AngloGold Ashanti Australia

Independence Group NL

Tropicana Gold Project

Biodiversity and Greenhouse Offset Strategy

Draft

February 2010

Tropicana Joint Venture

360 environmental

TROPICANA GOLD PROJECT

BIODIVERSITY AND GREENHOUSE OFFSET STRATEGY

DRAFT

February 2010

Tropicana Joint Venture

Date	Revision	Description of Revision	Originator	Review	Project Approval
January 2010	A	Issued draft for AGAA Review	MR/FD	BB/Peer Review Panel	
February 2010	B	Issued draft for Tropicana Joint Venture Review	MR/FD	BB	
February 2010	C	Issued draft for Government Review	MR/FD		

EXECUTIVE SUMMARY

This document comprises the Biodiversity and Greenhouse Emissions Offset Strategy for Tropicana Gold Project (the Project). The Project is located approximately 330 km east northeast of Kalgoorlie and 200 km east of Laverton, on the western edge of the Great Victoria Desert in Western Australia. The Joint Venture is between AngloGold Ashanti Australia Ltd (AngloGold; 70% stakeholder and manager) and Independence Group NL (30% stakeholder).

In developing the Tropicana Gold Project (the Project), the Joint Venture aims to deliver an environmentally responsible project with a minimum standard of 'no net environmental loss' or alternatively with 'net conservation benefit' (EPA 2006). The document outlines the strategic thinking and direction and provides further details on the proposed offset packages for the Project, supplementing the information provided in the Public Environmental Review (Joint Tropicana Venture 2009).

The State and Federal governments recommend that an offset package is only used as a last resort following implementation of the typical hierarchy of control; avoid, minimise, rectify and reduce, along with proactive environmental management practices (Figure E.1).

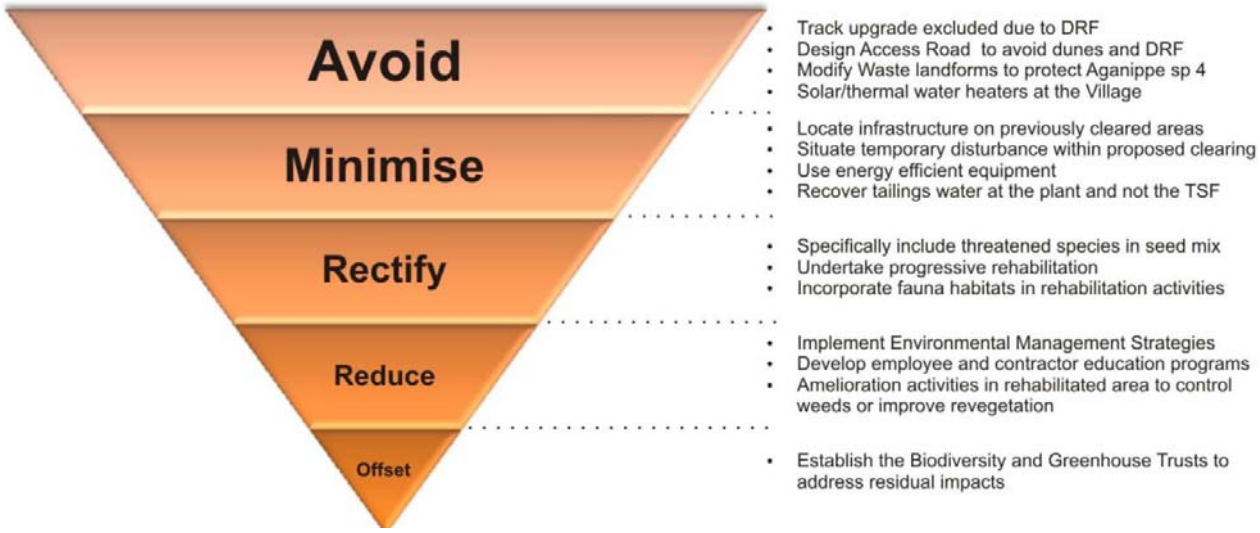

Figure E.1 Examples of how the Hierarchy of Control has been Utilized for the Project

Offsets Proposed

The Great Victoria Desert (GVD) has considerable inherent biodiversity values and the offsets package has been tailored giving consideration to ecological, cultural and economic factors. Little information is on the public record which is due to the lack of scientific investigation focused in the region.

The Great Victoria Desert Trust (the Trust) forms the centerpiece of the offsets strategy for both Biodiversity and Greenhouse Offsets. This document makes reference to the Trust, although it is acknowledged that the legal structure utilized could be via another mechanism agreed by the Joint Venture, State and Federal governments. It is possible that the Trust oversees the Great Victoria Desert Biodiversity and the Greenhouse Reduction and Energy Efficiency Trusts (or arrangements with existing entities are sought with the same outcome in mind). The Joint Venture has committed to undertake additional surveys and research to improve the knowledge of the distribution, abundance and biology of conservation interest taxa directly affected by the Project, as well as providing resources to facilitate energy efficiency and renewable energy sources as part of the proposed Trust.

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1. BACKGROUND

The Tropicana Joint Venture (Joint Venture) plans to establish the Tropicana Gold Project (the Project). The proposed Project is an open-cut gold mine (with supporting infrastructure) located on the western edge of the Great Victoria Desert (GVD) in WA. The Project is comprised of an open-cut mine, processing plant, waste landforms and other supporting infrastructure such as an access road, borefield, village and airstrip. The Joint Venture is between AngloGold Ashanti Australia Ltd (AngloGold; 70% stakeholder) and Independence Group NL (30% stakeholder).

AngloGold is the manager of the Tropicana Joint Venture and is acting as agent severally for each of the Joint Venturers in their respective percentage interests from time to time. The obligations and liabilities of the Joint Venturers are several only, in accordance with their respective percentage interests.

The Joint Venture's environmental objectives for the Project are to establish an operation that meets the environmental and social expectations of current and future stakeholders by preventing or limiting impacts on the environment and heritage values of the area. To achieve this objective a series of design criteria were used by the Project team to prevent or minimize the potential impacts of the project. Fundamental design criteria adopted are:

- avoid direct impacts to Declared Rare Flora;
- minimise impacts on ecological communities of conservation interest;
- minimise impacts to fauna protected under the *State Wildlife Conservation Act 1950* (WC Act) and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- minimise impacts to Threatened and Priority Flora and Fauna;
- minimise impacts on Priority Ecological Communities;
- design an energy and water efficient mine and processing plant;
- minimize greenhouse emissions associated with the Project;
- listen to, and incorporate, stakeholder feedback for the Project;
- consider closure requirements during all design stages;
- design the waste landform (a series of interconnected waste dumps) to blend into the natural environment;
- design the infrastructure to cope with a 1:100 yr 72 hr rainfall event; and,
- ensure compliance with industry codes and recognised standards such as the International Cyanide Management Code, Australian Standards, Environmental Management Standards (ISO14001) and Safety Management Standards (OHSAS18001).

In order to adopt these criteria the Joint Venture has undertaken extensive surveys over the project area and the surrounding environments. As a result flora and vegetation surveys span some 230,000 ha, with the vegetation mapping associated with the Operational Area alone covering some 131,000 ha. These surveys clearly demonstrate the intact nature of the local environment and occurrence of all communities outside the proposed Project footprint.

As described in the Tropicana Gold Project Public Environmental Review (PER) document released in September 2009, the Joint Venture aims to deliver an environmentally responsible project with a minimum standard of 'no net environmental loss' or alternatively with 'net conservation benefit' while ensuring that greenhouse emissions are reduced to as low as practical as recommended by the Environmental Protection Authority (EPA) (EPA 2002 and 2006). To achieve this objective, Biodiversity and Greenhouse offsets have been proposed for the project in

addition to the design philosophy and environmental management measures discussed in the PER. As indicated by the EPA and the Commonwealth Department of the Environment, Water Heritage and Arts (DEWHA) an Offsets package should only be used as a last resort and the typical hierarchy of control; avoid, minimise, rectify, reduce (refer Figures 1.1 and 1.2) shall be adopted along with proactive environmental management practices.

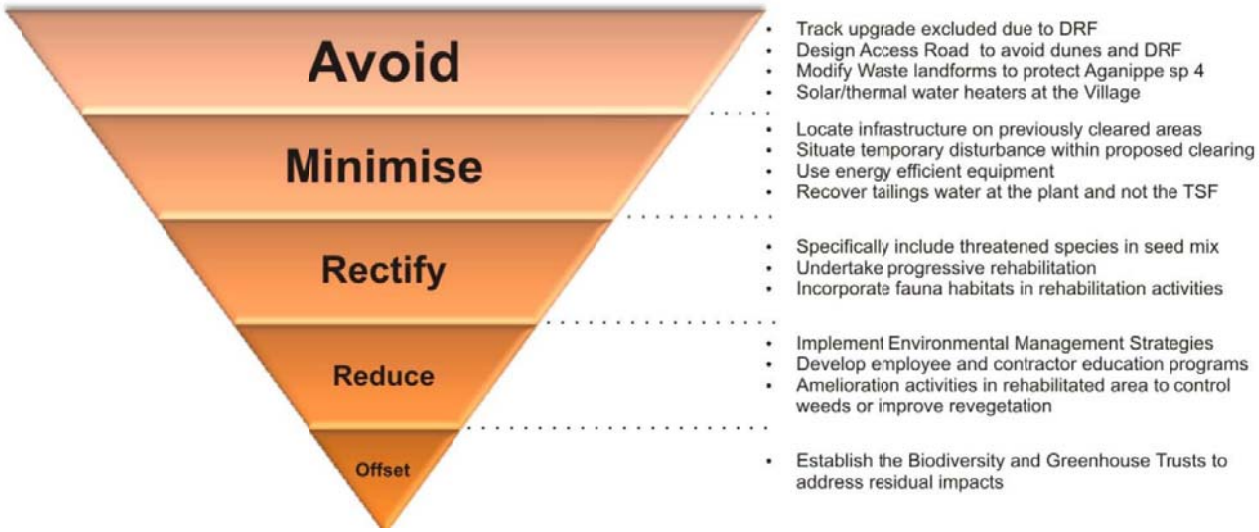

Figure 1.1 Examples of how the Hierarchy of Control has been Utilized for the Project

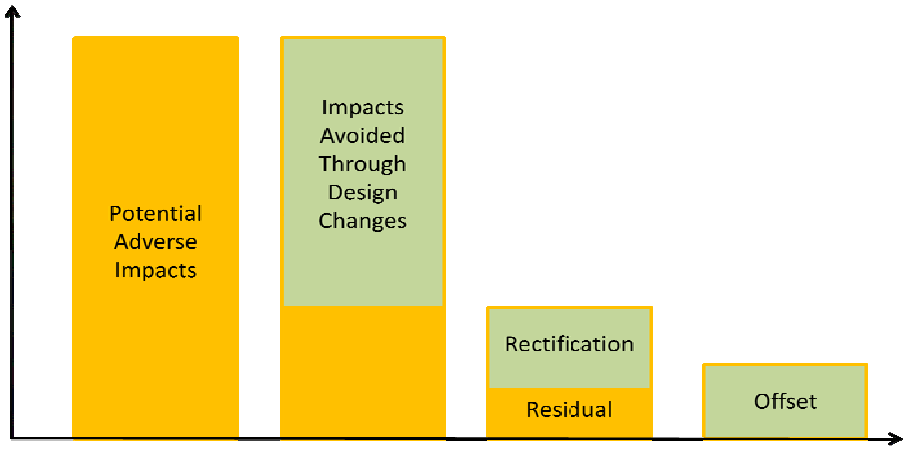

Figure 1.2 Mitigation Hierarchy
(Adapted from EPA Offset Mitigation Hierarchy, 2008 & Nazari & Proebstel, 2009)

Offset packages are only to be used when all other management options have been exhausted and residual impacts to significant environmental values remain. An offsets package is not intended to make proposals with unacceptable impacts acceptable (Australian Government 2007a), but rather as a tool to be used during project design, environmental assessment and implementation to achieve the principles of an ecologically sustainable development. The Joint Venture biodiversity and greenhouse offset packages focus on the residual environmental impacts such as impacts Threatened Species habitats and greenhouse emissions that cannot be avoided.

Offset strategies are comprised of direct and contributing offsets. Direct offsets are environmentally beneficial activities undertaken to counterbalance an adverse environmental impact or harm such as ecosystem restoration offset, rehabilitation offset or land acquisition for conservation. Contributing offsets on the other hand are environmentally beneficial activities undertaken that add to the environmental knowledge, research, management and protection that leads to improved environmental outcomes (EPA, 2008). The general approach adopted for offset packages associated with projects within an urban or agricultural setting, focuses more on land swaps or additions to the conservation estate, perhaps supported by a contributing offset that funds the management of the land. In other locations, where land clearing is not the major threatening process, an alternative approach may be more appropriate. Land used for broad acre farming or pastoralism in the Great Victoria Desert bio-geographic region is relatively small with the bulk of the region being either vacant crown land (VCL), unallocated crown land (UCL), or nature reserves managed by the State. This limits the possibility for the acquisition of land in the same bio-geographic region with the same or better environmental values. It is also within the government's ability to convert VCL or UCL into conservation reserves should they feel it is appropriate.

It is important to note that GVD bio-geographic region has considerable inherent biodiversity values and as such the benefits of the offsets package should be tailored giving consideration to ecological, cultural and economic factors. Little information is currently available on the region which is likely due to a lack of development in the region, a limited number of regional environmental studies and a lack of infrastructure to promote access to the region. The remoteness of the area and a lack of funding for environmental studies have undoubtedly contributed to the lack of available scientific information on the region.

1.1. Purpose and Objective

This document provides further details on the Joint Venture's offset package and details the implementation mechanisms considered as part of developing the offsets package. This document also describes conservation priorities within the GVD.

The objective of the strategy is to facilitate a net environmental benefit for the bioregion and the community through the establishment of suitable offsets for unavoidable residual project impact through the establishment of collaborative working relationships with Conservation Groups, Conservation Agencies and other interested Stakeholders.

1.2. Structure of Document

This document is separated into four sections.

- **Section One** – provides the environmental approval status specific to offsets. This section discusses the biodiversity context of the proposed offsets strategy.
- **Section Two** – summaries the avoidance and mitigation adopted by the Joint Venture for the Project.
- **Section Three** – describes residual impacts and provides further details on the biodiversity offset package as outlined in the Project's PER. This section focuses on direct and contributing offsets, specifically the proposed Biodiversity Trust and land management considerations and the anticipated outcomes.
- **Section Four –** provides further details on the Greenhouse offset package as outlined in the Project's PER. This section focuses on direct and contributing offsets, specifically the proposed Greenhouse Reduction and Energy Efficiency Trust and its anticipated benefits. The Greenhouse Reduction and Energy Efficiency Trust will be aligned with the Great Victoria Desert Trust.
- **Section Five** – outlines the implementation considerations as part of the offsets strategies.
- **Section Six** – key management objectives and milestones required to implement the offsets strategy are described.

1.3. State Approach and Guidance on Biodiversity Offsets

EPA Bulletin. No.1. Environmental Offsets – Biodiversity (2008b) recognizes that offsets packages will vary depending on the type of project, the environment being impacted and the significance of the impact on the environment. Environmental offsets are one management tool that can help achieve sustainable outcomes.

Environmental offsets are commonly referred to as 'environmentally beneficial activities' undertaken to counterbalance an adverse environmental impact and achieve a 'net environmental benefit' outcome. EPA Position Statement No. 3 (EPA 2002) discusses the principles the EPA would apply when assessing proposals that may have an effect on biodiversity values in Western Australia. The Position Statement intends to provide the following outcomes:

- Promote and encourage all proponents and their consultants to focus their attention on the significance of biodiversity and, therefore, the need to develop and implement best practice in terrestrial biological surveys; and,
- Enable greater certainty for proponents in the formal environmental impact assessment process by defining the principles the EPA will use when assessing Proposals that may have an effect on biodiversity values.

The State government is currently reviewing offsets policy and departmental accountabilities for approving and managing offsets associated with project approvals.

In Position Statement No. 9 (EPA 2006) environmental offsets are discussed in terms of:

- Direct Offsets, which are environmentally beneficial activities undertaken to counterbalance an adverse environmental impact or harm, with the goal of achieving a 'net environmental benefit'. Examples of direct offsets may include ecosystem restoration (offsite), rehabilitation (offsite), land acquisition for conservation and re-establishment.
- Contributing Offsets, which are environmentally beneficial activities undertaken to complement and enhance direct offset activities. Contributing offset activities may not immediately assist in a 'net environmental benefit' outcome, but instead materially add to environmental knowledge, research, management and protection, and ultimately lead to improved environmental outcomes.

EPA Position Statement No. 19, Environmental Offsets – Biodiversity (EPA 2008a) suggests the chances for a successful offsets package can be increased if they are implemented within a strategic framework, identifying key priorities, rather than on a development-by-development basis. Direct offsets can include various activities, depending on the level of disturbance on the original impacted site and the state of the offset site. EPA (2008a) states that ideally, the environmental values of the offset site should be similar to those being impacted and located in the same local vicinity as the area being impacted so as to ensure the immediate environment receives the benefit. The risk that environmental offsets may not fully succeed in the long term should also be considered. It is crucial that offsets packages deliver a long lasting benefit to the environment. EPA (2008a) refers to Principle G, specifically that environmental offsets must be clearly defined, publicly registered, transparent, auditable and enforceable. According to this principle, an offsets package must have clearly defined objectives, key performance measures, responsibilities for management, outcome-based completion criteria, be clearly documented in the offsets reporting form (refer Attachment 5.0) and be able to produce environmental benefits in an agreed timeframe.

EPA (2006) and EPA (2008a) do not specifically address carbon offsets for greenhouse gas emissions, these are discussed in the Western Australian Greenhouse Strategy (Government of Western Australia 2004) as well as in other relevant State and Commonwealth Government documents.

1.4. Federal Approach and Guidance on Biodiversity Offsets

The EPBC Act was developed to:

- provide for the protection of the environment, especially those aspects of the environment that are matters of 'national environmental significance' (NES)
- to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- to promote the conservation of biodiversity; and,
- to enable the assessment of environmental impacts of developments on land under Federal tenure (this, and other requirements of the EPBC Act, is nor relevant to the Joint Venture's activities).

The Australian Government defines environmental offsets as '*actions taken outside a development site that compensate for the impacts of that development - including direct, indirect or consequential impacts*'. Environmental offsets provide an opportunity to achieve long-term conservation outcomes whilst providing a management option for proponents seeking to undertake development(s) which will have residual environmental impacts, after avoidance and mitigation options have been employed. Environmental offsets are not intended to make proposals with unacceptable impacts acceptable. Environmental offsets provide compensation for those impacts which cannot be adequately reduced through avoidance and mitigation. 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 (typically undertaken on-site).

1.5. State Approach and Guidance on Greenhouse Offsets

The EPA's environmental objective for greenhouse gas management is to reduce emissions to a level which is as low as is practicable (EPA 2002). To achieve this the EPA's environmental assessment objective is to ensure that potential greenhouse gas emissions emitted from proposed projects are adequately addressed in the planning/design and operation of projects and that:

- best practice is applied to maximise energy efficiency and minimise emissions;
- comprehensive analysis is undertaken to identify and implement appropriate offsets; and,
- proponents undertake an ongoing program to monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time.

It should be noted that at the time of writing the Western Australian and Australian Governments are in the process of reviewing the Policy for Greenhouse offsets and much debate that surrounds the relationship between offsets and the proposed Emissions Trading Scheme (ETS).

1.6. Environmental Impact Assessment Process – Public Environmental Review / Offsets

In May and June 2008 the Project was referred to the WA EPA and the DEWHA respectively. Following an assessment of the referred informed information the level of assessment was set at a Public Environmental Review (PER) and classified as a "Controlled Action" under the EPBC Act. The Federal assessment is being carried out via the Bilateral Agreement between the State and Federal Governments.

With the decision to formally assess the Project, a series of discussion occurred with key State and Federal agencies on the need for an environmental offset and the most suitable offset strategy. During these discussions it was suggested that consideration should be given to the acquisition of land for inclusion in the conservation

estate and the potential funding of indigenous capacity building while another suggested that the strategy must address impact on Threatened and Protected species.

The Project Environmental Scoping document was approved by the EPA in March 2009 and the PER was released for public comments between 28 September and the 24 November 2009. During this period 11 submissions were received from government, community groups and general members of the community.

With respect to offsets, the following feedback was received (summarised, see the Project's Response to Submissions document for further detail [Tropicana Joint Venture 2010]):

- Department of Environment and Conservation (DEC) submitted that the proposal is not without residual impacts to conservation significant species and communities. The DEC specifically recommends that the Joint Venture mitigates or offsets the residual impacts on priority flora. It is envisaged that these discussions will provide for the basis of environmental outcomes for further consideration by the Environmental Protection Authority (DEC Submission to the EPA, 23/11/2009).

  A meeting was held between the Joint Venture and DEC on 16/11/2009 to progress offset discussions. It was agreed that further details would be provided on the Joint Venture's offset strategy (this document).

- Wildflower Society of Western Australia raised concerns about offsets and particularly those involving money provided by proponents. The main concern was that Offset funding paid to DEC may result in a reduction in non-Consolidated Revenue Funding received by DEC, resulting in no net benefit to conservation, particularly where impacts on biodiversity values are involved.

The Response to Submissions document (Joint Venture 2010) addresses these concerns specifically. In addition to the submission received during the public consultation period, the DEWHA notified the EPA that the PER meets their requirements.

EPA (2008b) states that it is important to note that in assessing the adequacy of a proposed offsets package, the EPA will not negotiate on, nor propose changes to, the components of an offsets package. Government agencies will provide advice to the EPA about a proposal or scheme and its offsets package. In turn, the EPA provides its recommendations to the Minister for the Environment who then decides whether a proposal or scheme (and its associated offsets package) should be approved or not. The EPA and/ or Minister may seek further advice from a probity panel on the appropriateness and adequacy of proposed offsets under the policy guidance framework.

1.7. Regional Biodiversity Considerations

The goals, objectives and principles of the National Plan for Ecologically Sustainable Development are specifically recognised as providing a framework for sustainable resource management in the region. Regional governance frameworks are advocated as a valuable mechanism for addressing Australia's pressing environmental problems, including biodiversity conservation (for example, The Wentworth Group 2002). In Australia, the Federal and State governments are increasingly devolving natural resource management (NRM) responsibilities to regional bodies. This move has led to the development of regional NRM plans. Regional NRM plans are the starting point for addressing regional environmental issues such as water quality, sustainable natural resource use and biodiversity conservation.

These considerations are important to the Project and confirm the need to focus on biodiversity and greenhouse needs within the project area. There are a number of factors that drive effective incorporation of biodiversity conservation in regional planning. The key drivers of effective biodiversity planning and action are (DEWHA 2010):

- Leadership;
- Providing consistent and appropriate support;

- Providing information that is relevant and available;
- Building on success;
- Appropriate application of science;
- Effective partnership arrangements;
- Identifying biodiversity values;
- Rewarding private effort to protect public values; and,
- Encouraging private investment.

2. AVOIDANCE AND MITIGATION MEASURES

As indicated in Section 1, the Joint Venture's objective for the Project has been to design and establish an operation that meets the environmental and social expectations of current and future stakeholders by preventing or limiting impacts on the environmental values of the local area. To achieve this, the Joint Venture has undertaken a number of design modifications that will have the effect of avoiding environmental impacts or reducing the environmental impacts that would have occurred under a "Business as Usual" approach. Examples of the design modification that have been incorporated in to the Project are provided in Section 2.1 and 2.2. The effect of the fundamental design principles resulted in the protection of all Declared Rare Flora populations and the minimization of impacts for most priority flora species observed (21 species recorded, 13 directly affected and only four with an impact of more than 5%). The design changes will result in a more natural reconstructed landscape on the completion of the project with the slopes of the waste landform being constructed at 15° which is compatible with adjacent landform and the capping of the height of the waste landform to 375m RL so the structures do not exceed the maximum height of the natural environment surrounding the operational area.

2.1. BIODIVERSITY AVOIDANCE AND MITIGATION STRATEGIES PROPOSED

Modifications incorporated into the Project design to avoid and minimise impacts on the biodiversity values of the region include but are not limited:

- Discounted the upgrading of the existing access tracks because it would result in the removal of the only confirmed occurrence of *Eucalyptus articulata* and dissect the Yellow Sandplain Priority Ecological Communities (PEC) of the Great Victoria Desert located north of the Queen Victoria Spring Nature Reserve. This would have resulted in a smaller clearing footprint while having a significant unacceptable impact on environment.
- Designing the infrastructure corridor (such as the Mine Access Road and Communication Corridor) to avoid high conservation areas such as the "Sand Dunes" and by limiting impacts on the Yellow Sandplain PEC of the Great Victoria Desert by positioning the corridors on the known outer boundaries of the community. This has resulted in the corridors being longer with additional corners.
- Avoiding the dune field located west of the mining area for the tailings storage area. The dune provided an opportunity to establish a series of lined tailings facilities that would require very little earthworks for their establishment. Baseline flora and fauna surveys determined that these dunes represented a high biodiversity when compared to other areas near the project as they contained evidence of Marsupial Moles, populations of *Conospermum toddii (DRF)* and a significant proportion of priority flora species recorded in the region. As a result, the TJV located the tailings facility adjacent to the processing plant and one of the waste landforms. This facility will require the construction of all four walls significantly increasing the capital cost.
- The modification of the southwest waste landform to protect the habitat of the only recorded occurrence of *Aganippe* sp.4 observed within the Project area. This modification removed 65ha from this landform.
- Scheduling clearing activities to avoid, if possible, breeding/flowering times of conservation significant species.
- Adopting a project implementation strategy that will see the project progressively clear to prevent unnecessary clearing wherever possible and where possible temporary facilities required during construction will be established within the footprint of future facilities (such as construction laydown area being located within the stockpile footprint, temporary camps required for the Road being established on borrow areas).
- Selectively collect sand and other growth mediums and cleared vegetation from the cleared footprint and stockpile for progressive rehabilitation
- Establishing the Access Road as a private road that will require other users to enter into an agreement with the Joint Venture which will require compliance with the Project environmental and safety management obligations and requirements. This will include adherence to management strategies for

weed, rubbish, feral animas, and fire protection and reduce the potential indirect affect on Nature Reserves in the region.

- Development of management strategies for the construction and operational phases that cover clearing, weed and feral management, waste control, fire and personnel management to prevent indirect impact on regional biodiversity.
- Adopting a design and landscaping strategy for the village and project area that will make use of the insitu vegetation, prevent the introduction of non-local species and reduce the risk that weed species will be introduced.
- Incorporation of leading practice dust control in the plant to minimize the adverse impact of point source dust emissions on biodiversity rich areas such as the western dune field.
- Setting the waste landform slopes at 15° and returning at least 1m of topsoil/growth medium so that it is comparable with the natural environment to increase the likelihood of rehabilitation success and to reduce the erosion potential.

Table 2.1 provides examples of how the Joint Venture has followed the hierarchy of controls to prevent and minimize impacts associated with the project. Chapter 7 of the PER provides full details on all management strategies adopted to avoid and mitigate the potential impact of the Project on the Great Victoria Desert biodiversity.

2.2. GREENHOUSE EMISSION REDUCTION STRATEGIES PROPOSED

In order to comply with the in EPA Guidance Statement 12 (2002) to keep the greenhouse emission as low as practical at all times the Joint Venture will:

- Incorporate energy efficient equipment into the plant e.g. adopting a processing flowsheet that incorporates high pressure grinding rolls (section 2.10);
- Ensure that site layout is efficient and limiting disturbance footprint (i.e. minimise biomass clearing);
- Selection of the most appropriate mining equipment to maximise efficiency and minimise emissions as far as practical;
- Optimise haul profiles to minimise fuel use by the mining fleet;
- Analysis of blast emissions and process emissions to reduce re-handling and reduce power requirements during crushing, which reduces processing energy use and emissions;
- Periodically review blasting effectiveness;
- Undertake regular review of the mine to mill process to identify improvement opportunities;
- Consider future opportunities for in-pit dumping to minimise haulage and therefore fuel use and emissions;
- Maximise equipment reuse between construction and operation;
- Maximise back loading;
- Establish a greenhouse friendly/ 5-star energy rating village by incorporating things such as solar panels, recycled water, double roofs, insulation, energy efficient lighting, refrigeration and cooling;
- Ensure active participation in the Energy Efficiency Opportunity (EEO) program; and
- Continue to investigate ways to improve efficiencies and reduce emissions over the life of the Project (e.g. under EEO).

Table 2.1 Examples of strategies adopted for the Tropicana Gold Project in accordance with the Environmental Management Hierarchy of Control

Hierarchy	Aspect / Impact	Strategy Adopted
Avoidance	Impacts on the Threatened Fauna	Infrastructure layouts have been designed to avoid areas where Sandhill Dunnarts have been previously trapped, Malleefowl mound locations and area considered to be prime Marsupial Mole habitats.
Minimize	Clearing	Wherever practical, temporary laydown areas and camps will be established within the footprint of future operational activities such as waste landform or borrow pits. The location of the Access Route and pipeline corridor have been located on top of already cleared areas associated with exploration activities. The Joint Venture opted to use hypersaline water from the nearby Minigwal Tough rather than to establish a 100km pipeline corridor to a sub-potable aquifer located NE of the project. 50km of clearing was prevented.
	Indirect impacts vegetation from the Road Corridors and altered landforms	Incorporating water management strategies into the road and site designs to prevent water accumulating adjacent to a site facility potentially inundating vegetation and interfering with natural sheet flow. Alterations to sheet flow can have adverse affects on Mulga and other vegetation in the arid zone.
Rectify	Removal of Priority Flora	Ensuring that rehabilitation and revegetation activities return Priority Flora species to rehabilitation areas. To achieve this research will be undertaken to understand plant regeneration strategies and habitat preferences.
	Clearing	On completion of construction all disturbance areas no longer required will be rehabilitated and rehabilitation activities will be progressively undertaken. The Joint Venture has developed a detailed conceptual closure and rehabilitation strategy. Broad rehabilitation plans have been developed for all aspects for the Project. It is currently envisaged that all infrastructure will be removed and rehabilitated except for the mining void.
Reduce	Weeds / Feral Animal Spread or introduction	The Joint Venture has developed Environmental Management Strategies (EMS) for construction (CEMS) and operational (OEMS) phases. The EMS specifies the general strategies that will be adopted and incorporated into the Project Integrated Management System to reduce the risk of introducing and spreading weeds and feral animals. The strategies incorporated in the CEMS and OEMS for weeds includes ensuring all equipment brought to site is free of soil and vegetation. Gravel obtained from the Pinjin Station will not be used outside the station boundary. Only endemic species will be used on site.

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3. RESIDUAL IMPACTS AND BIODIVERSITY OFFSET STRATEGY FOR THE PROJECT

In line with State and Federal guidance documents, the Joint Venture is only considering environmental offsets to manage impacts for which leading practice management options are insufficient to avoid and mitigate impacts (EPA 2006, 2007b; Federal Government 2007). The key environmental factors of the Project that cannot be fully managed or mitigated without the use of offsets are reduction in local biodiversity values through the clearing of native vegetation, impacts to priority flora and threatened fauna habitats and potential increased access to the region through improved road infrastructure and greenhouse emissions.

3.1. RESIDUAL IMPACTS FOR WHICH OFFSETS ARE PROPOSED

3.1.1. Clearing and Impacts on Protected and Threatened Species

The Project will result in clearing and the associated reduction in local biodiversity that may result in changes in ecosystem function. The maximum clearing footprint for the Project is estimated to be up to 3,440 ha, most of which will be rehabilitated over the life of the Project (excluding the Pit Void – 400ha). However, the impact on biodiversity and ecological function cannot be fully mitigated. Localised impacts to some threatened and priority species and their habitat are unavoidable, for example, some loss of individuals and habitat that exist under the footprint of critical infrastructure that cannot be moved (such as the resource area). These include species protected under the *Wildlife Conservation Act 1950* (WC Act), EPBC Act and other species which are generally thought to be of conservation significance (e.g. putative short range endemic species or Priority species recognised by the DEC) such as:

- Marsupial Mole - *Notoryctes typhlops* (or *caurinus*) (both listed as Schedule 1 under the WC Act, Endangered under the EPBC Act);
- Malleefowl - *Leipoa ocellata* (Schedule 1 under the WC Act, Vulnerable/ Migratory under the EPBC Act);,
- Potential habitat of the Sandhill Dunnart - *Sminthopsis psammophila* (Schedule 1 under the WC Act, Endangered under the EPBC Act); and
- Priority Flora species and potential Priority Ecological Communities (Listed by DEC)

To date, approximately 35 species (or potential habitats) of conservation interest have been recorded during surveys commissioned by the Joint Venture in the Project area. These include flora, terrestrial vertebrates, terrestrial invertebrates and subterranean fauna. Most of these species will not be significantly affected by the proposed Project for example, 21 DRF and Priority Flora were recorded during the Project surveys, of these four species will have more than 5% of their populations affected, the remaining species will either not be affected or will have less than 5% of their known populations affected by the project. The number of conservation interest species recorded during the Project surveys results from the large scale of surveys that have been undertaken to set the context for the Project and a lack of historical environmental surveys undertaken within the region. For example, many of the Priority Flora species are listed as a precaution because of limited knowledge of their distribution. Survey data generated by the Joint Venture is being considered by the DEC in a potential reclassification of Priority Flora (pers. comm. Melanie Smith to Belinda Bastow 8/01/10).

Unavoidable clearing that potentially has an adverse impact on conservation significant species will be managed through the implementation of this offset strategy.

3.1.2. Indirect Impacts from Increased Access to the Region

One of the key environmental challenges for the Project is the issue of increased access to the region as a direct result of improved road access via the Pinjin Infrastructure Corridor. Increased access has the potential to impact

on areas surrounding the Project, in particular, on the Queen Victoria Spring and Plumridge Lakes Nature Reserves.

Without the proposed Project and associated upgraded road access, the area receives limited vehicle traffic and public access due to its remoteness and the standard of existing access tracks which limit access by recreationists and travelers to the area. The development of the Project will necessitate the construction of a higher quality gravel road than currently services the area. While the TJV will manage access to this private road, it is possible that the road may lead to an increased number of visitors to the region, which in turn, could lead to negative environmental outcomes including (but not limited to):

- Increased pressure on Nature Reserves in the region which have been instated to protect biodiversity and conservation values in WA;
- Introduction or spread of invasive species by the general public who may not be aware of the threat to biodiversity of weeds and feral species in the wider region, and who will not have been educated and inducted into the hygiene and weed management practices of staff and contractors of the Joint Venture; and,
- Increased incidence of anthropogenic (human induced) fire in the region with associated detrimental effects on ecosystem values and threatened flora and fauna.

The infrastructure will be privately owned which will provide a means of controlling access to the region and impose obligations on the users to comply with the Project environmental requirements such as education, only using designated tracks and controlling the potential spread of weeds. Residual impacts may result even with strict controls, therefore mitigation includes contributing offsets.

3.1.3. Biodiversity and Ecosystem Functionality

The Project may have adverse impacts on the conservation of biodiversity and ecosystem functionality. Threatened species, their natural habitats and threatened ecological communities require special measures to preserve biodiversity within the region. In 2001-02, the (then) Department of Conservation and Land Management (responsibilities now imparted to DEC) undertook an extensive audit of the State's terrestrial biodiversity as part of the National Land and Water Resources Audit Biodiversity Assessment (McKenzie et al. 2002). Key conservation priorities within the GVD are:

- Rare species such as the Southern Marsupial Mole, *Polytelis alexandrae* (Princess Parrot), *Conospermum toddii* and *Eucalyptus articulata* all of which are considered endangered;
- Three ecosystems are considered vulnerable – the Yellow Sandplain Communities, assemblages of Queen Victoria Spring and the Mirramiratjarra dune field. The 'Yellow Sandplain Communities of the Great Victoria Desert' has diverse mammal and reptile assemblages. Their distinctive plant communities are considered to be threatened by grazing, feral animals, mining and changed fire regimes; and,
- in addition to the three ecosystems described above, eight vegetation associations have a high priority for reservation.

The main threats to biodiversity and ecosystems in the GVD are:

- feral herbivore and carnivores;
- altered fire regimes; and,
- lack of knowledge of the bioregion.

Major data gaps and research priorities within the GVD identified by the biodiversity audit (McKenzie et al. 2002) are:

- regolith mapping is unavailable at better than 1:250,000 resolution;
- no systematic biological survey has been made of the region, although there has been some assessment of biota on proposed and current reserves and a number of localised studies have been completed;
- there is little fine scale floristic data available for the subregion;
- there is little data on habitat requirements of virtually all invertebrate species, most ephemeral plants, persisting critical weight range mammals and uncommon vertebrate and plant species; and,
- there is no data to provide a regional context on life-history (including population trend) of any species.

3.1.4. Threats to Biodiversity and Ecosystem Function

The main potential impacts to ecological function as a result of Joint Venture's activities in, and around the Project area are:

- reduced species diversity through native vegetation clearing, wildlife corridor reduction and habitat fragmentation;
- impacts to conservation significant fauna by loss of habitat from clearing;
- impacts to conservation significant flora from clearing;
- vegetation complexes impacted directly by clearing and indirectly by impacts to groundwater;
- groundwater dependent ecosystems impacted by water abstraction;
- reduced water quality through increased sediment and pollution runoff and an increase in runoff from impervious surfaces; and,
- ecosystem functionality may be impacted by the introduction of feral species (flora or fauna) and increased incidence of fire.

3.1.5. Impacts to Biodiversity Potentially Resulting from the Project

Impacting Process: Clearing

Over 80% of the vegetation proposed to be cleared for the Project appears to be of typical conservation status for the region. The Project will disturb some locations of Priority Flora species, however, as these species are not restricted to the Project footprint and occur relatively broadly throughout the GVD, their conservation status is not anticipated to alter as a result of the Project.

