



Environmental Protection Authority

EPA
REFERRAL
FORM
PROPONENT

Referral of a Proposal by the Proponent to the Environmental Protection Authority under Section 38(1) of the Environmental Protection Act.

PURPOSE OF THIS FORM

Section 38(1) of the *Environmental Protection Act 1986* (EP Act) provides that where a development proposal is likely to have a significant effect on the environment, a proponent may refer the proposal to the Environmental Protection Authority (EPA) for a decision on whether or not it requires assessment under the EP Act. This form sets out the information requirements for the referral of a proposal by a proponent.

Proponents are encouraged to familiarise themselves with the EPA's *General Guide on Referral of Proposals* [see Environmental Impact Assessment/Referral of Proposals and Schemes] before completing this form.

A referral under section 38(1) by a proponent to the EPA must be made on this form. A request to the EPA for a declaration under section 39B (derived proposal) must be made on this form. This form will be treated as a referral provided all information required by Part A has been included and all information requested by Part B has been provided to the extent that it is pertinent to the proposal being referred. Referral documents are to be submitted in two formats – hard copy and electronic copy. The electronic copy of the referral will be provided for public comment for a period of 7 days, prior to the EPA making its decision on whether or not to assess the proposal.

CHECKLIST

Before you submit this form, have you

	Yes	No
Completed all the questions in Part A (essential)	✓	
Completed all applicable questions in Part B	✓	
Included Attachment 1 – location maps	✓	
Included Attachment 2 – additional document the proponent wishes to provide (if applicable)	✓	
Included Attachment 3 – confidential information (if applicable)		✓
Enclosed the CD of all referral information, including spatial data and contextual mapping but excluding confidential information.	✓	

Following a review of the information presented in this form, please consider the following question. (A response is Optional)

DO YOU CONSIDER THE PROPOSAL REQUIRES FORMAL ENVIRONMENTAL IMPACT ASSESSMENT?

YES NO NOT SURE


IF YES, WHAT LEVEL OF ASSESSMENT?

ASSESSMENT ON PROPONENT INFORMATION

PUBLIC ENVIRONMENTAL REVIEW [STRATEGIC PROPOSAL]

PROPONENT DECLARATION (To be completed by the proponent)

I, GAVIN PRICE....., (*full name*) declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature 	Name (print) <u>GAVIN PRICE</u>
Position: <u>Head of Environment</u>	Company: <u>BHP Billiton Iron Ore Pty Ltd</u>
Date <u>25.6.2012</u>	

PART A - PROPONENT AND PROPOSAL INFORMATION

(All fields of this Part must be completed for this document to be treated as a referral)

1.1 PROPONENT

Name	BHP Billiton Iron Ore Pty Ltd.
Joint Venture parties (if applicable)	Not applicable
Postal Address	BHP Billiton Iron Ore Pty Ltd PO Box 7122 Cloisters Square PERTH WA 6850
Key proponent contact for the proposal <ul style="list-style-type: none"> • Name • Address • Phone • Email 	Gavin Price Head of Environment BHP Billiton Iron Ore 225 St Georges Terrace PERTH WA 6000 Telephone: (08) 6224 4024 Email: Gavin.H.Price@bhpbilliton.com
Consultant for the proposal (if applicable) <ul style="list-style-type: none"> • Name • Address • Phone • Email 	GHD Pty Ltd/360 Environment Pty Ltd Phil Baker 239 Adelaide Terrace, PERTH, WA, 6004 Telephone: (08) 6222 8615 Email: Phil.baker@ghd.com

1.2 PROPOSAL

Title	BHP Billiton Iron Ore Pilbara Expansion
Description	<p>BHP Billiton Iron Ore is expanding its operations in the Pilbara to meet increased global demand for iron ore. The Company's Western Australian Iron Ore Growth Master Plan is to more than double current production to 350 million tonnes per annum (mtpa) with an ultimate objective of 450 mtpa in the longer term. In support of its plans, the Company is seeking a regional strategic environmental assessment for its proposed future mines and associated infrastructure developments in the central Pilbara that will support its growth and maintain its production levels in the longer term.</p> <p>To help achieve this, BHP Billiton Iron Ore is investigating a number of new mine developments and supporting infrastructure, including bringing new ore bodies into operation from the Company's existing sites.</p> <p>BHP Billiton Iron Ore has been operating in the Pilbara for over 40 years and has a wealth of scientific, environmental and social data. Having articulated its Growth Master Plan, the Company is well placed to undertake a robust regional environmental assessment of its proposed future mine and infrastructure developments in the central Pilbara.</p> <p>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</p>

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.

Further details on BHP Billiton Iron Ore's approach to the assessment of the Strategic Proposal can be found in Attachment 1.

To achieve BHP Billiton Iron Ore's export targets will require the development of a number of new and existing mining operations and associated infrastructure. 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 1 and will be further defined within the scope of the Strategic Proposal.

It should be noted that while the Jinidi Iron Ore Project is identified in Figure 1, it was referred to the EPA for separate assessment in 2011 and is not part of the Strategic Proposal.

Whilst at this stage, detailed engineering has not yet been undertaken for any of the elements of the Strategic Proposal, it 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 1. Similar to current operations, conveyors may also be used to link adjacent operations or different tenements within operations.

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 which is the subject of this referral.

	<p>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.</p> <p>The Strategic Proposal specifically excludes:</p> <ul style="list-style-type: none"> • Existing BHP Billiton Iron Ore 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; • Development and operations at Port Hedland <p>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.</p> <p>In managing its existing and proposed operations, BHP Billiton Iron Ore regularly seeks approvals and amendments under both Part IV and V of the <i>Environmental Protection Act</i>. Such approvals are necessary to the business given continually changing external factors that influence the business. The Strategic Assessment process under the <i>Environmental Protection Act</i> allows BHP Billiton Iron Ore to maintain activities in respect of its existing operations, commence implementation of approved projects and progress approval processes for projects where planning and design is significantly developed. The Strategic Proposal process also provides flexibility for changes to be made to the Strategic Proposal during assessment and will allow BHP Billiton Iron Ore to respond to unexpected changes such as project scheduling driven by market demand.</p> <p>Given the anticipated timeframe for preparation, assessment and stakeholder consultation on the Strategic Proposal, Part IV and V of the <i>Environmental Protection Act</i> approvals may need to be sought in the interim. The statutory process permits such approvals being obtained. This is without impact to the integrity of the Strategic Proposal as the assessment of cumulative and indirect impacts of the Strategic Proposal necessarily includes those activities for which approvals have been sought.</p>
Extent (area) of proposed ground disturbance	<p>The indicative land clearance for individual greenfield operations is expected to range between approximately 3,000 to 9,000 hectares (ha), with a cumulative total of approximately 95,000 ha over the life of the growth plans contained in the Strategic Proposal. Linear infrastructure corridors for pipelines, road, rail and powerlines are typically 80 – 100 m in width, although not all this area is cleared.</p> <p>Proposed mine and infrastructure plans will be optimised and land clearance area defined during detailed design studies. These details will be presented as part of the referral of subsequent Derived</p>

