billiton Iron Ore Response & Action	ESD Section
Newman Community Consultative Group (CCG)	Presentation at CCG meeting 30/04/2012	Introduce the SPEA.	No specific issues raised, general questions and discussion regarding scope and process of the SPEA.	Newman CCG to continue to be kept updated at key milestones in the approval process.	Not applicable.
DoE and OEPA	Site visit (4 days) 29/05/2012 to 01/06/2012	Site familiarisation tour of BHP Billiton Iron Ore's Pilbara operations.	Cumulative impacts (especially groundwater and Fortescue Marsh). Biodiversity. Stakeholder engagement.	Continue to keep DoE and OEPA updated on progress on topics raised.	Section 7.2.2 Cumulative Impact Assessment. Section 8.2 Stakeholder Engagement.
DoE and OEPA	Environmental Values and Scoping Workshop 18/06/2012	To workshop the methodology and approach for determining and agreeing the Environmental Values associated with the strategic environmental assessments.	Factors requiring conditions. The need for and approach to offsets. Timing of State and Commonwealth approvals processes. Derived Proposal scope, detail and peer review. At a later stage, applying conditions to existing operations. Develop consistent messaging between approvals processes.	The terms 'Regions' 'Landscapes' and 'Landforms' to be defined with consideration given the community and traditional owner view point. Develop conceptual model When Strategic Assessment Agreement is signed, develop consistent messages that link to DoEs messages. Finalise the project plan based on the discussion.	Conceptual model development addressed in Section 7.2.2 Cumulative Impact Assessment. Section 6 Offsets
Rangelands Natural Resource Management (NRM)	Meeting 02/07/2012	Discuss various initiatives in the project area and/or pastoral leases	Discussion on value/asset identification and ranking	BHP Billiton will participate in regional workshops to rank values/assets. Rangelands NRM to be kept updated of initiatives relevant to SPEA and pastoral lease management.	Not applicable.
DoE and OEPA	Workshop 01/08/2012	Work towards alignment between the three organisations with respect to: (1) collective objectives; (2) key	Overarching goal determined. Critical issues listed. Discussion of integrating control actions and the need for offsets.	Ongoing engagement throughout the SPEA.	Not applicable.

Stakeholder	Engagement Activity and Date	Purpose of Engagement	Issues or Concerns Raised	BHP Billiton Iron Ore Response & Action	ESD Section
		technical studies; and (3) integrating control actions and offsets where appropriate.			
Care for Hedland	Meeting 13/08/12	Overview of SPEA process moving forward and opportunities for community to be consulted during PER process and make comment.	No specific issues raised, general questions and discussion regarding scope and process of the SPEA.	No actions.	Not applicable.
Port Hedland CCG	Presentation at CCG meeting 05/07/12	Provide an overview of the SEA and draw attention to the opportunity for public comment.	No specific issues raised, general questions and discussion regarding scope and process of the SPEA.	No actions.	Not applicable.
Town of Port Hedland	Email	Courtesy email notifying Town of Port Hedland of SPEA referral to EPA, lodged on 6 July 2012.	Not applicable	No actions.	Not applicable.
Karlka Niyaparli Aboriginal Corporation	Presentation 12/9/12	Presentation to the Implementation Committee by the Environmental Approvals Team in relation to the Strategic Environmental Assessment that is currently being undertaken within the region	No specific issues raised, general questions and discussion regarding scope and process of the SPEA.	Regular briefings as required.	Not applicable.
OEPA	Briefing 03/10/2012	Briefing on SPEA status.	No specific issues raised, general questions and discussion regarding scope and process of the SPEA.	No actions.	Not applicable.
Rangelands NRM	Meeting 03/10/2012	Update on SPEA and NRM initiatives.	Discussion on values ranking methodology.	Participation in workshop on 1/11/12.	Not applicable.
Rangelands NRM	Workshop participation	Identify assets and create an asset register for the	Importance of a considered asset ranking process.	Asset ranking will be considered in the identification of key assets, the	Section 6.3 Adaptive

Stakeholder	Engagement Activity and Date	Purpose of Engagement	Issues or Concerns Raised	BHP Billiton Iron Ore Response & Action	ESD Section
	1/11/12	region and define a list of criteria to identify those assets that are strong candidates for further investigation, and potential future investment.	Process and outcomes used in workshop should be considered in the SEA.	CIA, and will inform any offsets strategy.	Management Framework. Section 7.2.2 Cumulative Impact Assessment.
Shire of East Pilbara Town of Port Hedland	Letter 03/12/2012	Update on SPEA.	Not applicable.	Not applicable.	Not applicable.
DPaW	Meeting 19/12/2012	Meeting to discuss the cumulative impact assessment methodology and present an opportunity for DPaW to provide input and advice, and discuss any concerns.	No issues/concerns raised with respect to the CIA methodology. Discussion regarding recent work defining the key biodiversity assets of the Pilbara.	BHP Billiton to meet with DPaW again to discuss its strategy for developing the asset list.	Section 7.2.2 Cumulative Impact Assessment.