Loss of habitat due to clearing is likely to displace individual Marsupial Moles within the Project area, specifically within the Resource Area. These mammals are part of what appears to be a large local population and the loss represents a low threat to the viability of local populations within the Project footprint and in the region.

Similarly species such as the Malleefowl, Mulgara and Sandhill Dunnart may undergo a localised impact due to the removal of available habitat. Populations of these taxa are known to persist outside the Project footprint, the loss of a relatively small proportion of their known and perceived habitat is likely to represent a low threat to their long-term viability within the GVD (Benshemesh 2009).

Fauna habitats occurring across the Project area are typical of the surrounding area and are well represented across the GVD region. No fauna habitat of endangered species will be significantly affected by the Project and

significant impacts to fauna of conservation significance at a regional, state, national or international level are highly unlikely.

Impacting Process: Water Abstraction

The Project will require water for the purposes of process and other mine-related operations. The Project requires up to 14 ML/day based on 7 Mtpa processing. Potential impacts include:

- Mine water supply extraction: The water investigations to date indicate that, while the permeability of the sandstone in the Minigwal Trough may be poor relative to other basin aquifers in Western Australia, the aquifer is sufficient to meet the Project's process water requirements without causing unacceptable environmental impacts;
- Dewatering of the confined aquifer: There should be no change in the existing groundwater quality;
- Groundwater Dependent Ecosystems: The depth to groundwater over the impacted area is greater than the rooting depth of local vegetation. Drawdowns should therefore have no impacts on groundwater dependent ecosystems as linkage between surface to the deep aquifers is minimal (due to clay layers); and,
- given the depth of the aquifer, the only potential biological dependence on groundwater in the impacted area are subterranean species. Stygofauna have not been identified and the drawdown effects are unlikely to have an effect on the known Troglofauna observed within the Operational Area, some 50km to the south-west. Troglofauna appear to be located within the top 20m of the profile. It is also worth noting that the geology and regolith associated with the Borefield and Operational areas are very different.

Resulting Impact

While there will be a localised impact on biodiversity (i.e. loss of fauna from within clearance areas), it is not anticipated that the Project will have a major or ongoing impact on flora/ fauna biodiversity, provided that sufficient management measures are implemented.

Possible impacts to biodiversity will occur if habitat suitable to support conservation interest species is removed, or the site layout results in habitat fragmentation. Considering that the proposed Operational Area is located in an area with little existing disturbance or degradation (with the exception of fire), and local habitats are regionally well represented, it is not anticipated that the Project will have a significant effect on the biodiversity of the adjacent areas or the region.

3.2. Anticipated Residual Impacts Post Rehabilitation

Threatened species, their natural habitats and locally important ecological communities require special measures to preserve biodiversity. Action will be taken to maintain, and where possible restore, natural processes and communities by protecting them from unnatural disturbances and maintaining ecological processes. Biodiversity will be protected from threatening processes, agents and activities such as feral animals, weeds, and inappropriate fire management.

The local biodiversity associated with the project footprint will be at least partly restored as a result of the project rehabilitation and revegetation activities. The Joint Venture is aiming to return at least 70% of the flora species comparable in composition to that previously recorded in the Project footprint before relinquishment of the site to include the return of Threatened and key indicator species. The Joint Venture acknowledges that it could take well over 100 years for all plant species to return to a point of ecological equilibrium. It is the Joint Ventures obligation to rehabilitate most of the Project clearing footprint; such that of the maximum anticipated clearing 3,440ha; only the proposed mining void (up to 400ha) will remain un-rehabilitated. While not guaranteed, the Joint Venture will

look for opportunities to minimize the void area through more efficient mining and potential backfilling with waste material. The proposed offset package will go some way to reducing the un-rehabilitated mining void.

3.3. OFFSET STRATEGY

The cornerstone of the Project offsets package is the establishment of a Great Victoria Desert Trust (the Trust). It is envisaged that the Trust would facilitate research, environmental education and on-ground conservation work that will benefit the wider Great Victoria Desert region during and after the life of the Project. The Trust will seek to collaborate with and/ or support other initiatives in the area, for example, supporting regional DEC staff or other appropriate organizations in undertaking baseline surveys. Research would be focused on the Project Biodiversity area as shown in Figure 3.1. It is planned that the knowledge gained through the Trust would be released to the public and be available for use by the State and other stakeholders in the region.

The benefits derived from biodiversity conservation in the GVD will be inherent in the knowledge base gleaned from scientific research. Once the concept of biodiversity is appreciated at the regional level, sound decisions on priorities for investment and management will be determined. Defining and articulating the values with stakeholders will assist in the protection of those values in the long term.

Research associated with Project restoration activities will not be covered by the Trust. This work will be funded directly by the Joint Venture.

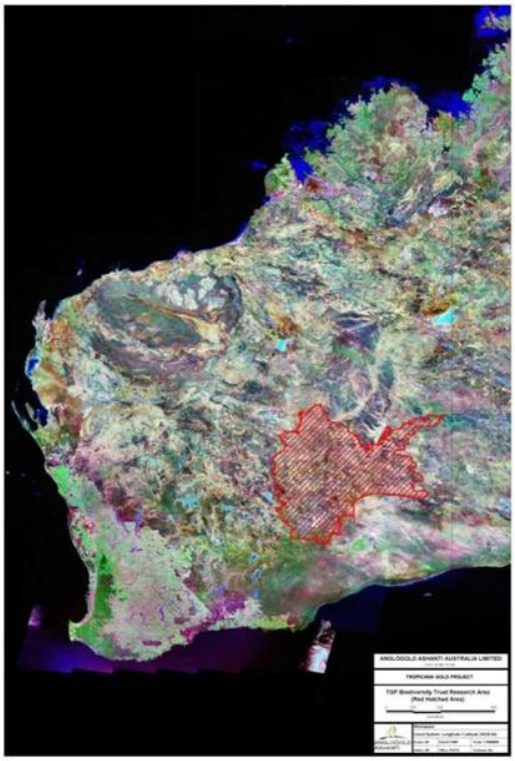

Figure 3.1 Project Biodiversity Trust Research Area (Red Hatched Area)

The Trust's Board (see Section 5 for further detail) would establish a Charter, based on the following strategic objectives:

- Understanding of the true biodiversity values of the Trust Area (broadly GVD 1 & 2 regions as indicated in figure 3.1) from a regional level before actions to protect values (in pristine areas, or recover values in

impacted areas) are defined. Following this, sound decisions on priorities for conservation investment and management can be made.

- Research, scientific publication and the general improvement of conservation efforts, scientific knowledge and understanding of the region. Focus will be on the maintenance of functioning sustainable ecosystems and native flora and fauna protection, specifically priority, threatened and/ or endangered species. For example:
    - Taxonomic, morphological and genetic studies of conservation interest species within the research area. Offsets may include research for management and resolution of outstanding taxonomic issues identified in existing biological survey documents.
    - Increase knowledge and skills in restoration of species and vegetation complexes.
    - Regional surveys to improve the current lack of knowledge of species presence, abundance, distribution and required conservation status;
    - Participate in, and contribute to, programmes that improve the overall knowledge of putative Short Range Endemic fauna;
    - Relationships between conservation interest fauna and habitat;
    - Research into impacts threatening process such as fire, feral animals and climate change on the biodiversity values within the Trust Area;
    - Investigate the impacts of controlled burning on native species in the region with the intent of informing future fire management practices;
    - Traditional Indigenous land management practices;
    - Management of threatening process and recovery of conservation significant species;
    - Record and understand the ethno botany and ethno zoology of the Trust Area and integration of traditional knowledge into biodiversity protection.

Activities that are of regional environmental benefit such as undertaking on-ground works which contribute to conservation efforts, specific protection and enhancement of the regions natural assets in the long term will also be considered. These activities may include:

- Predator and feral control program - animal management targeted at European fox, rabbit, feral cat and camel populations in the area;
- Weed management - focusing not only on the introduction and spread of weeds, but reducing (and if possible eradicating) weed infestations within the Trust Area;
- Assistance with the implementation of “Recovery plans” for threatened species;
- Assistance with fire management;
- Protective mechanisms associated with increased visitor use of the area;
- Research programs aimed at further understanding and protecting the conservation values of the region. Research areas that require further work, funding or possible new areas of research and/ or funding will be identified to better understand and manage conservation impacts in the Trust Area;
- Education programs targeted towards recreators and travelers to minimise impacts associated with rubbish, fire and weed control;
- Rehabilitation research that is relevant beyond the boundaries of the Project such as understanding dune restoration requirements, the ecophysiology of framework species such as spinifex, mulga and marble gum, seed bank handling, seed catchment understanding, broadcasting, germination and propagation.

- Promoting the employment and training of Indigenous personnel to support these programs.

Table 3.1 provides a list of potential projects that could be undertaken under the via the Trust. This list is intended to be illustrative of the range of programs that could be funded by the Trust.

Table 3.1 Potential Projects undertaken by through the GVD Biodiversity Trust

Aspect	Potential Projects	Outcome
Biodiversity Values	Flora and Vegetation Community Mapping and Threatened Flora and Ecological Community Assessments within State reserves and key areas within the Research Area.	Understanding of the biodiversity values within the existing reserve areas and the identification of additional areas that could be considered for inclusion in the conservation estate. Increased understanding of the distribution and habitat preferences of Threatened Flora species (DRF and Priority Species) and important Ecological Communities (Threatened and Priority). Results publically available.
	Targeted Threatened Fauna Surveys within State reserves and key areas within the Trust Area and public results for use by the community.	Increased understanding of the distribution and habitat preferences of Threatened fauna species (Matters of NES, WA Threatened and Priority Species).
	Undertake terrestrial and subterranean invertebrate species surveys within the state reserves and key area within the Trust Area regions and public results for use by the community.	Better understanding of the invertebrate taxa within the region, understanding of potentially conservation significant taxa and the management or protection of conservation important taxa.
Taxonomy	Commission a taxonomist to review and describe the unnamed priority flora species recorded within the GVD (such as *Baeckea* sp. GVD; *Baeckea* sp. Sandstone, *Malleostemon* sp. Officer Basin).	Formal publication of a taxonomic description of the species will provide the community with a clear description that will improve the likelihood that they will be identified correctly and thus avoided.
	Commission a taxonomist to review and describe the unnamed SRE and troglobitic species recorded during the TGP surveys.	Formal publication of a taxonomic description of the species will provide conservation certainty for species and the community with a clear description that will enable non-taxonomist to identify specimens.
	Assist a taxonomic review of Mulgara in WA to verify if *Dasycercus cristicauda* does exist in WA.	Clear understanding of which Mulgara occurs in WA and thus if *Dasycercus cristicauda* is present appropriate management strategy can be adopted and industry will be able to assess potential impact effectively.
Threatened Flora	Undertake population and recruitment biology research into DRF and Priority Flora Species in the Trust Area.	Understanding of the regeneration strategies is critical for the development of species recovery plan.
Ethno Botany / Zoology	Undertake ethno botanical and zoological surveys of the Queen Victoria Spring, Plumridge Lakes and Neale Junction Nature Reserve and other areas of interest within the Trust Area.	Recorded and understand the traditional values and use of plants and animals within the region. Knowledge will assist in identifying the area for the conservation estate.
Education	Assist with the development of education material for tourist and other use focusing on caring for country, waste management, feral/weed spread and introduction.	Minimise impacts on the region by the potential increase in use due to the improved access and interest in the region.

Aspect	Potential Projects	Outcome
Land Management	Assist with land management activities within the Queen Victoria Spring, Plumridge Lakes and Neale Junction Nature Reserve.	Minimise impacts on the region by the potential increase in use due to the improved access and interest in the region.
	Research and document indigenous land management practice adopted in the GVD region.	Knowledge will be available for incorporation into land management practices and use in future impact assessments in the region.
	Assist with the development and implementation of Threatened species recovery plans.	Species protection and recovery.
	Assist with threatening process management within the Trust Research Area.	Species protection and recovery.

The Trust will build on work completed and knowledge gained to date. The Joint Venture has participated in a number of studies that will greatly expand the knowledge and understanding of the region's biodiversity as described:

- Marsupial Mole assessment within the WA Great Victoria Desert (May 2008);
- Joint surveys with DEC in the Neale Junction Nature Reserve:

  Terrestrial Fauna – Vertebrate and Invertebrate (April and October 2008);

  Short Range Endemic Invertebrate (October 2008);

  Threatened Flora Species (October 2008);

  Broad Vegetation Assessment (October 2008);
- Assisted with the Great Victoria Desert Feral Camel Assessment (May 2008); and,
- Regional Threatened Flora Species – Joint Venture Exploration area, Plumridge Lake and Queen Victoria Spring Nature Reserve (December 2008 – January 2009).

The above surveys are in addition to the $1.8M expenditure on baseline flora and fauna surveys undertaken between 2007 and 2009 as part of the environmental impact assessment process. This expenditure appears to exceed that which typically supports other environmental impact assessments for projects of similar scale.

3.3.1. Direct Offset - Restoration and Rehabilitation

The restoration and rehabilitation of degraded areas outside the Project's disturbance area is proposed. Areas to be rehabilitated will be agreed with stakeholders and will total at least 100 hectares. This may include:

- Rehabilitation of surplus tracks in the region and particularly those in Nature Reserves in consultation with relevant authorities and other stakeholders; and,
- Rehabilitation of disturbed areas within State Reserves located within the GVD in consultation with the DEC.

These rehabilitation activities can assist in reducing access into the region, will benefit the existing ecosystem by targeting and improving habitat for species including the Sandhill Dunnart and Malleefowl. Rehabilitation of the existing Nature Reserves has the advantage of involving land that is already in the conservation estate and therefore has secure tenure. The Australian Government (2007a) recognises that it may not be desirable or possible to locate offsets in the vicinity of a development site and in some cases, greater conservation outcomes may be delivered by locating offsets elsewhere e.g. opportunities in the vicinity of the site (or in the same bioregion if a better environmental outcome can be achieved) and to regional biodiversity strategies (EPA 2008). To inform this process a desktop assessment of degraded areas in the vicinity of the site will be undertaken in 2010. Consideration will be given to the condition of vegetation complexes, linkages, soil types, presence of protected species and habitat.

3.4. Social Management Commitments

Effective regional planning requires both science-based biodiversity information and local knowledge and expertise. Information needs to be in a form appropriate for landscape-scale planning and management.

The Joint Venture is committed to working cooperatively with local indigenous Communities, Traditional Owners and their representatives (e.g. Central Desert Native Title Service), to build relationships to explore opportunities related to the project's development that may result in enduring beneficial community outcomes.

Areas envisaged as primary opportunities are in employment, business development, cultural heritage preservation and cross cultural education. Youth development and education related initiatives are focus areas.

3.5. Proposed Social and Environmental Management Commitments for the Project

The development of the Project will proceed as described in the PER and its supporting documentation (e.g. Management Strategies; Tropicana Joint Venture 2009) and as amended. The methodologies stated in the Management Strategies are correct at the date of publication. The methodologies may change during implementation as more knowledge or improved methodologies become available (adaptive management approach). Material changes to methodology will be referred to the advisory agency listed for the Condition.

The Joint Venture seeks to document conditions with clarity. Table 13.5 in the PER states what actions are required, when the actions are to be taken, where the conditions apply, where to take action(s) and how the action(s) should be administered.

3.6. Benefits of the Trust

The benefits of the Trust will be the actions, research and publications that improve knowledge, understanding and management that lead to improved conservation outcomes for the GVD. These will range from surveys, research, education programs, removal of threatening processes, on-going management activities such as monitoring, maintenance, preparation and implementation of management plans outside of the Project environmental management program.

A strategic focus for selecting priorities for conservation based on solid scientific principles is required. This will lead to more appropriate priorities in the initial program and enable the approach to be repeatable in other situations (for comparative purposes and for future research).

To achieve the most appropriate conservation outcomes, effective cooperation and communication is required between a range of agencies and other bodies, supported by coordinated mapping and information at appropriate scales and, appropriate networks, and sound decision-making tools. In order to ensure sound process is established for funding decisions from the Trust, the establishment of a Trust Review Panel is proposed.

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4. GREENHOUSE OFFSET STRATEGY FOR THE PROJECT

The Joint Venture aims to achieve the Environmental Protection Authority's (EPA) environmental objective; to ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards. The Joint Venture aims also to meet the overall objective of EPA Guidance Statement 12 (EPA 2002) (and documents referenced therein) to reduce greenhouse (GHG) emissions to as low as practicable. In order to meet these two overall aims, the Joint Venture has:

- consulted with stakeholders including:
  - Carbon Neutral;
  - Conservation Council of WA;
  - Office of Energy; and,
  - Office of Climate Change.
- optimised the efficient use of power/ fuel (and therefore minimised emissions) in the design of the Project layout and selection of equipment;
- commissioned studies into GHG emissions and air quality to identify impacts; and,
- designed an offset package that will lead to improvements in knowledge through emissions research and development that will enable the Joint Venture (and other operators) to minimise emissions in the future through better practices/ improved technology.

Consistent with recent EPA requirements, GHG reduction measures shall be considered on a 'whole of activity or mine life' basis. The most effective way to mitigate greenhouse emissions is to reduce emissions at the source. The Joint Venture has committed to an energy-efficient Project. Further to this, a trust fund to support a research and development program for GHG offsets is proposed.

4.1. Potential Impacts

Over the potential 15 year life of the Project, the average $CO_{2\text{-}e}$/annum produced is 294 kt (if the Project reaches its full predicted extent), with a total over the 17 year life span (construction and operations) of approximately 4,500 kt $CO_{2\text{-}e}$ (Appendix 2-B9). This equates to an average emission of 44.1 kt $CO_{2\text{-}e}$ per tonne of ore milled. Actual operational emissions, based on a worst case scenario, in a typical maximum-capacity operating year, will not exceed 330,000 tonnes $CO_{2\text{-}e}$, equivalent to approximately 0.6% of total Australian emissions in 2006.

The main sources, accounting for more than 90% of the Project GHG emissions, will be:

- combustion of diesel fuel for the mining vehicles; and,
- combustion of diesel to meet the Project's power requirements.

4.2. Proposed Offset Strategy

According to EPA Guidance Statement 12 (2002), offsets for GHG emissions can potentially include:

- establishment and maintenance of perennial vegetation. Rehabilitation of areas disturbed by the Joint Venture is a requirement under the *Mining Act* 1978 and therefore on-site rehabilitation does not count towards an offset for GHG emissions;

- reduce carbon intensity of existing activities. As discussed, the Joint Venture has sought to minimise emissions through the selection of the processing pathway and mining fleet which are significant contributors to the Project's overall GHG footprint. The Joint Venture is also committed to investigating ways to reduce the amount of GHG emitted per tonne of gold produced as part of their continuing participation in the EEO and Greenhouse Challenge Plus programs;
- fuel substitution to reduce emissions. This PER documentation has been based on the assumption that the main power supply for the Project will be sourced from a diesel fuelled power station. In the event that a substitute fuel source becomes available during the life of the Project, and is shown to be economically viable, the Joint Venture will consider the substitution. Likewise, if a technologically assured renewable option becomes available and is economically viable the Joint Venture would consider a conversion; and,
- development of new technologies. The Joint Venture's proposed contributing offset would be used in a research and development program to identify ways to reduce GHG emissions beyond the scope of the Project.

To demonstrate its commitment to reducing the Project's and the wider communities greenhouse emissions, the Joint Venture plans to establish an Energy Efficiency and Emission Reduction Trust (or enter into an arrangement with an existing entity with the same outcome in mind) focused on reducing greenhouse emissions and improving energy efficiency. Initially, a framework will be developed for the research and development program in consultation with relevant stakeholders and research institution(s). The framework would be developed during the construction phase of the Project, so that the program is ready to be commenced during the operational phase, following the first year of full gold production. Each year following full gold production the Joint Venture will invest (into a trust fund) $1.00/tonne/ annum of CO2-e produced in the preceding year.

This investment will be used to fund a research and development program to reduce GHG emissions (e.g. the development of cleaner technologies) or to purchase emission permits (i.e. under the CPRS or similar) that would be retired. Preference will be given to the research and development program as this has greater social and environmental benefits through the facilitation of technological advancements in low carbon technology and improvements in energy efficiency equipment. Inputs to the trust could also be made by other parties to further improve research and development opportunities.

The Joint Venture envisages that the overall aim of research and development is to stimulate and accelerate innovations that will reduce emissions and has the potential to lead to dramatic reductions in the emissions intensity of the mining sector as a whole, and perhaps have application beyond the mining sector. If an independent trust is established it is likely that program could involve the establishment of an agreement with a Western Australian University or a National Research Centre, to be selected in consultation with relevant stakeholders.

The EPA (2002) encourages the consideration of benefits to offsets at a scale broader than the proposal. Broader benefits (i.e. outside of the Project's emission footprint) are expected from the research and development program. For example, new technologies resulting from the research and development program should provide opportunities for other mining operations to reduce their GHG footprint. This contributing offset also addresses the following points identified by the EPA (2002):

- importance of partnerships between government, industry and the community in delivering an appropriate greenhouse response; and,
- need for greenhouse action to be informed by research.

5. IMPLEMENTATION OF THE OFFSET STRATEGIES

5.1. MECHANISMS CONSIDERED FOR THE ADMINISTRATION OF OFFSET FUNDING

5.1.1. Legal Structure

There are a number of potential legal structures such as a trust, agreements and partnerships. It appears a trust is the most common structure for formal environmental offsets e.g Harvey River Restoration Trust and the Karara Trust. Principle G of the EPA Offset Guidelines (EPA 2008a) requires that environmental offsets are publicly registered.

Discussion for the remainder of this paper assumes a Trust is the preferred legal structure, although it is acknowledged that the legal structure utilized could be via another mechanism agreed by the Joint Venture, State and Federal governments. For example, it is proposed that the Great Victoria Desert Trust forms the centerpiece of the offsets strategy for both the Biodiversity and Greenhouse Offsets (the aligned trusts are likely to include the Greenhouse Reduction and Energy Efficiency Trust and the Great Victoria Desert Biodiversity Trust).

5.2. TRUST BOARD AND TECHNICAL ADVISORY PANELS

To ensure that work undertaken via the Trust is in accordance with the objectives discussed in Section 3.2 and the Charter (refer Attachment 1.0), the Joint Venture envisages that Board or Governance Panel (Board) would be established along with two technical advisory panels, one to administer the Biodiversity outcomes and a second for the Greenhouse and Energy efficiency outcomes. The Board will be comprised of representatives from the Joint Venture, State and Federal Governments and up to two community members. The technical advisory panels will have up to eight members from a combination of academic institutions, government departments, non-government organizations, and indigenous representatives.

For example the Biodiversity Technical Advisory Panel could comprise:

- Tropicana Joint Venture (1) – Chairperson of Panel meetings;
- Indigenous representatives or Registered Native Title Claimant / Native Title Holder (1);
- Western Australian Museum (1);
- Botanic Gardens and Parks Authority (1);
- DEC Science Division (1)
- NGOs (1) e.g Wildflower Society, Wilderness Society, Conservation Council; and
- Academic advisors (2) e.g University of Western Australia, Curtin University.

and the Greenhouse and Energy Efficiency Technical Advisory Panel could be comprised:

- Tropicana Joint Venture (1) – Chairperson of Panel meetings;
- NGOs (1) e.g Conservation Council, Carbon Neutral, Sustainable Energy Now;
- Office of Climate Change Representative (1);
- Sustainable Energy Development Office (1)
- Academic advisors (2) e.g University of Western Australia, Curtin University

Once established the Board will administer the funds and ensure funds are allocated in accordance with the Trust's Charter. The Technical Advisory Panels will bring together a broad range of technical knowledge and

interests, advising which project should be undertaken and for what reason. The term for Board and Advisory Panel members will be three (plus three) years. The Board will provide leadership, consistency and appropriate support, to ensure the funds are allocated in such a way as to build on success, appropriate application of science, effective partnership arrangements and encourages further investment.

The Board and Advisory Panels will act as a conduit and seek clarification and perspective from a wider range of community, professional and agency staff as required. Progress of the Trust will be reported annually to the Joint Venture and the community.

5.3. FUNDING

The Joint Venture will provide funds to be held in a trust. Money will be deposited into the trust funds annually once the Project is operational and will be provided over the operating life of the project (up to 15 years). The funding for the Biodiversity outcomes will be comprised of three parts, an annual operational payment and a two part post project performance payment linked to the overall environmental performance of the project. The performance payment will take into consideration:

- Saving in clearing footprint achieved by the Joint Venture (i.e. Project clears vegetation less than 3,4440ha)
- Void management (e.g. if area of void reduced, or if backfill of voids and rehabilitation of voids is achieved)
- Success of revegetation on rehabilitated landform (i.e. return of more species than conditions require, establishment of DRF).

The annual operational payment is to be paid into the Trust during February each year for the duration of the operating life[1] ($/yr yet to be finalized). Whereas the post-operational payment will be split into two payments firstly a payment made 1-year after operations based on $/ha for un-rehabilitated mining voids and then a second payment on achievement or exceedance of the percentage of species returned to rehabilitation either 5-years after the closure or on the achievement of rehabilitation completion criteria.

Revegetation performance component and payment will be based:

- 1 if the Project achieves 70% of species
- 0 if the Project achieves 100% of species (unlikely)
- A multiple if less than 70% is achieved (which would mean that the closure conditions are not achieved).

Total Offset costs = area * $/ha * performance.

The funding for the Greenhouse and Energy efficiency area will be made via an annual payment linked to the project previous years greenhouse emissions at a rate of $1/t of CO_{2e} emitted. This encourages the Project to continually minimize its emissions. The final payment will occur the year after the project completes production.

Board and Advisory Panel members will seek to access additional funding to complement the proposed research and ongoing work from other sources, such as industry sources and government funds.

[1] Operating life means the years in which gold production occurs. In the event that gold production occurs for less than six-months then this is not considered as an operating year and the contribution to the trust will be proportionally reduced.

5.3.1. Grants and Assessment of Grant Applications

Devolved grants which run for a defined period are considered a major mechanism for distributing funding. Grants engage community members on an individual and small group basis. Research scientists, community groups or individuals could apply for funding under the Trust.

Through the provision of information externally (via education, awareness and advice), broader interest may be generated in conservation in the region. A broader based Reference Committee can be approached when/if wider ratification is required. Local facilitators from the agencies will support the process and it is the aim that community members take the lead.

A balanced approach to assessing applications will be required, including:

- Compliance with the Trust Charter and the environmental approval (based on section 2.2).
- Regional priorities and benefits.
- Ability for the information/project to contribute to science (generate, build on and/or improve the current state of knowledge), achieve conservation outcomes and/or provide benefit to the community.
- Methods, timing and deliverables for research. Resourcing, technical support, academic and/or expert advice.

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6. MANAGEMENT OBJECTIVES AND KEY MILESTONES TO EFFECTIVELY IMPLEMENT THE OFFSETS STRATEGY

6.1. CHARTER

The Joint Venture will work collaboratively with the key stakeholders to identify and confirm representatives from each stakeholder organisation. Once the Board has been established a Charter will be developed (A draft Charter is provided in Attachment 1.0). Following this, the Offset Mission, Vision and Values will be developed and the following will occur:

- Develop a process for agreeing on key inputs and deliverables;
- Finalise key dates and milestones;
- Establish communication processes and protocols; and,
- Allocation of responsibilities and accountabilities.

The legal requirements on the TJV as part of the environmental approval process will be reflected in the Charter which will be finalized in collaboration with relevant parties prior to commencement of Project construction. The Joint Venture timing for the implementation of the Project offsets is shown in Table 6.1.

Table 6.1: Joint Venture Timing for Implementation of Offsets

Offset Activities	Joint Venture Timing Phase
Establish Biodiversity Review Panel. Finalise the governance structure and trust objectives (Charter/ Agreement). Establish the legal structure for the Trust.	During Construction Phase
Gather information of the natural values within the area of interest to facilitate the identification of areas that should be passed into the Conservation Estate.	During Operational Phase
In consultation with the relevant agencies, define the rehabilitation scope and rehabilitation plans, undertake rehabilitation activities in Nature Reserves and Unallocated Crown Land areas adjacent to the Project.	During Operational Phase
Undertake biodiversity research and management activities.	During Operational Phase
Commence research and development (R&D) program for greenhouse offsets. The Joint Venture will invest \$1.00/tone/annum of $CO_{2\text{-}e}$ produced in the preceding year following the first full year of gold production (if the thermal-solar power option is not preferred).	During Operational Phase

Potential outcome based conditions that could be used for the project that related to the proposed offsets package are shown in Table 6.2.

Table 6.2: The Joint Venture Outcome Based Conditions

Topic	Actions	Joint Venture Outcome	Success Measured By	Timing	Responsibility
Environmental Offsets - Trust	Establish the Trust. Finalise the Strategic Direction for the Trust.	Regional environmental benefits realised as a result of the Project from: • Improved knowledge • Improved management of conservation reserves	Strategic Direction for the Trust signed and finalised. Trust Charter established.	Prior to and during construction.	TJV / State / Federal Governments
Environmental Offsets - Rehabilitation	Finalise the Environmental Offsets Documentation. Define the rehabilitation scope and rehabilitation plans. Undertake rehabilitation activities in conservation areas and areas adjacent Project.	Regional environmental benefits realised as a result of the Project from restoration activities.	Rehabilitation success criteria met.	During operations.	TJV
Environmental Offsets - Research	Environmental Offsets - Biodiversity Trust. Undertake biodiversity research and management activities.	Regional environmental benefits realised as a result of the Project from improved knowledge.	Publication of research via reputable mechanisms.	During operations.	Governance Panel

EPA Offset Guidelines (EPA 2008a) require that environmental offsets are clearly defined, publicly registered, transparent, auditable and enforceable. It is also a requirement of this guidance that offsets are clearly documented in the offsets reporting form (refer Attachment 5.0).

Further details of this program will continue to be provided once the strategic framework has been reviewed and agreed by the Joint Venture and State / Federal governments.

Since 2008 key State and Federal Agencies have been consulted on the Project proposed offset package, these include DEC's Environment Management Branch, DEWHA, DMP and DSD. The purpose of the consultation was to seek feedback as to the appropriateness of the offsets proposed. Generally, most organisations are in agreement with the proposed strategies however, some suggestions have been raised that land acquisition should not be completely excluded and that the legal and financial mechanism possibly should be with a single agency and that the funding should maybe be provided as an upfront contribution to the managing agency.

To this end the legal instrument associated with these offset packages is yet to be finalized.

Glossary of Terms and Abbreviations

AngloGold	AngloGold Ashanti Australia
CDNTS	Central Desert Native Title Services
CEMS	Construction Environmental Management Strategy
DEC	Department of the Environment and Conservation (Western Australia)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Federal)
DIA	Department of Indigenous Affairs (Western Australia)
DMP	Department of Mines and Petroleum (Western Australia)
DoIR	Department of Industry and Resources (previous Western Australian government department, now DMP)
DRF	Declared Rare Flora
EEO	Energy Efficiency Opportunity
EIA	Environmental Impact Assessment
EMS	Environmental Management Strategy
EPA	Environmental Protection Authority (Western Australia)
EP Act	*Environmental Protection Act 1986* (Western Australia)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal)
ESD	Environmental Scoping Document
ETS	Emissions Trading Scheme
GHG	Greenhouse Gas
GVD	Great Victoria Desert
IBRA	Interim Biogeographic Regionalisation for Australia
NGO	Non-Government Organisation
OEMS	Operational Environmental Management Strategy
PER	Public Environmental Review
PIMS	Project Integrated Management System
UCL	Unallocated Crown Land
VCL	Vacant Crown Land
WC Act	*Wildlife Conservation Act 1950* (Western Australia)

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ATTACHMENT 1 - DRAFT CHARTER GREAT VICTORIA DESERT TRUST

The Tropicana Joint Venture aims to deliver an environmentally responsible project with a minimum standard of 'no net environmental loss' or alternatively with 'net conservation benefit' as recommended by the Environmental Protection Authority (EPA 2006). To achieve this, environmental offsets have been proposed for the Tropicana Gold Project in addition to the design philosophy and environmental management measures discussed in the Public Environmental Review (TJV 2009) and the Offsets Strategy (TJV 2010). The Great Victoria Desert Trust will be administered by a Board and supported by Advisory Panels (likely to be the Greenhouse and Energy Efficiency and Biodiversity Technical Advisory Panels).

Together the TJV, State and Federal governments will effectively allocate and administer the funds of the Great Victoria Desert Trust to achieve positive and long-term environmental benefits. This will be achieved via the Board and the Advisory Panels.

Vision

It is the vision of the Joint Venture (via the Board and the Advisory Panels) that Trust funds are allocated to undertake ongoing surveys and research to improve the knowledge of the distribution, abundance and biology of conservation interest taxa directly affected by the Project and within the Great Victoria Desert.

It is the vision of the Joint Venture (via the Board and the Advisory Panels) that Trust funds are allocated to the provision of resources to facilitate energy efficiency and renewable energy sources.

Progress of the Trust will be reported annually to the Joint Venture, government and the community.

Goals

The Advisory Panels will recommend to the Board how the funds are best allocated and the Board will ensure funds are allocated in accordance with this Charter and the environmental approvals between governments (State and Federal) and the TJV. The Advisory Panels will bring together a broad range of technical knowledge and interests.

The Board and Advisory Panels will provide leadership, consistent and appropriate support, ensure the Trust builds on success, appropriate application of science, effective partnership arrangements and encourage further investment.

The Advisory Panels will act as a conduit and seek clarification and perspective from a wider range of community, professional and agency staff as required.

Mode of Operation

Whilst working on the implementation of the offsets package on behalf of the TJV, State and Federal governments, Board and Advisory Panel members agree to:

- Facilitate an understanding of the conservation priorities within the GVD.
- Facilitate an understanding of the greenhouse opportunities within the GVD and the mining industry.
- Encourage, foster, assess and approve conservation and research proposals, seeking a net environmental benefit for the bioregion and the community.
- Pro-actively involve stakeholders, participate in community consultation opportunities, listen to and consider stakeholder feedback when allocating funds;
- Consider long term land uses and access requirements;

- Maximise the long-term nature of the funding arrangements and seek opportunities for top-up funding for the Trust to maximise contribution/ benefits to conservation and scientific knowledge.
- Report annually and publicly on achievements directly attributable to the established partnerships.
- Keep Confidential Information confidential. 'Confidential Information' means all information that:
    - by its nature is confidential;
    - is designated by TJV as confidential; or,
    - is confidential commercial information as identified by TJV.

Invitations to speak to outside organisations or to attend meetings in their capacity as a member of either the Panels should be notified and discussed with the TJV representative. Acceptance of such invitations must be discussed in advance.

ATTACHMENT 2 – WA STATE STRATEGIES, POLICIES AND GUIDANCE DOCUMENTS ON OFFSETS

Environmental Protection Authority

September 2008

Environmental Protection Bulletin No. 1

Environmental Offsets – Biodiversity

Western Australia's growing society and strong economy pose many challenges to protecting and conserving our natural environment. In the past, some adverse environmental impacts may have been regarded as an acceptable consequence of economic and social growth. Today, we must find a way to ensure the protection and *improvement* of the environment while allowing for development. Environmental offsets are one management tool that can help achieve sustainable outcomes.

What are environmental offsets?

Environmental offsets are a package of activities undertaken to counter adverse environmental impacts arising from a development. Offsets are the 'last line of defence' and are considered after all steps have been taken to minimise impacts resulting from a development. Offsets aim to ensure that any adverse impacts from development are counter-balanced by an environmental gain somewhere else.

The Environmental Protection Authority (EPA) believes environmental offsets should be used with a goal of achieving a *net environmental benefit*. This recognises that the environment has been significantly compromised in the past and that halting and reversing the decline of the environment is now a priority.

Avoiding and minimising impacts always comes first

Whenever development occurs there is usually some impact that results in a loss of environmental values. Developers have a responsibility to avoid and minimise their environmental impact. Impacts on the environment may be avoided or minimised by considering alternative development strategies or using new technologies and 'best practice' processes and operations. Sometimes this may not be enough to prevent significant damage to important parts of the environment. Something else is needed to ensure that development can still occur, but not to the overall detriment of the environment. This is where environmental offsets can help.

When should offsets be considered?

Offsets should only be considered after all efforts to avoid and minimise environmental impacts have been made and significant environmental impacts still remain.

Major development proposals or schemes that have significant environmental impacts, particularly on 'critical' and 'high' value assets, will usually trigger the EPA's environmental impact assessment process. 'Critical' assets are the most important

ISSN 1837-1213

environmental assets in the State and are listed in *EPA Position Statement No. 9*. 'High' value assets are those considered valuable by the community and/or government and are in good to excellent condition but are not listed as 'critical' assets. The EPA will develop a publication to further identify 'critical' and 'high' value assets.

The EPA advises the Minister for the Environment on whether a project should be approved or not. In providing its advice to the Minister, the EPA adopts a presumption against recommending approval of proposed projects where significant adverse environmental impacts affect 'critical' assets. The EPA determines on a case-by-case basis how significant an impact is and this in turn influences the decision to assess the project through the environmental impact assessment process and its recommendations to the Minister including advice on the adequacy of proposed offsets.

Types of environmental offsets

Restoring and rehabilitating land directly impacted by development are considered accepted on-site environmental management requirements. Offsets activities are usually undertaken outside the area where the impact occurs (i.e. off-site) and may consist of beneficial environmental activities including restoration and rehabilitation of degraded but valuable environments. In some circumstances, these activities may not be feasible and other types of offsets may be needed. For example, securing land for conservation or enhancing its protection could be options.

To help ensure that offset activities are successful over the long term, supporting initiatives may be undertaken. These supporting activities may include conservation (for example, a covenant can be placed over the land to prevent clearing in the future), protection (fencing the offset site to keep out livestock), management activities (weed and feral animal control, fire control, monitoring and maintenance of the offset site), new research, education and other activities that have a proven environmental benefit. Together the combination of activities and supporting initiatives form an 'offsets package' that should deliver an overall net environmental benefit.

What makes a good environmental offsets package?