	Proposals.
Timeframe in which the activity or development is proposed to occur. (Include start and finish dates where applicable)	This Proposal will run for the life of the Growth Master Plan. Therefore, no specific timeframe is to apply to this Proposal, given the operations will be progressively developed over at least 50 years.
Details of any staging of the proposal	BHP Billiton Iron Ore proposes that future proposed operations comprising the Strategic Proposal will be developed sequentially. Such operations will be referred and a request made that the referred proposal is declared a Derived Proposal.
Is the proposal a strategic proposal?	Yes
Is the proponent requesting a declaration that the proposal is a derived proposal? If so, provide the following information on the strategic assessment within which the referred proposal was identified - <ul style="list-style-type: none"> • Title of the strategic assessment • Ministerial Statement number 	No, but future development proposals arising from the Strategic Proposal are planned to be requested as Derived Proposals.
Indicate whether, and in what way, the proposal is related to other proposals in the region.	Proposed operations are located in the vicinity of existing operations and may share common infrastructure, such as rail. Ore will be exported via existing port facilities at Port Hedland or the recently EPA approved Outer Harbour Development at Port Hedland.
Does the proponent own the land on which the proposal is to be established? If not, what other arrangements have been established to access the land?	All the nominated operations are located on mining tenure for which BHP Billiton Iron Ore is the Manager and Agent. Various Projects occur partly within the BHP Billiton Iron Ore-managed Marillana and Ethel Creek pastoral leases. Any linear infrastructure will likely be located on the above tenure or Miscellaneous Licences for which BHP Billiton Iron Ore will be the licence holder.
What is the current land use on the property, and the extent (area in hectares) of the property?	The proposals are primarily located on land used for mineral exploration and iron ore mining and dry land agriculture, specifically cattle grazing.

1.3 LOCATION

Name of the Shire in which the proposal is located	Shire of East Pilbara Town of Port Hedland
For urban areas – <ul style="list-style-type: none"> street address lot number suburb nearest road intersection 	Not applicable
For remote localities – <ul style="list-style-type: none"> nearest town distance and direction from that town to the proposal site 	Nearest towns are Newman and Port Hedland
Electronic spatial data - GIS or CAD on CD, geo-referenced and conforming to the following parameters: <ul style="list-style-type: none"> GIS: polygons representing all activities and named CAD: simple closed polygons representing all activities and named datum: GDA94 projection: Geographic (latitude/longitude) or Map Grid of Australia (MGA) format: Arcview shapefile, Arcinfo coverages, Microstation or AutoCAD 	Enclosed: Yes / No

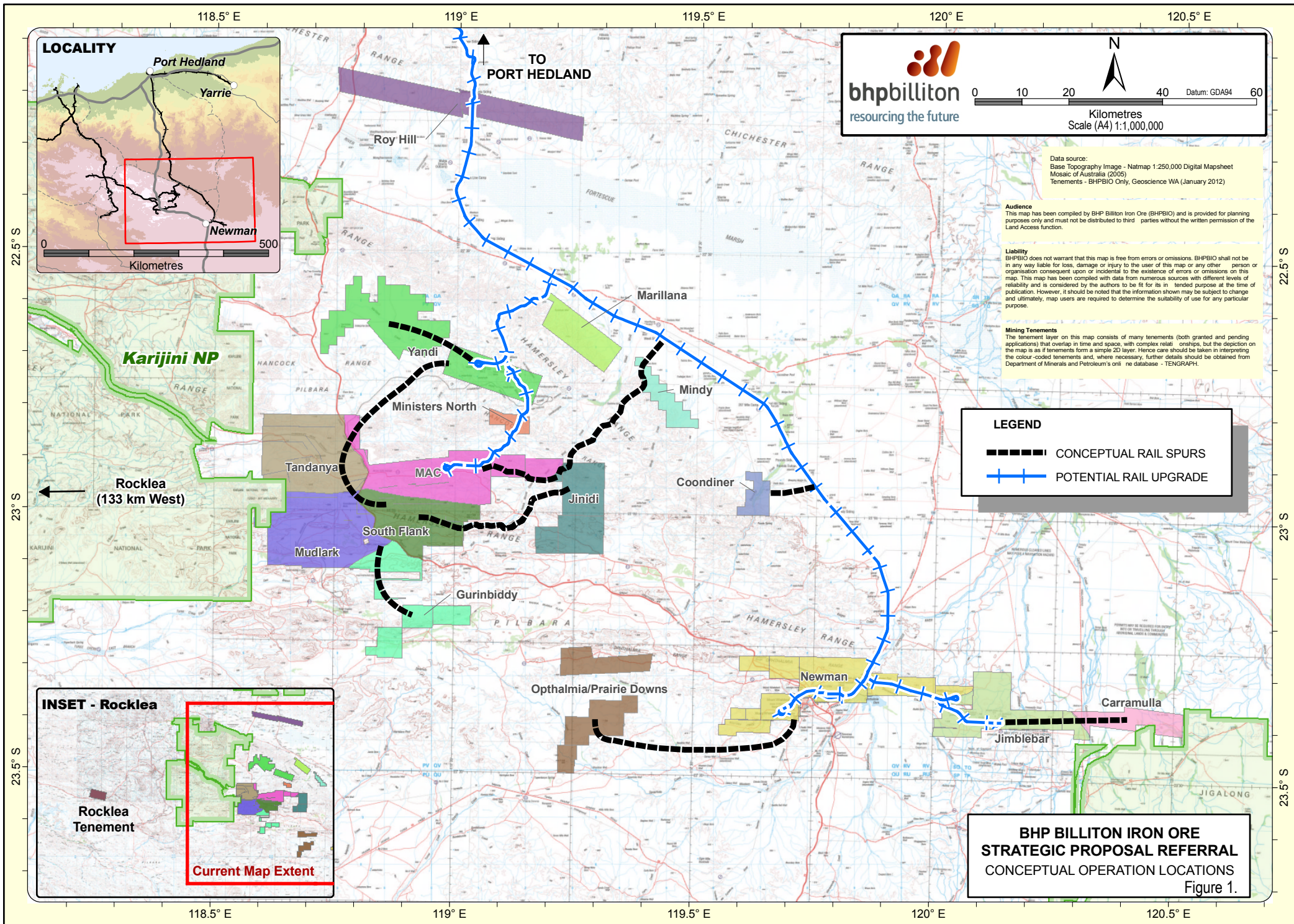
1.4 CONFIDENTIAL INFORMATION

Does the proponent wish to request the EPA to allow any part of the referral information to be treated as confidential?	No
If yes, is confidential information attached as a separate document in hard copy.	No