8.3.2 POTENTIAL STAKEHOLDER ISSUES TO BE INVESTIGATED AS PART OF CONSULTATION

Preliminary desktop research has identified potential concerns and issues associated with the Strategic Proposal that will be explored further with key stakeholders during consultation. These include:

- **The SPEA process:** Understanding the assessment process and opportunities for public input;
- **Environmental issues and impacts:** Discussing the environmental issues identified, scope of the impact assessment, and proposed management approaches;
- **Social issues and impacts:** Understanding the social impacts that will be considered as part of the SPEA;
- **Cumulative and 'big picture' view:** Scale of future operations in the region, cumulative environmental and social impacts;
- **Consultation process:** Appropriate and meaningful consultation, helping stakeholders 'keep up' with what is happening due to the speed or complexity and long-term engagement mechanisms;
- **Trust:** Appropriate governance and accountability mechanisms; and
- **Expectations:** Any growth plans are subject to market conditions and all relevant government, regulatory and BHP Billiton board approvals.

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10 APPENDIX

APPENDIX A

KEY GUIDANCE MATERIAL

Key Guidance Material

BHP Billiton Iron Ore will consider the requirements of legislation and relevant environmental policies and guidelines during the SPEA process. Subsequent Derived Proposals will consider legislation, policies, guidelines and industry standards current at the time of referral.

Key EPA position statements, EPA guidance statements and relevant environmental guidelines and Codes of Practice potentially applicable to the proposed Project are provided below.

Environmental Protection Bulletins

- Environmental Protection Bulletin No. 1: *Environmental Offsets – Biodiversity* (EPA 2010c); and
- Environmental Protection Bulletin No. 17: *Strategic and Derived Proposals* (EPA 2012a).

Position Statements

- Position Statement No. 2: *Environmental Protection of Native Vegetation* (EPA 2000a);
- Position Statement No. 3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (EPA 2002);
- Position Statement No. 4: *Environmental Protection of Wetlands* (EPA 2004f);
- Position Statement No. 5: *Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia* (EPA 2004c);
- Position Statement No. 6: *Towards Sustainability* (EPA 2004g);
- Position Statement No. 7: *Principles of Environmental Protection* (EPA 2004b);
- Position Statement No. 8: *Environmental Protection in Natural Resource Management* (EPA 2005); and
- Position Statement No. 9: *Environmental Offsets* (EPA 2006a).

Environmental Assessment Guidelines

- Environmental Assessment Guideline 1: *Defining a Proposal* (EPA 2009b);
- Draft Environmental Assessment Guideline for Environmental Offsets (EPA 2012b); and
- Environmental Assessment Guideline 6: *Timelines for Environmental Impact Assessment of Proposals* (EPA 2010a).

Guidance Statements

- Guidance Statement No. 6: *Rehabilitation of Terrestrial Ecosystems* (EPA 2006b);
- Draft Guidance Statement No. 8: *Environmental Noise* (EPA 2007b);
- Guidance Statement No. 18: *Prevention of Air Quality Impacts from Land Development Sites* (EPA 2000b);
- Guidance Statement No. 19: *Environmental Offsets – Biodiversity* (EPA 2008b);
- Guidance Statement No. 20: *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia* (EPA 2009a);
- Guidance Statement No. 33: *Environmental Guidance for Planning and Development* (EPA 2008a);
- Guidance Statement No. 41: *Assessment of Aboriginal Heritage* (EPA 2004a);

- Guidance Statement No. 51: *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004d);
- Guidance Statement No. 54: *Consideration of Subterranean Fauna in Groundwater Caves during Environmental Impact Assessment in Western Australia* (EPA 2003a);
- Draft Guidance Statement No. 54a: *Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia* (EPA 2007a);
- Guidance Statement No. 55: *Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process* (EPA 2003b);
- Guidance Statement No. 56: *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004e);
- *Guidelines for Preparing Mine Closure Plans* (DMP & EPA 2011); and
- Draft Guidance for Environmental and Water Assessment Relating to Mining Operations in the Fortescue Marsh Area (DoW, Department of Environment and Conservation and OEPA 2011).