All development projects are different. For this reason, offsets packages will vary depending on the type of project, the environment being impacted and the significance of the impact on the environment. Environmental offsets should still meet all planning, statutory and regulatory requirements.

Ideally, the environmental values of the offset site should be similar to those being impacted. This concept is often referred to as 'like for like' and considers the environment's distinctive values and characteristics. The offset site should be located in the same local vicinity as the area being impacted, so as to ensure the immediate

environment receives the benefit. However, flexibility to determine the best environmental outcome must be considered in selecting offset sites. For example, sometimes a better environmental outcome could be achieved at a broader rather than at a local scale.

Detailed assessments of the environment being impacted and of the proposed offset site are needed to ensure that a suitable offsets package is proposed and results in an overall environmental benefit. The offsets package and its intended outcomes need to be clearly defined and transparent, so it can be publicly registered, audited and enforced if necessary. The offset activities need to be monitored over time to determine if adequate progress is being made and the desired outcome is achieved.

The risk that environmental offsets may not fully succeed in the long term should also be considered. This risk can be addressed by making the size of the offset site larger than the size of the impact site. It is crucial that offsets packages deliver a long lasting benefit to the environment. The benefits must continue after the development project has been completed.

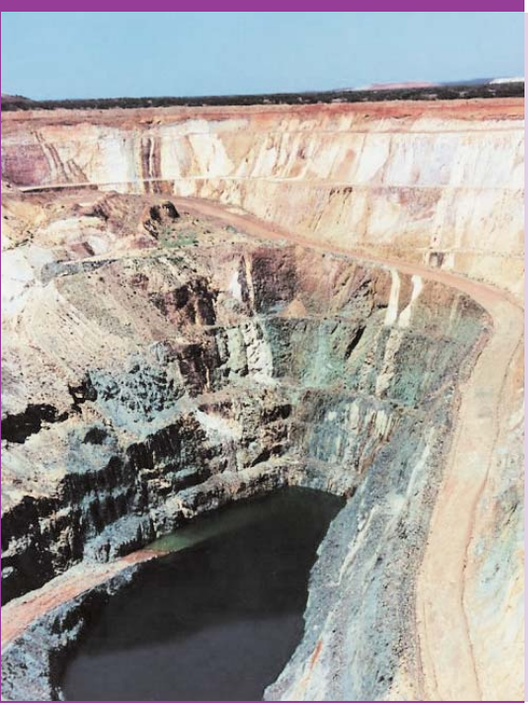
It is important to note that in assessing the adequacy of a proposed offsets package, the EPA will not negotiate on, nor propose changes to, the components of an offsets package. Government agencies will provide advice to the EPA about a proposal or scheme and its offsets package. In turn, the EPA provides its recommendations to the Minister for the Environment who then decides whether a proposal or scheme (and its associated offsets package) should be approved or not. The EPA and/or Minister may seek further advice from a probity panel on the appropriateness and adequacy of proposed offsets under the policy guidance framework.

If you require more detailed information about offsets, please refer to *EPA Position Statement No. 9* and *EPA Guidance Statement No. 19*. These documents can be downloaded from the EPA website at www.epa.wa.gov.au.

ENVIRONMENTAL OFFSETS

9

Position Statement No. 9



January 2006

Environmental Protection Authority

Environmental Offsets

Position Statement No. 9

January 2006

Environmental Protection Authority

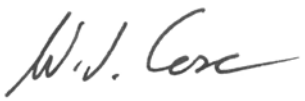
FOREWORD

Environmental offsets aim to ensure that significant and unavoidable adverse environmental impacts are counterbalanced by a positive environmental gain, with an aspirational goal of achieving a 'net environmental benefit'. In view of the State's recent alignment with the sustainability philosophy, it has potential to be a useful management tool – enabling development to occur, but not at the total expense of the environment. It is important to recognize that environmental offsets represent a 'last line of defense' for the environment, only being used when all other options to avoid and mitigate environmental impacts have been considered and exhausted.

This final Position Statement sets out the EPA's views on environmental offsets. The EPA considers that environmental offsets should be included, where appropriate, as part of approvals for environmentally acceptable projects to maintain and wherever possible enhance the State's environment. To this end, this Position Statement establishes a purpose, scope and principles for environmental offsets that the EPA will consider in future advice and recommendations. I anticipate that this Position Statement will provide the basis for developing a whole of government policy on environmental offsets. The EPA does not propose that this Position Statement be retrospective in its application.

The EPA is also currently preparing a Guidance Statement on environmental offsets which will be tailored directly to the environmental impact assessment process for development proposals.

The EPA wishes to thank those persons who, and organization which, commented on both versions of the Preliminary Position Statement. It has been substantially amended in response and is a much better document as a consequence.



Walter Cox
Chairman
Environmental Protection Authority

5 January 2006

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1. INTRODUCTION

1.1 Background

In recent decades, there have been several attempts at developing and using environmental offsets as an environmental management tool in Western Australia (WA). For example, in the 1980s and 1990s government agencies attempted to counter adverse environmental impacts to Swan Coastal Plain wetlands by creating, conserving or enhancing wetlands elsewhere.

In more recent years the focus has evolved to using offsets in a broader environmental management context, that is for counterbalancing waste emissions and impacts to conservation reserves, native vegetation, wetlands, habitat and biodiversity. Sustainability has also recently become a key philosophy endorsed by the State and methods are being developed to help achieve this (Government of WA, 2003a). Environmental offsets are one tool being used in this context, providing alternative beneficial environmental outcomes in situations where social and economic growth is sought at some detriment to the environment.

The Environmental Protection Authority (EPA) currently recognises that various offset policies and approaches are being developed and used without common overarching principles and acknowledges that there is the potential for inconsistent messages to be given. In addition, there is some concern from the community about what offsets should and shouldn't be.

The EPA is also concerned about perceptions that negotiated offset and compensation packages are being used to make otherwise 'unacceptable' adverse environmental impacts 'acceptable' within government. It is aware that some environmental offsets, proposed in the guise of sustainability tools, are sometimes over-riding the protection and conservation of our State's most valuable environmental assets. Over time, the cumulative effects of this type of decision-making would contribute to a gradual decline in both the quality and quantity of the State's priority environmental assets. The EPA is of the view that this approach is neither sustainable nor focused on protecting the environment. It is also aware there may be equity issues that need to be addressed by government. The challenge now is to find the means of doing so effectively.

Previous EPA policy has provided the context for using environmental offsets in various applications. One approach currently being used for Environmental Impact Assessment (EIA) is the 'net conservation benefit' approach, having been developed by conservation agencies in collaboration with the EPA (EPA Bulletin 1101, 2003). This approach focuses on offsetting the clearing of conservation estate land with the addition of another area of suitable land into the conservation estate. This approach also extended to making contributions towards environmental research, management and other environmentally beneficial activities.

The EPA has also published a draft policy framework on wetland banking. This document was released for public comment in 2001 (EPA, 2001a). It proposed the development of a wetland credit-trading scheme, regulated through a 'bank', which would issue credits for wetland improvements and debits for wetland degradation. A summary of public comments on this document has been provided in the first version of

this Preliminary Position Statement. Many of the issues identified in this document's public consultation phase were used in the development of this Position Statement.

General EPA offsets policy direction has also previously been provided for native vegetation and wetlands outside of the conservation estate (EPA, 2000; EPA, 2001b), marine benthic habitats where substantial cumulative losses have already occurred (EPA, 2003a) and in general circumstances where 'best practices' are considered inappropriate or inadequate (EPA, 2003b).

State Government agencies have also been developing various offset policies. The Department of Environment (DoE) is preparing a native vegetation offset policy for clearing of native vegetation regulated under the *Environmental Protection Act 1986*. In addition, the Department of Conservation and Land Management (CALM) in consultation with the Conservation Commission has been developing a 'conservation offsets' policy with respect to offsetting adverse impacts to conservation reserves, State forest, threatened flora, fauna and ecological communities. Public consultation is being undertaken on this policy approach as part of the proposed Biodiversity Conservation Act. The Department of Planning and Infrastructure (DPI) is developing an offsets and mitigation policy for impacts to 'Bush Forever' native vegetation sites.

In view of the afore-mentioned issues, the EPA is developing this Position Statement to provide overarching guidance and to establish a consistent policy approach on the matter. This position statement provides some clarification on the options for industry, developers, environmental consultants, specialist scientists and community groups who may be involved in developing or reviewing options for environmental offsets.

Where a proponent for a development is subject to the environmental impact assessment and approval process, and environmental offsets are properly part of those considerations, the EPA expects proponents to put forward commitments for offsets as part of their proposal.

1.2 Why offsets are important

Conservation of the environment is always desirable. However, in a growing society and economy this is not always achievable. Where environmental impacts must occur, environmental offsets represent the 'last line of defence' for the environment. They aim to ensure that any adverse impacts are counterbalanced by an environmental gain somewhere else, so there are no adverse environmental impacts as a result.

Historically, adverse environmental impacts were regarded as an acceptable consequence of economic and social growth. However, it is now well recognised this past thinking was unsustainable. As a consequence, the State is now dealing with significant environmental problems that threaten the condition of the State's environment and also its social and economic integrity. For example, past clearing of native vegetation in the wheat belt has contributed to the current threat of land and water salinisation, which in turn, is contributing to loss of biodiversity, loss of potable water supplies, destabilization of rural communities and reduced primary agricultural production.

Sustainability tools are needed to ensure the protection and *improvement* of the environment whilst allowing for economic and social growth. Environmental offsets are one management tool that has the potential to help achieve sustainable outcomes, as identified in the State Sustainability Strategy (Government of Western Australia, 2003a).

Other similar management tools include credit trading schemes and wetland/bushland banking.

Environmental offsets as a basic concept is well established nationally, having been incorporated into government policies for native vegetation, carbon trading and forestry. Western Australia is also a signatory to national agreements that employ the offset concept. Of particular significance is the National Objectives and Targets for Biodiversity Conservation (Environment Australia, 2001b) which aims to reduce the national net rate of land clearing to zero. The offsets concept has also been integrated into the National and State Greenhouse Strategies through vegetation carbon offsets and carbon credit trading schemes (Commonwealth of Australia, 1998; Government of Western Australia, 2003b); being similar in nature to schemes adopted internationally under the Kyoto Protocol.

Despite global strengthening of environmental policy and regulation, many key aspects of environmental health continue to degrade (Government of Western Australia, 1998; Commonwealth of Australia, 2001; UNEP, 2002). By itself, strict environmental policy and regulation can be a resource and time consuming activity for both regulators and proponents. However, by using environmental offsets as a complementary activity, it may allow a more flexible approach where some minor impacts may be considered if there is an overall net benefit for the environment. This approach may be particularly relevant where there is a minor environmental benefit to be gained by reducing emissions a small amount (beyond that which can be achieved through best available technology) at a large cost to the proponent. In these circumstances, the proponent may use offsets to achieve a greater environmental benefit somewhere else at a much-reduced cost (NSW EPA, 2002). Notwithstanding the above, it is widely recognised that regulatory tools and enforcement still have a very important role to ensure the environment remains protected in the long term.

Emissions appear to be the clearest or easiest application for environmental offsets. This can be attributed, in part, to established methods for quantifying, comparing and assessing pollutants being discharged to the environment. Many examples are available from around the world that show how emission offsets (in particular greenhouse gas emissions and nutrient emissions) can produce positive environmental outcomes, and in some instances, a truly sustainable outcome (for example, US EPA 2002, Climate Trust, World Resources Institute, 2000; EPA Bulletin 945 1999).

In addition to their obvious connection with point source pollution, offsets may also prove to be a remedy for the management of diffuse pollutant sources that have historically proven to be a large and onerous task for government to manage alone. Diffuse pollution offsets may utilise the creation of plantations or re-establishment of ecosystems to act as diffuse pollutant (carbon and other nutrients) sinks (NSW EPA 2002; O'Sullivan, 2002).

Another potential benefit of offsets is their ability to utilise market forces in environmental protection. The incorporation of offsets into programs or schemes (such as wetland banking, credit trading or other market-based incentives) can allow the marketplace to become actively involved in environmental protection and enhancement. Companies can be formed with the sole purpose of generating environmental improvements (via ecosystem restoration, rehabilitation and re-establishment projects) knowing that these improvements can then be on-sold at market price to other companies

wanting to offset environmental impacts. In this way, proactive environmental improvements can be undertaken before impacts occur. Integrating environmental protection into the marketplace represents a further step towards achieving sustainability and a great deal of research is currently being undertaken throughout Australia on this matter (James, 1997; Van Bueren, 2001; Murtough et. al., 2002; Binning et. al., 2002; Robinson and Ryan, 2002; Godden and Vernon, 2003; amongst others).

While environmental offsets can offer a tool for a sustainable approach to environmental protection, the concept is not without its limitations. Long-term studies of environmental offset schemes overseas have shown that implementing offset projects without sufficient data, research, information, available resources, regulation and commitment will only result in a *net loss* of environmental assets and values – the opposite desired effect of environmental offsets (Brown and Lant, 1999; Committee of Mitigating Wetland Losses, 2001; Ambrose, 2000; Johnson et. al., 2002). This has been shown to be especially true for offsets related to natural ecosystems, especially wetlands and complex vegetation types. Therefore it is imperative to ensure that offset-related policies, programs and projects are robustly coordinated, monitored, managed, evaluated and enforced to ensure the environmental offset contributes to successful, long-term environmental outcomes.

In addition, there have been general concerns that the whole offsets concept adopts a 'reactive' approach. That is, offsets depend on an adverse environmental impact happening for an environmental improvement to occur. There have also been suggestions that some offset programs in other Australian States have been too narrowly focussed and failed to address broader ecosystem benefits of the impacted ecosystem (Gillespie, 2000; NCC of NSW, 2001; Environment Victoria, 2000).

Offsets may also be perceived as suggesting that all environmental assets are 'up for grabs'. This perception highlights an important point. There must be clear and unambiguous delineation about the role and use of offsets as an environmental impact management tool, and *not* as a project approval negotiation tool. It emphasises the need to reaffirm the mitigation sequence for environmental impact management and to reaffirm the conservation and protection of 'critical assets' that represent our State's most important environmental assets.

The apparent limitations of environmental offsets highlight the need for the EPA to establish strong principles based on a foundation of environmental protection. It also highlights the need for the State to reaffirm its position on 'critical assets' – to provide a scope for the intended use of environmental offsets. It must also be reinforced that offsets are only one tool in the suite of environmental management instruments and that they must be used in conjunction with proactive tools (such as use of best practices and incentives), so as to promote the conservation of the environment first and foremost.

1.3 Offsets go beyond normal environmental management responsibilities

Offsets are not a substitute for normal environmental management responsibilities. These are required as part of normal environmental approvals processes under the Environmental Protection Act 1986.

Offsets are in addition to these and are about maintaining and preferably improving environmental quality. However, different parts of the environment under consideration may require different approaches albeit based upon the common principles. For example, for addressing offsets for emissions to, and loss of benthic habitat in, the marine

environment maintenance of ecological functions should be the focus with ecological linkages and flows important at the ‘bay’ scale rather than the ‘landscape’ scale. Creation of suitable habitat for mangroves and algal mats to colonise to directly offset losses elsewhere would be an example.

Finally, there can be wider potential benefits of offsets (ten Kate et. al. (2004)) which can include: a ‘social license to operate’ for proponents (i.e. community support or no community opposition), the possibility for proponents to influence emerging environmental regulation and policy, reduced cost of compliance with environmental regulation and easier access to capital with associated competitive advantage.

2. PURPOSE

The purpose of this Position Statement is to provide the community, government agencies, industry, developers, consultants, business and other key stakeholders with overarching advice about the intent and appropriate use of environmental offsets.

The EPA considers the purpose, scope and principles in this Position Statement to be important and these will help guide the EPA in future decision-making and in its advice. It must also be reinforced that the EPA's environmental offsets policy position in no way affects the legitimacy of other policy positions related to conservation and environmental protection. The EPA holds the view that environmental offsets should not be considered in isolation, but rather as part of an integrated framework for improved management of the environment that includes regulatory and behavioral incentive programs.

NET ENVIRONMENTAL BENEFIT GOAL

The EPA is of the opinion that environmental offsets should be used with an aspirational goal of achieving a '*net environmental benefit*'. This policy position recognises that the environment has been significantly compromised in the past and that halting and reversing the decline of the environment is now a priority (Figure 1).

Achieving a '*net environmental benefit*' goal means that each offset proposal should address direct and contributing offsets to meet the offset principles in this Position Statement.

Direct offsets are at least one activity selected to help counterbalance the environmental impact, with the aim of achieving no environmental difference, e.g. restoration (offsite*), rehabilitation (offsite*), re-establishment, sequestration. However, direct offsets may not be possible to achieve in every circumstance. Where native vegetation is outside the conservation estate and is subject to threatening processes, its acquisition and inclusion into the conservation estate may be considered a direct offset for the purposes of this Position Statement because of its security of tenure, purpose and management.

Contributing offsets = selected complementary activities (as necessary) which, with the direct offset, meet the offset principles (see Section 3); e.g. protection mechanisms; management; education; research; removal of threats; or other activities having a proven environmental benefit; or contributions to an approved 'bank', credit trading scheme or trust fund (as deemed appropriate by the EPA).

(* 'Offsite' carries the implication that offsets are not substitutable for normal environmental management requirements but in addition to these. That is, restoration and rehabilitation of land directly affected by a development are considered normal environmental management requirements.)

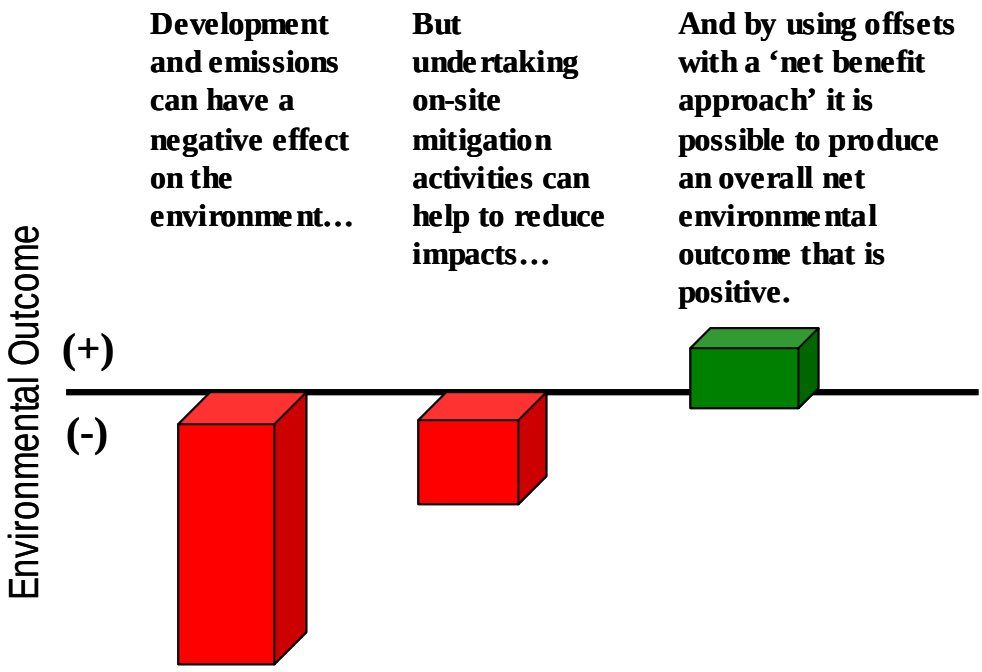

Figure 1: **The purpose of a 'net environmental benefit' goal is to achieve a positive environmental outcome from new development or emissions. Adapted from NSW EPA (2002).**

3. PRINCIPLES

In its advice and decision making the EPA has regard for a number of environmental principles from s.4A of the *Environmental Protection Act (1986)*, including:

- The precautionary principle
- The principle of intergenerational equity
- The principle of the conservation of biological diversity and ecological integrity
- Principles relating to improved valuation, pricing and incentive mechanisms; and
- The principle of waste minimisation

With reference to environmental offsets, the policies, decisions and advice of the EPA will be guided by the following principles, in accordance with the purpose and scope:

A. Environmental offsets should only be considered after all other reasonable attempts to mitigate adverse impacts have been exhausted.

- On-site adverse environmental impacts must first be addressed using the mitigation sequence (i.e. avoidance, minimise, rectify, reduce, offset in that order – refer Figure 2). Protection and conservation of existing critical environmental assets will always remain a priority above the use of environmental offsets. Offsets are then used to address any significant residual environmental impacts following mitigation considerations. The risk of residual environmental impacts being significant should be addressed early in development planning.

- Proponents wanting to undertake environmental offsets must provide a statement of reasoning to explain what mitigation will occur and why other mitigation options have not been selected to demonstrate that the 'impact mitigation sequence' has been fully considered and to provide justification for the environmental offset to be accepted.

B. An environmental offset package should address both direct offsets and contributing offsets.

- Direct offsets counterbalance the adverse environmental impact directly, with the aim of achieving no environmental difference (i.e. no net loss) and aspirationally, a net benefit. An understanding of an appropriate direct offset activity will require research, investigations and a debate of findings with key stakeholders.

    - When relevant to ecosystems, direct offset options may include restoration or rehabilitation of existing degraded ecosystems, re-establishing desirable ecosystems (e.g. re-establishing biodiversity corridors or specific ecosystems in areas of low representation) or implementation of agreed recovery plans for species. Where native vegetation is outside the conservation estate and is subject to threatening processes, its acquisition and inclusion into the conservation estate may be considered a direct offset for the purposes of this Position Statement because of its security of tenure, purpose and management.

    - When relevant to emissions, direct offsets include sequestration activities that permanently remove or 'lock up' a pollutant from the environment

(such as establishing new ecosystems, deep well injection and capping, or removing or capturing pollutants from the environment via other approved methods).

For greenhouse gas emissions, the EPA is mindful that there is no agreed international or national position yet regarding the addressing of offsetting of such emissions under the United Nations' Framework Convention on Climate Change. The position in Western Australia, as contained in the Western Australian Greenhouse Strategy (2004), is to promote market-based abatement solutions, to establish a registry for certifying and documenting carbon credit sequestration and to support international and national emissions trading and abatement models. Until these are in place the EPA will continue to ask proponents to address the mitigation of greenhouse gas emissions for levels above a best practicable technology benchmark. The EPA expects that its approach will be subsumed by WA's inclusion in a national approach in the future.

- Contributing offset activities should be considered as part of a combined approach with direct offset activities.

- Contributing offsets can in some cases be preferable because for example, they would lead to a better environmental outcome or direct offsets are not possible. The relative priority of different forms of offsets for biodiversity will vary according to circumstances

    - When relevant to ecosystems, contributing offset options may include conservation activities (covenanting), protection (such as fencing, buffering, or bunding), new research, education, removing threats, or on-going management activities (such as monitoring, maintenance, preparing management plans, evaluation, reporting, etc.). These may be more secure in the long term than, for example, rehabilitation on private property.

    - When relevant to emissions, contributing offsets may include going beyond Best Practicable Measures (as defined in EPA Guidance Statement 55 (Environmental Protection Authority, 2003b), assisting other industries with resource-efficient practices, new research, education or on-going management activities.

    - Where a proponent is unable to undertake restoration, rehabilitation, re-establishment or sequestration activities, they may consider the use of 'banking' or 'credit-trading schemes' to purchase equivalent environmental credits (improvements) to offset their adverse environmental impacts. As an alternative to banking, an appropriate financial amount could be contributed to a statutory trust fund with the sole purpose of being used for an environmental improvement activity.

- Successful integration and application of offset activities should aim to produce a 'net environmental benefit' outcome.

C. Environmental offsets should ideally be 'like for like or better'.

- 'Like for like' ensures that the offset activity counterbalances the same type of impacted ecosystem or emission.

    - When relevant to ecosystems, 'like for like' applies to environmental values, vegetation, habitat, species, ecosystem, landscape, hydrology, and physical area. The principle aims to avoid comparable threatened ecosystems, flora and fauna species from being systematically degraded over time through individual and cumulative impacts. Ideally the receiving offset site should be located in the same local vicinity, so as to ensure the offset effect is expressed within the same area of impact. This ensures that offsets are not diluted or concentrated within a specific geographical area or bioregion.

    - When relevant to emissions, 'like for like' applies to both the chemical and quantity of emissions. The chemical being offset should be the same as the chemical being emitted. For example, phosphate waste discharge should be offset with phosphate sequestration methods. It is worth noting that offsets should not extend to chemicals that are hazardous to the environment or human health (i.e. toxic or synthetic chemicals such as plastics, pesticides, heavy metals, etc). With reference to quantity of emissions, 'like for like' refers to sequestering the equivalent mass or volume of the chemical that is being discharged to the environment. The EPA acknowledges that 'like for like' and 'like for like or better' for greenhouse gases should be approached in most cases on a CO_2 equivalent basis if the greenhouse gas emitted is other than CO_2.

- 'Like for like or better' refers to not only achieving 'like for like' but aiming for improvements beyond what is required for 'like for like'. This may refer to either an enhancement in either the quality or quantity aspects of the offset activity while still considering 'like for like' requirements.

    - Where relevant to ecosystems, to achieve 'like for like or better' an offset resource from a lower quality asset which is the subject of the impact may be substituted for a higher quality asset in order to obtain an improved environmental outcome.

    - Where relevant to emissions, 'like for like or better' may consist of a greater amount of pollutant being sequestered than what is required under 'like for like' and 'offset ratio' requirements (see Principle D). 'Like for like or better' may also refer to achieving ecosystem improvements *at the same time* as achieving emission offsets. For example, re-establishment of a desirable ecosystem would meet offset requirements for both emissions *and* ecosystems. However, establishing a plantation or nutrient-stripping pond would meet only emission offset requirements.

- Where 'like for like or better' principles cannot be achieved due to limited availability of comparable ecosystems in the local vicinity, it must be ascertained if the ecosystem to be impacted is special to the bioregion. This may require relevant government environmental agencies to reassess whether this particular

ecosystem type is a 'critical asset'. Under this scenario, other more suitable offset sites may be recommended to the proponent by the relevant environmental agencies.

D. Positive environmental offset ratios should apply where risk of failure is apparent.

- Positive offset ratios should be used where there is a reasonable risk that the offset will not fully succeed over the long term. That is, the size of the offset to impact ratio should be larger than 1:1 and be *proportional* to both the importance of the environmental asset being impacted, and the likelihood that the offset is unlikely to achieve a 'net environmental benefit' outcome. Offset ratios should be based on past findings, success rates, current research or other similar projects being undertaken. Risk of failure could be reduced through, for example, putting offsets in more than one location.

    - When relevant to ecosystems, offset ratios should apply to environmental values, vegetation, habitat, species, ecosystem, landscape, and hydrology, in addition to physical area. The principle prevents complex ecosystems or unique species (that are difficult to restore, rehabilitate or reestablish) from being systematically degraded over time, particularly through cumulative impacts.

    - When relevant to emissions, offset ratios should apply to the quantity of the pollutant being discharged. The ratio should consider if pollutant emissions or offset outcomes (i.e. sequestration or net uptake) are expected to fluctuate significantly over time. Ratios should be weighted to accommodate periods of higher-than-expected emissions, or where an offset activity's sequestration rate is likely to deteriorate over time.

    In this regard, the issues associated with predicting and measuring environmental impacts – especially on biodiversity loss – should not be underestimated. Addressing these issues through offsets can lead to collateral benefits to improve the environmental impact process.

E. Environmental offsets must entail a robust and consistent assessment process.

- A robust, consistent and transparent assessment process will help to ensure that environmental offsets provide an equitable environmental outcome.

- Proponents proposing to cause or allow significant adverse environmental impacts must demonstrate adequate knowledge of the environmental values of the impact site and the proposed offset site(s). After acquiring this adequate knowledge, proponents must demonstrate how their proposed offset package will result in a 'net environmental benefit' outcome. If adequate information is lacking in any of these areas, the project proposal will be considered in the context of the 'precautionary principle'.

- Assessments of both the impact and offset sites should include factors that are commonly identified through the Environmental Impact Assessment process.

- The EPA expects that those involved in the impact assessment or development of environmental offset proposals should have appropriate qualifications and experience to ensure reasonable standards are maintained.

F. Environmental offsets must meet all statutory requirements.

- Environmental offsets must meet all planning, statutory and regulatory requirements prior to further consideration.

- Negotiation of offset conditions should not be used to approve projects where they have been previously restricted by the abovementioned requirements.

G. Environmental offsets must be clearly defined, transparent and enforceable.

- Offsets must clearly define the environmental impact(s) it is intended for. Should the project be modified and cause further additional impacts beyond the original impact, this will require the project to be reassessed for additional environmental offsets.

- Actual offset activities being undertaken should be fully documented by the proponent. Environmental offsets must be based on open and accountable administration. The general public should be able to see that offset principles have been put into practice and that offset goals are being achieved.

- If the offset depends upon another party or parties (other than the proponent) for implementation then agreement should be reached before proposing the offset.

Implementation of offset activities should be legally secure and enforceable and, subject to compliance auditing as well as enforcement activities when breaches are apparent.

H. Environmental offset must ensure a long lasting benefit.

- Environmental offsets must be undertaken on the understanding that the activities and outcomes must be long-term. The probability of success (or otherwise) is an important consideration in the choice of offsets. Offset projects should demonstrate security of purpose, security of tenure and security of management. The costs of enduring management and maintenance form part of the offset and should be factored in. Where it is proposed to transfer enduring management responsibility from the proponent to another party or parties, agreed completion criteria may be relevant.

    - When relevant to ecosystems, the offset site should be legally protected with covenants or conservation agreements or transferred into the conservation estate to ensure that the positive environmental benefit is long lasting. Legal agreements may be required in some instances to identify responsibilities and to ensure the on-going management and maintenance of the offset site over an ecologically meaningful timeframe (perhaps decades).

- When relevant to emissions, the offset activity should last for *at least* the duration of the emissions or environmental impact (whichever occurs for the longer duration). Legal agreements may be required to secure on-going management and maintenance over this timeframe.

- Where environmental improvements are purchased from a 'bank', credit trading scheme, or contributions made to an appropriate trust fund, it must be clearly demonstrated that the organization responsible for undertaking the environmental improvement activity is also demonstrating security of tenure and management.

4. SCOPE

The scope of this Position Statement applies to all environmental issues, matters and advice for which the EPA has jurisdiction (recognising that some government agencies have responsibilities which involve offsets for activities on which the EPA does not provide advice)

Ecosystems and Emissions

This Position Statement is relevant to all new proposals for significant adverse impacts to ecosystems and for emissions to the environment.

The EPA on the advice of relevant government agencies will determine whether adverse residual impacts are significant or not. (Residue impacts are those which cannot be avoided, minimised, rectified or reduced such that they be no longer significant.)

The EPA encourages industry, developers, consultants, specialist scientists and community groups to consider options for environmental offsets in the early phases of a proposed project and, where reasonable and practicable, in consultation with the wider community.

Critical Assets

'Critical assets' represent the most important environmental assets in the State that must be fully protected and conserved for:

- the State to fulfill its statutory and policy requirements;
- the State to remain sustainable in the longer term; and,
- the EPA to comply with its general principles for advice and decision making (see Section 3 on Principles).

Therefore, when the issue is before the EPA, there is a presumption against recommending approval for proposals that are likely to have significant adverse impacts to 'critical assets'. The EPA does not consider it appropriate to validate or endorse the use of environmental offsets where projects are predicted to have significant adverse impacts to the following:

i) Public Conservation Reserve System

- Nature reserves, national parks, conservation parks, regional parks, marine parks, marine nature reserves and marine management areas.
  [*Established in accordance with Conservation and Land Management Act 1984 and Land Administration Act 1997 and having regard for policies such as 'New Horizons'.*]

ii) Native Vegetation

- Where adverse impacts to native vegetation are seriously at variance to the principles to protect native vegetation listed under Schedule 5 of the *Environmental Protection Act 1986* or associated Regulations where:
  "a) It comprises a high level of biological diversity;
  b) It comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;

c) It includes, or is necessary for the continued existence of, rare flora;
d) It comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community;
e) It is significant as a remnant of native vegetation in an area that has been extensively cleared;
f) It is growing in, or in association with, an environment associated with a watercourse or wetland;
g) The clearing of the vegetation is likely to cause appreciable land degradation;
h) The clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area;
i) The clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water;
j) The clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."

(note: native vegetation includes marine habitats. Also, permitting processes for vegetation clearing on a merits basis are managed by the Department of Environment under Part V Division 2 of the Environmental Protection Act 1986. ss.51H(1) and 51I(2)(b) provides for specific powers to address offsets.)

- Where adverse impacts to a native terrestrial vegetation complex would result in a 30% or less representation of the pre-clearing extent of that vegetation complex in a bioregion (noting however that this threshold has been exceeded in some areas). [*National Objectives and Targets for Biodiversity Conservation 2001-2005, EPA Position Statemen 2*]

- Where adverse impacts to a native vegetation complex in constrained areas (i.e. areas of urban development in cities and major towns) on the Swan Coastal Plain would result in a 10% or less representation of the pre-clearing extent of that native vegetation complex.
  [*for example Bush Forever 2000; Greater Bunbury Region Scheme, Peel Region Scheme*]

- Bush Forever reserves (not including those areas subject to negotiated planning solutions or complementary mechanisms and for which agreement has been reached that such areas fall outside the conservation requirements) having regard for the Western Australian Planning Commission's Statement of Planning Policy No. 2.8 'Bushland Policy for the Perth Metropolitan Region (Draft)'.
  [*Bush Forever 2000*]

iii) Biodiversity

- Declared Rare Flora (DRF) - that significantly impacts local populations.
  [*listed pursuant to Wildlife Conservation Act 1950*]

- Declared Threatened Fauna - that significantly impacts local populations.
  [*listed pursuant to Wildlife Conservation Act 1950*]

- Having regard for Threatened Ecological Communities (TEC) - which fits in any of the following categories: presumed totally destroyed, critically endangered, endangered, vulnerable or data deficient (where it would not be unreasonable to assume the TEC would fit into one of the other listed categories).

[*as defined by English and Blyth, 1999, and identified by Department of Conservation and Land Management or approved pursuant to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999*]

- Having regard for the Priority Species List prepared by the Department of Conservation and Land Management.
  [*as identified by Department of Conservation and Land Management*]

[*in accordance with Environmental Protection Act 1986, Conservation and Land Management Act 1984, and with EPA Position Statements 2 and 3*]

iv) Wetlands

- Ramsar Wetlands core conservation areas (as defined in the statement of values for nomination)

- A wetland listed in the '*A Directory of Important Wetlands in Australia*', 3rd edition and more recent additions as contained in the Australian Wetlands Database at http://www.deh.gov.au/water/wetlands/database/index.html.
  [*Environment Australia, 2001a*]

- Environmental Protection Policy (EPP) wetlands.

- Conservation Category Wetlands (CCW)
  Conservation category wetlands not included in an Environmental Protection Policy may be viewed in the context of whether they have a reasonable chance of medium to long term survival of their environmental values although the underlying presumption is that they would normally be considered a critical asset
  [*as identified by Department of Environment and Department of Conservation and Land Management*]

[*in accordance with Environmental Protection Act 1986, Conservation and Land Management Act 1984 and with EPA Position Statement 4*]

v) Rivers

- Wild and Scenic Rivers.
  [*as identified under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) and the Department of Environment*]

vi) Landscape

- Where an important landscape, natural feature or environmental icon will be irreversibly impacted or destroyed. Such landscape features may be identified through planning instruments, systematic reviews of conservation reserves or the like.
  [*as accepted by the Environmental Protection Authority*]

vii) Environments sensitive to Emissions / Discharges

- In areas where new or an addition to existing emissions present a significant risk to human health or the environment.

- In areas where new or an addition to existing emissions exceed a prescribed environmental or health standard.

- Where emissions contribute to a global environmental problem such as ozone depletion.

[*in accordance with Environmental Protection Act 1986, Health Act 1911*]

viii) Ecosystems vulnerable to threats

- Where the introduction of a key threatening organism, process or activity threatens, or has potential to threaten, the survival, abundance or evolutionary development of an indigenous species or ecological community as identified for 'biodiversity critical assets'.

ix) Heritage

- Identified places of State, National or World Heritage significance (where potential impacts could compromise identified values) within the scope of the Environmental Protection Act 1986.
  [*as identified by the Environment Protection and Biodiversity Conservation Act 1999 (Cwth), Heritage of Western Australia Act, 1990*]

- Places of Indigenous Heritage of high importance.
  [*as provided for by the Aboriginal Heritage Act 1972*]

Government decision framework

In some instances, significant adverse impacts to 'critical assets' may be approved by State Government Ministers to provide an essential community service (such as electricity, water, gas and transport infrastructure), public benefit, or to allow strategic social or economic development to occur.

Under these circumstances, the EPA's advice is that approval of any such project of this nature should be made conditional on the:

- Consideration or demonstration (to the maximum extent possible) of on-site impact mitigation; and
- Development and implementation of an acceptable, comprehensive offsets package for significant, residual adverse impacts.

5. IMPLEMENTATION

The purpose, scope and principles outlined in this Position Statement provide overarching guidance and direction on the issue from the EPA's perspective. Government agencies, local authorities, and relevant business and industry groups are encouraged to develop environmental offset policies and implementation guidelines that are consistent with this Position Statement.

WHEN AND HOW SHOULD ENVIRONMENTAL OFFSETS BE APPROVED?

The following are key questions about the application of environmental offsets. They are dealt with in more detail in the companion paper to this Position Statement viz. the EPA's Guidance Statement on Environmental Offsets. (in preparation).

Test 1 – are these proposed new activities, extensions or enhancements to existing activity, or existing activities requiring renewal of State government environmental approvals likely to have significant environmental impacts?

Test 2 – before offsets are considered, are potential environmental impacts demonstrably addressed following the hierarchy:

- avoid
- minimise (limit magnitude)
- rectify (restore, repair)
- reduce (over time) ?