1.5 GOVERNMENT APPROVALS

Is rezoning of any land required before the proposal can be implemented? If Yes, provide details.	Not applicable		
Is approval required from any Commonwealth or State Government agency or Local Authority for any part of the proposal? If yes, complete the table below -	Yes		
Agency/Authority	Approval Required	Application lodged Yes / No	Agency/Local Authority contact/s for proposal
Minister for Environment; Water/Environmental Protection Authority	<i>Environmental Protection Act 1986 - Part IV:</i> Ministerial Statement	Purpose of this document	Paul Vogel Chairman EPA The Atrium 168 St Georges Terrace PERTH WA 6000

			(08) 6467 5600
Department of Sustainability, Environment, Water, Population and Communities	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> : Referral of Proposed Action	No	Carolyn Cameron Strategic Approaches Branch GPO Box 787 CANBERRA ACT 2601 (08) 1800 803 772



bhpbilliton
resourcing the future

0 10 20 40 60
Kilometres
Scale (A4) 1:1,000,000

Datum: GDA94

Data source:
Base Topographic Image - Natmap 1:250,000 Digital Mapsheet
Mosaic of Australia (2005)
Tenements - BHPBIO Only, Geoscience WA (January 2012)

Audience
This map has been compiled by BHP Billiton Iron Ore (BHPBIO) and is provided for planning purposes only and must not be distributed to third parties without the written permission of the Land Access function.

Liability
BHPBIO does not warrant that this map is free from errors or omissions. BHPBIO shall not be in any way liable for loss, damage or injury to the user of this map or any other person or organisation consequent upon or incidental to the existence of errors or omissions on this map. This map has been compiled with data from numerous sources with different levels of reliability and is considered by the authors to be fit for its intended purpose at the time of publication. However, it should be noted that the information shown may be subject to change and ultimately, map users are required to determine the suitability of use for any particular purpose.

Mining Tenements
The tenement layer on this map consists of many tenements (both granted and pending applications) that overlap in time and space, with complex relationships, but the depiction on the map is as if tenements form a simple 2D layer. Hence care should be taken in interpreting the colour-coded tenements and, where necessary, further details should be obtained from Department of Minerals and Petroleum's online database - TENOGRAPH.

LEGEND

- CONCEPTUAL RAIL SPURS
- +—+—+ POTENTIAL RAIL UPGRADE

**BHP BILLITON IRON ORE
STRATEGIC PROPOSAL REFERRAL
CONCEPTUAL OPERATION LOCATIONS
Figure 1.**

LOCALITY

Port Hedland
Yarrie
Newman

0 500
Kilometres

INSET - Rocklea

Rocklea Tenement

Current Map Extent

PART B - ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

2. ENVIRONMENTAL IMPACTS

Describe the impacts of the proposal on the following elements of the environment, through the questions below:

- (i) flora and vegetation #;
- (ii) fauna #;
- (iii) rivers, creeks, wetlands and estuaries;
- (iv) significant areas and/ or land features;
- (v) coastal zone areas;
- (vi) marine areas and biota #;
- (vii) water supply and drainage catchments;
- (viii) pollution;
- (ix) greenhouse gas emissions;
- (x) contamination; and
- (xi) social surroundings.

These features should be shown on the site plan, where appropriate.

For all information, please indicate:

- (a) the source of the information; and
- (b) the currency of the information.