WA Policies/Strategies

- *Water Quality Protection Guidelines (Nos. 1 – 11), Mining and Mineral Processing* (Water and Rivers Commission 1999);
- *Guidelines for the Safe Design and Operating Standards for Tailings Storage* (Department of Minerals and Energy 1999);
- *Western Australian State Sustainability Strategy* (Government of Western Australia 2003);
- *Environmental water policy for Western Australia* (in prep), Department of Water;
- *Pilbara Groundwater Allocation Plan. Water Resource Allocation and Planning Report series* (Department of Water 2012);
- *Shire of East Pilbara Local Planning Strategy* (Taylor Burrell Barnett Town Planning and Design 2004);
- *Shire of East Pilbara Town Planning Scheme No.4 District Zoning Scheme* (Department of Planning 2005);
- *State Planning Policy No. 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (WAPC 2009);
- *State Planning Policy No. 2: Environment and Natural Resource Policy for Western Australia* (WAPC 2003);
- *Western Australian Environmental Offsets Policy* (Government of Western Australia 2011);
- *Mine void water resource issues in Western Australia. Hydrogeological Record Series, Report HG 9.* Water and Rivers Commission, Perth, Australia. 93pp (Johnson and Wright 2003); and
- *Town of Port Hedland Town Planning Scheme No.5* (Department of Planning 2001).

National Policies/Strategies

- *Approved Conservation Advice for *Liasis olivaceus barroni* (Olive Python – Pilbara subspecies)* (Threatened Species Scientific Committee 2008c);
- *Approved Conservation Advice for *Pezoporus occidentalis* (Night Parrot)* (Threatened Species Scientific Committee 2008d);
- *Approved Conservation Advice for *Thryptomene wittweri* (Mountain Thryptomene)* (Threatened Species Scientific Committee 2008b);

- Australian Code for the Transport of Dangerous Goods by Road and Rail (Commonwealth of Australia 2007);
- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (SEWPaC 2012);
- National Environment Protection (Air Toxics) Measure (EPHC 2004);
- National Environment Protection (National Pollutant Inventory) (EPHC 2008);
- National Environment Protection (Diesel Vehicle Emissions) (EPHC 2001);
- National Water Initiative (Intergovernmental agreement signed at the COAG meeting on 25 June 2004);
- Leading Practice Sustainable Development Program for the Mining Industry (DITR 2006);
- Leading Practice Sustainable Development Program for the Mining Industry - Managing Acid and Metalliferous Drainage (DITR 2007);
- Leading Practice Sustainable Development Program for the Mining Industry. Water Management (DRET 2008);
- National Strategy for Ecologically Sustainable Development (SEWPaC 1992);
- National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth Department of the Environment, Sport and Territories 1996);
- National Environmental Protection Measures for Ambient Air Quality (National Environment Protection Council 1998);
- Night Parrot (*Pezoporus occidentalis*) Interim Recovery Plan for Western Australia 1996 to 1998 (Blyth 1996);
- Survey guidelines for Australia's threatened birds. (Department of the Environment, Water, Heritage and the Arts 2010);
- Survey guidelines for Australia's threatened mammals. EPBC Act survey guidelines 6.5. (SEWPaC 2011a);
- Survey guidelines for Australia's threatened reptiles. EPBC Act survey guidelines 6.6 (SEWPaC 2011b);
- Threat Abatement Plan for competition and land degradation by rabbits (Department of the Environment, Water, Heritage and the Arts 2008c);
- Threat Abatement Plan for predation by feral cats (Department of the Environment, Water, Heritage and the Arts 2008a);
- Threat Abatement Plan for Predation by the European Red Fox (Department of the Environment, Water, Heritage and the Arts 2008b);
- Threat Abatement Plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories (Department of the Environment, Water, Heritage and the Arts 2006); and
- Guidelines for Air Quality (World Health Organisation 2005).

Technical Guides

- Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA and Department of Environment and Conservation 2010);
- Australian Standard 1940 The Storage and Handling of Flammable and Combustible Liquids (Standards Australia 2004);
- *Guidelines for the Safe Design and Operating Standards for Tailings Storage* (Department of Minerals and Energy 1999);

- Groundwater-dependent ecosystems: guideline for assessing licences in the Pilbara, In: Pilbara groundwater allocation plan (DoW 2012a);
- Western Australian water in mining guideline (draft) (DoW 2012b); and
- Pilbara Water in Mining Guideline (DoW 2009).

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