Test 3 – are residual environmental impacts expected to have a significant adverse impact on critical or high value assets?

Test 4 – do residual environmental impacts remain significant but not so significant that the activity is likely to be found environmentally unacceptable (including in a cumulative impacts context)?

Test 5 – can significant residual environmental impacts be offset directly (including 'like for like or better')?

Test 6 – if such impacts cannot be fully or partially offset directly what contributing offsets could be reasonably proposed and implemented?

Test 7 – does the offsets package (direct and contributing) achieve the aspirational goal of 'net environmental benefit'? Are positive offsets ratios relevant?

Test 8 – is the offsets package robust and likely to provide a long-lasting benefit?

Test 9 – have the costs of enduring management and maintenance been included?

Test 10 – is the commitment to an offsets package clearly defined, transparent, implementable, enforceable and auditable?

DECISION-MAKING PROCESS

Figure 2 provides a summary of the decision-making process for using environmental offsets. Key features of the flowchart are outlined as follows.

First triangle: Environmental Assets

The following environmental asset types affect how project proposals and related offset activities are assessed.

- Critical Assets: represent the State's most important environmental assets that must be fully protected and conserved (as defined in Section 4). Significant adverse impacts to these assets should be avoided at all costs. Therefore, the EPA in providing its advice will adopt a presumption against approval of project proposals where significant adverse impacts affect 'critical assets'. However, where projects have been approved by the State Government (see Section 4) approval should be conditional on the:
    - consideration or demonstration (to the maximum extent possible) of on-site impact mitigation; and
    - development and implementation of an acceptable offsets package for significant, residual adverse impacts.

  In these special circumstances, the project proponent should develop an environmental offset package using advice from relevant environmental government agencies and applying the principles identified in this Position Statement.

- High Value Assets: represents those environmental assets that are in good to excellent condition, are considered valuable by the community and / or government, but are not identified as 'critical assets'. Project proposals and offset activities for these assets may be referred to and assessed by the EPA on a case-by-case basis, but are otherwise considered by relevant environmental government agencies. EPA's Guidance Statement 33 'Environmental Guidance for Planning and Development' (Draft) (June 2005) is a useful resource when considering the suite of pertinent environmental assets.

- Low to Medium Value Assets: represents those assets that are less than good to excellent condition as recognised by government agencies and / or community. Offset activities do not need to be addressed through EPA's processes but will be dealt with by relevant government agencies. As a guide for plant communities, see Keighery (1994).

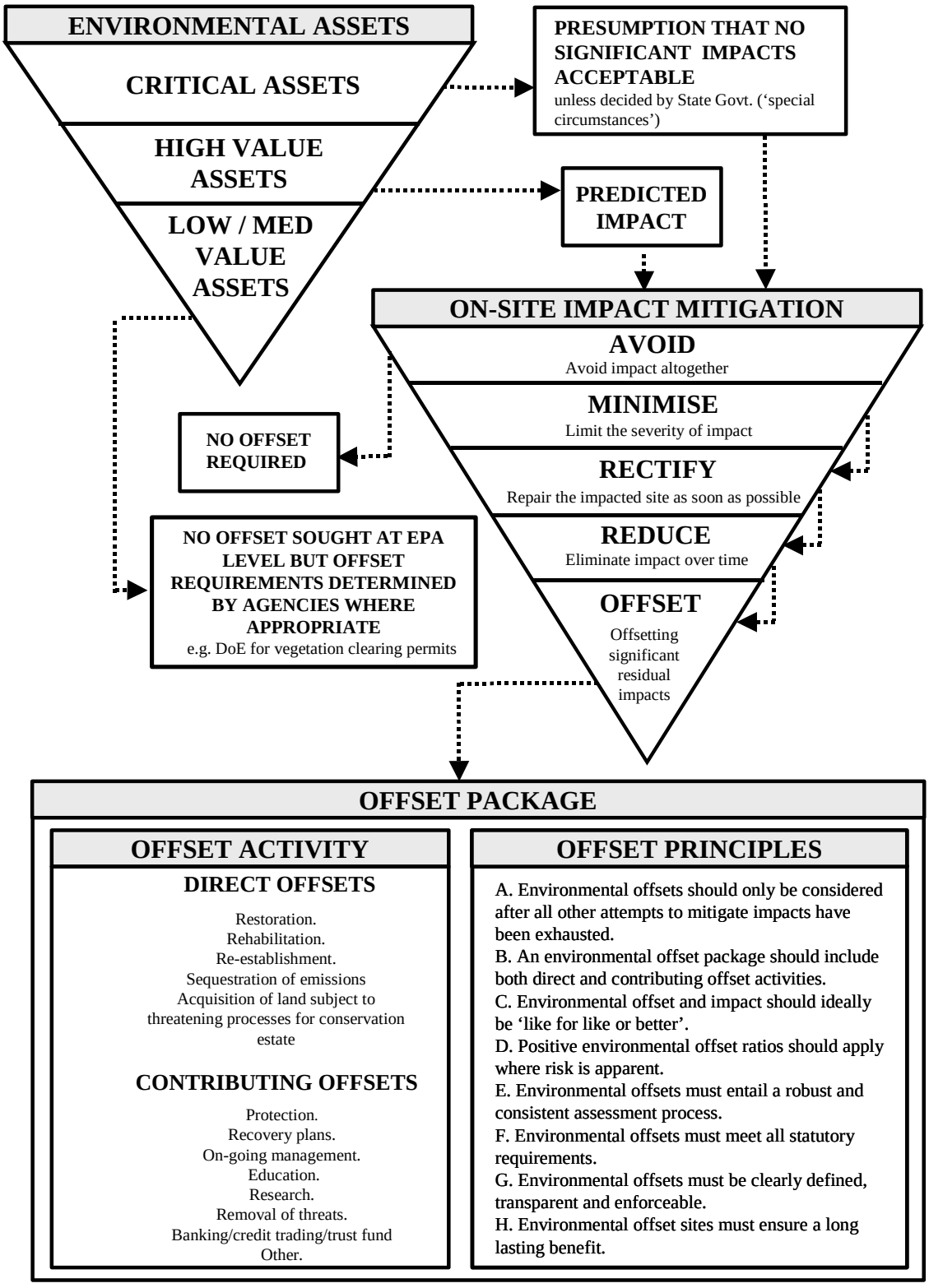

Figure 2: Decision framework for the use of environmental offsets

Second triangle: On-site Impact Mitigation

These five steps represent the sequence of considerations designed to help manage on-site environmental adverse impacts (in order of preference).

- Avoidance: significant adverse impacts to the environment are avoided through selection of a practicable alternative. If *all* environmental impacts are avoided then no offset activities are required.

- Minimisation: if adverse impacts are not avoidable, all appropriate and practicable steps should be taken to minimise adverse impacts.

- Rectification: where adverse impacts can't be minimised, all appropriate and practicable steps should be taken to repair, rehabilitate or restore the impacted site as soon as possible.

- Reduction: where adverse impacts can not be rectified as soon as possible, all appropriate and practicable steps should be taken to reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action and through the philosophy of continuous improvement

- Offsets: where significant residual adverse environmental impacts are still apparent after following the above mitigation sequence, then an environmental offset package may be used to achieve an aspirational 'net environmental benefit' outcome.

Box: Offset Package

An environmental offset package may be considered where adverse residual environmental impacts are significant, but not significant enough to make the project unacceptable.

To achieve a 'net environmental benefit' goal, the environmental offset package should address both direct offsets and contributing offsets.

Various types of offset activities are as follows.

- Direct Offsets: these ameliorative actions would generally occur away from the impact site and are designed to counterbalance the adverse environmental impact, with the aim of achieving no environmental difference (ie. no net loss). As a minimum, one direct offset activity should be considered from the following list of activities:

    - Restoration: has the goal of improving an existing ecosystem to near pre-impact condition. This includes restoring natural or historic functions, appearance and other characteristics. Restoration of existing ecosystems, while recognised as difficult, is a highly desirable offset because it results in a more fully functioning ecosystem. It is also more likely to succeed given existing hydrology and soils are conducive to maintenance of ecosystem functions. Restoration is time dependent.

- Rehabilitation: has the goal of improving and re-instating some of the functions of an existing high value asset (where appropriate, a critical asset), but impacted, ecosystem. Examples may include increasing native vegetation, enhancing habitat value, weed or feral fauna eradication, and/or establishing buffers. Rehabilitation of an existing ecosystem to produce an environmental benefit must outweigh the loss of the impacted ecosystem. When used as a sole direct offset activity, it may require the enhancement of several ecosystems or a much larger area than that lost from the impact. Rehabilitation is time dependent. Rehabilitation (and re-establishment) extends to recovery plans for directly affected species.

- Re-establishment: has the goal of re-establishing a functioning ecosystem with strategic environmental benefit. While restoration and enhancement of existing ecosystems is preferred, re-establishment may be beneficial in some instances. For example, forming a biodiversity corridor between two important ecosystems, or re-establishing ecosystems in areas of low representation. Re-establishment too is time dependent.

- Sequestration: specific to offsetting pollutant emissions, it has the goal of permanently removing or 'locking up' pollutants in the environment. This may be linked to activities associated with restoration, rehabilitation or re-establishment, or the use of banking or credit trading mechanisms, deep well injection and capping, soil amendment, or using other sequestration methods

- Acquiring Land for conservation: consists of purchasing the offset and transferring the land title into the conservation estate. Alternatively, establishing covenants with an approved organisation or establishing legal tenure agreements are other related activities. Land acquisition for conservation is considered a direct offset for the purposes of this Position statement if the land is subject to threatening processes because it has proven to be an important and valuable contributing offset measure by offering security of tenure, purpose and management in perpetuity

  In some situations where adverse impacts to low, medium or high value environmental assets occurs, the environmental benefits of acquiring a 'critical asset' for conservation may greatly outweigh the overall environmental loss - in which case conservation through a combination of land acquisition, protection and on-going management may be considered a viable offsets package. It must be noted that this exception does *not* extend to adverse impacts to 'critical assets' (i.e. adverse impacts to one 'critical asset' should not be offset by conservation of another 'critical asset').

- Contributing Offsets: Contributing offset activities should be selected as necessary to meet the principles of this Position Statement. These activities may include:

- Protection: protecting the environment from threats or harm is achieved by using barriers or buffers, thereby reducing the risk of damage to, or pollution of, the offset site. For example fencing of valuable ecosystems.

- Removal of threats: undertaking initiatives that remove a threat(s) from the direct offset site thereby preventing it from being potentially damaged in the future. Examples might include eradication of feral animals, or exotic flora, removing pollutants, removing livestock, controlling the spread of diseases such as 'dieback', etc.

- Management: management of ecosystems is achieved by undertaking day-to-day activities that benefit the direct offset site. For example contributing to an environmental management plan for critical assets.

- Banking, Credit Trading or Trust Fund: where a proponent is unable to undertake restoration, rehabilitation, re-establishment or sequestration activities, they may consider the use of approved 'banks' or 'credit-trading schemes' to purchase environmental credits (improvements) to offset their adverse environmental impacts. Alternatively, an appropriate financial amount should be contributed to a statutory trust fund with the sole purpose of being used for a strategic environmental improvement activity. Unless banks, credit trading schemes, and trust funds are already in operation, contributions to these types of schemes will require methodologies to be developed that fully (financially) cost the adverse impacts to environmental assets, values and ecosystem services. These methodologies may take time to develop and will require endorsement by the EPA.

- Education: sustained education of community, business and industry about environmental issues related to the direct offset site or activity, or educating other industries or businesses of best practices to remedy poor environmental practices or behaviours.

- Research: investigating new technologies or innovative ideas to better address environmental issues or improve best practice associated with the direct offset activity. This also includes the necessary investigative work required for environmental assessments of impact and offset sites where current data or information is lacking.

- Other: the EPA encourages the development of innovative approaches aimed at improving environmental outcomes.

HYPOTHETICAL OFFSET CASE EXAMPLES

Example A: Wetland offset package

Despite best attempts to conserve a high value (but not critical asset) wetland, approval is given by Government for it to be lost due to strategic development. The proponent has documented all attempts at on-site impact mitigation, but is unable to mitigate all significant adverse impacts. The developer proposes an offset package which consists of finding a wetland in the local vicinity that has similar wetland attributes, functions and values as the wetland that will be impacted. After an extensive assessment process, working in collaboration with environmental government agencies, a suitable offsite wetland is found. The selected offsite wetland is in good condition; although it is showing some signs of degradation from the invasion of aquatic and terrestrial weeds, the presence of foxes, and the loss of under-storey species from the vegetation. The proposed offset activities include a combination of wetland rehabilitation works (direct offset), and a large cleared area on the wetland boundary will be replanted with local endemic species to provide an additional buffer area (direct offset). The proponent will ensure the removal of weeds and feral fox threats, and allocate funds for on-going long term management including monitoring and evaluation (contributing offsets). The whole wetland area will then be fenced from adjoining recreational space (contributing offset). The land will be purchased and placed into the conservation estate for long-term security (contributing offset). The developers will erect signage at the offset site and post quarterly updates and photos of their offset wetland's progress on their Internet site to show the community the progress of their offset wetland (contributing offset). The combination of the proponent's direct and contributing offset activities will contribute to a 'net environmental benefit' outcome.

Example B: Nutrient offset package

A large horticultural business wishes to expand operations and potentially increase nutrient waste discharge emissions to the nearby creek. Despite the company consistently demonstrating the use of best practice/technology, they are unable to mitigate any further discharges without a huge additional cost. The company proposes a nutrient offset package. After a robust assessment, with guidance from relevant authorities, an appropriate number of nitrogen (N), phosphorus (P) and carbon (C) units are calculated. The company agrees to offset these units by the purchasing and covenanting of a mature, re-established bushland area in the catchment (contributing offset) from an environmental credit-trading company (doing this meets the C, N and P offset requirements and has a bonus ecosystem offset). In addition, the company also commits to undertaking a collaborative research project with a local university looking at innovative ways for the business to further reduce their nutrient waste emissions (contributing offset), as well as options for removing nutrient emissions to the water body from other sources (e.g. intensive animal husbandry) (direct offset if implemented). The results of the research would be made publicly available on completion of the project. The combination of the proponent's offset activities will contribute to a 'net environmental benefit' outcome.

Although these hypothetical case examples do not provide quantitative details that will be necessary to develop an actual offset activity, the examples still provide an indication of how environmental offsets can be developed to meet the requirements of this Position Statement.

POLICY APPROACHES FOR IMPLEMENTATION

The EPA recognises that, for this environmental offsets approach to be implemented successfully, it must work in partnership with, and have the support of, government agencies. The EPA will use Part II, Section 17(3)(d) of the EP Act (1986) to implement the environmental offsets approach as outlined in this Position Statement. This part of the Act empowers the EPA to develop policy positions on particular aspects of the environment as follows:

s.17(3) *…the Authority, if it considers it appropriate or is requested to do so by the Minister, may -*

(d) consider and make proposals as to the policy to be followed in the State with regard to environmental matters.

This tool would allow a state-wide environmental policy to be developed for environmental offsets. The EPA would develop the first stages of this policy as advice to the Minister for the Environment. State Government could then consider adopting the policy as whole-of-government policy. Such policies can provide definitive, whole-of-Government direction to government agencies, industry and community within existing statutory and regulatory frameworks. This is advantageous for dealing with major environmental issues that cross regional, sectoral and jurisdictional boundaries, as commonly occurs with issues associated with environmental offsets. It would be useful for State Government to adopt such a policy approach to ensure a consistent and unified system towards addressing environmental offsets.

It may be necessary to establish a repository of offset commitments to avoid double counting and to provide the basis of auditing success and compliance

The EPA sees that the responsibility for putting forward an offsets package and committing to and funding its implementation rests with the proponent of activities which could have a significant effect on the environment. The offsets package, in the context of a proponent seeking an approval from State government, is a tool to assist in the prevention, control and abatement of pollution and environmental harm and for the conservation, preservation, protection, enhancement and management of the environment. The EPA will take account of any offsets package put forward by proponents in advising Government on the environmental acceptability or otherwise of such activities.

6. GLOSSARY

Banking: banking, in an environmental context, refers to a system whereby credits are generated for undertaking environmental improvements (such as sequestration, restoration, rehabilitation and re-establishment activities). The credits can be later withdrawn (purchased) from the 'bank' to offset authorized adverse environmental impacts. The bank provides a centralized, cumulative record of credits (environmental improvements) and debits (adverse environmental impacts) within a standardized accounting framework and a goal of ensuring a neutral or positive balance as well as an audit function

Biodiversity: the variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form. Biodiversity, or biological diversity, is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity (Commonwealth of Australia, 1996).

Bioregion: represents an area with common ecological characteristics, including climate, geomorphology, landforms, lithology and characteristic flora and fauna.

Conservation: the positive, embracing, preservation, maintenance, sustainable utilisation, restoration and enhancement of the natural environment.

Covenant: is a voluntary, flexible agreement between a landholder and a recognised body to protect natural assets. It is attached to the landholder's land title and, if permanent, can prevent future owners from clearing or damaging natural assets on that land.

Credit trading: a market-based process of buying and selling credits (environmental improvements) and debits (environmental impacts).

Critical assets: represents the most important environmental assets in the State that must be fully protected and conserved for the State to meet its statutory requirements and to remain sustainable in the longer term.

Ecosystem: a defined community of organisms, their interactions, and their physical surroundings.

Environmental impact: represents an effect on the environment that leads to changes in its condition. Depending on the nature of the activity causing the impact, it may have either beneficial or adverse environmental outcomes.

Environmental harm: means direct or indirect harm resulting from the removal or damage to native flora or fauna, habitat, or environmental values. (see *Environmental Protection Act 1986*)

Environmental offset: (Synonyms: 'trade-offs', 'set-off', 'counterbalance')
Environmental offsets are commonly referred to environmentally beneficial activities undertaken to counterbalance an adverse environmental impact, aspiring to achieve 'no net environmental loss' or a 'net environmental benefit' outcome. This Position Statement discusses offsets in terms of:

Direct Offsets
A direct environmental offset is any environmentally beneficial activity undertaken to counterbalance an adverse environmental impact or harm, with the goal of achieving 'no net loss' and preferably a 'net environmental benefit'. Examples may include ameliorative actions including ecosystem restoration, rehabilitation or re-establishment activities or pollutant sequestration.

Contributing Offsets
A contributing environmental offset is any environmentally beneficial activity undertaken to complement and enhance the direct offset activity. Contributing offset activities do *not* assist in a 'no net loss' outcome, but instead add materially to environmental knowledge, research, management, protection, etc. It may also extend to forms of banking, credit trading and use of trust funds (where established) where adverse impacts can be offset through the purchase of environmental improvements elsewhere.

The terms 'direct' and 'contributing' reflect a sequence of approach, rather than a ranking of importance.

Environmental value: are particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and which requires protection from the effects of pollution and harm. (ANZECC and ARMCANZ, 2000; see *Environmental Protection Act 1986*) .

Incentives: something that induces or encourages people to act on a particular matter.

Intergenerational equity: the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (Commonwealth of Australia, 1992).

Mitigation: Mitigation, in an environmental context, refers to a sequence of considerations designed to help manage adverse environmental impacts, which includes (in order of preference):

1. Avoidance – avoiding the adverse environmental impact all together;
2. Minimisation – limiting the degree or magnitude of the adverse impact;
3. Rectification – repairing, rehabilitating or restoring the impacted site as soon as possible;
4. Reduction – gradually eliminating the adverse impact over time by preservation and maintenance operations during the life of the action.; and,
5. Offsets – undertaking such activities that counterbalance an adverse, residual environmental impact.

Adapted from EPA (2001a). A similar approach is used by US EPA (1990).

'No net loss' concept : (Synonyms: 'zero net impact', 'no net difference')
The 'no net loss' concept aims to ensure that environmental loss is balanced by an environmental gain, so that there is no overall significant environmental difference. It

refers to no overall loss of the total extent, quality, ecological integrity and security of environmental assets and their values.

'Net benefit' concept: (Synonyms: 'net gain', 'net improvement')
The 'net benefit' concept aims to ensure more environmental gains occur compared to environmental losses. It refers to an overall improvement in the total extent, quality, ecological integrity and security of environmental assets and their values. The concept is subject to cumulative gains and losses within a specific area, region or project.

Offsets: see environmental offsets

Precautionary principle: where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
ii) an assessment of the risk-weighted consequences of various options.

(s.4A, Environmental Protection Act 1986)

Sustainability: is meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. (Government of Western Australia, 2003)

Wetland banking: see 'banking'.

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Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Environmental Offsets - Biodiversity

No. 19

September 2008

Western Australia

FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of environmental protection Guidance Statements for the environmental impact assessment (EIA) of proposals and schemes.

This document is one in a series being issued by the EPA to assist proponents, responsible authorities, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process. The series provides the basis for EPA's evaluation of, and advice on, proposals or schemes subject to EIA. The Guidance Statements are one part of assisting proponents and responsible authorities in achieving environmentally acceptable outcomes. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects persons responsible for development to take all reasonable measures to protect the environment.

This Guidance Statement sets out the EPA's advice on when offsets are considered to be appropriate as part of the EIA process for proposals and schemes and how proponents should address and present environmental offsets in those instances. The advice complements and should be read in conjunction with Position Statement No. 9 *Environmental Offsets* (EPA, 2006) which provides the EPA's overarching position on environmental offsets.

While guidance is provided specifically in relation to Part IV of the Western Australian *Environmental Protection Act 1986*, persons proposing development are reminded to ascertain any responsibilities they may have in regard to this issue under other regulatory requirements.

This Guidance Statement has the status of "Final" which means it has been reviewed by stakeholders and the public. The EPA has signed off the Guidance Statement and published it although it will be updated regularly as new documents and information become available.

I am pleased to release this document which now supersedes the draft version.

Dr Paul Vogel
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

September 2008

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Guidance Statement No. 19

Guidance for Environmental Offsets - Biodiversity

Key Words: environmental offset, biodiversity offset, direct offset, contributing offset, net environmental benefit, mitigation, residual environmental impact

1 PURPOSE

Guidance Statements are developed by the Environmental Protection Authority to provide advice to proponents, responsible authorities and the public generally about the minimum requirements for environmental management in Western Australia which the EPA would expect to be met when the EPA considers a proposal or scheme during environmental impact assessment (EIA) under Part IV of the *Environmental Protection Act 1986*. The generic process for Guidance Statements is set out in Appendix 1.

This Guidance Statement is termed 'Final' and thus the EPA expects that proponents and responsible authorities will give full attention to the information provided when they submit proposals or schemes for assessment.

This Guidance Statement specifically addresses environmental offsets for proposals or schemes that impact on biodiversity. It should be read in conjunction with Position Statement No. 9 *Environmental Offsets* (EPA, 2006). The main purpose of this Guidance Statement is to provide more specific advice than in the Position Statement, particularly in relation to the technical application of biodiversity offsets and the presentation of offsets packages to the EPA.

The EPA advocates the goal of 'net environmental benefit' as this approach recognises that the environment has been significantly compromised in the past and halting and reversing environmental decline is now a priority.

This Guidance Statement provides advice for the development of offsets packages by proponents which the EPA will assess on a case-by-case basis against the principles in Position Statement No. 9 *Environmental Offsets*. It outlines the EPA's expectations for environmental offsets associated with development proposals and planning schemes subject to EIA. This information will assist industry, proponents, environmental and planning consultants, specialist scientists, decision makers and the community involved in developing or assessing options for environmental offsets packages.

The scope of this Guidance Statement applies to all proposals and schemes referred to the EPA that have significant adverse impacts on *biodiversity* assets of 'high' or 'critical' value. The Guidance Statement is relevant to all environmental issues,

matters and advice for which the EPA has jurisdiction (recognising that some government agencies have offset policies and / or requirements for which the EPA does not provide advice).

This Guidance Statement does not apply to offsets associated with greenhouse gas emissions and other pollutant emissions. The Department of Environment and Conservation is providing advice to the EPA to develop an assessment framework for greenhouse gas emissions. It is expected that this framework will include guidance on carbon offsets. Other pollutant offsets can be developed in accordance with direction provided in EPA Position Statement No. 9 *Environmental Offsets* (EPA, 2006).

Proponents and responsible authorities are encouraged to consider development proposals and planning schemes in accordance with this Guidance Statement. Proponents and responsible authorities should endeavour to demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals and schemes, in a manner which ensures that they are enforceable and auditable.

2 THE ISSUE

The EPA's Position Statement No. 9 *Environmental Offsets* (EPA, 2006) established a policy approach for the use of environmental offsets in the context of EIA in Western Australia. This policy approach forms the basis for this Guidance Statement. Through practical application of this Position Statement over time, it has become apparent that several issues require further clarification in relation to the policy's interpretation and implementation.

Specifically, these issues require further clarification about:

- the EPA's expectation for the appropriate use of environmental offsets;
- application of offset principles in relation to significant adverse impacts to biodiversity assets – in particular the 'like for like or better' principle;
- situations where the application of offset principles are extremely difficult or challenging to implement;
- timing of offset considerations during the EIA process; and
- transparency and auditing effectiveness of offsets packages.

This Guidance Statement addresses the above issues. It is emphasised that both the Position Statement and Guidance Statement should be used in conjunction when considering biodiversity offsets.

3 THE GUIDANCE

This Guidance Statement provides direction for developing biodiversity offsets with an emphasis on meeting the principles set out in EPA Position Statement No. 9 *Environmental Offsets* (EPA, 2006). It is not considered appropriate at this stage to be prescriptive about offsets given the complexity of environmental impact assessment, limits of existing knowledge and the unique circumstances of specific

proposals or schemes. In the future, criteria and formulae may be developed in association with new tools for implementing offsets.

3.1 Determining when it is appropriate to apply offsets

In the context of EIA, several criteria need to be assessed by proponents to determine if they have significant adverse residual impacts and therefore if it is appropriate to consider offsets.

- **Significant adverse impacts to assets**

Where there are significant adverse impacts to 'critical' assets, the EPA will assess the proposal or scheme through EIA. The EPA, in providing its advice to the Minister, will adopt a presumption against recommending approval of proposals or schemes where significant adverse environmental impacts affect 'critical' assets.

Proposals or schemes may also be referred to the EPA where they have significant adverse impacts to 'high' value assets. These assets represent those environmental assets that are in good to excellent condition, are considered valuable by the community and/or government, but are not identified as 'critical' assets.

In some cases, a proposal or scheme that has significant impacts on a 'high' value asset may be found to be environmentally unacceptable whether or not a comprehensive offsets package is proposed.

A broad list of 'critical' assets has been defined in Position Statement No. 9 *Environmental Offsets* (EPA, 2006). Following requests for further information, the EPA will develop a publication to further identify 'critical' and 'high' value assets.

The EPA does not generally undertake EIA in relation to 'low to medium' value assets. These represent those assets that are in less than good to excellent condition as recognised by government agencies and/or community. Impacts to this class of assets are usually dealt with by relevant government agency approvals processes.

- **Exhaustion of mitigation options**

Mitigation, in an environmental context, refers to a sequence of considerations designed to help manage adverse environmental impacts, which includes (in order of preference): avoidance, minimisation, rectification, reduction and offsets (see EPA, 2006).

The first four steps of the mitigation sequence (described above) need to be exhaustively considered before a proposal or scheme that is likely to have significant adverse impacts is presented to the EPA. The EPA will be interested in the extent, quality and likelihood of success of mitigation activities undertaken to reduce significant adverse impacts on 'critical' and 'high' value assets.

The EPA is unlikely to find a proposal or scheme acceptable where a proponent has not reasonably demonstrated or documented attempts to mitigate significant adverse impacts. Proponents must specify the various mitigation activities that have been or will be undertaken, preferably using a risk assessment approach.

In demonstrating adherence to the mitigation sequence, proponents must also justify the selection of the preferred proposal or scheme in the context of other viable alternatives that were identified during the scoping or planning phase. Therefore, proponents are required to state the reasons for giving preference to a proposal or scheme that has more significant adverse residual impacts compared to other viable alternatives (see Fig.3 Environmental offsets reporting form).

It should be noted that what is considered to be accepted on-site industry / business standards or practice, or best practice environmental management, should not be considered as offsets. Rectification activities, as part of the mitigation sequence, may include on-site repair, rehabilitation and restoration. This usually occurs post-impact or following proposal or scheme completion and may require long periods of time to repair the project site. It should be noted that on-site rectification (i.e. repair, rehabilitation and restoration) is typically regarded nowadays as industry best practice in most circumstances and is of itself not an offset (see EPA, 2006a).

- **Significance of adverse environmental impacts**

The *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002* (the Administrative Procedures) provide a set of considerations that the EPA will take into account when assessing the significance of a proposal (see Definitions). The EPA will also consider the advice of relevant government agencies when determining significance.

The 'significance' of a proposal or scheme is also likely to influence the extent and type of environmental offsets that may be required. The more significant the adverse residual impact is, the more likely a substantial offsets package will be necessary. While the set of considerations in the Administrative Procedures may help a proponent understand how the level of significance for an adverse environmental impact is derived, it should be remembered that it is the EPA's interpretation of 'significance' on a case-by-case basis that influences the decision to assess, the consideration of offsets and the EPA's advice to the Minister for the Environment.

Figure 1 sets out the steps that the EPA recommends are followed by proponents and others to help them decide whether offsets are likely to be appropriate for proposals or schemes that are subject to EIA.

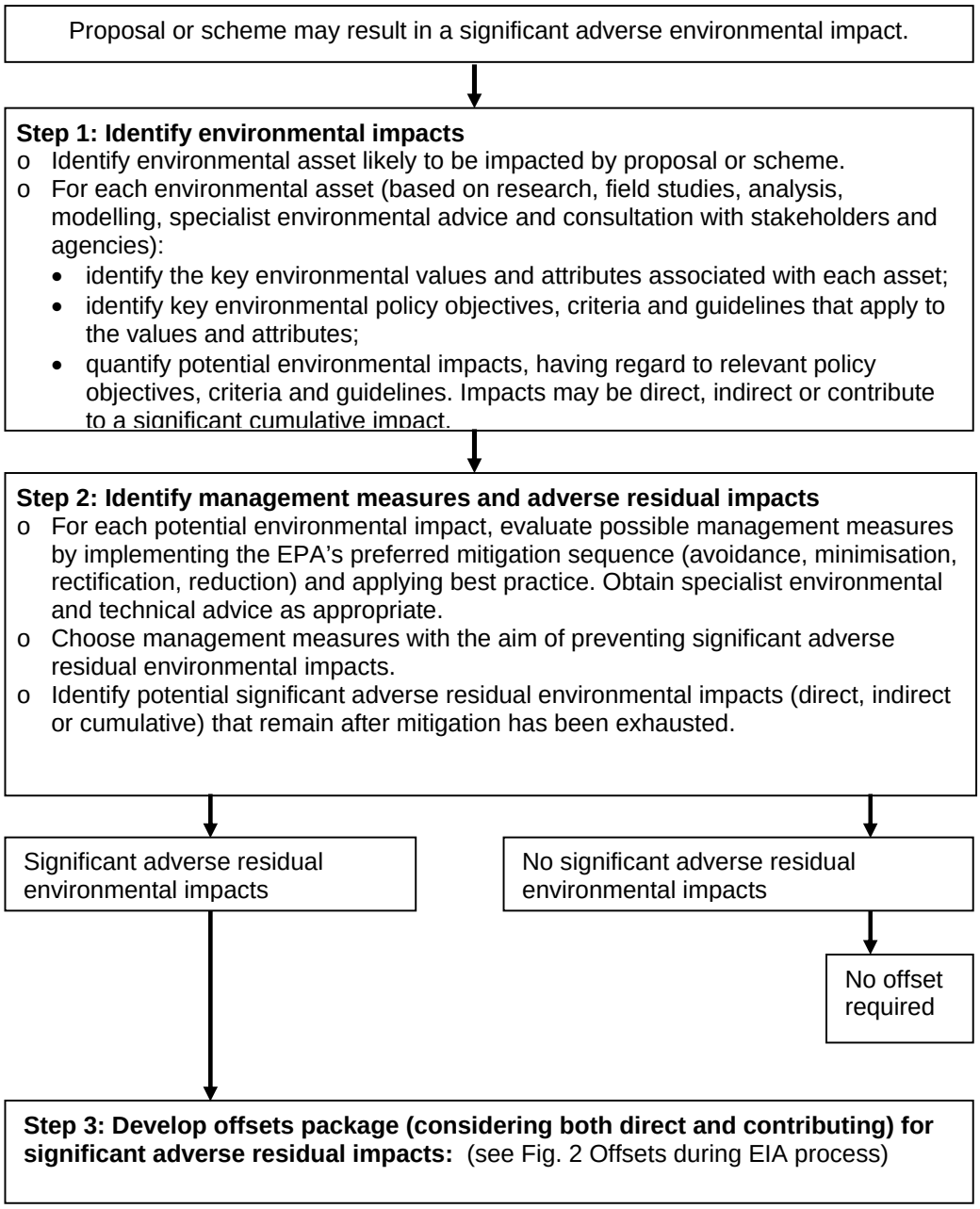


Figure 1: Steps to assist proponents and responsible authorities to consider whether offsets are likely to be appropriate for proposals and schemes referred to the EPA.

These steps involve the collection and analysis of information that will also assist proponents to formulate an offsets package and report to the EPA, should an offsets package be prepared.

3.2 Formulating an environmental offsets package

This Guidance Statement provides additional information in relation to developing an environmental offsets package with the emphasis on complying with the principles outlined in Position Statement No. 9 *Environmental Offsets* (EPA 2006). While in the future there could be a role for a more prescriptive approach to some types of impacts or offsets, it is not currently favoured given the general complexity and range of offsets issues.

Where the application of offsets is considered appropriate, it is the proponent's responsibility to identify and develop a suitable offsets package and demonstrate that the offsets meet the EPA's principles. In assessing the adequacy of proposed offsets, the EPA itself will not negotiate, nor propose modification to, the components of an offsets package. Government agencies will provide advice to the EPA about a proposal or scheme and its offsets package. In turn, the EPA provides its recommendations to the Minister for the Environment who then decides whether a proposal or scheme (and its associated offsets package) should be approved or not.

Principle A: Environmental offsets should only be considered after all reasonable attempts to mitigate adverse impacts have been exhausted.

It is emphasised that environmental offsets should only be considered after all other reasonable attempts to mitigate adverse impacts have been exhausted and evidence of this should be clearly demonstrated when presenting an offsets package (see Fig.3 Environmental offsets reporting form). The EPA will be looking for clear demonstration that all mitigation measures have been exhausted prior to consideration of offsets.

Principle B: An environmental offsets package should consider direct offsets and contributing offsets, as appropriate.

For each significant residual environmental impact, potential direct and contributing offsets need to be identified. Different proposals or schemes are likely to have a particular range of offsets activities that could comprise an acceptable offsets package. Priority should be given to formulating an offsets package that will deliver the maximum long-term environmental benefit with a high level of certainty that it can be successfully implemented in the context of 'like for like or better'.

To identify potential environmental offsets, give consideration to:

- advice and guidance from relevant government agencies, experts and industry;
- environmental policies, strategies and reports relevant to the environmental factor being impacted and the particular location (e.g. consider local / regional biodiversity strategies, regional natural resource management plans, recovery plans and community initiatives); and

- offsets precedents or programs in place within and outside Western Australia, noting that precedent **should not be relied on** as the application of offsets in WA is still evolving, is applied on a case-by-case basis, and subject to continuous improvement and refinement.

An offsets package must not include:

(a) actions that are accepted on-site environmental management requirements for the proposal or scheme;

(b) actions that would be readily implemented in the absence of the proposal or scheme; or

(c) actions that comprise part of the environmental management measures for another proposal or scheme or are funded by other parties.

Addition of land to the conservation estate as a direct offset should be in line with State Government conservation strategies and provided with upfront funding to enable its protection and rehabilitation to a state that requires minimum active management over time.

Principle C: Environmental offsets should ideally be 'like for like or better'.

In achieving a 'like for like or better' outcome, biodiversity related offset sites should:

(a) have similar or better environmental values and attributes (e.g. same vegetation complex, similar species compositions, landscape functions) in the vicinity of the impacted site (i.e. same local area) or in the same bioregion if a better environmental outcome could be achieved; and / or

(b) be in accordance with regional biodiversity strategies that address regional development and priority areas for protection.

Key **environmental values** and **attributes** of the asset subject to significant adverse residual impact need to be thoroughly investigated and documented. This may involve considerable expert consultation, community consultation, site studies, background research and modelling.

Environmental values can be defined as particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and which require protection from the effects of pollution and harm (EPA, 2006). The legal definition used in the *Environmental Protection Act 1986* is provided in the definitions section.

Environmental values fall into two groups: ecological values and beneficial uses. Ecological values, such as ecosystem health, relate to the protection of the inherent composition, structure and functioning of the natural ecosystem (see EPA, 2005a). Ecological structure refers to the natural proportionality of habitat types within ecosystems and the natural size class frequencies and abundances / biomasses of populations of organisms within each of those habitat types. Ecosystem composition includes the representative biota within an ecosystem (e.g. list of flora and fauna present within the site). Ecological functions include the provision of food, habitat and shelter for native biota, maintenance of interactions between species (e.g. pollination, dispersal, mutualism, competition and predation), cycling, filtering and retention of nutrients, maintenance of soil / sediment processes, maintenance of hydrological and geochemical processes and ecological linkages at a range of scales, etc.

Beneficial uses of the environment are utilitarian because they relate to specific human uses, for example recreation, farming, fishing, cultural and spiritual uses (EPA, 2005a). Beneficial uses are conducive to public benefit, public amenity, public safety, public health or aesthetic enjoyment. They are identified and declared under section 35(2) of the *Environmental Protection Act 1986* to be a beneficial use to be protected under an approved policy.