The response to each of these elements can be found in Attachment 2

Attachment 1

A Strategic Environmental Assessment for future Pilbara mining operations

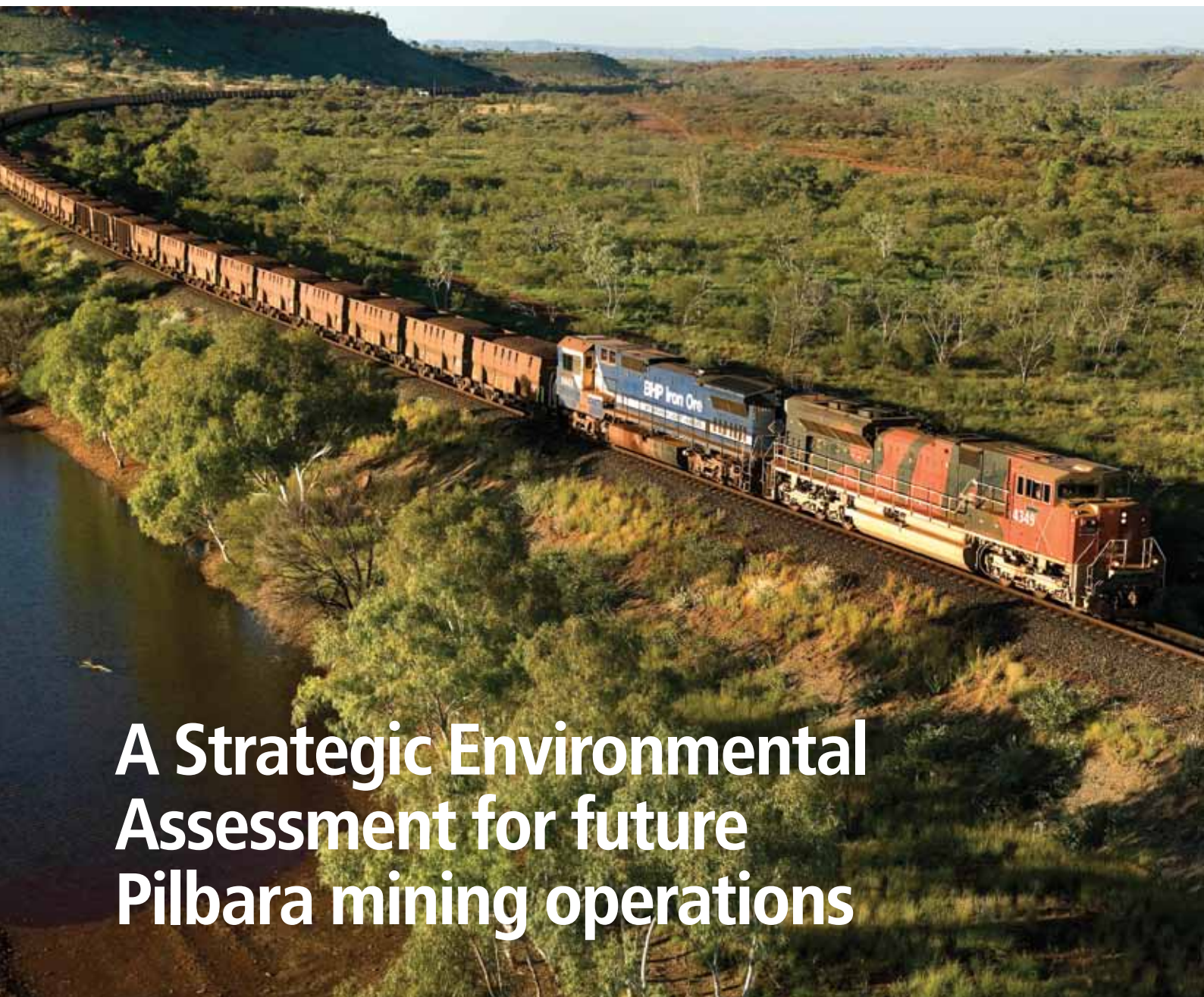
Attachment 2

Part B – Environmental impacts and proposed management



bhpbilliton

resourcing the future



A Strategic Environmental Assessment for future Pilbara mining operations

Strategic Environmental Assessment for BHP Billiton Iron Ore's Pilbara mining operations

BHP Billiton is growing its Iron Ore business in the Pilbara and its Growth Master Plan is to achieve 350 million tonnes per annum of installed production capacity.

In support of its growth plans, the Company is seeking a Strategic Environmental Assessment for its proposed future mines and associated infrastructure developments in the central Pilbara that will support its growth and maintain its developments production

levels in the longer term (see Figure 1). To achieve this, BHP Billiton Iron Ore has lodged a referral with the Environmental Protection Authority (EPA) for a Strategic Proposal, which is the established process for this type of environmental assessment.

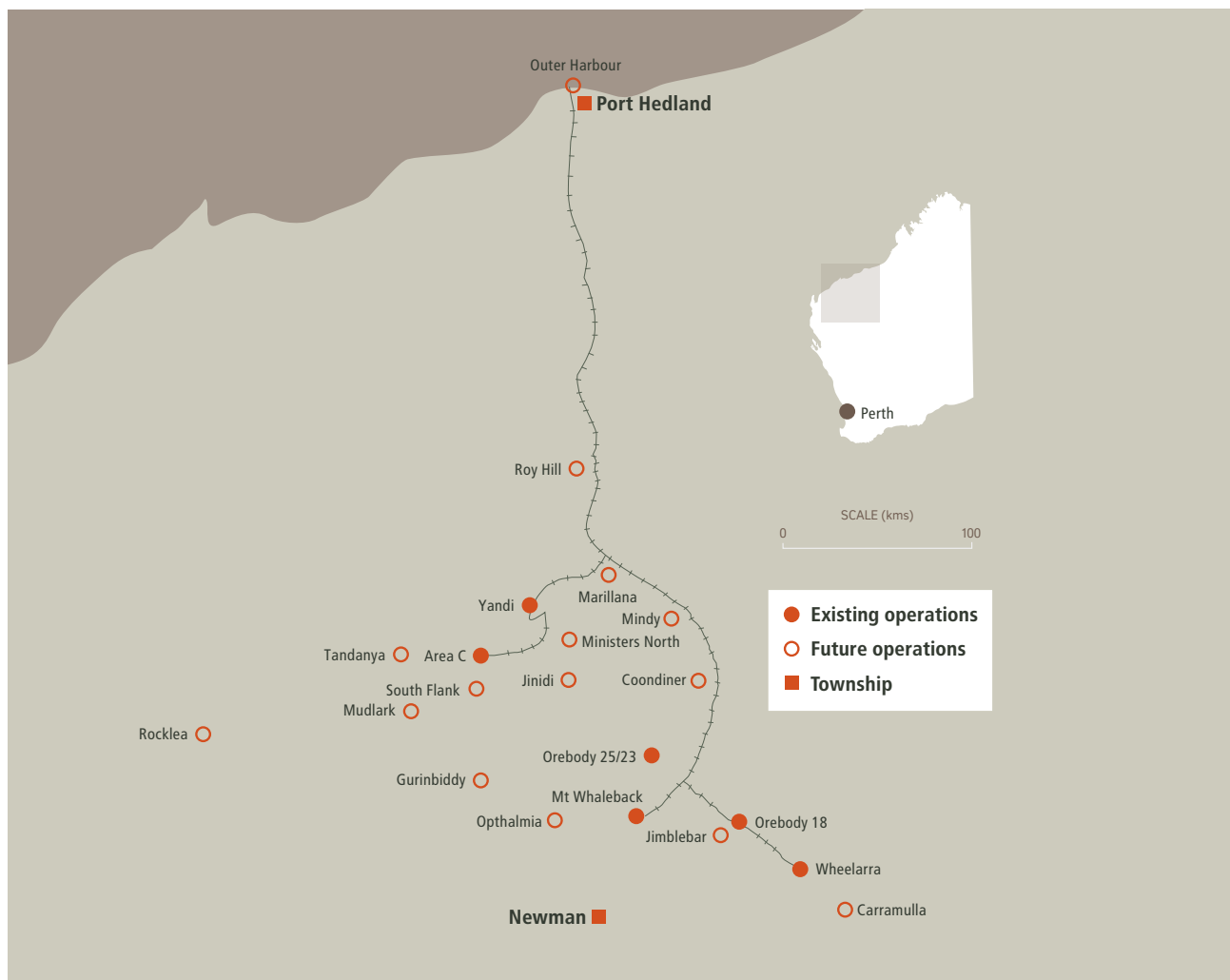


Figure 1. Area of Regional Assessment including proposed mining operations.



BHP Billiton aims to supply 350 Mtpa of iron ore.

BHP Billiton Iron Ore's Western Australian Growth Master Plan

BHP Billiton Iron Ore is expanding its operations in the Pilbara to meet increased global demand for iron ore. The Company's Western Australian Iron Ore Growth Master Plan is to more than double current production to 350 million tonnes per annum (mtpa) with an ultimate objective of 450 mtpa in the longer term.

To help achieve this, BHP Billiton Iron Ore is currently investigating a number of new mine developments including Jinidi, South Flank and Marillana (the proposed Jinidi project is already the subject of a separate environmental assessment and is not part of the Strategic Proposal for a Strategic Environmental Assessment).

While these developments are significant, to achieve the Company's future growth targets, the development of additional mining developments will be required. BHP Billiton Iron Ore has identified a number of potential mining areas on existing tenements at Rocklea, Roy Hill, Tandanya, Gurinbidy, Ministers North, Mindy, Coondiner, Ophthalmia and Carramulla (see Figure 1).

A mining development involves more than the orebody itself. There is considerable infrastructure required to support each new project, including: ore-handling facilities, road and rail networks to transport ore, train load-out and rail infrastructure, access roads, power and water supply infrastructure, lay down and storage areas, ancillary buildings and workshops, material storage facilities, beneficiation plants to improve ore quality and accommodation facilities.

An opportunity to build on the Company's strengths

BHP Billiton Iron Ore is well placed with both its resources and expertise to lodge a Strategic Proposal for Strategic Environmental Assessment of its 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 and leads to improved efficiencies and community benefits for everyone involved, particularly those in the Pilbara region.

Federal and State Governments have been seeking 'landscape scale' environmental assessments where possible, and BHP Billiton Iron Ore supports that aspiration.

BHP Billiton Iron Ore is working with the Federal and State environmental agencies to establish the benchmark on how the environmental studies to support a Strategic Environmental Assessment may be undertaken.

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.

BHP Billiton Iron Ore is working with the Federal and State environmental agencies to establish the benchmark on how such studies may be undertaken.

Community input throughout the Strategic and Derived Proposal processes

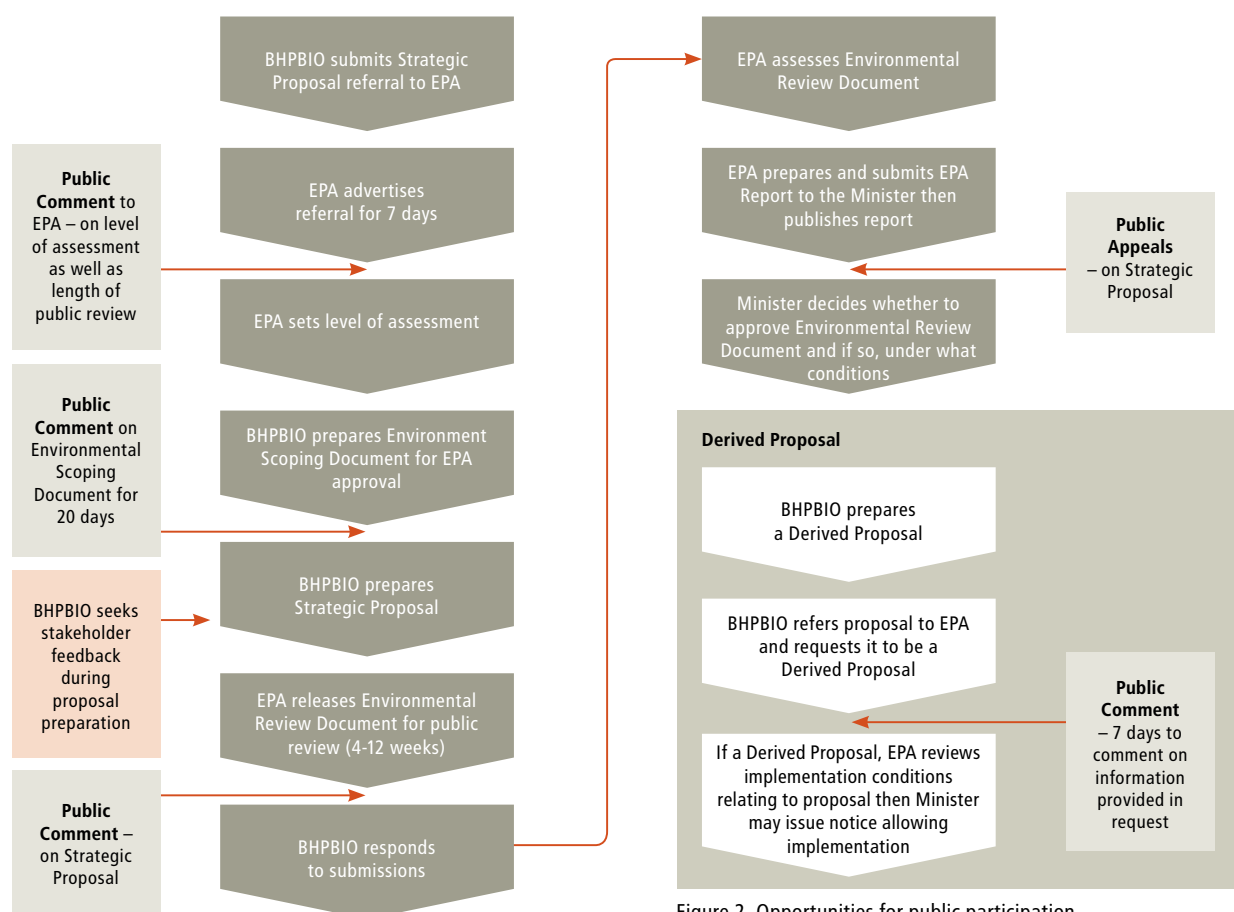


Figure 2. Opportunities for public participation. (Adapted from EPA Bulletin No. 17)

The Strategic and Derived Proposal assessment process

The Strategic Proposal will be undertaken using existing provisions under the *Environmental Protection Act 1986*. These provisions are similar to those used in the Federal environmental legislation both elsewhere in Australia and in a number of countries throughout the world. In Western Australia, this environmental assessment process is called a 'Strategic Proposal' assessment.

To commence the process, BHP Billiton Iron Ore will submit a Strategic Proposal to the EPA for formal environmental impact assessment. It covers the assessment of the Company's proposed new mine areas and associated infrastructure. The Strategic Proposal will consider the environmental impacts and issues of proposed projects and provide overall environmental conditions and management strategies for their development.

As each mining operation is developed, the Company will refer to the EPA a specific 'Derived Proposal'. This ensures that additional information on each project is provided to the Government as more specific detail is known. The Derived Proposal phase includes further opportunities for public comment (see Figure 2).

BHP Billiton Iron Ore has been operating in the Pilbara for over 40 years and has a wealth of scientific, environmental and social data. Having articulated its Growth Master Plan, the Company is well placed to undertake a robust Strategic Environmental Assessment of its proposed future mine developments in the central Pilbara region.

Environmental approvals required under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* are being sought through a separate and complementary Federal Government process.



Environmental management is an important part of planning and assessment.

Benefits for stakeholders

BHP Billiton Iron Ore is environmentally responsible. 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 Environmental Assessment of its proposed future mines and associated infrastructure developments in the central Pilbara, and thereby facilitate achievement of the benefits the assessment of Strategic and Derived Proposals offers.

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, 2012).

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;

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

Long-term planning for stakeholders

Many of the Company's 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 for BHP Billiton Iron Ore's Growth Master Plan 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.

Community engagement – now and in the future

A Strategic Proposal will involve a consultation process across large parts of the Pilbara.

Even though there will be many consultation opportunities, BHP Billiton Iron Ore recognises that the regional population will change over time, as will the views of stakeholders. People who are living in the Pilbara communities in the future will have a chance to contribute their views, as each individual project will also go through its own Derived Proposal approval process prior to development, which will also include public comment (see Figure 2).