Environmental attributes refer to a specific environmental asset and can be defined as a characteristic associated with or which supports an environmental value (e.g. a beneficial use or ecosystem health) (adapted from Guidance Statement No. 33; EPA 2008). Environmental attributes may include:

- types / units (where possible to be based on recognised classification systems) in relation to landscape, landforms, vegetation, flora, fauna, hydrology, soils, geology and geomorphology;
- endemism;
- native vegetation structural integrity;
- scale, shape and linkages of natural areas relevant to ecological processes;
- natural diversity (e.g. a range of vegetation types, total flora species or genera);
- rarity (e.g. rare and priority flora, threatened fauna, threatened ecological communities, other unusual or special attributes);
- important fauna habitat;

- significance (e.g. international, national, regional, local, etc.) may be related to biophysical factors and social surroundings (including indigenous or non-indigenous heritage) as identified through legislation, community objectives, management categories, government listings, etc. (see Guidance Statement No. 33 for examples of biophysical factors and social surroundings); and

- other special attributes (e.g. fauna associations).

In order to assess the degree to which 'like for like or better' principle has been achieved, environmental values and the quantum of loss or modification of environmental attributes associated for each significant adverse residual impact should be identified and compared quantitatively with those to be gained through successful implementation of the proposed offset.

The term "better" in the context of 'like for like or better' in reference to a biodiversity asset could mean:

- better condition / less disturbance;

- vegetation structure more similar to undisturbed examples of the vegetation type;

- better ratio of area to perimeter for an ecosystem;

- more natural ecological diversity;

- greater number of rare and otherwise significant species;

- a higher ranked threatened species or community;

- more secure tenure;

- enhanced beneficial uses of the environment;

- larger area to be rehabilitated / restored / acquired for conservation, compared with area impacted;

- contiguous with existing reserve; and

- enhanced biological corridors or linkages between conservation reserves.

Where offset sites consistent with the principle of 'like for like or better' are not available in the same local vicinity as the impact site, then offsets sites associated

with different but comparable attributes / values or better should be selected in the same bioregion to achieve a better environmental outcome; or, select multiple sites that address the individual environmental attributes or values at risk (e.g. separate sites that address species, hydrology and linkage attributes specifically). In these instances, the significance of the impacted site may determine whether alternative offset sites are appropriate.

Proponents should allow sufficient time and resources to identify relevant environmental values at the impact site and offset sites and to quantify their associated environmental attributes. This may require specially timed surveys to be undertaken (e.g. spring flora surveys) or data to be collected for a significant period of time (i.e. more than one year).

Principle D: Positive environmental offset ratios should apply where risk of failure is apparent.

Positive environmental offset ratios should apply where the offset is unlikely to achieve a net environmental benefit outcome (EPA, 2006). That is, positive offset ratios should be applied to account for the potential risk that the offset may not fully succeed in the long term.

This principle prevents complex ecosystems or unique species (that are difficult to restore, rehabilitate or re-establish) from being systematically degraded over time, particularly through cumulative impacts. Therefore, in these instances, the size of the offset to impact ratio should be greater than 'like for like' and be proportional to both the importance of the environmental asset being impacted and the likelihood that the offset is unlikely to achieve a 'net environmental benefit' outcome.

Accordingly, in the case of offsets for significant adverse residual impacts on complex ecosystems or unique species it is expected that positive offset ratios will be applied in almost every case due to the difficulty in restoring, rehabilitating or re-establishing these. Where the age of the vegetation (e.g. mature trees) is a factor, positive ratios should be set to compensate for the loss of valuable fauna habitat. In the case of acquisition of land for conservation, the ratio of 'area of addition to area cleared' should also be a positive ratio greater than 1:1.

Principle E: Environmental offsets must entail a robust and consistent assessment process.

To assist in the selection of a robust, feasible and appropriate offsets package, the offsets package should thoroughly investigate the following aspects.

An environmental offsets reporting form is provided in this Guidance Statement to help summarise the relevant information for the EPA (see Fig. 3) and is available from the EPA website (www.epa.wa.gov.au).

Aim of the offset

- Clearly define the offset and the objectives for the offset. The objectives should identify the significant adverse residual impact being offset, the intended outcomes of the offset activity and the extent to which these will counterbalance the residual environmental impact. For example, objectives for offsets involving habitats should refer to the degree to which offsets should aim to restore structural and functional elements of overall ecological integrity.

- In achieving the principle that environmental offsets should ideally be 'like for like or better', identify the environmental values and quantify the environmental attributes for each residual impact and compare them with those associated with the proposed offset.

Type of offset

- Determine whether the offset is a direct offset or a contributing offset.

Governance requirements

- Identify the processes and approvals required to take place prior to implementing the offset.

- Identify whether the participation of a third-party will be required to ensure the satisfactory implementation of the offset project. Determine what contractual arrangements will be required to identify and resolve the legal obligations and implications of offsets activities where third-parties are involved.

- Determine the on-going maintenance and management measures that will need to be established to ensure the offset fulfils its objectives.

- Identify completion criteria for the offset, based on the objectives and intended outcomes for the offset project.

- Consider the type of monitoring activities that will need to be undertaken to audit its implementation.

- Consider how the offset will be enforced. Civil contracts for the enforcement of some offsets may be an option.

- Consider use of memorandum of understandings (MOUs) or agreements to identify responsibilities and accountability.

Feasibility / risk assessment

- Identify the proposed form of land tenure / details registered on title for the offset site and whether tenure is likely to be a barrier to implementation (e.g. access to site or security of tenure).

- Determine the timeframe for implementation to fulfil the intended objectives and whether this is reasonable.

- Determine how long the offset benefit is intended to last in accordance with Principle H.

- Evaluate expertise needs. Does the proponent have sufficient expertise, or access to expertise, to implement the offset successfully and in a timely manner.

- Consider whether all relevant parts of the proponent's organisation will support the offset.

- Identify the risks / impediments to successful implementation of the offset and what contingencies will be put in place to address risks.

- Identify any limitations in scientific knowledge required to develop and implement the offset successfully.

- Consider what fluctuations in environmental conditions may affect implementation (e.g. climate variability).

- Assess the offset's likelihood of success.

Consultation

- Identify what consultation has occurred or proposed. Consider the outcomes of consultation to date.

- Consider other relevant issues or information needed to assist in the selection of an adequate offsets package.

Principle F: Environmental offsets must meet all statutory requirements.

The environmental offsets package must meet all statutory, planning and regulatory requirements and ideally should be acceptable to key stakeholders, any involved third parties and approval authorities.

When a proposal or scheme is referred, the EPA may decide not to assess it. In reaching this decision, the EPA may consider that there are other government approval processes to ensure desired environmental outcomes are achieved (e.g. clearing permits and land use planning approvals). If a proposal or scheme is not assessed by the EPA, environmental offsets may be required through these other approval processes. Other approval processes that have the potential to require some types of environmental offset activities include:

- land use planning approvals, including approvals for proposals or schemes proposing impacts on Bush Forever sites and conservation areas;
- clearing permits under Part V *Environmental Protection Act 1986;*
- approvals for land managed under the *Conservation and Land Management Act 1984* ;
- approvals under the *Wildlife Conservation Act 1950;*
- approvals administered by the Department of Industry and Resources; and
- approvals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (noting that this is outside State jurisdiction).

The EPA supports the implementation of offsets regardless of whether formal statutory assessment under the *Environmental Protection Act 1986* is triggered or not.

Principle G: Environmental offsets must be clearly defined, publicly registered, transparent, auditable and enforceable.

According to this principle, an offsets package must:

- have clearly defined objectives, key performance measures, responsibilities for management and outcome-based completion criteria;
- be auditable so that compliance with objectives can be monitored;
- be enforceable for as long as the impact occurs;
- be clearly documented in the offsets reporting form (Fig. 3);
- be able to produce environmental benefits in an agreed timeframe; and

- be in place (including any bonds or guarantees, where applicable) before development commences.

Principle H: Environmental offsets must ensure a long lasting benefit.

Biodiversity offsets must ensure a long lasting environmental benefit and be capable of being maintained into the future even after the proposal or scheme has been completed (i.e. demonstrate that ongoing costs and responsibilities in maintaining the offset are capable of being met). This may involve management and protection commitments being divested to responsible third parties to ensure the offset is seen through to completion. Therefore, funding for long term management should occur over a time period necessary to improve the condition of the land to a state where ongoing management would be minimal.

3.3 Challenges with implementing offsets.

Proponents should be reminded that, in many instances, it has been found challenging to design offsets packages that can be readily implemented in a timely way, are enforceable and will achieve a net environmental benefit outcome. There are various issues associated with the implementation of offsets including technical limitations (e.g. difficulty in restoring or rehabilitating some types of impacted environments; limited science to evaluate offsets; problems associated with tenure especially in the marine environment; or lack of availability of suitable offset sites). Should this type of situation become apparent, it must be documented (with supporting evidence) for consideration by the EPA.

- **Offsets in the marine environment**

EPA Guidance Statement No. 29 provides guidance relevant to offsets in the marine environment (EPA, 2004a). Offsets (particularly direct offsets) in the marine environment pose significant technical and tenure-related difficulties. Proponents should be mindful of the difficulties in developing and implementing marine-based offsets before proceeding with these.

Firstly, there are few proven techniques for, and little documentary evidence of, successful broadscale restoration of the structure and function of marine habitats. This means that proposals to directly offset loss of, or damage to, benthic habitats through restoration will generally be accompanied by a high degree of uncertainty about success. Attempts to restore meadows of long-lived seagrass species are underway in WA with mixed degrees of success depending on the species and location. The environmental conditions at different geographic locations are thought to be key drivers of the degree of success of such restoration actions, however there is significant uncertainty about the range of environmental conditions required for successful restoration.

Secondly, the ability to develop and implement permanent or enduring offsets will be restricted because of the lack of private tenure, and the ability of individuals to legally control access to, or undertake activities within, the marine environment.

Therefore, when developing offsets for the marine environment, proponents will need to consider the mechanisms and processes available to them to ensure security of the offset. Early consultation with relevant authorities is recommended.

- **Cumulative impacts**

Where cumulative impacts arise from incremental development (e.g. loss of native vegetation or deterioration of surface and ground water quality from urban development, multiple industries or mining activities) the EPA urges decision-making authorities or proponents (as appropriate) to consider how overall environmental objectives will be met. As part of this process, it is helpful to determine the scope for offsets at a strategic stage of planning. Using offset mechanisms within a strategic framework, rather than on an individual proposal or scheme basis is generally more likely to assist in reducing overall environmental impacts.

3.4 Presenting environmental offsets to the EPA

- **When to present an offsets package**

If after demonstrating a rigorous consideration of the mitigation sequence, proponents identify significant residual impacts, consideration of offsets may emerge early in the assessment process and the timing of their presentation may relate to the availability of a suitable offsets package. It is also recognised that consideration of offsets may become apparent in the final stages of the Environmental Impact Assessment process during the proponents' preparation of their final EIA document.

- **How to present an offsets package**

If a proposal or scheme is being formally assessed by the EPA, then proponents, responsible authorities and their consultants are advised to report on:

- the description of studies / investigations and program of consultation required to develop environmental offset options in their environmental scoping document (depending on the level of assessment); and / or
- the details of the proposed offset project in their environmental review document that is then released for public review and consultation (depending on the level of assessment). See the *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002*.

A suggested format for reporting an offsets package as part of the proponent's assessment documentation is shown at Figure 3 (also downloadable from the EPA website at www.epa.wa.gov.au). The information requested in Figure 3 is the minimum information that should be provided to the EPA for a proposed offsets package.

If the proposal or scheme is being formally assessed by the EPA, then the information presented in Figure 3 should be presented in the proponent's environmental review documentation. The EPA will request additional information if it requires it.

An example of how to present an offset proposal is provided at Appendix 2. The hypothetical example involves a town planning scheme amendment that proposes the reservation of land for regional road purposes where the proposed road reserve impacts on regionally significant native vegetation, a wetland buffer and the conservation estate.

Details on submitting spatial data for the offsets package is provided in Appendix 4.

4 APPLICATION

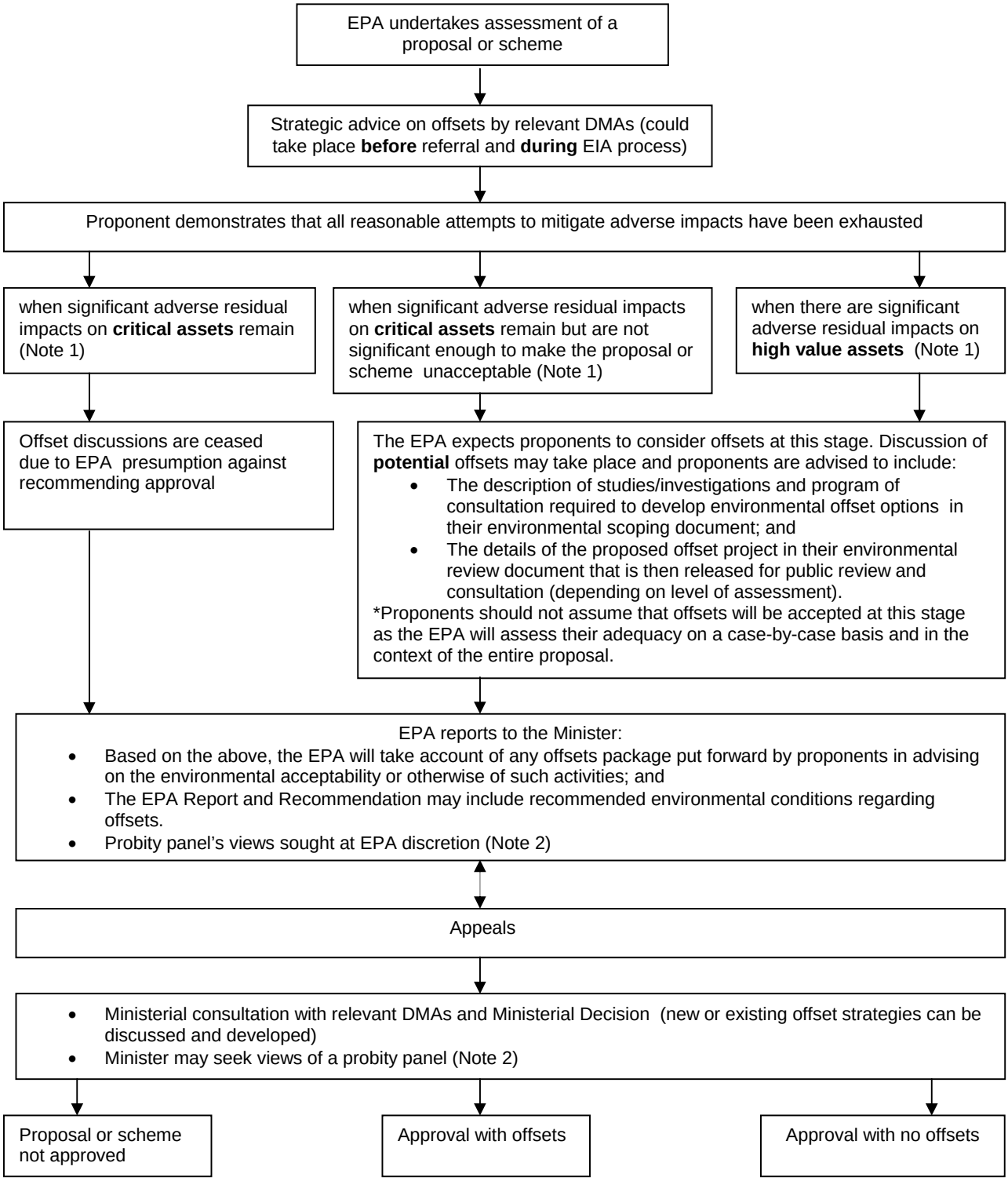
4.1 Area

This Guidance Statement applies to all new development proposals and planning schemes or scheme amendments throughout the State of Western Australia that are subject to the EIA processes set out in Part IV of the *Environmental Protection Act 1986*.

The Guidance Statement does not apply to offsets for greenhouse gas emissions.

4.2 Duration and Review

This Guidance Statement remains current until such time the EPA decides to review it. While generally the review period would be after five years, circumstances may require it to be reviewed earlier.



Note 1: Determination of 'significance' is a judgement of the EPA
Note 2: The probity panel's primary role is to provide advice on an 'as needs' basis on the appropriateness and adequacy of proposed offsets under the policy guidance framework.

Figure 2. Offsets during the EIA process

Figure 3: Environmental offsets reporting form

This table is available for download as a template from the EPA website www.epa.gov.au
Please note that the EPA may request additional information.

Section A: Administrative information
1. Proposal or scheme name:
2. Summary of proposal or scheme:
Section B: Type of environmental asset (s) – State whether Critical or High Value, describe the environmental values and attributes
Section C: Significant impacts (describe the significant adverse environmental impacts related to the proposal or scheme before mitigation measures are applied)
Section D: Mitigation measures (describe all measures to Avoid, Minimise, Rectify and Reduce)
Section E: Significant residual impacts (describe all the significant adverse residual impacts that remain after all mitigation attempts have been exhausted)
Section F: Proposed offsets for each significant residual impact (identify direct and contributing offsets). Include a description of the land tenure and zoning / reservation status of the proposed offset site. Identify any encumbrances or other restrictions on the land that may impact the implementation of the proposed offset and provide evidence demonstrating how these issues have been resolved.

Section G: Spatial data relating to offset site/s (see APPENDIX 4)
Section H: Relevant data sources and evidence of consultation (consultation with agencies, relevant stakeholders, community and references to sources of data / information). Include details of specific environmental, technical or other relevant advice and information obtained to assist in the formulation of the offset.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority responsibilities

The EPA will apply this Guidance Statement during the assessment of proposals and schemes under Part IV of the *Environmental Protection Act 1986.*

5.2 Department of Environment and Conservation responsibilities

The Department of Environment and Conservation will assist the EPA in applying this Guidance Statement in environmental impact assessment and in conducting its own functions under Part V of the *Environmental Protection Act 1986*.

5.3 Other referring agencies

The EPA encourages government to adopt a consistent and coordinated approach, as far as possible, in applying offsets. Agencies are encouraged to adopt a policy position and guidelines for the application of offsets that align with Position Statement No. 9: *Environmental Offsets*.

However, the EPA also recognises that, due to differing agency roles and legislative requirements, detailed guidelines and criteria for applying offsets may vary between approval processes. It is the proponent's responsibility to ascertain the specific requirements of the relevant approval and advisory agencies when formulating offsets.

5.4 Proponent responsibilities

Where proponents demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals or schemes in a manner which ensures that they are enforceable and auditable, the assessment of such proposals or schemes is likely to be assisted.

Proponents should discuss potential offsets packages with key government agencies and stakeholders before submitting an offsets package to the EPA. It is helpful for the proponent to provide evidence where possible of the views of stakeholders. However, it is recognised that agencies will have their own protocols for commencement of detailed discussions on offsets and may not be able to provide written comments at the time a proponent submits an offsets package to the EPA.

Relevant agencies may include the Department of Environment and Conservation (for biodiversity, air quality and wetlands issues), the Department of Water (for waterways, water quality, water quantity and salinity issues), the Swan River Trust (currently developing a draft nutrient offsets policy and framework for banking and trading nutrient offsets in the Swan Canning catchment), and the Department for Planning and Infrastructure (for issues involving Bush Forever sites and other significant bushland).

Budgetary requirements, offset strategy governance and a commitment to the development of an offsets implementation strategy are also the proponent's responsibilities when developing offsets packages. These components should be developed in consultation with relevant agencies, community groups, local governments, traditional owners, other industry and other stakeholders as appropriate.

6 DEFINITIONS AND ACRONYMS

6.1 DEFINITIONS

Best practice: the EPA's concept of 'best practice', as described in EPA Guidance Statement No. 55 (EPA, 2003) is that:

- "All relevant environmental quality standards must be met.
- Common pollutants should be controlled by proponents adopting Best Practicable Measures to protect the environment.
- Hazardous pollutants (for example, dioxins) should be controlled to the Maximum Extent Achievable which involves the most stringent measures available and the Best Available Technology. For a small number of very hazardous and toxic pollutants, costs are not taken into account.
- There is a responsibility for proponents not only to minimise adverse impacts, but also to improve the environment through rehabilitation and offsets."

Completion criteria: criteria that details how an approval condition or commitment will be judged to be fulfilled.

Critical assets: represent the most important environmental assets in the State that must be fully protected and conserved for:

- The State to fulfil its statutory and policy requirements;
- The State to remain sustainable in the longer term; and
- The EPA to comply with its general principles for advice and decision-making (EPA, 2006).

Cumulative impact: is the combined effect from multiple activities within a defined geographic area over a period of time (EPA, 2004a).

Endemism: (endemic) A species or other unit of classification naturally restricted to a specified region or locality (adapted from Commonwealth of Australia, 2007).

Environment: Under section 3 of the *Environmental Protection Act 1986*, means living things, their physical, biological and social surroundings, and interactions between all of these. For the purposes of this definition, the social surroundings of man are his aesthetic, cultural, economic and social surroundings to the extent that those surroundings directly affect or are affected by his physical or biological surroundings.

Environmental attribute: in relation to natural areas, 'attributes' can be defined as a characteristic associated with or which support an environmental value (e.g. beneficial use or ecosystem health) (adapted from EPA Guidance Statement No. 33).

Environmental factor: a part or an aspect of the environment. *See* EPA Guidance Statement No. 33 (EPA, 2008) for a checklist of environmental factors.

Environmental impact: represents an effect on the environment that leads to changes in its condition. Depending on the nature of the activity causing the impact, it may have either beneficial or adverse environmental outcomes (EPA, 2006).

Environmental offsets: commonly referred to as 'environmentally beneficial activities' undertaken to counterbalance an adverse environmental impact and achieve a 'net environmental benefit' outcome. In Position Statement No. 9 (EPA, 2006) these are discussed in terms of:

- Direct Offsets, which are environmentally beneficial activities undertaken to counterbalance an adverse environmental impact or harm, with the goal of achieving a 'net environmental benefit'. Examples of direct offsets may include ecosystem restoration (offsite), rehabilitation (offsite), land acquisition for conservation and re-establishment. See definition of 'off-site'.

- Contributing Offsets, which are environmentally beneficial activities undertaken to complement and enhance direct offset activities. Contributing offset activities may not immediately assist in a 'net environmental benefit' outcome, but instead materially add to environmental knowledge, research, management and protection, and ultimately lead to improved environmental outcomes.

The terms 'direct' and 'contributing' reflect a sequence of approach, rather than a ranking of importance.

Environmental offsets package: the set of offset activities undertaken to counterbalance an adverse environmental impact. It should consider direct and contributing offsets, as appropriate.

Environmental significance (of a proposal or scheme): The significance of a proposal or scheme in terms of its environmental effect or impact. Determination of the environmental significance of a proposal or scheme is a judgement of the EPA. The EPA's use of this term is described in Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002 (Section 4.1.2, Western Australian Government, 2002) as follows:

"The Authority will take into consideration the environmental significance of a proposal when deciding whether the proposal will be assessed. This will include:

(i) the extent and consequence of biophysical impacts;

(ii) the environmental values of the area affected;

(iii) the extent of emissions and their potential to unreasonably interfere with the health, welfare, convenience, comfort or amenity of people;

(iv) the potential for biophysical impacts of the proposal to significantly and adversely change people's social surroundings;

(v) the extent and rigour to which potential impacts have been investigated and described in the referral, and the confidence in the reliability of predicted impacts;

(vi) the extent to which the proposal implements the principles of sustainability;

(vii) the ability of decision making authorities to place conditions on the proposals to ensure required environmental outcomes are achieved; and

(viii) the likely level of public interest, and the extent to which the proponent has consulted with interested and affected people and responded to issues raised."

Environmental value: this term is defined in section 3(1) of the *Environmental Protection Act 1986* as (a) beneficial use; or (b) an ecosystem health condition**.** The Act further defines these two categories as follows:

A **beneficial use** means "a use of the environment, or of any portion thereof, which is –

(a) conducive to public benefit, public amenity, public safety, public health or aesthetic enjoyment and which requires protection from the effects of emissions or of activities referred to in paragraph (a)

or (b) of the definition of "environmental harm" in section 3A(2); or

(b) identified and declared under section 35(2) to be a beneficial use to be protected under an approved policy"; and

An **ecosystem health condition** means "a condition of the ecosystem which is-

(a) relevant to the maintenance of ecological structure, ecological function or ecological process and which requires protection from the effects of emissions or of activities referred to in paragraph (a) or (b) of the definition of "environmental harm" in section 3A(2); or
(b) identified and declared under section 35(2) to be an ecosystem health condition to be protected under an approved policy".

See definition of 'environmental harm' in section 3A(2) of the *Environmental Protection Act 1986.*

High value assets: represent those environmental assets that are in good to excellent condition, are considered valuable by the community and / or government, but are not identified as 'critical assets' (EPA, 2006).

Mitigation: in an environmental context, refers to a sequence of considerations designed to help manage adverse environmental impacts which includes (in order of preference):

1.	Avoidance	avoiding the adverse environmental impact altogether;
2.	Minimisation	limiting the degree or magnitude of the adverse impact;
3.	Rectification	repairing, rehabilitating or restoring the impacted site as soon as possible;
4.	Reduction	gradually eliminating the adverse impact over time by preservation and maintenance operations during the life of the action and
5.	Offsets	undertaking such activities that counterbalance an adverse residual environmental impact.

Natural area: a naturally vegetated area or non-vegetated areas such as water bodies (generally rivers, lake and estuaries), bare ground (generally sand or mud) and rock outcrops (EPA 2004c).

'Net environmental benefit' concept: aims to ensure more environmental gains occur compared to environmental losses. It refers to an overall improvement in the total extent, quality, ecological integrity and / or security of environmental assets and their values. The concept is

subject to cumulative gains and losses within a specific area, region or project (EPA, 2006).
Offsets: see environmental offsets.

Off-site: off-site carries the implication that offsets are not substitutable for accepted on-site environmental management requirements but in addition to these. That is, restoration and rehabilitation of land directly affected by a development are considered accepted on-site environmental management requirements (EPA, 2006).

Proposal: as defined in section 3(1) of the *Environmental Protection Act 1986* means a project, plan, programme, policy, operation, undertaking or development or change in land use, or amendment of any of the foregoing, but does not include scheme.

Re-establishment: has the goal of establishing a functioning self-sustaining ecosystem with strategic environmental benefit. It does not replicate pristine ecosystems. While restoration and enhancement of existing ecosystems is preferred, re-establishment may be beneficial in some instances, for example, forming a biodiversity corridor between two important ecosystems, or re-establishing ecosystems in areas of low representation.

Rehabilitation: a process where disturbed land is returned to a stable, productive and self-sustaining condition, taking future land use into account. It aims to maximise the return of biodiversity by reinstating self-sustaining and functional ecosystems based on local species. This process differs from restoration by not aspiring to fully replace all of the original components of an ecosystem.

Residual environmental impacts: are adverse environmental impacts likely to result from the implementation of new development proposals and schemes, which cannot be avoided, minimised, rectified or reduced on-site such that they are no longer significant.

Responsible Authority: in the context of a scheme, is the authority responsible under legislation for the scheme.

Restoration: ecological restoration is the process of aspiring to fully return an ecosystem to a former natural condition in terms of composition, structure, function and dynamics.

Revegetation: the return of vegetation (indigenous or otherwise) to an area.

Scheme: as defined in section 3(1) of the *Environmental Protection Act 1986* means –

(a) a redevelopment scheme within the meaning of the East Perth Redevelopment Act 1991, or an amendment to such a redevelopment scheme;

(b) a redevelopment scheme within the meaning of the Midland Redevelopment Act 1999, or an amendment to such a redevelopment scheme;

(c) a master plan within the meaning of the Hope Valley-Wattleup Redevelopment Act 2000, or an amendment to such a master plan;

(d) a redevelopment scheme within the meaning of the Armadale Redevelopment Act 2001, or an amendment to such a redevelopment scheme;

(e) a redevelopment scheme within the meaning of the Subiaco Redevelopment Act 1994, or an amendment to such a redevelopment scheme;

(f) an amendment to the Metropolitan Region Scheme;

(g) a regional planning scheme, or an amendment to a regional planning scheme;

(h) a town planning scheme, or an amendment to a town planning scheme; or

(i) a statement of planning policy to which section 5AA(8) of the Town Planning and Development Act 1928 applies, or an amendment to such a statement.

Significant (as in significant effect or significant impact): see 'environmental significance'.

6.2 ACRONYMS

DEC	Department of Environment and Conservation
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority

7 LIMITATIONS

This Guidance Statement has been prepared by the EPA to assist proponents and the public. While it represents the contemporary views of the EPA, each proposal or scheme which comes before the EPA for EIA will be judged on its merits. Proponents wishing to deviate from the Guidance provided in this document should provide robust justification for the proposed departure.

8 REFERENCES

Commonwealth of Australia 2007, *Weeds in Australia*, Department of the Environment, Water, Heritage and the Arts, viewed 1 July 2008, < http://www.weeds.gov.au/publications/glossary.html>.

Environmental Protection Authority 2003, *Implementing Best Practice in proposals submitted to the environmental impact assessment process*, Final Guidance Statement No. 55, EPA, Perth.

Environmental Protection Authority 2004a, *Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment*, Guidance Statement No. 29, EPA, Perth.

Environmental Protection Authority 2004, *EIA principles, factors and objectives – Guide to EIA principles, factors and objectives*, EPA, Perth.

Environmental Protection Authority 2004c, *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia*, Guidance Statement 56, EPA, Perth.

Environmental Protection Authority 2005a, *Environmental Protection in Natural Resource Management*, Position Statement No. 8, EPA, Perth

Environmental Protection Authority 2006, *Environmental offsets*, Position Statement No. 9, EPA, Perth.

Environmental Protection Authority 2006a, *Rehabilitation of Terrestrial Ecosystems*, Guidance Statement No. 6, EPA, Perth

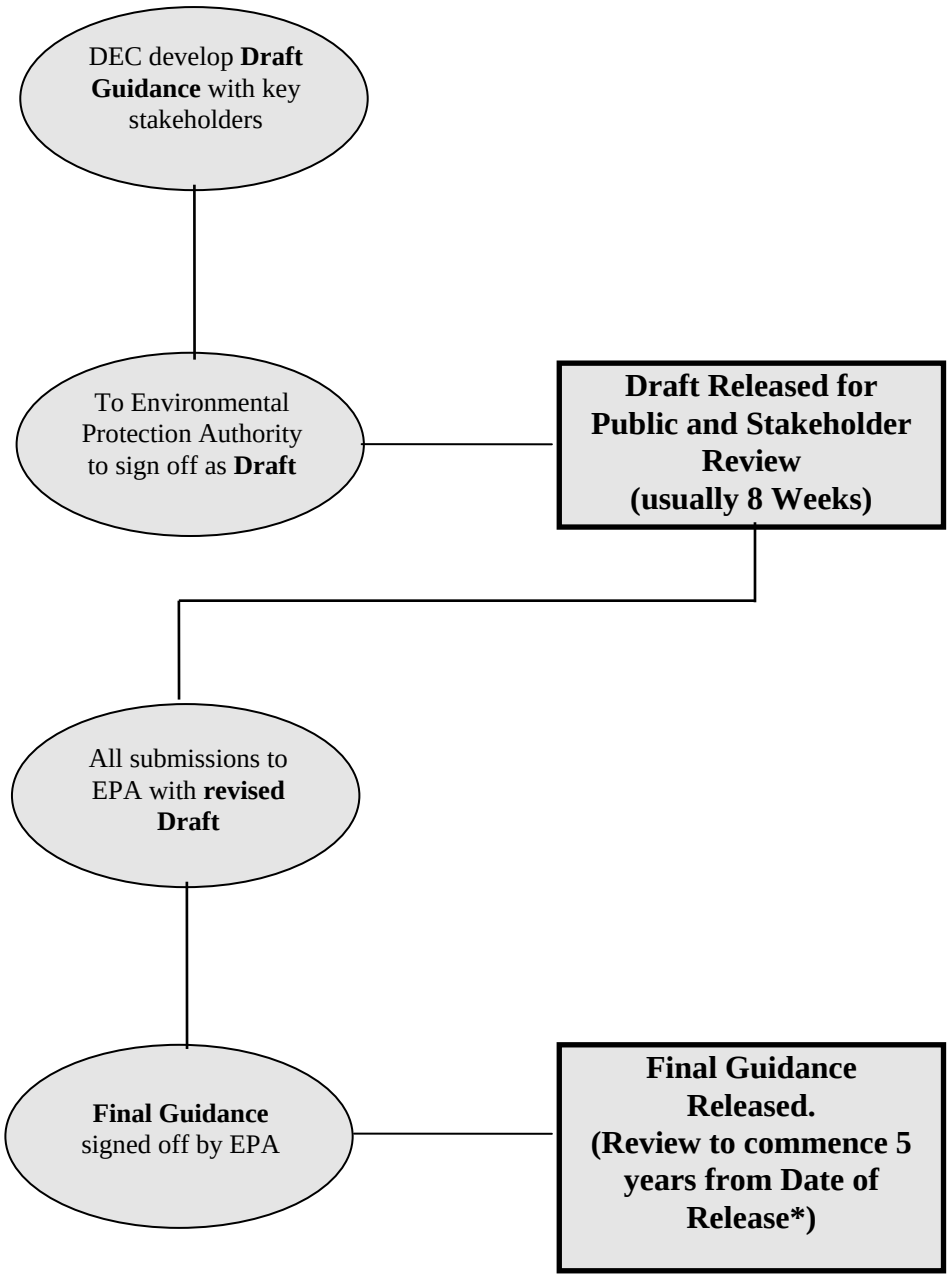
Environmental Protection Authority 2008, *Environmental guidance for planning and development*, Guidance Statement No. 33, EPA, Perth.

Government of Western Australia 2000, *Bush Forever: Keeping the bush in the city* (several volumes), Western Australian Planning Commission, Perth.

Western Australian Government 2002, *Environmental impact assessment (Part IV Division 1) administrative procedures 2002*, in 'Western Australian Government Gazette' No. 26, 8 February 2002, WA Government, Perth.

APPENDIX 1

Generic flow diagram for the Guidance Statement Process



* **Guidance may be reviewed earlier if circumstances require it**

APPENDIX 2

Example of information on offsets to accompany a proposal or scheme

The purpose of this hypothetical scenario is to provide guidance in developing an offsets package for a range of residual impacts relevant to Western Australia. Therefore, it only outlines general information. Each proposal or scheme is different and assessed on a case-by-case basis. Proponents are reminded that this scenario is wholly hypothetical and should not be considered fixed for every proposal or scheme. Please note that the EPA may request information additional to that indicated in this form.

Section A: Administrative information
1. Proposal or scheme name: City of X TPS, No. 2, Amendment No. 3
2. Summary of proposal or scheme: This hypothetical example involves a planning scheme amendment to reserve land for regional road purposes. The widening of an existing road reserve is proposed in an environmentally sensitive location where regionally significant bushland and the buffer of a conservation category wetland would be impacted. A plan of the hypothetical road reserve, environmental features and offset site is shown on Figure A. In a case such as this, the responsible authority would also need to seek a decision on aspects of the project from other authorities such as the Conservation Commission of Western Australia. Objectives of the Planning Scheme Amendment: • to reserve land for regional road purposes • to reserve land adjoining Nature Reserve B for the purpose of an extension to the Nature Reserve *(to offset the environmental impacts of the proposed road)*.
Section B: Type of environmental asset (s) – State whether Critical or High Value, describe environmental values and attributes.
• Nature Reserve B is a critical asset • Threatened Ecological Community (TEC) C is a critical asset • Buffer to Lake A is a high value asset

Environmental Values: After an extensive public consultation process, the community has identified the following environmental values relating to environmental health, structure, composition, function and beneficial uses:

- Provision of food, habitat and shelter for native biota and threatened species
- Maintenance of interactions between species
- Cycling, filtering and retention of nutrients
- Maintenance of geological and geochemical processes
- Public amenity
- Cultural and spiritual uses

Section C: Significant impacts (describe the significant adverse environmental impacts related to the proposal or scheme before mitigation measures are applied)

1. Clearing of regionally significant vegetation in Nature Reserve B
2. Disturbance of bushland buffer around Threatened Ecological Community (TEC) C
3. Construction within buffer of Lake A
4. Impacts on water regime of Lake A associated with stormwater runoff from road
5. Risk of contamination of buffer and Lake A from spills

Section D: Mitigation measures (describe all measures to avoid, minimise, rectify and reduce)

Proposed on-site management measures for Nature Reserve B (Impact 1 above):

a) Design to ensure encroachment of road formation on native vegetation in Nature Reserve is minimised.
b) Management activities and performance criteria for rehabilitation of Nature Reserve inside proposed road reserve comprising XXX.
c) Fencing and access plan comprising XXX.

Proposed on-site management measures for TEC C (Impact 2 above):

a) Design to ensure encroachment of road formation on TEC buffer is minimised.
b) Management activities and performance criteria for rehabilitation of TEC buffer inside road reserve comprising XXX.

Proposed on-site management measures for construction within buffer of Lake A (Impact 3 above):

a) Design to ensure road formation and embankment are as far from lake as practicable, consistent with road function and safety.
b) Construction management plan, comprising XXX.
c) Management activities and performance criteria for rehabilitation of lake buffer inside road reserve comprising XXX.

Proposed on-site management measure for impacts on water regime of Lake A associated with stormwater runoff from road (Impact 4 above): Stormwater management plan comprising XXX

Proposed on-site management measures for risk of contamination to buffer and Lake A from spills (Impact 5 above): Spill management plan comprising XXX

Section E: Significant residual impacts (describe all the significant adverse residual impacts that remain after all mitigation attempts have been exhausted)

1. Clearing 1 ha of bushland in conservation estate (vegetation association X which is overall 29% retained and 5% reserved) comprising 0.5 ha of vegetation in good condition and 0.5 ha of vegetation in degraded condition based on Bush Forever scale (Government WA, 2000).

2. A 0.75 ha portion of conservation reserve could become more prone to 'edge effects': 0.3 ha of this is in good condition and 0.45 ha is in degraded condition; the 0.3ha portion is in buffer to Threatened Ecological Community (TEC) C and is in good condition.

3. A 0.2 ha portion of the 1ha of bushland in conservation estate is part of buffer around TEC C.

4. Up to 1.5ha of buffer of conservation category wetland (Lake A) may be impacted. The vegetation is degraded condition and includes 12 mature habitat trees.

Section F: Proposed offsets for each significant residual impact (identify direct and contributing offsets). Include a description of the land tenure and zoning / reservation status of the proposed offset site. Identify any encumbrances or other restrictions on the land that may impact the implementation of the proposed offset and provide evidence demonstrating how these issues have been resolved.

Offset 1 - Direct

Acquisition of 4ha of land to be dedicated as a nature reserve with funding to enable its protection and rehabilitation to a state that requires minimum active management over time.

Offset 2 - Direct

Rehabilitation of 0.3ha in TEC buffer in nature reserve.

Offset 3 - Direct

Rehabilitation of 2ha Lake A buffer.

Offset 4 - Contributing

Contribution to implement Lake A Wetland Management Plan.

Offset 5 - Contributing

Contribution to community education program promoting protection of local biodiversity for Nature Reserve B (TEC) and Lake A.

Section G: Spatial data requirements relating to offset site/s (see Appendix 4)

Section H: Relevant data sources and evidence of consultation (consultation with agencies, relevant stakeholders, community and references to sources of data / information). Include details of specific environmental, technical or other relevant advice and information obtained to assist in the formulation of the offset.

1. Wetland boundary and buffer studies for Lake A to satisfaction of DEC.
2. Vegetation, flora and fauna assessments for Nature Reserve B (establishing attributes, values, significance of vegetation, flora and fauna in proposed road reserve and adjoining land) to satisfaction of DEC.
3. Local biodiversity strategy, Lake A Wetland Management Plan.
4. Local government environmental policies X, Y, Z.
5. Native vegetation clearing principles in *Environmental Protection Act 1986*; EPA Position Statements 2 (protection of native vegetation), 4 (wetlands), and 9 (offsets); EPA Draft Guidance Statement 33 (environmental guidance for planning), Guidance 51 and 56 (flora and fauna studies) and Guidance 6 (rehabilitation).
6. Engineering advice and geotechnical report for road.
7. Consultation with DEC, DoW, community group X.

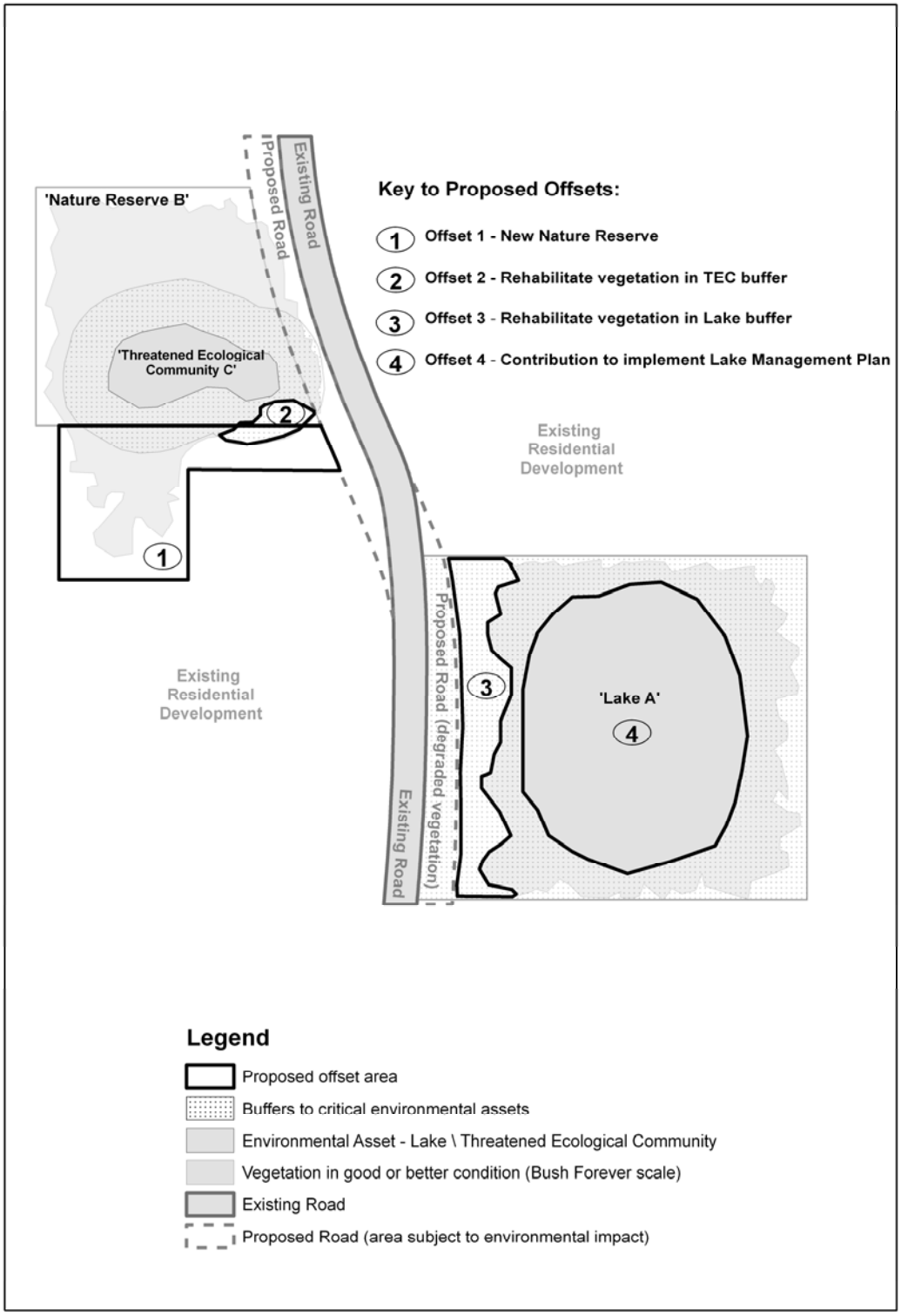


Figure A: Site plan for City of X TPS, No. 2, Amendment No. 3

APPENDIX 3

Hypothetical Offset Case Example

The purpose of this hypothetical scenario is to provide guidance in developing an offsets package for a range of residual impacts relevant to Western Australia. Therefore, it only outlines general information. Each proposal or scheme is different and assessed on a case-by-case basis. Proponents are reminded that this scenario is wholly hypothetical and should not be considered fixed for every proposal or scheme. Please note that the EPA may request information additional to that indicated in this form.

Section A: Administrative information
1. Proposal or scheme name: Titan Resources Pty Ltd – Open Pit Titanium Mine – Southwest Australia
2. Summary of proposal or scheme: Titan Resources Pty Ltd proposes to mine 6 million tones of titanium ore to produce 750,000 tonnes of heavy metal concentrate in the South West of Western Australia (approximately 50km south east of Bunbury). The proposal consists of mining a high grade titanium ore body to a maximum depth of seven metres within a lease area of 200 hectares and the return of waste material to excavated pits in an attempt to recreate soil profile and land forms. The proposal will take place over a 5 year period. The proposed disturbance footprint is estimated at 157 ha (inclusive of ore body foot print) including approximately 1200 old growth habitat trees. The lease area also provides habitat for 23 mammal species, 85 bird species, 25 reptile species and 9 amphibian species.
Section B: Type of environmental asset (s) – State whether Critical or High Value, describe environmental values and attributes
Critical Asset - Nature Reserve 1. **Environmental Values:** After an extensive public consultation process, the community has identified the following environmental values relating to environmental health, structure, composition, function and beneficial uses: • Provision of food, habitat and shelter for native biota and threatened species • Maintenance of interactions between species • Cycling, filtering and retention of nutrients

- Maintenance of geological and geochemical processes
- Public amenity
- Cultural and spiritual uses

2. **Environmental Attributes:** 157 ha of vegetation within a section of Nature Reserve. The area has 14 vegetation complexes with the majority of the area consisting of mixed old growth habitat woodland with some pines and an understorey of peppermints and weed species. 1200 old growth habitat trees will be cleared from within the Nature Reserve. Based on surveys and assessments of the site, the **habitat area** could support 23 mammal species, 85 bird species, 25 reptile species, and 9 amphibian species. These include a number of threatened or priority species such as *Mammals*: Chuditch, Brush-tailed Phascogale, Quenda, Western Ring-tailed Possum, Brush Wallaby, and a bat species (*Falsistrellus mackenziei*) *Birds*: Square-Tailed Kite, Peregrine Falcon, Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Barking Owl, Masked Owl and a number of migratory birds. Among the old growth habitat trees on the mining lease are approximately 50 trees that are of greater significance as habitat. These are important for possums, may be used by breeding water birds (such as the Australian Sheldrake) and may support the Masked Owl.

Section C: Significant Impacts (describe the significant adverse environmental impacts related to the proposal or scheme before mitigation measures are applied)

1. Vegetation clearing for pit, stockpiling, infrastructure and road networks
2. The primary impacts on fauna will be attributed to the loss of habitat associated with clearing the old growth habitat forest and the displacement of fauna through mining activities such as dust, noise, vibration, traffic. The proposal will also impact on fauna through the removal of a wildlife corridor between the Nature Reserve and nearby Baudin Hill National Park which provides similar habitat to what is proposed to be disturbed.

Section D: Mitigation measures (describe all measures to Avoid, Minimise, Rectify and Reduce)

1. The location of the pit is dependent on the location of the ore body. The proponent has committed to avoiding disturbance through consolidation of stockpiling areas, progressive rehabilitation which avoids the need for larger stockpiling areas. Highly disturbed areas will be used for facilities and infrastructure.
2. The proponent has generally restricted disturbance to the area of the ore body and so will retain approximately 30% of available habitat within the lease.
3. Vegetation and flora management plan will be developed which will demarcate sensitive areas, identify a staged approach for progressive back fill and rehabilitation and outline specific strategies that will be employed to minimise disturbance outside of the direct project footprint.
4. Significant fauna habitat will be identified (e.g. hollows, burrows, feeding habitat). Trees / vegetation that are identified as having greater habitat significance will be demarcated where possible and / or stockpiled for rehabilitation purposes. Timing of clearing will be staged to occur as close as practicable to the time of mining the cleared area, clearing will be timed to avoid the breeding cycles of threatened species where practicable, habitat trees are identified and marked and will only be cleared after inspection by a suitably qualified fauna expert.

5. The entire area will be rehabilitated and returned to the State once completion criteria have been met. A rehabilitation management plan will be developed with the target of rehabilitating 157ha of vegetation with native species dominated by similar overstorey and will include a suite of understorey species considered endemic to the area. Seed and propagation material from indigenous native grasses, herbs, shrubs and trees will be collected prior to clearing for rehabilitation purposes. Timing of topsoil removal coordinated with open cut operations to ensure minimal handling and storage.
6. Rehabilitation of the disturbed area will take into account fauna habitat values. This will include the rehabilitation of vegetation such as; fodder species, hollow forming species i.e. old growth habitat trees, ground dwelling habitat such as fallen hollows and native understorey cover. A working group will be developed to guide rehabilitation plans consistent with fauna habitat values. Relevant recovery teams will also be consulted during the development of species specific rehabilitation measures. Nesting and diurnal roosting habitat for a range of fauna will be restored where possible. Artificial habitat such as nest / roost boxes will be designed for specific target species and placed at heights, aspects and on structures appropriate to target species within rehabilitated areas and in lease areas that will be retained.
7. Ground debris and standing dead timber will be collected for restoration and rehabilitation purposes. Remaining material will be mulched for rehabilitation.
8. Soil reconstruction targets to be based on analogue values. Techniques appropriate to achieve a soil profile that has high potential to provide for development of a sustainable woodland ecosystem comparable to undisturbed sites.

Section E: Significant residual impacts (describe all the significant adverse residual impacts that remain after all mitigation attempts have been exhausted)

1. The residual impact includes loss of 157ha of vegetation including some areas of significant fauna habitat and old growth habitat trees. Approximately 1200 mature old growth habitat trees will be cleared. Although the proponent has committed to undertaking a significant rehabilitation effort, rehabilitation is not always successful and residual impacts may still remain, particularly in the short-term. Therefore to gain a net conservation benefit, offsetting 157ha of old growth habitat and / or regionally significant vegetation with similar habitat values will be required.
2. 157ha of potentially suitable habitat for fourteen conservation significant species will be disturbed. In addition, the area supports 23 mammal species, 25 reptiles, 9 amphibians and 85 bird species. Edge effects, noise, vibration, light and potential lack of success in rehabilitation activities will result in short-term and potentially longer term residual impacts. It is therefore imperative that the proponent offsets at least 157ha of conservation significant species habitat and addresses priority recovery actions for threatened species known to inhabit the mining lease.

Section F: Proposed offsets for each significant residual impact (identify direct and contributing offsets). Include a description of the land tenure and zoning / reservation status of the proposed offset site. Identify any encumbrances or other restrictions on the land that may impact the implementation of the proposed offset and provide evidence demonstrating how these issues have been resolved.

Direct Offset 1 - Contribution of 80ha of regionally significant vegetation into the adjacent Baudin Hill National Park

The proposed contribution of 80ha of vegetation adjacent to the Baudin Hill National Park is proposed to offset the 1200 individual mature old growth

habitat trees to be cleared. This area is located within the same sub catchment as the proposed site and provides a mixture of both old and regrowth habitat comprising of a native understorey in moderate condition (at least 1000 mature old growth habitat trees will be protected in the formal reserve system). With adequate management and threat abatement, it is envisaged that this area of vegetation can be restored to good condition which will require fencing, weed management and some rehabilitation. In addition, the offset site provides similar environmental values to the proposed area to be cleared. This proposed offset project will fund the following activities:

- Planning and acquisition of land into the conservation estate to be dedicated as a nature reserve. Addition of land to the conservation estate as a direct offset should be provided with upfront funding to enable its protection and rehabilitation to a state that requires minimum active management over time.
- Management costs including weed management, dieback hygiene, fencing and predator control
- Rehabilitation activity where required
- Employment of additional rangers / conservation staff to manage the acquisition and on-reserve management
- Flora and fauna surveys (baseline and ongoing monitoring to measure habitat value).

Direct Offset 2 - Rehabilitation and remediation of farmland and isolated woodland remnants adjacent to currently vegetated areas
This offset project involves the identification of priority remnants of regionally significant woodland for remediation, revegetation and rehabilitation with a long-term goal of restoration. These areas will be located outside the mining lease, but within close proximity as far as practicable. This will enhance nearby available habitat and improve connectivity between the lease, Nature Reserve, Baudin Hill National Park and isolated remnants scattered throughout farmland within the catchment area. Combined with the existing vegetation retention areas at the Titan Resources' lease, the proposed rehabilitation works, and the 80ha of old growth habitat woodland proposed for addition to the Baudin Hill National Park, the overall net gain in regionally significant vegetation over an estimated 20 year period will be doubled. This offset project includes the following actions:

- Identification of priority / regionally significant woodland remnants for remediation and rehabilitation
- Acquisition and / or covenanting of identified priority remnants
- Destocking / fencing / threat abatement (where relevant) for priority remnants
- Ongoing management and partnership development with landholders and community groups or government agencies.
- Ongoing monitoring and associated management.

Contributing Offset – Management of threatened species habitat
Contributions towards priority recovery actions as identified in Recovery Plans and/or by recovery teams for each threatened species such as the Carnaby's Black Cockatoo, brush-tailed phascogale and the chuditch will be provided. This will include habitat protection measures, research, translocation, captive breeding, wild population monitoring, and off reserve conservation such as conservation covenants on private land. The following

actions will be undertaken for this project: • Work in consultation with recovery teams and DEC to determine priority species and priority recovery actions to be addressed (consistent with Recovery Plans and Interim Recovery Plans where these exist) • Undertake research, translocations and captive breeding programs in partnership with relevant research institutions • Undertake on-ground actions in partnership with relevant landholders, community groups and government agencies • Monitor success of fauna recovery actions where relevant.
Section G: Spatial data requirements relating to offset site/s (see Appendix 4)
Section H: Relevant data sources and evidence of consultation (consultation with agencies, relevant stakeholders, community and references to sources of data / information). Include details of specific environmental, technical or other relevant advice and information obtained to assist in the formulation of the offset.

APPENDIX 4

Guidelines for Submitting Proposed Offset Boundaries as Spatial Data

This appendix describes the nature of proposed offset boundaries required to be submitted as spatial data to the EPA as part of the environmental impact assessment of a proposal or scheme.

What is spatial data?

Spatial data is digital information which can be used in computer mapping software; this information is also referred to as GIS or CAD data.

Why are offset boundaries required to be submitted to the EPA as spatial data?

The EPA considers offset sites in the context of spatial data and uses this to;

i) find what environmental assets and issues are on or near the proposed offset

ii) serve as a administrative record

iii) communicate where the EPA has made decisions to others and their processes

iv) support transparency and to audit the effectiveness of the process

What are the specifications required?

Proponents are required to submit geo-referenced GIS or CAD data on disc, depicting the proposed offset extent, conforming to the following parameters:

i) datum: GDA94

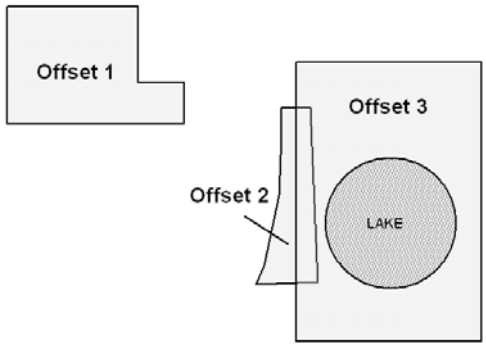
ii) projection: Geographic (latitude/longitude) or Map Grid of Australia (MGA)

iii) format: ESRI shapefile, geodatabase or coverage, Microstation or AutoCAD

iv) where a series of offsets are proposed, each should be individually mapped

v) each mapped boundary should be clearly labelled (CAD) or attributed (GIS)

Three proposed offset actions



GIS boundaries

OffsetName	OffsetAction
Offset 1	Purchase land for reserve
Offset 2	Rehabilitate vegetation
Offset 3	Fund management plan of lake area

GIS table

Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Guidance Statement for Minimising Greenhouse Gas Emissions

No. 12

October 2002

Western Australia

FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of environmental protection Guidance Statements for the environmental impact assessment (EIA) of proposals.

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process. The series provides the basis for EPA's evaluation of, and advice on, development proposals subject to EIA. The Guidance Statements are one part of assisting proponents in achieving an environmentally acceptable proposal. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to implement best practice measures to protect the environment and to view the requirements of this Guidance as representing the minimum necessary process required to achieve an appropriate level of environmental protection.

This Guidance Statement specifically addresses the minimisation of greenhouse gas emissions from significant new or expanding operations. At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. This Guidance Statement will be reviewed when new Government policy is announced.

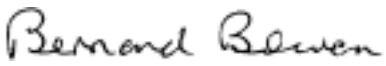
Carbon dioxide is the major greenhouse gas in Australia and climate change will have significant impacts here. South-west Australia will be worst affected in a number of ways. The enhanced greenhouse effect may result in increased fire frequency, temperature rises and changes in rainfall and carbon dioxide concentrations which could favour some plants at the expense of others, affecting agricultural production and species distributions. Changes in habitat distribution could particularly threaten native plant and animal species that are geographically isolated or occupy narrow ecological niches. Coastal areas could also be vulnerable, particularly to changes in intensity and frequency of storms and sea level rise. Clearly there is an important and urgent incentive for Western Australia to respond by encouraging timely and effective greenhouse gas management.

Current trends indicate that Australia would exceed its target under a "business as usual" scenario and will still do so with currently projected specific measures to reduce emissions. Accordingly, it is necessary for greenhouse gas minimisation to be kept firmly in mind when considering new development proposals which are likely to significantly add to emissions. Hence the EPA has produced this Guidance Statement to indicate the type of approach required when considering significant new or expanded proposals under its processes.

This Guidance Statement has the status of "**Final**" which means that a previous version has been reviewed by stakeholders and the public. The EPA has welcomed the inputs from an array of

sources, but any inaccuracies found or emphases given are entirely the responsibility of the EPA. The EPA will review this Guidance Statement, as appropriate, when new information is available.

I am pleased to release this document which now supersedes the draft version.



Bernard Bowen
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

October 2002

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Guidance Statement No. 12

Guidance Statement for Minimising Greenhouse Gas Emissions

Key Words: **greenhouse gas emissions, abatement measures, carbon sequestration**

1 PURPOSE

1.1 Guidance Statements generally are developed by the EPA to provide advice to proponents, and the public generally, about the minimum requirements for environmental management which the EPA would expect to be met when the Authority considers a proposal during the assessment process. The generic process is set out in Appendix 1.

This Guidance Statement is termed "Final", in the context of Appendix 1 of this document, and thus the EPA expects that proponents will give full attention to the information provided when they submit proposals for assessment. Please note, however, the qualifying statement in Section 1.4 below.

1.2 This Guidance Statement specifically addresses the minimisation of greenhouse gas emissions from significant new or expanding operations. The Guidance provides information which the EPA will consider when assessing proposals where greenhouse gas emissions is a *relevant environmental factor* in an assessment. The EPA recognises, however, that greenhouse gas abatement is the responsibility of all sectors of the community.

1.3 This is a Guidance Statement and proponents are encouraged to consider their proposals in the light of the guidance given. A proponent wishing to deviate from the minimum level of performance set out in this Guidance Statement would be expected to put a well-researched and clear justification to the EPA arguing the need for that deviation. In practical terms this means that the proponent would need to show that the intent of the EPA Guidance has been understood and given serious consideration. An argument to deviate from the position in this Guidance Statement would need to demonstrate that all practicable endeavours have been made to meet the intent of the EPA's Guidance, even though the approach may differ from that outlined in this document.

1.4 At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. Since such a Government document will set new policy directions, this Guidance Statement should be regarded as an interim statement of the EPA's views, which will be reviewed when new Government policy is announced.

2 THE ISSUE

The Greenhouse effect

The greenhouse effect is a natural phenomenon that warms the earth and enables it to support life. Without it, the average temperature on earth would be around minus 18^{o}C, a frozen wilderness, instead of the current +15^{o}C. It works on the same principle as the ordinary glass garden greenhouse. The atmosphere allows light energy to get in, then retains absorbed heat. This makes for a much higher temperature inside the greenhouse (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

On a planetary scale, similar processes occur. Short wave radiation from the sun penetrates the atmosphere and reaches the earth's surface, warming it. The earth re-radiates much of this heat in the form of (invisible) infra red radiation. Infra red rays have a longer wavelength than incoming sunlight and for this reason can be absorbed by certain gases in the atmosphere, labelled greenhouse gases. This absorption of heat warms up the atmosphere, which in turn radiates some of the heat back to the earth. Human activities have enhanced the amount of greenhouse gases in the atmosphere. The Kyoto Protocol is an international agreement designed to foster action to manage the human enhanced greenhouse effect.

The six greenhouse gases specifically covered by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), perfluorocarbons (CF_x), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF_6) and nitrous oxide (N_2O) (Commonwealth of Australia, 1998). To give a common base for considering the impact of the various gases, they are usually expressed in terms of carbon dioxide equivalents, where the potential of each to lead to heating in the atmosphere is expressed as a multiple of the heating potential of carbon dioxide.

Other greenhouse gases exist which are not specifically covered by the Kyoto Protocol. These include water vapour (H_2O), chlorofluorocarbons (CFCs), ozone (O_3), oxides of nitrogen (NO_x), carbon monoxide (CO), non-methane volatile organic compounds (NMVOC) and sulphur dioxide (SO_2) for example (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

The concentration of carbon dioxide in the atmosphere has increased by about 31% over the past 200 years. The concentration of methane has also increased by 151% over the same period (Intergovernmental Panel on Climate Change (IPCC), 2001). The main anthropogenic greenhouse gas is CO_2. Much of the attention to greenhouse gases thus falls on CO_2**.**

In its Third Assessment Report, released in 2001, the IPCC reported on the new results from the past five years of research on climate change. The IPCC reported that, (Intergovernmental Panel on Climate Change, 2001):

- an increasing body of observations gives a collective picture of a warming world and other changes in the climate system;
- the Earth’s climate system has demonstrably changed on both global and regional scales since the pre-industrial era, with some of these changes attributable to human activities;

- carbon dioxide concentrations, globally averaged surface temperature, and sea level are projected to increase under all IPCC emissions scenarios during the 21st century;
- physical and biological systems have already been affected in many parts of the world by changes in climate, particularly increases in regional temperature; and
- projected climate change will have beneficial as well as adverse effects on both environmental and socio-economic systems, but the larger the changes and rate of change in climate, the more the adverse effects predominate.

The IPCC has reported that the global average surface temperature has increased by 0.6°C since 1861. Globally, it is likely that the 1990s was the warmest decade and 1998 the warmest year, in the instrumented record (1861-2000). The IPCC predicts that the global mean surface air temperature is likely to rise within a range of 1.4°C to 5.8°C over the period 1990 to 2100. Global mean sea level is projected to rise within the range 0.09 to 0.88 m between the years 1990 and 2100. This rise is due primarily to thermal expansion of the oceans and melting of glaciers and ice caps.

The impact of rising global mean surface air temperatures and sea levels on the environment range from modified ocean circulation and changed marine ecosystems, altered and modified ecosystems as a result of shifts in climatic zones induced by the enhanced greenhouse effect, altered levels of food production due to changes in weather and pest distributions (as associated with climate change), water scarcity through altered patterns of agricultural, ecosystem and other water uses and increased severity and frequency of natural hazards such as severe droughts and tropical cyclones (Intergovernmental Panel on Climate Change, 1990).

The findings by the IPCC have been supported in the Ministerial Declaration of the Sixth Conference of the Parties (Ministers to the United Nations Framework Convention on Climate Change, 2001) to the United Nations Framework Convention on Climate Change (UNFCCC) in June 2001 and give credence to the need for more effective action by all countries including Australia.

International Response

The United Nations Framework Convention on Climate Change provides the focus for international action to address the threat of climate change. The EPA notes and supports the objective of this treaty which is to achieve 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (man-made) interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure the food production is not threatened and to enable economic development to proceed in a sustainable manner' (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

In order to put the UNFCCC into operation, further rules were required. In December 1997, the signatories to the UNFCCC finalised the Kyoto Protocol for this purpose. The Kyoto Protocol (if and when it comes into force) would represent a significant first step in an effective international response to climate change. As signatories to the Protocol, developed countries collectively would be required to reduce their greenhouse gas emissions from 1990 levels by at least five percent by 2008-2012. Within this agreement, Australia negotiated

special concessions to limit its increase to no more than 8% above the 1990 levels over the same timeframe.

During 2001, further detailed rules for implementation of the Protocol were added in Marrakech. The United States, representing some 30% of global greenhouse gas emissions, withdrew from the Kyoto Protocol to pursue a 'parallel path' for emissions reductions. To come into effect, the protocol requires ratification by 55 countries responsible for 55% or more of the emissions.

Australia has not ratified the Kyoto Protocol at present. However the Australian government has signalled its intention for the nation to meet the 108% Kyoto target regardless of ratification.

National Inventories

National inventories for greenhouse gas emissions have been prepared by the National Greenhouse Gas Inventory Committee (NGGIC) for the period 1990 to 1999 and by the Australian Greenhouse Office subsequently.

Table 1: Greenhouse Gas Inventories

Jurisdiction	Net greenhouse gas emissions: 1990 $MtCO_2e$	Net greenhouse gas emissions: 1995 $MtCO_2e$	Net greenhouse gas emissions: 2000 $MtCO_2e$	Net greenhouse gas emissions: 2010[3] projected $MtCO_2e$
W Australia	42.5[1]	49.3[1]	ne	ne
Australia	503.3[2]	ne	535.3	580[2,4]

Sources: National Greenhouse Gas Inventory Committee (NGGIC), 1996, 1998, 1999a,b; Australian Greenhouse Office, 2002.

Notes:

1 excluding land use change

2 including land use change

3 projection with specific measures to reduce greenhouse gas emissions

4 projection based on UNFCCC accounting, does not equate with a projection for comparison with the 108% Kyoto target. Projection based on Kyoto rules is 111% of the1990 target.

ne – no estimate

Australia, with 0.3% of the world's population contributed 1.4% of global greenhouse gases in 1995 (Government of Western Australia, 1997; Department of Foreign Affairs and Trade, 1997 and Government of Western Australia, 1998). Western Australia contributed around 11% of national emissions in 1990 and approximately 12% in 1995 (National Greenhouse Gas Inventory Committee, 1998).

Current trends indicate that Australia would exceed its target under a "business as usual" scenario and will still do so with currently projected specific measures to reduce emissions (Australian Greenhouse Office, 2002). Australia's Third National Communication on Climate Change to the United Nations Framework Convention on Climate Change (UNFCCC) indicates that Australian emissions are currently projected to be 111% of the Kyoto target if calculated using the Kyoto rules or 116% if the UNFCCC rules are

used[1] (Australian Greenhouse Office, 2002). Accordingly, it is necessary for greenhouse gas minimisation to be kept firmly in mind when considering new development proposals which are likely to significantly add to emissions. Hence the EPA has produced this Guidance Statement to indicate the type of approach required when considering significant new or expanded proposals under its processes.

National Greenhouse Strategy

The Framework Convention on Climate Change (FCCC) recognises that all Parties have a common but differentiated responsibility to address climate change. The Convention further recognises that each Party is unique and, therefore, its climate change response strategy must be tailored to suit its particular circumstances. In its Third National Communication to the UNFCCC (2002), Australia's own requirement is to limit our greenhouse gas emissions in the target period to no more than eight percent above the 1990 base year level (Commonwealth of Australia, 1998).

Australia's size, diverse environments and population growth concentrated along an extensive coastline exposes Australia to a wide range of potential impacts and costs arising from climate change, and its associated disruption of the environment and human activities (Third National Communication Report, 2002).

Australia is also vulnerable to the potential economic impacts of international and domestic actions to reduce greenhouse gas emissions. This vulnerability is due to factors such as Australia's significant role in the world trade of energy and mineral resources and processed products, reliance on long haul transport over a large land area, its widely dispersed natural resources and remoteness from overseas markets. Australia has few economically viable alternatives to sourcing most of its energy from fossil fuels, with no nuclear energy and limited hydro-electricity capacity. This large supply of fossil fuels has formed the basis for energy intensive export industries such as aluminium smelting, steel making and LNG production.

Australia is taking these national circumstances into account in formulating its response to climate change, recognising that effective climate change policies must accommodate adaptation, environmental protection, conservation, economic growth and social justice (Third National Communication Report, 2002).

Australia developed a National Greenhouse Strategy (NGS) published in 1998, which provides the strategic framework for advancing Australia's Greenhouse response. There are no State or project-specific requirements in the National Strategy, although the strategy does indicate responsibility for measures for the Commonwealth and State governments.

Implementation plans have been developed by States and Territories as subsidiary documents to the National Strategy.

These plans are to be guided by the same principles which have guided the NGS namely:

[1] The two projections use very different bases when estimating forestry sinks.

- the need to have a Greenhouse response which is tailored to Australia's national interests;
- the need to integrate Greenhouse considerations with other government commitments;
- the pursuit of Greenhouse action consistent with equity and cost effectiveness and with multiple benefits;
- recognition of the importance of partnerships between governments, industry and the community in delivering an effective Greenhouse response; and
- the need for action to be informed by research.

State Greenhouse Strategy

According to Australia's Third National Communication to the United Nations Framework Convention on Climate Change, CO_2 makes the largest contribution to Australia's total emissions, amounting to 72% of all emissions in 2000 (Australian Greenhouse Office, 2002). Annual temperatures could be 0.4 to 2.0^{o}C higher over most of Australia by 2030. Most climate models project an annual average rainfall decrease in south-west Australia and generally warmer conditions by 2030, which would lead to increased evaporation. When combined with the projected changes in rainfall, these changes would result in a decrease in available moisture and greater moisture stress. Natural and human systems that are particularly vulnerable to climate change include the semi-arid habitats in south-west and inland Australia. Water supply and hydrology systems are likely to become increasingly vulnerable to climate change due to projected drying trends. South-west Australia is likely to be most affected by increased temperatures and reduced rainfall (Australian Greenhouse Office, 2002).

The enhanced greenhouse effect may result in increased fire frequency, temperature rises and changes in rainfall and carbon dioxide concentrations which could favour some plants at the expense of others, affecting agricultural production and species distributions. Changes in habitat distribution could particularly threaten native plant and animal species that are geographically isolated or occupy narrow ecological niches. Coastal areas could also be vulnerable, particularly to changes in intensity and frequency of storms and sea level rise (Government of Western Australia, 1998).

In summary, CO_2 is the major greenhouse gas emitted in Australia and climate change will have significant impacts here. South-west Australia will be worst affected in a number of ways. Clearly there is an important and urgent incentive for Western Australia to respond by encouraging timely and effective greenhouse gas management.

The Western Australian government is currently developing a comprehensive greenhouse strategy which is based on four strategic directions as listed below.

- Adaptation strategies to reduce vulnerability of human activities and natural systems to changes in climate and weather.
- Emissions reduction strategies to protect Western Australia's quality of life and economic development while reducing greenhouse gas emissions through better energy efficiency, industry re-engineering and restructuring, renewable energy sources, and improved land management and other practices.

- Carbon sink promotion, by revegetation and other processes that promote the absorption and storage of carbon dioxide from the atmosphere, to increase the amount of carbon stored in the Western Australian landscape.
- New industry development to increase the contribution to the Western Australian economy of 'greenhouse friendly' goods and services that take maximum advantage of new opportunities in response to climate change.

Flexibility Mechanisms

The Kyoto Protocol established three mechanisms to provide parties to the Convention with flexibility to meet emissions targets:

- Clean Development Mechanism (CDM). This provided for developed countries to access emissions credits derived from projects in developing countries;
- International Emissions Trading (IET). This applies only to Annex B countries (primarily developed countries as listed in Annex B to the Protocol). These countries can use assigned amounts listed in Annex B or sell unused amounts to other Annex B countries. The buying and selling of emissions credits can be through direct negotiation or indirectly through brokers or exchanges; and
- Joint Implementation (JI). This mechanism functions like CDM but is confined to Annex 1 countries (counties listed in Annex 1 of the FCCC and are those which have adopted the commitments under the FCCC to limit greenhouse gas emissions. It basically comprises OECD countries, Russia, Eastern European counties and Turkey).

While the Kyoto Protocol offers one mechanism for trading carbon emissions, the pertinent environmental outcome is that a bona fide carbon reduction occurs. If other carbon trading instruments are proposed, they would be considered by the EPA provided they can be monitored and verified to accepted Australian or international standards.

3 THE GUIDANCE

3.1 Overview

Whilst there is a range of views within the scientific community over the climatic and environmental effects that can be expected as a result of increasing levels of greenhouse gases, the majority view held in the scientific community is that global warming is occurring and will continue unless abatement measures commence promptly.

The Enhanced Greenhouse Effect has been given a 4 star rating in the 1998 Western Australian State of the Environment Report which indicates the issue has a high priority for government and community action.

This Guidance Statement applies to all new proposed projects and extensions to projects subject to environmental impact assessment by the EPA where greenhouse gas emissions is considered to be a *relevant environmental factor*.

3.2 EPA's Objectives

The EPA's environmental objective for greenhouse gas management is to reduce emissions to a level which is as low as is practicable. To achieve this the EPA's environmental assessment objective is to ensure that potential greenhouse gas emissions emitted from proposed projects are adequately addressed in the planning/design and operation of projects and that:

- best practice is applied to maximise energy efficiency and minimise emissions;
- comprehensive analysis is undertaken to identify and implement appropriate offsets; and
- proponents undertake an ongoing program to monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time.

While it is recognised that the enhanced greenhouse effect is clearly a global issue, the EPA's jurisdiction is limited to Western Australia. In the context of Western Australia, offsets include activities that reduce the greenhouse gas output or intensity per unit product from current or future activities over the lifecycle of the asset or activity in ways which are clearly linked to Western Australia. Examples include but are not limited to actions within Western Australia such as;

- establishment and maintenance of perennial vegetation;
- sequestration of carbon by geological, chemical, biological or other means;
- reducing the carbon intensity of existing activities;
- replacing fossil fuels with renewable fuels;
- synergistic linking of enterprises to reduce net greenhouse gas outputs;
- approved trading mechanisms; and
- development of new greenhouse gas efficient technologies.

Other national and international offsets are of course valuable in addressing the global issue and the EPA encourages proponents to discuss these also.

3.3 Guidance on greenhouse gas emissions

Proponents should clearly indicate in their environmental review documentation the following:

(a) Greenhouse gas emissions inventory and benchmarking

Using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee[2] or other nationally agreed methodology, estimate the gross emissions of greenhouse gases that are likely to be emitted from the proposed project for each year of its operation in absolute and in carbon dioxide equivalent figures (see (b) below).

Detail the project lifecycle greenhouse gas emissions and the greenhouse gas efficiency of the proposed project (per unit of product and/or other agreed performance indicators). The parameters should be compared with similar technologies producing similar products or their analogues. As well, compare emissions in the context of improvement in industry practice since 1990.

Using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee, estimate for the proposal for each year of its operation, in carbon dioxide equivalent figures, any gross removals of greenhouse gases due to carbon sequestration activities (see (c) below).

(b) Measures to minimise greenhouse gas emissions

Consider a wide range of options and then indicate the intended measures and efficient technologies to be adopted to minimise or reduce total greenhouse gas emissions in the proposed project. This should include:

(i) identifying improvements in energy efficiency, conservation measures and the reduction of fugitive emissions where applicable; and

(ii) indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources. This should take into account fossil fuels used for supplementary power generation.

(c) Carbon Sequestration

Consider a wide range of carbon sequestration options and include intended measures for research and adoption. Options include:

- forestry or other revegetation;
- geological re-injection;
- chemical methods;

[2] The methodology developed by the National Greenhouse Gas Inventory Committee is detailed in the list of references provided in this Guidance Statement.