Key environmental considerations

A Strategic Environmental Assessment provides greater scope for considering environmental issues and management strategies across all of BHP Billiton Iron Ore's proposed future mine and associated infrastructure developments in the Pilbara.

Collective environmental issues associated with large-scale mining operations in the Pilbara may include:

- ▶ Flora and vegetation;
- ▶ Groundwater;
- ▶ Surface water;
- ▶ Fauna and subterranean fauna;
- ▶ Air quality, dust;
- ▶ Visual amenity;
- ▶ Noise; and
- ▶ Mine closure.

A Strategic Proposal provides for a 'big picture' approach to environmental impact assessment which the WA Environmental Protection Authority (EPA) has recognised could lead to more efficient planning and better environmental outcomes (EPA, 2012).

Next steps

Find out more or provide feedback

BHP Billiton Iron Ore welcomes discussion on its proposal to lodge a Strategic Proposal for assessment. Your feedback or questions will help the Company to shape its approach and refine the process.

If you would like more information about BHP Billiton Iron Ore or the Company's Strategic Proposal then please contact us:

Phone: 08 6224 4444

Email: growth@bhpbilliton.com

www.bhpbilliton.com

Alternatively, to learn more about the Western Australian Government's environmental assessment processes visit: www.epa.wa.gov.au

PART B - ENVIRONMENTAL FACTORS, IMPACTS AND PROPOSED MANAGEMENT

1. Background

The Interim Biogeographic Regionalisation for Australia (IBRA) recognises 85 distinct bioregions (Environment Australia 2001) on the basis of their climate, geology, landform, native vegetation and species information. The Strategic Proposal area lies predominantly within the Pilbara Bioregion, an area of approximately 178,500 km² within the north-west of Western Australia. 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 2004). 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.

Physical Setting

The Pilbara Bioregion 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 Paleoproterozoic 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. 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).

Biological Setting

Biologically, the Pilbara is considered to be a centre of particularly high diversity and endemism. Vegetation complexes on the plains range are often dominated by open to groved Mulga shrublands and woodlands over bunch grasses (van Vreeswyk et al 2004). These are interspersed by stands of Snakewood, and various Acacia, Senna, and Eremophila shrublands on hardpan plains. Sandy plains similarly support hummock and tussock grasslands with open tree and shrub steppes of Mulga and Eucalypt. The upland plateaux and breakaways are dominated by Snappy Gum and open Acacia shrublands over Triodia grasslands.

The Pilbara supports persisting populations of various threatened, endangered and conservationally significant vertebrate fauna species (Bilby, Mulgara, Spectacled Hare-wallaby and Pilbara Leaf-nosed Bat), as well as arid zone populations of species more characteristically associated with mesic habitats (Northern Brush-tailed Possum, Ghost Bat and North-western Long-eared Bats) (McKenzie et al 2002). Ecosystems associated with the Fortescue River and Marsh, and Millstream wetlands are species rich and support high levels of endemism. Similarly, the gorges associated with the Hamersley and Chichester Ranges are recognized as significant refugia for many fauna taxa during drought, wildfire and other disturbances.

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. 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 Pilbara Bioregion, with the major reserves of Karijini and Millstream-Chichester National Parks being supplemented by smaller conservation estates such as Cane River and Meentheena Conservation Parks. Wetlands of National significance include the permanent pools of Millstream and Karijini and the Fortescue Marshes, although none of these are recognized as Ramsar wetlands.

2. Relevant Environmental Factors and Impacts

Flora and Vegetation

Baseline flora and vegetation surveys have been undertaken over a majority of the tenements included in this Strategic Proposal. BHP Billiton Iron Ore is currently undertaking surveys to review and consolidate existing data, and undertake field surveys in those areas not previously covered. Surveys and associated baseline documentation are ongoing.

BHP Billiton Iron Ore has worked with the Department of Environment and Conservation (DEC) to develop a detailed flora and vegetation survey methodology which is now applied on all baseline studies. This methodology meets the requirements of the DEC and enables consistency of survey and data recording across all sites. All surveys undertaken over the last four years have used this approach. Results from older surveys have been reviewed for consistency and updated where appropriate.

A number of rare and priority flora species and threatened and priority ecological communities are known from the Central Pilbara region. Targeted surveys have been undertaken over much of the BHP Billiton Iron Ore tenure to identify the presence of rare, threatened or priority flora and ecological communities.

Direct and indirect impacts to flora and vegetation can be expected to result from construction and mining activities. An indicative land clearing area for individual proposed future operations is between approximately 3,000 to 9,000 hectares (ha). Mine expansion areas associated with existing projects are typically much smaller and could be up to an indicative figure of 500 ha per new orebody. The area of clearing required for each proposed future operations will be dependent on a number of factors including, but not limited to, the size of the target resource, existing and historic land use, proposed mining method, mine planning and project infrastructure requirements. Mine plans will be optimised and land clearing area specifically defined during detailed design.

Clearing will also be required for a number of infrastructure corridors required for rail, power, pipelines and roads.

Future Derived Proposals will confirm the level of impact of individual activities. The Strategic Proposal Environmental Review Document will assess direct, indirect and cumulative potential impacts on flora and vegetation. BHP Billiton Iron Ore recognises that the categorisation of flora and ecological communities may change over the course of the project life. Any changes to the conservation status of flora species and ecological communities will be addressed in the Derived Proposals.

Fauna

Baseline vertebrate fauna surveys have previously been undertaken over a majority of the tenements included in this Strategic Proposal. BHP Billiton Iron Ore is currently undertaking vertebrate fauna surveys to review and consolidate existing data, and undertake surveys in areas not previously covered. As with flora and vegetation survey, a baseline fauna survey methodology has been developed in conjunction with the DEC and applied over the last four years.

Between 2007 and 2011 BHP Billiton Iron Ore undertook a regional subterranean fauna survey which involved sampling over a majority of its tenements where drill holes were available. The extent of coverage for Short-range Endemic surveys has historically been limited to where required for environmental impact assessment; however regional surveys across much of BHP Billiton Iron Ore's Central Pilbara tenements have now been undertaken and baseline documentation is in progress.

A number of Specially Protected (Threatened) and priority fauna species are known from the Central Pilbara region. Targeted surveys are currently being undertaken across BHP Billiton Iron Ore's tenements and regionally to determine potential impacts of the Strategic Proposal. Reporting of this work is in progress.

Potential impacts to fauna and fauna habitat associated with the Strategic Proposal are likely to result from land clearing, mine dewatering and surplus water discharge. To a lesser extent, light, vehicle collisions and introduction of feral species may impact on native fauna. The assessment of the Strategic Proposal will consider direct, indirect and cumulative potential impacts on terrestrial and subterranean fauna.