- soil uptake; and
- re-use.

(d) Minimising emissions over the life of the project

The design measures to minimise emissions, and the sequestration and sink enhancement actions to offset emissions, identified in points (b) and (c) above should represent best practice at the time of seeking project approval. Consistent with the principles of continuous improvement, the EPA expects that, as part of their environmental review, proponents should also commit to an ongoing programme of monitoring, investigation, review and reporting of internal and external greenhouse gas abatement measures. Periodic reviews through the life of the project should identify opportunities to further reduce greenhouse gas emissions over time.

This may include use of the Kyoto Protocol flexibility mechanisms (Emissions Trading, Joint Implementation, Clean Development Mechanism), other trading systems verifiable to relevant standards, carbon sequestration options and direct emissions reduction. Consistent with established EIA practice, such a commitment would then form part of the approval conditions for the proposal.

Proponents should also consider and advise whether they will join the Commonwealth Government's "Greenhouse Challenge" (Department of Primary Industry and Energy, undated) voluntary cooperative agreement program (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate).

(e) Benefits on a national or global scale

This section provides the opportunity for proponents to place the proposal in a national and global context so as to provide an understanding of where broader offset benefits might occur. It provides the opportunity for the proponent to provide an overarching statement in support of the proposal indicating where positive outcomes would be achieved in relation to greenhouse gas emissions, regardless of where these measures are located.

The EPA looks to proponents to provide the best possible outcome within Western Australia but also recognises the potential for benefits to accrue at the national and global scale. If a proponent has adopted best practice to reduce greenhouse gas emissions in Western Australia, the EPA then acknowledges that benefits may also accrue through actions taken by the proponent elsewhere in Australia or internationally.

4 APPLICATION

4.1 Area

This Guidance Statement applies to all applications for new proposed projects and extensions to projects formally assessed by the EPA throughout the State of Western Australia where greenhouse gas emissions is considered to be a relevant environmental factor.

4.2 Duration and Review

The duration of this Guidance Statement is for five years unless some circumstances require it to be revised earlier. At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. Since such a Government document will set new policy directions, this Guidance Statement should be regarded as an interim statement of the EPA's views, which will be reviewed when new Government policy is announced.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority Responsibilities

The EPA will apply this Guidance Statement during the assessment of proposals under Part IV of the *Environmental Protection Act, 1986* where greenhouse gas emissions is considered to be a relevant environmental factor.

5.2 Proponent Responsibilities

Where proponents demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals, in a manner which ensures that they are enforced and audited, the assessment of such proposals is likely to be assisted.

6 GLOSSARY OF TERMS

Abatement

Limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, fuel displacement or switching, carbon stabilising techniques or sink enhancement (Department of Primary Industry and Energy, undated).

Absolute Emissions

Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period (Department of Primary Industry and Energy, undated).

Business as usual

Continuing current practices with no additional action to reduce or mitigate greenhouse gas emissions.

Best practice

Best practice means the adoption of technology and environmental management procedures defined as best practice by the EPA from time to time. The EPA intends to develop a Guidance Statement outlining the operational aspects of the term “best practice” in the near future. That Guidance Statement will be made available as a draft for the full round of public comment in the usual way.

Carbon Dioxide Equivalent

This is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential factor. This will enable emissions of different gases to be added together and compared with carbon dioxide (Environmental Protection Authority, 1995).

Commonwealth Government's "Greenhouse Challenge" Voluntary Cooperative Agreement Program

The Greenhouse Challenge is a cooperative effort by industry and Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. Participation in the challenge will be through 'cooperative agreements' between the Commonwealth Government and industry participants.

The objective of these agreements is to capture the capacity of industry to abate its greenhouse emissions, mainly by improving its efficiency in energy use and processing. A successful program will mean that Australia is developing sustainable strategies that respond effectively to climate change, while maintaining or enhancing Australian industry competitiveness.

The following features form the basis for cooperative agreements between industry and the Commonwealth to abate greenhouse gas emissions and enhance sinks, as part of a comprehensive approach.

Cooperative agreements include the following (Department of Primary Industries and Environment, undated):

- an appropriate emissions inventory;
- specific greenhouse action plans;
- a commitment to regular monitoring and reporting of performance against action plans;
- provision for verification of performance; and
- a public statement, as agreed by the parties, on the undertakings contained in the agreement.

Greenhouse Gases

Proponents would be required to report on the emissions of:

a) carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (CF_x) in terms of their absolute emissions and their "carbon-dioxide equivalent" (CO_2-e); and

b) hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) in terms of their absolute emissions.

The "carbon dioxide equivalent" is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor published by the Intergovernmental Panel on Climate Change (Environmental Protection Authority, 1995 and Intergovernmental Panel on Climate Change, 1995).

Gross Emissions

The actual mass of the greenhouse gases emitted. These emissions may be expressed as either absolute or "carbon dioxide equivalent" emissions.

Global Warming Potential

Global Warming Potential (GWP) is the warming potential of a gas. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. GWPs also vary with the time horizon being considered. The 100 year horizon is generally used in policy analyses. At the time of the publication of this document the published GWPs were 1 for carbon dioxide (CO_2), 21 for methane (CH_4), 310 for nitrous oxide (NO_2), 23,900 for sulphur hexafluoride (SF_6), 6,500 for the PFC perfluoromethane (CF_4) and 9,200 for the PFC perfluoroethane (C_2F_6). GWPs are not available for other greenhouse gases at this stage (Intergovernmental Panel on Climate Change 1996; National Greenhouse Gas Inventory Committee 1997; United Nations 1997 and Environmental Protection Authority 1995).

Project lifecycle greenhouse gas emissions

Project lifecycle greenhouse gas emissions are those measured cumulatively from the point of extraction of the raw materials to the beginning of the consumer phase of the product.

Measures

Refers to the range of possible actions that could be undertaken which directly or indirectly contribute to the abatement of greenhouse gas emissions through source reduction or sink enhancement (Department of Primary Industry and Energy, undated).

National Greenhouse Gas Inventory Committee (NGGIC)

The National Greenhouse Gas Inventory Committee consists of representatives of the Commonwealth, State and Territory Governments and oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia (Environment Australia, pers. comm.). Up-to-date methodology workbooks may be obtained by contacting Environment Australia.

Net Greenhouse Gas Emissions

The actual mass of the greenhouse gases emitted minus any emissions that may have been removed through sequestration or sink enhancement (Department of Primary Industry and Energy undated and National Greenhouse Gas Inventory Committee 1996a).

Sequestration

Sequestration is not yet precisely defined for the purposes of recognised trading or offset schemes. Accordingly, the EPA will need to take a common sense approach on a case by case basis in the interim. To assist proponents, the EPA regards sequestration as a process that results in the isolation of carbon dioxide from the atmosphere for a period which is significant in terms of influencing the global warming effect. Sequestration includes sink enhancement whereby structures are created or the use of existing structures is facilitated in ways which remove carbon dioxide from the atmosphere for a significant period.

7 LIMITATIONS

This Guidance Statement has been prepared by the Environmental Protection Authority to assist proponents and the public. While it represents the contemporary views of the Environmental Protection Authority, each proposal which comes before the Environmental Protection Authority for environmental impact assessment will be judged on its overall merits. Proponents wishing to deviate from the Guidance provided in this document should provide robust justification for the proposed departure.

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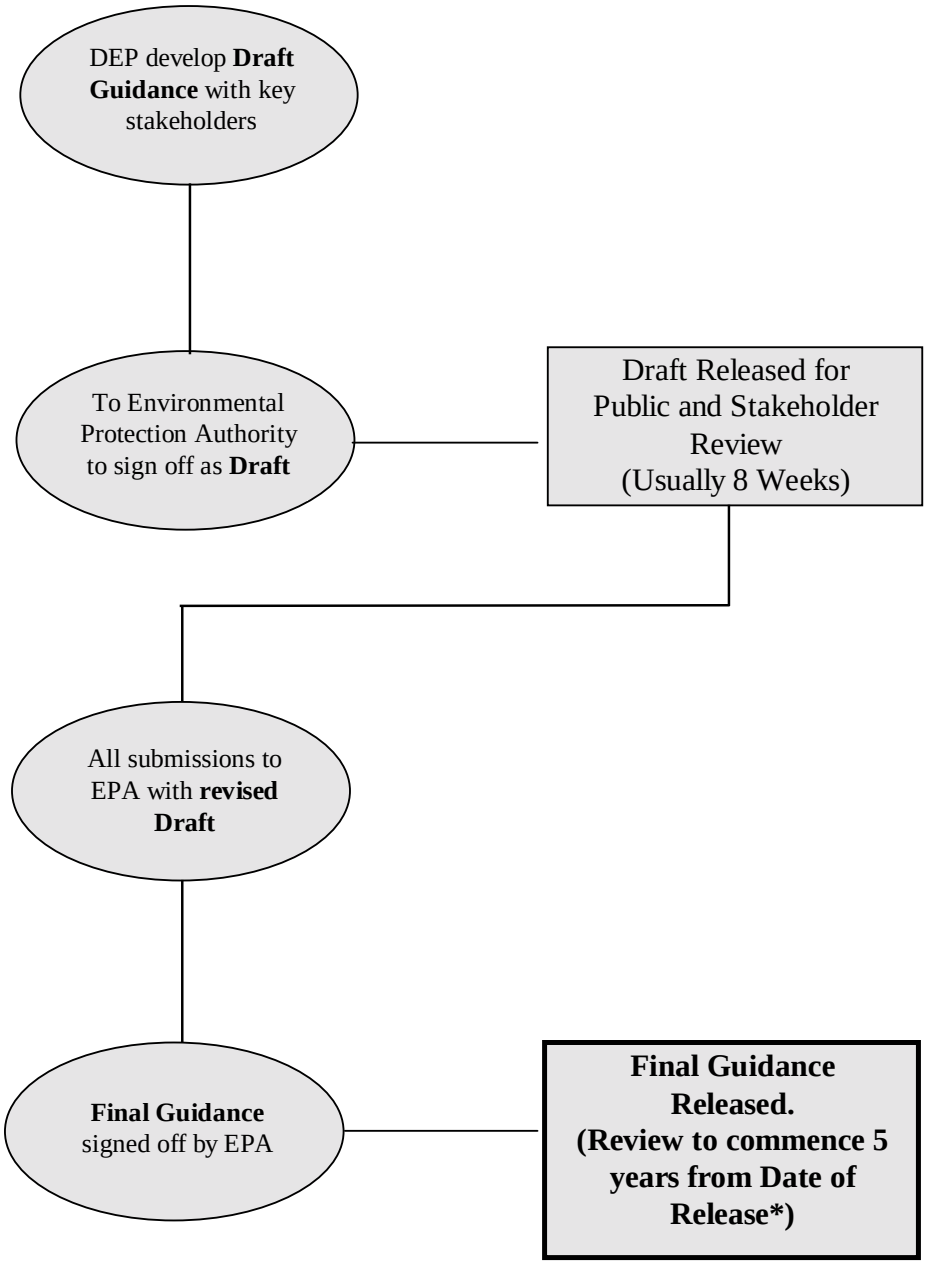
Contact officer	Warren Tacey warren.tacey@environ.wa.gov.au

Appendix 1

Generic Flow Diagram for the Guidance Statement Process



* Guidance may be reviewed earlier if circumstances require it.

ATTACHMENT 3 - FEDERAL STRATEGIES, POLICIES AND GUIDANCE DOCUMENTS ON OFFSETS

Draft Policy Statement: Use of environmental offsets under the *Environment Protection and Biodiversity Conservation Act 1999*

August 2007

Australian Government

Department of the Environment and Water Resources

Environment Protection and Biodiversity Conservation Act 1999
Draft Environmental Offsets Policy

'Environmental offsets' are broadly understood to mean actions taken by developers to compensate for the adverse impacts of their developments. The Australian Government is increasingly considering environmental offsets as part of its process of taking a decision on whether to approve proposed actions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The purpose of this draft policy statement is to outline the Australian Government's position on the use of environmental offsets under the EPBC Act. The aim is to ensure the consistent, transparent and equitable use of environmental offsets under the Act. This draft policy should also provide developers, the community and other governments with greater certainty about the Australian Government's position on a range of issues including: what is an environmental offset; when is it appropriate to consider offsets as part of a project and what is the appropriate nature and scale of environmental offsets?

Comments on this draft policy statement are being invited from interested groups and individuals until [date]. The Australian Government will take any comments received into account when finalising this policy.

This document presents a very short summary of the Australian Government's draft policy on environmental offsets. A more detailed discussion of the issues associated with this policy statement can be found in the companion document 'Use of Environmental Offsets under the *Environment Protection and Biodiversity Conservation Act 1999* – Discussion Paper'.

What are environmental offsets?

There are many definitions of environmental offsets. The Australian Government defines environmental offsets as 'actions taken ***outside a development site*** that compensate for the impacts of that development - including direct, indirect or consequential impacts'.

Environmental offsets provide an opportunity to achieve long-term conservation outcomes whilst providing flexibility for proponents seeking to undertake development which will have environmental impacts.

Environmental offsets are not intended to make proposals with unacceptable impacts acceptable. They are simply intended be provide another tool that can be used during project design, environmental assessment and implementation to achieve the principles of ecologically sustainable development.

Is there any difference between environmental offsets and mitigation measures?

Environmental offsets provide compensation for those impacts which can not be adequately reduced through avoidance and mitigation. 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 (typically undertaken on-site).

Types of environmental offsets

Actions that can be considered as environmental offsets are generally categorised into *direct* and *indirect* offsets.

Direct offsets

Direct offsets are aimed at on-ground maintenance and improvement of habitat or landscape values. They may include:

- long-term protection of existing habitat – including through the acquisition and inclusion of land in the conservation estate, and covenanting arrangements on private land;
- restoration or rehabilitation of existing degraded habitat; or
- re-establishing habitat.

Indirect offsets

Indirect offsets are the range of other actions that improve knowledge, understanding and management leading to improved conservation outcomes. They may include:

- implementation of recovery plan actions – including surveys;
- contributions to relevant research or education programs;
- removal of threatening processes;
- contributions to appropriate trust funds or banking schemes that can deliver direct offsets through a consolidation of funds and investment in priority areas; or
- on-going management activities such as monitoring, maintenance, preparation and implementation of management plans etc.

Use of environmental offsets under the EPBC Act

Environmental offsets can be used under the EPBC Act to ***maintain or enhance*** the health, diversity and productivity of the environment as it relates to matters protected by the EPBC Act (i.e. matters of national environmental significance and the environment more broadly for actions involving the Commonwealth).

Environmental offsets can be applied as an approval condition under the EPBC Act for developments that have undergone assessment. They may be used when a development will result in impacts on a matter protected by the EPBC Act.

Environmental offsets are not applicable to all approvals under the EPBC Act. Each approval must be assessed on a case-by-case basis and must take into account the scale and intensity of impact from the development on the site and the potential for conservation outcomes through offsets. They should not be applied where the impacts of a development are considered to be minor in nature or could reasonably be mitigated. In some circumstances suitable offsets may not be available to adequately compensate for the impacts of a development and a decision on the overall acceptability of the project will need to be made.

Principles for the use of environmental offsets

The Australian Government has identified eight principles for the use of environmental offsets under the EPBC Act. These eight principles will be used to assess any proposed environmental offsets to ensure consistency, transparency and equity under the EPBC Act.

The Australian Government's position is that:

1. Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted.
2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.
3. Environmental offsets should deliver a real conservation outcome.
4. Environmental offsets should be developed as a package of actions - which may include both direct and indirect offsets.
5. Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.
6. Environmental offsets should be located within the same general area as the development activity.
7. Environmental offsets should be delivered in a timely manner and be long lasting.
8. Environmental offsets should be enforceable, monitored and audited.

These eight principles are discussed in greater detail below.

1. Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted.

Environmental offsets may be appropriate when they:

- are necessary or convenient to protect or repair impacts to a protected matter – i.e. a matter of national environmental significance or the environment more broadly for actions involving the Commonwealth;
- relate specifically to the matter (for example, species) being impacted; and
- seek to ensure that the health, diversity and productivity of the environment is maintained or enhanced.

Offsets are **not appropriate** where the impacts of a development are considered to be minor in nature; or could reasonably be avoided or mitigated.

2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.

Offsets are not intended to replace avoidance and mitigation which are expected to be the primary strategies for managing the potential impacts of development proposals. The Australian Government **will not consider** any proposal for environmental offsets unless the intended measures to avoid and/or mitigate the anticipated impacts are presented at the same time.

However, consideration should be given to how offsets can combine with avoidance and mitigation measures to achieve the best outcomes for the matters protected and the proponent. This means that if it can be demonstrated that better conservation outcomes would be achieved by the use of an environmental offset rather than measures to avoid and/or mitigate certain impacts, then the Australian Government will be prepared to consider such an approach.

In assessing the merits of avoidance, mitigation and offsets there needs to be clear information about the scale and intensity of impacts of the development and the relative benefits to be gained through various actions.

3. Environmental offsets should deliver a real conservation outcome.

The Australian Government aims to ensure that offsets deliver a conservation outcome that would not otherwise be achieved. For example, funding open ended research programs which deliver little or no on-ground benefit for the matter impacted are not considered to deliver a conservation outcome. Also, the purchase of existing unprotected habitat only provides a real conservation outcome if that habitat becomes protected in perpetuity and actively managed for long term conservation purposes.

4. Environmental offsets should be developed as a package of actions, which may include both direct and indirect offsets.

When available, direct offsets (e.g. reservation or covenanting of land) are more desirable than indirect offsets (e.g. contribution to research) as they are more likely to lead to long-term conservation outcomes and it is easier to demonstrate a consistent, transparent and equitable relationship between the offset and the impact.

In some cases, however, a package of offsets incorporating direct and indirect actions may deliver the best results. A package of measures increases the scope of possible conservation outcomes, spreads the risk of offsets failing to deliver, and may provide greater flexibility for proponents to successfully deliver a sustainable outcome.

5. As a minimum, environmental offsets should be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.

Environmental offsets should be developed to ensure the relevant matter protected by the EPBC Act is 'maintained or enhanced' by adequately compensating for the impacts of the development.

The appropriate magnitude of an offset package is determined on a case-by-case basis, with consideration of the following:

- the scale and intensity of impacts of the development – including direct and indirect impacts. As a minimum, offsets should be commensurate with the level of impacts of the development and should provide for both maintenance and enhancement of the relevant protected matter;
- achieving the greatest long-term conservation gains – wherever possible in the context of 'like for like' which requires offsets to be targeted towards the specific environmental value being impacted by a development (e.g. foraging habitat for an endangered species). Offsets are required that are (at a minimum) of equal quantity and quality to the area to be impacted, but preferably of greater quantity and/or higher quality;
- precedents for the previous development of similar offsets – with a view to delivering consistency. Offset ratios may be applied when available;
- the approach of the relevant state or territory – with a view to complementing and/or building on that approach; and

- the level of certainty in the offset providing a conservation gain. In the case of uncertainty a greater variety and/or magnitude of offsets may be required including a focus on lower risk actions.

6. Environmental offsets should be located within the same general area as the development activity.

Environmental offsets should generally be located in the vicinity (e.g. same bioregion or sub-region) of the development site to ensure that one area of importance to a protected matter (e.g. a Ramsar listed area or part of a species' range) does not become severely degraded. This may be less relevant for those indirect offsets that are not location-based.

The Australian Government recognises that it may not always be desirable or possible to locate offsets in the vicinity of a development site. In some cases, greater conservation outcomes may be delivered by locating offsets elsewhere.

7. Environmental offsets should be delivered in a timely manner and be long lasting.

Given that environmental offsets are often complex to develop and may have a time lag before delivering a conservation outcome, it is important that an offset package be well formulated at the time of approval and preferably implemented prior to the commencement of the development. This is likely to maximise the chances of the offset package succeeding.

Environmental offsets should deliver a long lasting benefit to ensure environmental impacts are adequately compensated over the long-term. As a guide, offsets should generally compensate for the impact of a development for the period that the impacts occur. Consideration should be given to mechanisms for guaranteeing the security and long-term management of offset sites.

8. Environmental offsets should be enforceable, monitored and audited.

To ensure the success of environmental offsets, it is important that they are enforceable, monitored and audited. Proponents, or their contractors, must report on the success of the offset so that conditions of approval can be varied if the offset is not delivering the desired outcome and future offset packages can have greater chance of success.

The Australian Government will measure the success of environmental offsets by:

- requiring environmental offsets or offset packages to include clearly articulated measures of success that are linked to the purpose of the offsets and provide clear benchmarks about their success or failure;
- monitoring the performance of agreed offsets as part of the monitoring, compliance and audit program for all projects considered under the EPBC Act; and
- seeking feedback at regular intervals from parties affected by and/or interested in environmental offsets to inform offset policy and future offset negotiations with proponents and state, territory or local governments.

Use of Environmental Offsets Under the *Environment Protection and Biodiversity Conservation Act 1999*

Discussion Paper

August 2007

Australian Government

Department of the Environment and Water Resources

WITHOUT PREJUDICE DRAFT – FOR CONSULTATION PURPOSES ONLY

Introduction

The purpose of this paper is to facilitate the development of a public policy and internal guidance for the application of environmental offsets under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The objectives of this work are to ensure the best environmental outcomes are achieved through the consistent, transparent and equitable application of offsets under the EPBC Act. The approach will achieve this through the establishment of a clear set of principles for the development and assessment of offsets.

The paper does not directly address issues associated with mitigation. In addition the paper does not address the potential for funding to be provided to an independent organisation for an unspecified conservation activity. There are a number of initiatives currently under development by both states and non-government organisations to establish 'conservation banks' to hold funds for future conservation actions. While these 'banks' may support environmental offsets under the EPBC Act they are still in the early stage of development and implementation. Review of 'conservation banking' to ensure that it can meet the requirements of the Act and deliver a good conservation outcome for a matter of NES will be the subject of separate considerations.

The paper is presented in three sections:

Section 1 - background information:
- outlines the need for an offsets policy;
- defines offsets;
- describes offset approaches used by other jurisdictions which may apply to the EPBC Act;
- discusses some of the limitations of existing offset approaches; and
- presents an example of applying offsets under the EPBC Act.

Section 2 – offset principles:
- presents discussion on the key principles to be included in an offsets policy.

Section 1 - Background information

The need for an offsets policy under the EPBC Act

Offsets are an emerging issue in relation to environmental impact assessment in Australia. They are increasingly being required as part of development approvals to compensate for impacts on the environment, and aim to achieve long-term conservation gains while enabling development to proceed.

Applying offsets under the EPBC Act provides a range of opportunities to allow development to proceed while meeting the conservation goals of the Act. For example, recovery of threatened species is a key objective of the Act. However, the ongoing approval of developments without offsets will lead to a continual decline in many species. Offsets provide an important mechanism to facilitate both development and long-term conservation.

There is considerable potential for the use of offsets under the EPBC Act and a formal approach is needed to ensure the future application of offsets:

- is appropriate, consistent, transparent and equitable;
- complements and builds on other conservation activities being undertaken in Australia; and
- complements (as far as possible) the various approaches of the states and territories.

Offsets offer an opportunity to integrate regulatory decisions made under the EPBC Act with other 'non-regulatory' conservation measures. For example, offsets could be used to build on Australian, state and territory government policy objectives including conservation activities focussed on encouraging private land owners to maintain the environmental values on their properties (e.g. BushTender in Victoria). Where appropriate, offsets provide an opportunity to direct private investment to achieve similar outcomes as these government funded stewardship programmes.

What are offsets?

In the context of the EPBC Act, offsets are a mechanism available through environmental impact assessment and approvals processes to compensate for the impacts of developments on those matters of national environmental significance protected by the EPBC Act. They are applied through approval conditions and for the purposes of this discussion paper 'offsets' are defined as:

> *actions taken outside of a development site that compensate for the impacts of that development - including direct and indirect impacts*.

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.

While offsets to date have primarily been applied to threatened species and ecological communities, the approach set out in this paper also applies to offsetting impacts on the values of World Heritage and National Heritage sites or Ramsar listed wetlands.
Offsets come in a variety of forms and can be categorised into direct and indirect offset actions.

Direct offset actions

Direct offsets are aimed at on-ground maintenance and improvement of habitat or landscape values for the relevant protected matter. They may include:

- long-term protection of existing habitat – including the acquisition and inclusion of land in the conservation estate or covenanting arrangements on private land;
- restoration or rehabilitation of existing degraded habitat; or
- re-establishing habitat.

Indirect offset actions

Indirect offsets are the range of other actions that improve knowledge, understanding and management leading to improved conservation outcomes for the relevant protected matter. They may include:

- implementation of recovery plan actions – including surveys;
- contributions to relevant research or education programs;
- removal of threatening processes;
- contributions to appropriate trust funds or banking schemes that can deliver direct offsets through a consolidation of funds and investment in priority areas; or
- on-going management activities such as monitoring, maintenance, preparation and implementation of management plans etc.

Package of actions

When available, direct offsets (e.g. reservation or covenanting of land) are more desirable than indirect offsets (e.g. contribution to research) as they are more likely to lead to long-term conservation outcomes and it is easier to demonstrate a consistent, transparent and equitable relationship between the offset and the impact. However, a package of offsets incorporating direct and indirect actions may also deliver effective results. A package of measures increases the scope of possible conservation outcomes, spreads the risk of offsets failing to deliver, and may provide greater flexibility for proponents to successfully deliver a sustainable outcome.

Offsets should be real

It is important to ensure that offsets deliver conservation outcomes that would not otherwise be achieved. For example, they should not rely on securing habitat that is already protected for conservation purposes.

Case Study - Dingo Dam, Qld

In 2006, the Department determined that construction of the Dingo Dam in Queensland was a controlled action as the proposal would result in the inundation of 6ha native vegetation containing 40 plants of a daisy species listed as endangered under the EPBC Act.

The proponent proposed an offset of a conservation covenant over 10ha of lowland riverine scrub habitat on nearby private land which contained approximately 80 daisy plants of the same species. The Department advised the proponent that the proposed offsets would not be acceptable since the lowland riverine scrub habitat to be covenanted was already protected from clearing under stringent state legislation.

The final agreed offset was the placement of a conservation covenant over 15 ha of private land containing 70 daisies which had no existing legal protection from clearing and an ongoing commitment to manage the area to encourage the successful recruitment of the species.

Offsetting in the states and territories

A number of states have developed public policies on offsets (e.g. WA) and others are beginning to enshrine offset schemes into legislation (e.g. Victoria and NSW). A summary of state and territory approaches to offsets is presented at Appendix A.

An important element to the various approaches to offsetting by the states and territories is the overarching goals of their offset policies. While expressed in a range of different ways, there are essentially three conservation goals that are applied nationally in relation to offsets – 'no net loss', 'net gain' and 'maintain or improve' which are outlined below. These goals establish the desired outcomes for impact assessment and determine the role of offsetting in this process.

No Net Loss
No net loss aims to ensure the current extent and quality of the environment (or elements of the environment) are maintained. This principle does not incorporate the concept of improving or rehabilitating the environment over time.

Net Gain
Net gain is a principle which seeks to ensure an improvement in the extent and quality of the environment (or elements of the environment) over time. For example, the Victorian offsetting policy seeks to achieve net gain, which is defined as, 'a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation'.

Net gain requires greater magnitudes of offsets in the attempt to improve the environment while still allowing certain levels of development.

Maintain or improve
A combination of the previous two principles is the 'maintain or improve' goal for offsetting. NSW and Western Australia apply this goal which establishes no net loss as the minimum standard but also includes the scope to focus on environmental gains.

This goal provides flexibility in applying offsets. At a minimum it aims to ensure the extent and quality of the environment is maintained over time, while also incorporating the scope to achieve broader conservation gains (e.g. the recovery of species and the habitat that supports them).

Offsetting under the EPBC Act

The EPBC Act outlines a clear framework for the use of offsets and defines the circumstances in which they can be applied and the goal to be achieved in applying them.

Legal framework for offsets

Offsets, as an approval condition, are subject to the same legislative requirements that apply to all approval conditions under Part 9 of the EPBC Act. These legislative requirements are established in a number of parts of the Act (Sections 134 and 136 in particular) and are illustrated in Figure 1 (Pg 8).

Section 136 sets out the general considerations that the Australian Government Minister for the Environment (the Minister) must take into account when deciding whether or not to approve an action. These considerations specifically include the need for the Minister to take into account the principles of Ecologically Sustainable Development (ESD). Section 3A details the principles of ESD. Those principles of particular relevance to the referrals, assessments and approvals process are:

- the concept of 'inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the ***environment is maintained or enhanced*** for the benefit of future generations'; and
- that the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making. This point provides clear links between the recovery of threatened species and the decision-making framework.

Section 134 outlines the scope of approval conditions that can be made by the Minister. Conditions can only be made that are necessary or convenient to protect a matter of national environmental significance or the environment from actions involving the Commonwealth, or to repair or mitigate damage to a matter of national environmental significance or the environment from actions involving the Commonwealth (whether or not the damage has been caused by the action).

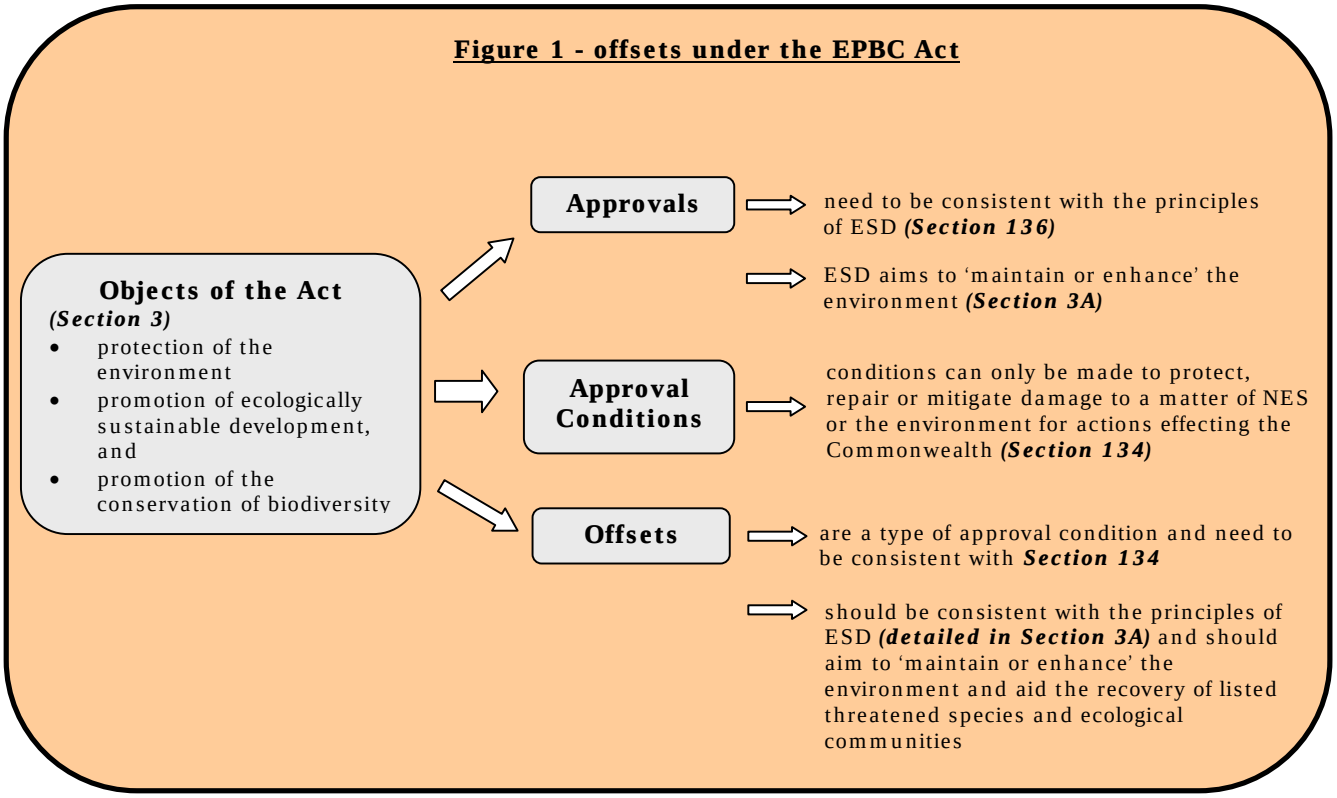
Offsets are therefore a legitimate option under the EPBC Act when they:

- are necessary or convenient to protect or repair impacts to a protected matter – i.e. a matter of national environmental significance or the environment from actions involving the Commonwealth;
- relate specifically to the matter being impacted; and
- seek to ensure that the health, diversity and productivity of the environment is maintained or enhanced (being consistent with the principles of ESD).

It is important to note that offsets are not applicable to all approvals. Offsets should not be required where the impacts of a development are considered to be minor in nature or could reasonably be mitigated. In some circumstances suitable offsets may also not be available to adequately compensate for the impacts. This is an issue that would need to be considered when deciding whether or not to approve an action, including consideration of social and economic issues.

Further discussion of the appropriate use and magnitude of offsets is presented in Section 2 of this paper.

Figure 1 - offsets under the EPBC Act



Amendments to the EPBC Act

The Australian Parliament passed amendments to the EPBC Act on 7 December 2006. The bulk of the amendments commenced on 19 February 2007 and included changes to the scope of approval conditions described in Section 134 of the EPBC Act. Section 134 now allows the Minister to attach a condition to a Part 9 approval which requires specified activities to be undertaken for protecting, or repairing or mitigating damage to, a matter protected under Part 3 of the Act; or, requiring a specified financial contribution to support such activities. The purpose of this amendment is to provide for activities which are not directly related to the taking of an action but which recompense for damage which the action may cause. Under section 134(3A) if conditions imposed under this provision are not reasonably related to the taking of the action, the Minister may not impose them unless the holder of the approval has consented to them.

Recognition of state/territory negotiated environmental offsets

Many proposals which require approval under the EPBC Act also require environmental approvals from state or territory governments before they can proceed. As a consequence, some proponents may need to satisfy the requirements of both state and territory and Australian Government environmental offset policies.

All existing state and territory government policies regarding environmental offsets have the capacity to deliver offsets which will also satisfy the proposed draft policy and thus the

requirements of the EPBC Act. However, approvals under the EPBC ACT are generally required to focus only on matters of national environmental significance which is a narrower scope than most state and territory approvals which aim to protect broader biodiversity values and the whole of the environment. As a consequence, it should not be assumed that an offset which satisfies state and territory requirements will automatically satisfy the requirements of the EPBC Act.

When state and territory governments negotiate offsets which can also satisfy the requirements of the EPBC Act there may be no need for additional environmental offsets as part of the EPBC approval. Any such offsets would be taken into account by the Australian Government when considering the possible need for a proposal to provide an offset in order to satisfy the requirements of the EPBC Act.

It is intended that the proposed policy on the application of environmental offsets under the EPBC Act will help all stakeholders involved in the development of offsets understand the parameters within which environmental offsets are likely to satisfy the requirements of the EPBC Act.

Limitations of offsets

Offsets are not a guarantee in themselves for delivering conservation outcomes. Implementing them without sufficient data, research, information, resources, regulation and commitment may lead to little or no benefits.

Issues that have been identified as key limitations to offsets include:

- the complexity of ecosystems and the difficulty in understanding the ecological function of habitats. For example, understanding the respective roles of two woodland sites as habitat for Carnaby's Black Cockatoo and the possibilities for offsetting one for the other by improved management is complex and subject to high levels of uncertainty;
- the time-lag before offsets become effective. For example, the re-establishment of habitat for the northern quoll may not become effective for a number of years while the impact of a development is immediate;
- equating indirect or consequential impacts with offsets. For example, while the loss of one area of habitat can be equated via a ratio to another area of habitat (although this may involve consideration of a range of complex variables), quantifying the impacts of increased traffic flow or changed water regimes and an appropriate offsets is more difficult; and
- whether protecting existing unprotected habitat can generate compensation for environmental impacts. For example, while one area of Spiny Rice Flower grassland may be conserved and managed as an offset, there can still be an overall loss of individuals and habitat for the species due to the loss at the development site.

Section 2 – Discussion of Offset Principles

A draft offset approach is presented at Section 3. There are however a number of key issues in relation to the principles of offsets that require discussion and resolution in order to formalise an approach for the EPBC Act.

The key issues for discussion in relation to agreement on offset principles are:

1. when are offsets an appropriate mechanism to apply under the EPBC Act?
2. what actions are suitable as offsets?
3. what is the appropriate magnitude of an offset?
4. where should offsets be located?
5. timing of offsets - when should they be delivered and for how long?
6. what should offset approval conditions look like?

1. When are offsets an appropriate mechanism to apply under the EPBC Act?

As outlined in Section 1 of this discussion paper, approval conditions (including offsets) may only be required when they:

- are necessary or convenient to protect or repair impacts to a protected matter – i.e. a matter of national environmental significance (e.g. a particular threatened species or Ramsar wetland) or the environment from actions involving the Commonwealth;
- relate specifically to the matter being impacted; and
- seek to ensure that the health, diversity and productivity of the environment is maintained or enhanced (being consistent with the principles of ESD).

In determining when offsets are 'necessary or convenient', a number of specific issues need to be considered:

a) what is the magnitude of impact from a development that warrants the need for offsets – i.e. impacts that are of sufficient magnitude that compensatory measures are required;
b) how much effort and how many resources should be put into mitigating on-site impacts before offsets are considered as an appropriate course of action; and
c) what is the appropriate course of action if sufficient offsets are not available?