Future Derived Proposals will confirm the level of impact of proposed future operations. BHP Billiton Iron Ore recognises that the categorisation of fauna and faunal communities may change over the course of the project life. Any changes to the conservation status of fauna species and faunal communities will be addressed in the Derived Proposals.

Rivers, Creeks, Wetlands and Estuaries

As with the flora and fauna studies, BHP Billiton Iron Ore has undertaken significant investigation and monitoring of ground and surface water systems within proximity of its current operations. Targeted studies are also underway, particularly investigating riparian communities and groundwater dependant ecosystems.

The extent of impacts to riparian vegetation will be defined during detailed design studies and presented as part of the Strategic Proposal Environmental Review Document.

Implementation of proposed future operations is unlikely to result in the widespread filling or excavation of a river, creek, wetland or estuary. However, development of proposed future operations may involve some disturbance to ephemeral creeks and drainage lines located within pit and associated disturbance areas, or during construction of infrastructure such as roads.

Some proposed future operations will be located upstream of creeks, springs and wetlands and may potentially have indirect impacts on these systems should they not be appropriately managed.

Implementation of proposed future operations is unlikely to result in the impoundment of a major river, creek, wetland or estuary. Some impoundment of drainage lines and minor ephemeral waterways may occur. BHP Billiton Iron Ore will undertake hydrological studies and design surface water control structures to protect mining operations and associated infrastructure from flooding and minimise impacts to local ephemeral creeks.

BHP Billiton Iron Ore will optimise mine/operations plans and water balances during detailed design. The Strategic Proposal Environmental Review Document will consider discharge of mine-derived water into creeklines should excess water be produced. BHP Billiton Iron Ore will preferentially utilise excess water for operations where possible and investigate opportunities for aquifer reinjection and water-sharing agreements to minimise surface discharge.

The Strategic Proposal will not directly impact on any of the following:

- Conservation Category Wetlands;
- Wetlands registered under the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*;
- Rivers, creeks, wetlands or estuaries within Perth's Bush Forever site;
- Watercourses protected under the *Environmental Protection (Swan & Canning Rivers) Policy 1998*; and
- The management area as defined in s4(1) of the *Swan River Trust Act 1988*.

Further, the Strategic Proposal is not expected to directly impact any rivers, creeks, wetlands or estuaries subject to an international agreement because of the importance of the wetland for waterbirds and waterbird habitats. However, BHP Billiton Iron Ore recognises that the classification of wetlands and watercourses may change over the course of the project life.

The Strategic Proposal Environmental Review Document will consider potential direct, indirect and cumulative impacts on rivers, creeks, wetlands or estuaries.

Significant Areas and/ or Land Features

The Strategic Proposal area does not cover any lands currently included as part of the conservation estate. The Mudlark and Tandanya lease boundaries are adjacent to Karijini National Park.

A number of Environmentally Sensitive Areas (ESAs) have been identified within the Strategic Proposal area. Potential impacts to ESAs associated with each proposed future operations will be discussed within the Environmental Review Document.

The Strategic Proposal Environmental Review Document will consider direct, indirect and cumulative potential impacts on significant natural features.

Coastal Zone, Marine Areas and Biota

No development associated with the Strategic Proposal will occur within 300 m of a coastal area. The western boundary of the Strategic Proposal area is at chainage 26 km along the Newman to Port Hedland rail line.

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. Consideration of these matters has already occurred and are beyond the scope of the Strategic Proposal.

Water Supply and Drainage Catchments

The Strategic Proposal is located within the Pilbara Groundwater Area and Pilbara Surface Water Area proclaimed *Rights in Water and Irrigation Act 1914*.

The Newman Water Reserve Public Drinking Water Supply Area (PDWSA) lies within the extents of the Strategic Proposal area. An assessment of potential impacts to the PDWSA associated with the proposed mining and infrastructure projects will be included in the Environmental Review Document. The Strategic Proposal Environmental Review Document will consider direct, indirect and cumulative potential impacts on PDSWAs.

The Strategic Proposal area is not within an existing or proposed Underground Water Supply and Pollution Control area.

The proposal will not require drainage of the land.

There is a water requirement for the construction and/or operation of the proposed future operations of the Strategic Proposal. However, it is anticipated that there will be sufficient water available for the Strategic Proposal and no drainage of the land will be required.

A site/operation water balance will be developed as part of the detailed design for each proposed future operation. Based on other similar operations within the region, water requirements for each proposed future operations will be approximately one to five gigalitres (GI) per year for construction and operation. A regional water strategy will be presented as part of the Strategic Proposal to identify water supply options as well as excess water management options. This will be discussed in the Environmental Review Document.

Specific details of the water requirement of each proposed future operation will be confirmed in the Derived Proposal for that proposed operation.

Emissions

Emissions such as such as noise, vibration, gaseous emissions, dust, liquid effluent and solid waste are likely to be caused by the development of proposed future operations during construction and operation. These are typical emissions for the mining industry and will be managed according to legislative requirements and BHP Billiton Iron Ore's standard management plans. BHP Billiton Iron ore has significant experience in this regard from its over 40 years of operation in the Pilbara.

Individual proposed future operations associated with the Strategic Proposal are likely to trigger a number of prescribed premises categories under Schedule 1 of the *Environmental Protection Regulations 1987*, including but not limited to:

- Category 5 – Processing or Beneficiation of Metallic or Non-metallic Ore; and,
- Category 6 – Mine Dewatering

Other categories may also be required and these will be identified and addressed during the EIA process.

Greenhouse gas and other gas emissions (e.g. sulphur oxides) will be generated through the combustion of hydrocarbons, clearing of native vegetation, use of explosives during blasting operations and the use of electricity. Air quality studies will be commissioned as part of the impact assessment process and the results will be discussed regionally in the Environmental Review Document.

Additionally, liquid effluent will be generated during the construction and operational phases of the various proposed future operations. Likely sources of liquid effluent include domestic wastewater and sewage associated with administration, workshop and accommodation areas. Further discussion of liquid waste sources and management will be provided in the Environmental Review Document.

While discharges to a watercourse are unlikely, the proposed future operations would likely produce industrial waste (scrap metal, wire, etc.), vehicle and equipment parts (oil filters, batteries, tyres, etc.), packaging, general refuse, office and administrative wastes and domestic putrescible wastes as a minimum. These will be managed to BHP Billiton Iron Ore's standards and to meet legislative requirements. Waste streams will be discussed in the Environmental Review Document.

With respect to off-site noise emissions, effects on sensitive receptors are unlikely. The bulk of the mining hubs are located within a relatively remote area. Expansion of operations within the Newman and/or Jimblebar hubs may be in proximity to the town of Newman. Proposed future operations would be constructed and operated in accordance with the *Environmental Protection (Noise) Regulations 1997*, where these regulations are applicable. A general assessment of potential noise impacts will be included in the Environmental Review Document.

Similarly, the Strategic Proposal is unlikely to have the potential to generate off-site air quality impacts such as dust or odour that may affect the amenity of resident and other sensitive premises. Some proposed future operations will have a residential component and noise and air quality will be managed to meet legislative and amenity requirements at the village locations.

Potential off-site air quality impacts will be assessed as part of the Environmental Review Document for the Strategic Proposal. Expansion of operations within the Newman and/or Jimblebar hubs may be in proximity to the town of Newman. However, the majority of the proposed future operations are generally located in remote areas with few sensitive receptors and therefore significant off-site impacts to sensitive receptors not anticipated.

The Strategic Proposal may have residential components such as accommodation villages and temporary camps. Consideration will be given to the siting of these facilities to maintain adequate buffer distances between existing or future land uses that may discharge an emission.

Greenhouse Gas Emissions

Proposed future operations will generate greenhouse gas emissions. A more detailed estimate of the amount of greenhouse gas emissions will be included in the Environmental Review Document for the Strategic Proposal.

BHP Billiton Iron Ore will consider opportunities to minimise emissions during mine/operation detailed design studies. Measures to minimise greenhouse gas emissions would be reported in the Environmental Review Document.

Contamination

Land use within the Strategic Proposal area is predominantly mineral exploration, iron ore mining and dry land agriculture, specifically pastoralism and cattle grazing. These activities are not considered to have a high risk of soil or groundwater contamination. There are no contaminated sites registered under

the *Contaminated Sites Act 2003* within the Strategic Proposal area. Consideration of the potential for contamination will be included in the Environmental Review Document.

Social Surroundings

Heritage surveys to date have recorded numerous archaeological and ethnographic sites within the Strategic Proposal area. Out of respect for the wishes of the Traditional Owners, the location of the recorded heritage sites are not shown or discussed in detail within this document. BHP Billiton Iron Ore would comply with the *Aboriginal Heritage Act 1972* and continue to consult with the Traditional Owners and their representatives throughout the life of the project.

In addition, the Strategic Proposal includes tenure located in close proximity to Karijini National Park, an iconic feature of the regional landscape. A number of Western Australia's highest peaks are located in this area. Visual impacts from the implementation of the Strategic Proposal will be addressed in the Environmental Review Document and specifically assessed in the Derived Proposals for the relevant proposed future operations.

Other sites of public interests within the Strategic Proposal area include:

- Fortescue Marsh, located north of BHP Billiton Iron Ore's existing operations at Yandi and Mining Area C; and
- Weeli Wolli Creek and Weeli Wolli Spring, located within the Strategic Proposal area. Both sites are within a catchment that is subject to existing mining operations.

BHP Billiton Iron Ore is committed to protecting these natural features proportional to the level of impact that may be caused by the Strategic Proposal and will continue to consult with the local community and relevant regulators. Potential impacts and management will be discussed in the Environmental Review Document.

Transport of goods and ore would be required but is not expected to affect the amenity of the local area (i.e. Newman and surrounds). Ore will be transported by rail to Port Hedland.

3. Proposed Management

Principles of Environmental Protection

As set out in section 4A of the *Environmental Protection Act 1986*, the EPA must apply the following principles to the assessment of proposals:

- Precautionary principle;
- Principle of intergenerational equity;
- Principle of the conservation of biological diversity and ecological integrity;
- Principles relating to improved valuation, pricing and incentive mechanism; and
- Principle of waste minimisation.

In developing the Strategic Proposal BHP Billiton Iron Ore has considered these principles, where relevant and this will be discussed in the Environmental Review Document. The supporting baseline and impact assessment studies and the overall implementation of the Strategic Proposal have, and will continue to, be completed consistent with the EPA's Environmental Protection Bulletins, Position Statements, Environmental Assessment Guidelines and Guidance Statements.

The overall design and strategy of the Strategic Proposal, and the management of the proposed future operations has, and will continue to, consider the EPA's Mitigation Hierarchy of:

- Avoid;
- Minimise;
- Rectify;
- Reduce; and finally
- Offset.

Consultation

BHP Billiton Iron Ore has a demonstrated record of consulting extensively for its current operations and growth projects. Although stakeholder consultation regarding the Strategic Proposal has been limited to date, a comprehensive and sustained consultation programme will be launched in the immediate future. BHP Billiton Iron Ore has briefed the EPA and various government departments on its pipeline of projects and approval requirements.

In addition to the local communities of Newman and Port Hedland, the following groups of stakeholders have been identified by BHP Billiton Iron Ore as requiring consultation during the assessment process for the Strategic Proposal:

- Federal Government:
 - Department of Sustainability, Environment, Water, Population and Communities
- State Government:
 - Environmental Protection Authority
 - Department of Environment and Conservation
 - Department of Water
 - Department for State Development
 - Department of Indigenous Affairs
 - Department of Mines and Petroleum
 - Department of Regional Development and Lands
 - Department of Planning
- Local Government
 - Shire of East Pilbara
 - Town of Port Hedland
- Registered Native Title claimant groups:
 - Bunjima
 - Nyiyaparli
 - Ngarlawangga
 - Yinhawangka
 - Palyku
 - Puutu Kuniti Kurrama
- Industry Groups:
 - Chamber of Minerals and Energy
 - Port Hedland Chamber of Commerce and Industry
- Non-government Conservation Organisations:
 - Conservation Council of Western Australia
 - World Wildlife Fund
 - Wildflower Society of Western Australia
 - Greening Australia

Note that the above list is not exhaustive. Further detail on stakeholder engagement will be provided in the Environmental Review Document.

4. References

Beard, J.S 1990, *Plant Life of Western Australia*. Kangaroo Press Pty Ltd, N.S.W.

Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) 2004, *Feel the Heat*. Biodiversity Hotspots. <http://www.environment.gov.au/land/publications/pubs/bush-nov04-article-8.pdf> Accessed online March 2012.

Environment Australia. 2010. *Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) 6.1 and development of Version 6.1 summary report*. May 2010.

McKenzie N.L., J.E. May and S. McKenna, 2002, *Bioregional Summary of the 2002 Biodiversity Audit for Western Australia*. Department of Conservation and Land Management, Government of Western Australia.

Tille, P, 2006, *Soil Landscapes of Western Australia's Rangelands and Arid Interior*. Department of Agriculture and Food, Government of Western Australia.

Van Vreeswyk A.M.E., Payne, A.L, Leighton, K.A and Hennig, P, 2004, *An Inventory and Condition Survey of the Pilbara Region, Western Australia*. Department of Agriculture, Government of Western Australia.