Environmental offsets are not intended to make proposals with unacceptable impacts acceptable. They are simply intended be another option in the environmental impact assessment process to achieve the principles of ESD.

a) Magnitude of impacts

The objective of approval conditions is to ensure that the health, diversity and productivity of the environment is maintained or enhanced over time (as outlined in the Section 1 of this discussion paper). Offsets may therefore be an appropriate mechanism where off-site actions are needed to compensate for the impacts of a development so that the environment is 'maintained or enhanced'. For example, clearing of a portion of the nationally listed Brigalow ecological community may be offset by securing and rehabilitating another area of Brigalow habitat. This would be appropriate where the loss of Brigalow was determined to be 'significant' and on-site mitigation could not sufficiently reduce the magnitude of these impacts to an acceptable level.

b) Balancing mitigation and offsetting

Offsets are generally applied in Australia on the basis that all options to avoid and mitigate on-site impacts have been applied prior to the consideration of off-site actions. This philosophy is designed to ensure on-site impacts to the environment are minimised and that offsetting does not become a mechanism for allowing incremental and unacceptable loss. Consequently, offsets would only be an option when a level of environmental impact remains that cannot be avoided or mitigated.

This approach does not take into account the relative benefits of mitigation and offsetting, and the possibility that resources directed to offsets may deliver more certain and higher quality conservation gains than money spent on mitigation. For example, in some circumstances on-site mitigation may be expensive and deliver uncertain long-term conservation benefits. In these cases, a focus on off-site actions may be more appropriate. They may be more cost effective for proponents and deliver greater conservation outcomes.

In assessing the merits of mitigation and offsets, there needs to be clear information about the level of impacts of the development and the relative benefits to be gained through various actions. 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 mitigatory measure where it can be shown that it will provide environmental values in the long-term.

In addition, developments may have off-site impacts that cannot be mitigated by on-site actions. For example, urban development in the vicinity of Cassowary habitat may lead to substantial increases in road traffic through essential habitat – a key threat to the species. No amount of on-site mitigation will reduce the impacts of this threat and offsets may be required to compensate for those impacts.

c) Availability of offsets

In some circumstances, suitable offsets may not be available to adequately compensate for the impacts of a development. This may occur for a variety of reasons such as where the impacts of a development are extremely large. For example, in 2001 the culling of Spectacled Flying Foxes by a large aerial electric grid on a lychee farm in north Queensland, adjacent to the Wet Tropics World Heritage Area was determined to be unacceptable. No amount of offsetting could appropriately compensate for the on-site impacts.

Where sufficient offsets are not available, consideration of the acceptability of the development will need to take into account the level of offsets that are available as well as social and economic issues.

Suggested Approach

A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents. The Australian Government should not consider any proposal for environmental offsets unless the intended measures to avoid and/or mitigate the anticipated impacts are presented at the same time. If it can be demonstrated that better conservation outcomes would be achieved by the use of an environmental offset rather than measures to avoid and/or mitigate certain impacts, then the Australian Government should be prepared to consider such an approach.

2. What actions are suitable as offsets?

There are various options for delivering offsets – including both direct and indirect actions. Given the complexity of environmental impact assessment, it is not useful to be prescriptive about the type of actions that are appropriate as offsets for particular impacts. Development proposals and their associated impacts will differ, the actions needed to protect various matters will differ, and the opportunities for offsetting impacts on-ground or through other measures will differ.

However, there are a number of guiding principles that can be applied to the development of offset actions. These include:

- direct offsets (e.g. reservation or covenanting of land) are generally more desirable than indirect offsets (e.g. contribution to research) as they are more likely to deliver long-term conservation outcomes and it is easier to demonstrate a consistent, transparent and equitable relationship between the offset and the impact;
- a package of actions is likely to deliver the best long-term conservation benefits (see Section 1 of this paper); and
- offset actions should be focused on delivering the greatest conservation benefit for the relevant protected matter.

Case Study – Tropical Palms Resort, Mission Beach, QLD

In 2005, the Department determined that the proposed development of a resort in Mission Beach, North Queensland, was a controlled action due to the indirect impacts on Southern Cassowary (*Casuarius casuarius johnsonii*) from increased traffic on the two principal access roads into Mission Beach. The Southern Cassowary is listed as endangered under the EPBC Act and as a key value of the Wet Tropics World Heritage Area. Road kill is the major cause of cassowary mortalities recorded in the Mission Beach area.

The proponent, with the assistance of a regional natural resource management body, developed an offsets package targeted towards both research and conservation actions for the Mission Beach Cassowary population which has to be implemented within 2 years of the date of the EPBC approval.

The offsets package included a contract with the. James Cook University to conduct research into traffic impacts on the Southern Cassowary in the Mission Beach area, an action identified in the Recovery Plan for the species, a contract with the local natural resource management body to conduct off-site riparian revegetation using Southern Cassowary food plants, and financial support to the Queensland Parks & Wildlife Service to assist post-Cyclone Larry Southern Cassowary feeding programmes.

In addition, offset proposals which are considered highly likely to achieve their intended outcome within a short time frame are generally preferable to measures which are untested and take a long

time to deliver their potential goals. Determining the suitability of an offset can therefore be assisted by considering:

- the likelihood of the proposed offset measure delivering the intended outcome; and
- the timeframe in which the intended outcome would be achieved.

The value of a proposed offset or the potential risk of a proposed offset not delivering a conservation outcome can be illustrated by a matrix approach. An example of such a matrix is provided at Appendix B.

'Like for like'

The EPBC Act requires offsets to relate directly to the specific protected matter that will be impacted (i.e. matter of national environmental significance or the environment from actions involving the Commonwealth). Within this legal requirement there are various possibilities for targeting offset actions.

'Like for like' is a principle used in a number of offset policies in Australia. It is a concept that requires offset actions to be targeted towards compensating for the specific environmental value or ecological function being impacted by a development. For example, in the case that foraging habitat for the Swift Parrot was to be lost, offset actions would be focussed on protecting, restoring, creating etc similar foraging habitat (i.e. rather than breeding habitat). It also incorporates the concept that environmental values can be described in terms of both quantity and quality, and that offset actions should ensure that both factors are taken into account.

It may not always be desirable to limit offset actions to the specific value or ecological function of the protected matter that is being impacted. In some cases greater conservation gains might be possible by focussing on other elements of the relevant matter. For example, a better outcome might be gained by restoring breeding habitat for a species instead of foraging habitat if breeding habitat was identified as the key limiting factor for that species.

In addition, the concept of 'like for like' may not work well in relation to issues such as the values of World Heritage or Ramsar listed areas. The best outcome might be achieved by developing offsets that relate to the holistic conservation of the relevant World Heritage area but not the specific values that are being impacted.

Case Study – Ballyhoo Canal Estate, SA

In 2005, the Department determined that development of a residential canal estate on the shores of Lake Alexandrina in South Australia was a controlled action. The proposal was likely to have adverse impacts on the Coorong, Lake Alexandrina and Lake Albert Ramsar site and neighbouring saltmarshes which provide habitat for listed migratory birds and potential habitat for the critically endangered Orange-bellied Parrot (OBP).

Key impacts of concern included:

- dredging and maintenance of a 350m long entrance channel out into the Ramsar site;
- the incursion of domestic pets into to the adjacent saltmarsh migratory bird habitat;
- the creation of an environment conducive to supporting pest fish species; and
- increased boat traffic resulting in water pollution and disturbance of fauna in the Ramsar site.

As an offset to the above impacts, the proponent proposed to create a reserve to protect and enhance 20ha of neighbouring saltmarsh habitat. Creation of the reserve would include:

- exclusion of livestock and domestic pets from the area;
- control of weed species and rehabilitation with native plant species;
- transferral of management of the reserve to the local council once the above rehabilitation and protection works were completed; and
- the provision of funds to council to assist with the ongoing maintenance of the reserve.

These measures are expected to result in long term protection of the saltmarshes and a substantial improvement in the quality of habitat in the reserve. They will also benefit the Ramsar site as many of the species which are supported by the saltmarshes are also important components of the Ramsar wetland ecosystem.

Suggested Approach

Offset actions should:

- be developed as a package - with a priority placed on delivering direct offsets;
- deliver conservation outcomes that would not otherwise be achieved;
- be focussed on achieving the greatest long-term conservation gains – wherever possible in the context of 'like for like';
- aim to provide a high level of certainty regarding their intended conservation outcomes; and
- deliver conservation outcomes in the shortest time possible.

3. What is the appropriate magnitude of an offset?

When it has been determined that offsets are required, consideration needs to be given to the appropriate magnitude of the offset package (noting that 'magnitude' relates to both quantity and quality). The guiding principles for determining the appropriate magnitude of offsets have been introduced earlier, and include:

- the magnitude of offsets needs to relate to the scale (extent) of the impacts of the development - including direct, indirect and consequential impacts; and
- offsets should be commensurate (as a minimum) with the intensity of impact of the development and should provide for both maintenance and enhancement of the relevant protected matter. For example, offsets should aim to secure a positive environmental outcome through an increase in the overall habitat available to a threatened species to allow it to recover.

In order to ensure offsets provide a long-term conservation outcome they should also be of a sufficient scale and in an appropriate location. For example, small isolated areas of habitat for a species may not be suitable in the long-term and the focus should be directed to conserving larger more consolidated patches of habitat.

A number of methodologies are used in Australia to determine the magnitude of offsets for specific projects. These vary from more prescriptive, formula based methods (e.g. Victoria) to more flexible, case-by-case considerations (as has been applied under the EPBC Act to date).

Prescriptive methodologies

Prescriptive methods for determining the magnitude of offsets can work well for direct offsetting of impacts on biodiversity (i.e. loss of native vegetation through clearing or development). In these cases it is possible to develop formulae and ratios to determine the relative size of the impact or the extent of the lost habitat and the appropriate magnitude of the required offsets.

Habitat values of both the impact site and the offset site can be compared in terms of quantity and quality. Ratios can then be established to ensure consistency in the level of offsetting required for certain types of vegetation within the overarching goal of the offset policy. For example, Table 1 provides an extract of the Victorian system based in *Victoria's Native Vegetation Management – a framework for action.*

These systems require a strong regulatory basis to ensure consistency and transparency. They can provide greater certainty for developers and ensure direct compensation for impacts on vegetation. However, prescriptive methodologies for determining offsets have a number of constraints;

They:

- are typically complex to develop;
- may lack flexibility – e.g. in the treatment of large versus small scale developments;
- have difficulty considering indirect or consequential impacts (e.g. road kill on Cassowary) and incorporating indirect offsets (e.g. implementation of recovery plan actions);
- require appropriate areas of habitat or potential habitat to be available to developers at the time of approval, or run the risk of delayed delivery of offsets; and
- may impact on market values of land.

Table 1 – example of Victoria's offset framework

Vegetation status	**Offset ratios**	
	For remnant vegetation	***For large old paddock trees***
High quality*****	Net gain – at least 1.5x the calculated loss in habitat hectares****** of the same vegetation type or higher quality	4 other large old trees to be protected and 20 new trees to be recruited

***** the quality of vegetation is determined through a range of criteria including the quantity and quality of the vegetation

****** habitat hectares is a measure of the quantity and quality of vegetation against agreed benchmarks

Case-by-case methodologies

Case-by-case methodologies for determining the magnitude of offsets tend to be more flexible and can take into account the benefits of both direct and indirect offsets. This is the approach that has been used under the EPBC Act to date. However, without an overarching set of decision rules to provide clarity about the desired outcomes or to ensure consistency in the process for developing offsets there is a risk of poor consistency and transparency.

The benefit of case-by-case consideration of offsets within a set of agreed principles is its flexibility. The EPBC Act regulates a broad range of issues and developing offset ratios for all threatened species, ecological communities, World Heritage areas and Ramsar listed areas would be highly resource intensive and would require appropriate areas of land to be available at 'reasonable' costs to the developer. Prescriptive approaches also cannot take into account the effects of indirect or consequential impacts (e.g. road kill of Cassowary) and find it difficult to incorporate the range of indirect offsets that might be suitable (e.g. funding a recovery plan action).

In addition to the criteria identified at the beginning of this section, a number of other considerations may apply for determining the appropriate magnitude of offsets under a case-by-case framework:

- precedents for the previous development of offsets. For example, where a 10:1 ratio of foraging habitat for the Swift parrot has been required for an offset in the past, this would provide a starting point for the development of future offsets in similar cases;
- the approach of the relevant state or territory. It would be effective and efficient to build on or complement the approach of another jurisdiction to deliver both state/territory and EPBC Act outcomes and consistent environmental approvals;
- the level of certainty in the offset providing a conservation gain. In the case that uncertainty exists about the potential conservation success of an offset package (e.g. due to uncertainty in the science), more immediate and higher certainty offsets should be sought. For example, re-establishing habitat may be less likely to succeed as an offset than rehabilitation of degraded habitat. It may be appropriate in this case to require a larger area of to be re-established as habitat; and
- use of strategic conservation guidelines for select regions, species or ecological communities (eg. priority actions identified in recovery plans).

Suggested Approach

The magnitude of offsets should be developed on a case-by-case basis. To ensure transparency, consistency and equity the following should be considered when determining the appropriate magnitude of the offset package:

- the scale and intensity of impacts of the development – including direct, indirect and consequential impacts. As a minimum, offsets should be commensurate with the impacts of the development and where possible should provide for both maintenance and enhancement of the relevant protected matter;
- precedents for the previous development of similar offsets – with a view to delivering consistency;
- the approach of the relevant state or territory – with a view to complementing and/or building on that approach; and
- the level of certainty in the offset providing a conservation gain. In the case that uncertainty exists consider requiring greater offsets and a package of offsets that reduces the risk of failure.

4. Where should the offsets be located?

Consideration needs to be given to the appropriate location of offsets. Offsets should, where possible, be located in the vicinity (e.g. same bioregion or sub-region) of the development site to ensure that one area of importance to a protected matter (e.g. a Ramsar listed area or part of a species' range) does not become severely degraded. This is less relevant for indirect offsets which may not be location based.

However, it may not always be desirable or possible to locate offsets in the vicinity of a development site. In some cases, greater conservation outcomes may be delivered by locating

offsets elsewhere. For example, where habitat has been prioritised for recovery, targeting offsets to these high priority areas may deliver the greatest conservation gains even if they were not in the vicinity of the development.

Consideration of the appropriate location of offsets will need to be made on a case-by-case basis – taking into account the relative long-term conservation benefits of locating them within the vicinity of the development or elsewhere. This assessment should be made using the best available information including recovery plans for threatened species and relevant scientific literature.

Suggested Approach

Direct offsets should be located within the same general area (e.g. bioregion or sub-region) as the development unless better long-term conservation outcomes can be achieved by locating them elsewhere.

5. Timing of offsets - when should they be delivered and for how long?

The timing of implementation and the duration of offsets are important factors in ensuring they deliver long-term conservation outcomes. Given that offsets are often complex to develop and potentially difficult to deliver, it is important that an offset package be well formulated at the time of approval and preferably implemented prior to the commencement of the development. This is likely to maximise the chances of the offset package succeeding.

To ensure that a suitable offset package has been formulated at the time of approval, analysis of possible offset options ideally needs to take place during the assessment process (rather than the approvals process). This allows for full consideration of the costs and benefits of offsets. In some cases it will be clear that offsets will be required early in this process. However, in others the assessment may be well progressed before it is clear that offsets are appropriate. Care needs to be taken to avoid the situation where a proponent is given inappropriate advice (i.e. prior to approval) that their project will be approved on the basis of potential offsets.

Commencing the implementation of offsets prior to the start of a development provides a greater guarantee that the offsets will compensate for the impacts of that development. It ensures offsets are secured prior to the environmental impact occurring, avoids difficult negotiations between the regulator and the proponent that may arise in cases where the proposed offsets cannot be secured, and reduces the time lag that may occur before the offsets deliver a conservation benefit. However, this needs to be balanced with the possibilities of imposing unreasonable delays on a project and causing unnecessary costs where offsets cannot reasonably be developed prior to a development commencing.

In relation to the duration of offsets, they should deliver a long lasting benefit to ensure environmental impacts are adequately compensated over the long-term. As a guide, offsets should compensate for the impact of developments for the period that the impacts occur – which may be in perpetuity. In delivering long lasting outcomes, consideration needs to be given to the security and long-term management of offset sites.

Suggested Approach

Offsets should be delivered in a timely manner and be long lasting. It is preferable for offsets to be delivered prior to the commencement of development and to provide long lasting benefits. Appropriate management of offsets is essential to ensure successful outcomes.

6. What should offset approval conditions look like?

As with all approval conditions, offsets should be enforceable, deliverable, monitored and audited at appropriate intervals.

Case Study – Ivory Towers Resort, Tasmania

In 2005, the Department determined that development of the Ivory Towers Resort in Tasmania was a controlled action as it involved clearing of approximately 14ha of vegetation containing a population of approximately 40 Phascogales listed as vulnerable under the EPBC Act.

The proponent proposed to offset this impact by contributing $80 000 to the Bassingthwaite Phascogale Conservation Trust's Regional Rehabilitation Fund. This money would be used by the trust to assist with their conservation activities in the Pembroke region.

The Department advised the proponent that the above offset would not be acceptable since the contribution to the Regional Rehabilitation Fund provided:

a. no indication of what activities the funds would be spent on;
b. no certainty that the funded activities would directly benefit the impacted species and
c. no timeframe for the use of funds;

Key considerations in developing approval conditions for offsets include:

- identifying the measures of success for the offset package - important to ensure clarity about the purpose of the offset(s) and to provide clear benchmarks about their success or failure; and
- ensuring that the performance of the offsets is monitored and the monitoring results are fed back into the decision making process. This feedback loop will be important to ensure ongoing improvement in the application of offsets under the EPBC Act.

Suggested Approach

In developing offset approval conditions, consideration should be given to:

- the legal construct of the offset conditions to ensure that they can be adequately enforced;
- the measures of success for the offsets;
- the mechanisms for monitoring the offsets; and
- the processes for feeding the monitoring results back into the decision making process.

Background literature

Freehills (2004) *Environmental offsets – legal recommendations and red flags*. www.freehills.com.au/publications_1565.asp

Kate, K; Bishop, J and Bayon, R (2004) *Biodiversity offsets: views, experience and business case*. IUCN The World Conservation Union.

National Framework for the Management and Monitoring of Australia's Native Vegetation http://www.deh.gov.au/land/publications/nvf/index.html

National Market-based Instruments Pilot Program (2005) *Project Final Report: Green offsets for sustainable regional development.*

NSW Government Department of Environment and Conservation (2006) *BioBanking – a biodiversity offsets and banking scheme. Conserving and restoring biodiversity in NSW. Working Paper*.

NSW Government Department of Environment and Conservation (2006) *BioBanking – an investigation of market-based instruments to secure long-term biodiversity objectives. Background Paper*.

NSW Government (2002) *Green offsets for sustainable development – concept paper.*

Parkes, D; Newell, G and Cheal D (2003) *Assessing the quality of native vegetation: the 'habitat hectares' approach*. Ecological Management and Restoration: **4** – supplement February.

Victorian Government Department of Sustainability and the Environment (2006) *Bush Broker – native vegetation credit registration and trading. Information Paper*.

Victorian Government Department of Sustainability and the Environment (2006) *Native vegetation offsets – practice note*.

Victorian Government (2002) *Victoria's Native Vegetation Management – A Framework for Action.*

WBM Oceanics Australia (2005) *Environmental Offsets – EPBC Act*. Report prepared for DEH.

Western Australian EPA (2006) *Environmental Offsets – Position Statement No. 9*.

Appendix A – State and territory offset policies

The majority of states and territories in Australia have developed, or are developing policies in relation to offsets. A summary of the key elements of the policies in each of the states and territories is presented below.

State	Policy / Approach
ACT	No current offsets policy.
NSW	BioBanking – a biodiversity offsets and banking scheme: • currently before the NSW Parliament in the form of the *Threatened Species Conservation Amendment (Biodiversity Banking) Bill 2006* • provides a systematic and quantitative approach for offsetting the impacts of development to achieve an 'improve or maintain' outcome for biodiversity values • involves developers purchasing offset (or biodiversity) credits produced by offset bankers
NT	No current offsets policy.
QLD	In the early stages of developing a whole-of-government approach to offsets. The process is being jointly coordinated by the QLD EPA and the Premier's Department.
SA	The *Native Vegetation Act 1991*: • requires offsets to be made in relation to land clearing permits • in order to receive a permit, contributions must be made to a Native Vegetation Fund to offset the environmental impact of the action by funding native revegetation within the same region
TAS	Draft offsets policy for the Department of Primary Industry and Water: • goal of the policy is likely to be - ensure the environment is 'as well-off or better off' after a development is approved • offsets are likely to be based on broad principles rather than prescriptive, quantitative approaches
VIC	*Native Vegetation Management – a framework for action*: • establishes 'net gain' as the primary goal for native vegetation management in Victoria and incorporates the principle of offsetting as an option to achieve that goal. 'Net gain' is defined as, 'a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation' • offsets are based on ratios that relate to the quantity and quality (habitat hectares) of the vegetation type to be cleared • applied in part through the BushBroker scheme which provides for the registration and trading of native vegetation credits
WA	WA EPA Environmental Offsets – Position Statement No. 9: • establishes the WA EPA's policy on offsets focussing on the goal of achieving a 'net environmental benefit'

Appendix B : Offsets Matrix

The certainty/outcome matrix below is designed to assist in the development and consideration of environmental offset proposals. Review of the key characteristics of an offsets proposal against the matrix can provide an indication of the probable conservation outcome and if there is an appropriate balance of high and low risk actions proposed.

	IMMEDIATE OUTCOME (less than 12 months)	**MEDIUM TERM OUTCOME** (within 12 months to two years)	**LONG TERM OUTCOMES** (greater than 2 years)
HIGH LEVEL OF CERTAINTY - technique used regularly with effective results - good quality scientific data is available on the key conservation needs of the matter of NES	- inclusion of existing high quality habitat in a secure reserve tenure - funding immediate on-ground conservation activities eg. stabilising historic fabric/structure, fencing to exclude stock	- covenanting of private land in perpetuity with appropriate ongoing management	
MEDIUM LEVEL OF CERTAINTY - approach has been successfully used previously in relation to this or highly similar matter of NES	- ongoing management – including development and implementation of management plans - construction of fauna crossing/bridge (with successful precedent for relevant species)	- rehabilitation of habitat - targeted survey - removal of threatening process - translocation where species is known to respond positively to translocation - funding for the long-term on-ground conservation management	- funding of research proposals - informational programs - variation of flow regimes in Ramsar area to improve ecology of the site. - creation of artificial wetland to improve water quality downstream - delayed inclusion of rehabilitated development site in a secure reserve tenure (eg. Minesite)
LOW LEVEL OF CERTAINTY - new or untested on-ground conservation activity - limited scientific data on the matter of NES is available	- construction of fauna crossing/bridge (without successful precedent for relevant species)	- translocation of species without precedent	- creation of habitat without precedent - inclusion of existing low quality habitat in a temporary covenanted area - translocation of ecological communities - contribution to banking schemes to undertake future conservation actions - educational programs

ATTACHMENT 4 - SUBMISSIONS RECEIVED DURING PER PUBLIC CONSULTATION PERIOD RELATING TO ENVIRONMENTAL OFFSETS

Government of **Western Australia**
Department of **Environment and Conservation**

Your ref: CRN 221610 DEC7966
Our ref: 2007/001477-2 CEO1227/09
Enquiries: Sandra Thomas
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DEC 7966 - 03
Doc 108123

Chairman
Environmental Protection Authority
Level 4 The Atrium
168 St Georges Terrace
PERTH WA 6000

Attention: Kaylene Carter

TROPICANA GOLD PROJECT (ASSESSMENT NO. 1745)

I refer to the letter of 28 September 2009 requesting comments on the proposal referred to in the above Public Environmental Review (PER). The Department of Environment and Conservation (DEC) provides the following advice and comments on the basis of its *Conservation and Land Management Act 1984* and *Wildlife Conservation Act 1950* responsibilities for your consideration in assessing this proposal.

The following is a summary of DEC's overall advice on the proposal. Detailed advice and comment are provided in Attachment 1.

The Tropicana Joint Venture is proposing to develop a major (3,940 hectare footprint) mining proposal in an environment which has previously been subject to very limited disturbance or development activity. Investigations have determined that the area contains diverse vertebrate fauna and the highest flora species richness known in the bioregion.

The proposal is not without residual risk to threatened fauna populations and DEC is accordingly engaged in discussions on mitigation and potential offsets. It is envisaged that these discussions will provide for the basis of environmental outcomes for further consideration of the Environmental Protection Authority.

The contact officer for advice in relation to this submission is Mr Daniel Coffey from DEC's Environmental Management Branch (telephone 9334 0102).

Keiran McNamara
DIRECTOR GENERAL

23 November 2009

Att

TROPICANA GOLD PROJECT (ASSESSMENT NO. 1745)

MANAGEMENT STRATEGIES

Issue: The proponent's key environmental management strategies are not binding on the proponent.

Recommendation 1: *That the proponent's key environmental management strategies be made conditions of approval.*

Discussion

Opening up a previously undeveloped landscape is likely to have unintended secondary consequences on biodiversity and ecosystem function through increased development activities, visitor access, risk of threatening processes and demands on the services provided by DEC.

To manage these impacts on biodiversity and ecosystem function, the proponent has proposed a series of management strategies and committed to "*... ensure its management strategies are adapted as new information becomes available and will develop additional management strategies as required...*" (PER, Executive Summary, page xxv, paragraph 1).

For some species of conservation significance (particularly the marsupial mole, sandhill dunnart and short range endemic (SRE) invertebrate fauna), the impact of the proposal is potentially significant and specific programs and strategies will need to be developed in consultation with DEC and these strategies should be made a condition of approval.

INDIRECT IMPACTS

Issue: Areas that will be subject to indirect impacts require delineation and monitoring programs.

Recommendation 2: *That a buffer, in which flora and vegetation may decline to pre-defined limits, be delineated around areas approved for disturbance.*

Recommendation 3: *That condition(s) are applied that stipulate trigger levels which specify the measurable level of decline/impact for flora and vegetation within the predetermined buffer area before contingency measures are applied to avert further decline/impact.*

Recommendation 4: *That the proponent develops a monitoring program applicable to the buffer area. This program should also include reference sites, and provide for adaptive management where the measurable change has reached identified trigger levels.*

Recommendation 5: *That a condition be developed that requires the proponent to report annually on the findings of the monitoring program.*

Discussion

The potential for indirect impacts on flora and vegetation has not been addressed. This could be done by delineating buffer areas where indirect impacts are expected, identifying thresholds of change and monitoring these areas accordingly.

PROJECT DEFINITION

Issue: Developing two access roads will increase the impact of the proposal.

Recommendation 6*: That only one access route is developed incorporating both the access road and the communications infrastructure corridor.*

Discussion

By incorporating the communications infrastructure into the preferred access road corridor, the project footprint and impact will be reduced.

Issue: The final locations of the borefield, accommodation village and access roads (including locations of borrow pits) have not been defined, nor the impacts assessed.

Recommendation 7: *That the proponent defines the proposed locations and footprints of outstanding areas, and provides commitments to avoid defined conservation significant species and communities.*

Recommendation 8: *That, if Recommendation 7 cannot be implemented, maximum acceptable levels of impact on conservation significant species and communities be set and become a condition of approval.*

Discussion

Undefined development areas potentially present unknown impacts on conservation significant species and communities, namely priority flora and threatened fauna, however, the extent of the impact is unknown and disturbance limits are required. Whilst the proponent has committed to reducing the impacts of the undefined areas, there will be residual impacts on conservation significant species and communities that require review.

FAUNA

Marsupial mole

Issue: The assessment on risk of isolation and fragmentation of marsupial mole habitat (connectivity of dunes) is incomplete.

Recommendation 9: *That the proponent provides the marsupial mole habitat fragmentation addendum to DEC for review and comment as required.*

Discussion

Both forms of the marsupial mole (*Notoryctes typhlops* and *N. caurinus)* are threatened fauna under the Wildlife Conservation Act and Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proponent has commissioned a report on the potential risk of isolation and fragmentation of marsupial mole habitat (indicated at the 26 October 2009 meeting) to address comments in Appendix F2 (page 23, para 4 and page 24, para 4), which state:

> *"The sensitivity of marsupial moles to the connectivity of dunefields in the WA GVD suggests that the species requires dunes to disperse and colonise new habitat, and perhaps also that small, isolated populations are untenable in the long term"; and*

"Projects involving large scale earth works could, for example, cause more damage to Itjaritjari than their footprint might suggest if their earthworks disrupted dune connectivity and effectively fragmented Itjaritjari populations".

Sandhill dunnart

Issue: Sandhill dunnart information remains outstanding.

Recommendation 10: *That the proponent provides the following information to DEC for review and comment as required:*

- *Local conservation status of the sandhill dunnart habitat paper.*
- *Results and analysis of sandhill dunnart sampling (survey work) that is currently being undertaken by Glen Gaikhorst.*

Discussion

The sandhill dunnart (*Smithopsis psammophila*) is specially protected as threatened fauna under the Wildlife Conservation Act and listed as Endangered under the EPBC Act. The proposal will have a direct impact on sandhill dunnart habitat by removing the majority of two of the four habitat areas identified within the operational area. This clearing will increase the distance between identified remaining sandhill dunnart habitats from 200-900 metres, to 3,000-4,000 metres.

The proponent is undertaking a review of the local conservation status of the sandhill dunnart habitat (at present and during the life of the mine) and further survey work. Whist no sandhill dunnarts were captured during the past surveys, this is thought to be a result of the difficulty in capturing the species, rather than an indication that sandhill dunnarts do not occupy the operational area.

Troglofauna

Issue: Troglofauna data are insufficient to adequately determine risk from this proposal.

Recommendation 11: *That the proponent provides the following information to DEC for review and comment as required:*

- *Results and analysis of troglofauna sampling (survey work) that is currently being undertaken.*
- *Prospective troglofauna habitat risk assessment addendum.*

Discussion

Two species of troglofauna (a dilpluran and a centipede) have been identified only within the proposed disturbance footprint. DEC understands that the equipment and methods used in setting the traps for the troglofauna sampling were flawed, and that the proponent has commissioned another sampling phase to rectify this, with collection due at the end of December.

Further, the Lawrence report (Appendix B20) does not adequately describe the nature, extent and continuity (connectivity) of the prospective troglofauna habitat. An addendum to Appendix B20 to clarify prospective troglofauna habitat connectivity is forthcoming.

Short range endemic (SRE) invertebrate fauna

Issue: The SRE invertebrate fauna community requires monitoring and adaptive management for protection.

Recommendation 12: *That the proponent develops a monitoring program to provide information on the indirect impacts from mine activities on SRE invertebrate fauna, and implements adaptive management measures to minimise impacts on these species, on the advice of, and in agreement with, DEC.*

Discussion

The project area "*...is located in a region unexpectedly rich in invertebrate diversity*" (Appendix B4, page iv). The proponent is developing a monitoring program and adaptive management strategy for the SRE community in the project area. This program and strategy should be developed on the advice of, and in agreement with, DEC.

Issue: The information currently available on *Kwonkan* sp. 2 habitat is insufficient to adequately determine risk from this proposal.

Recommendation 13 : *That the proponent provides the for thcoming Kwonkan sp. 2 habitat risk assessment addendum to DEC for review and comment.*

Discussion

Kwonkan sp. 2 has only been identified within the proposed disturbance footprint. A refined habitat assessment for this species has been compiled and an addendum is being developed. This addendum should be provided to DEC for review and comment.

Issue: The information currently available on *Aganippe* sp. 7 is insufficient to adequately determine the impacts from this proposal.

Recommendation 14: *That the proponent provides information on the size of the Aganippe sp. 7 populations outside the impact footprint addendum for DEC review and comment.*

Discussion

Further population information is required on *Aganippe* sp. 7 to confirm that this species has a viable population outside the project footprint (west of Lake Rason paleo-drainage channel). DEC understands that this information is forthcoming from the proponent.

FLORA AND VEGETATION

Issue: The proposed residual impacts on priority flora are significant.

Recommendation 15: *That the proponent mitigates or offsets the residual impacts on priority flora.*

Recommendation 16: *That the basis for extrapolations to estimate impacts on priority flora be provided to DEC for review and comment.*

Discussion

The proposal presents significant residual impacts on the following priority flora:

- *Acacia eremophila* variant (priority 3, 11.7 per cent).
- *Acacia eremophila* var. *variabilis* (priority 3, 4.9 per cent).
- *Daviesia purpurescens* (priority 4, 94.0 per cent of local population).
- *Dicrastylis cundeeleensis* (priority 3, 46.5 per cent).
- *Eucalyptus pimpiniana* (priority 3, 9.5 per cent).

Lechenaultia divericata is a new record for Western Australia and the only record within the Great Victoria Desert. This species is proposed for inclusion in the priority flora list (PER, page 6-30) and any impact on this species is considered significant.

The calculated "per cent" impact includes population extrapolations by the proponent. DEC has been unable to confirm the number of populations that will be impacted by the proposal as geographic information systems data have not been provided. The proponent has, however, committed to providing these extrapolations to DEC.

Vegetation Communities

Issue: The impacts on vegetation communities at a local scale are significant.

Recommendation 17: *That the proponent commits to not exceeding the stated limits of disturbance on vegetation communities S8, ExL.t2H and S4.*

Discussion

The proposal presents significant impacts on the following vegetation communities:

- S8 Low shrubland of *Acacia desertorium* var. *desertorum* with *Grevillea juncifolia*, low myrtaceous shrubs and mixed low shrubs with occasional emergent *Eucalyptus youngiana* and Eucalyptus spp. vegetation community within the PEC (9.7 per cent).
- ExL.t2H mixed Eucalypt woodlands over mixed open shrubs and *Triodia basedowii* (7.6 per cent).
- S4 open heath of *Melaleuca hamata* over *Aluta maisonneuvei* subsp. *auriculata* with *Grevillea auriculata* vegetation community (14.0 per cent).

REHABILITATION AND CLOSURE

Issue: The proposal will leave a permanent water-filled void at closure. The availability of free water within the pit void may result in long-term impacts on the biodiversity of the area.

Recommendation 18: *That conditions be applied to minimise the impacts of an increase in fauna and introduced animals attracted to the post-mining water-filled void.*

Discussion

The proposal is located in an area with habitats for a high concentration of conservation significant flora, fauna and communities. An increase in threatening process could have a negative impact on these conservation significant species and communities.

OFFSETS

Issue: Offsets discussions between DEC and the proponent are outstanding.

Recommendation 19: *That DEC is afforded an opportunity to advise the EPA on the outcome of the offset discussions, which are expected to be held subsequent to this submission.*

Discussion

The proponent has arranged a meeting regarding the offset proposal with DEC subsequent to this submission. Following this meeting, DEC will be able to provide advice to the EPA on the proponent's offset proposal.

Department of Environment and Conservation
November 2009

Wildflower Society
of WESTERN AUSTRALIA (Inc.)

PO Box 519
FLOREAT WA 6014

24th November 2009

Chairman, Environmental Protection Authority
Locked Bag 33
Cloisters Square WA 6850
Attention: Kaylene Carter

Dear Sir,
Tropicana Gold Project PER Assessment 1745

The Wildflower Society of Western Australia (Inc.) has been involved in discussions about the project over at least the last two years. Several briefings have been held and several of our concerns have been addressed in the PER.

Whilst not initiated by the company a couple of members have visited the site or nearby locations and have some knowledge of the area.

We look to the EPA to address the issues of vegetation and flora through the assessment process. It is also core business for the Department of Environment and Conservation.

A major concern for society members is that the infrastructure routes are well managed particularly with respect to clearing, fire management, feral plants and animals and rubbish dumping. It is noted in the PER the very low weed infestation that has been recorded across the area. Wildfires (probably from lightening) already have a significant impact on the area so fire management is important, both to see any prescribed burning is appropriate in scale and also that indiscriminate burning does not occur particularly along infrastructure routes. We look to these matters being addressed in operational practices and management plans. Both the plans and audits should be publicly available.

Mine closure planning is important right from the commencement of the project. It is vital the government and the community are not left with a degraded environment to try to repair. We will look with interest at the final management plans for the project and believe these should be made publicly available.

As part of the assessment the company should be undertaking research into rehabilitation in the area and also the EPA should be making sure there is a sufficient bond in place to cover this matter. This is particularly necessary because of the nature of the area, little knowledge of rehabilitation in such a place and the impacts of a changing climate.

The Society has concerns about offsets and particularly those involving money provided by proponents. It is not clear what the financial component of the offset will be however we believe there is a real possibility that the State Government Department of Treasury will be taking a close look at non Consolidated Revenue Funding received or managed by government agencies and particularly the DEC. The likely consequence is that CRF funding to the DEC will be reduced by the amount received by any offset or similar arrangement. It is obvious if this happens there will be no net benefit to conservation and we would probably argue there never was going to be anyway. This is particularly the case when impacts on biodiversity values are involved.

We look forward to the EPA's taking into account these comments during their assessment of the project. Should you have any queries please phone 9330 1754

Yours sincerely,

Brian Moyle

Mr. B Moyle
Conservation Sub Committee Chairman
Wildflower Society of Western Australia (Inc.)

ATTACHMENT 5 - ENVIRONMENTAL OFFSETS REPORTING FORM (EPA 2008A)

Environmental Offsets Reporting Form

See *EPA Guidance Statement No. 19: Environmental Offsets - Biodiversity*

Please note that the EPA may request additional information.

Section A: Administrative information
1. Proposal or scheme name: Tropicana Gold Project
2. Summary of proposal or scheme: The Tropicana Joint Venture (Joint Venture) plans to establish the Tropicana Gold Project (the Project). The Project is a proposed open-cut gold mine (with supporting infrastructure) located on the western edge of the Great Victoria Desert (GVD) in WA. The Project is comprised of an open-cut mine, processing plant, waste landforms and other supporting infrastructure such as an access road, borefield, village and airstrip. The Joint Venture is between AngloGold Ashanti Australia Ltd (AngloGold; 70% stakeholder) and Independence Group NL (30% stakeholder).
Section B: Type of environmental asset (s) – State whether Critical or High Value, describe the environmental values and attributes
The Project will result in clearing and the associated reduction in local biodiversity that may result in changes in ecosystem function. The maximum clearing footprint for the Project is estimated to be up to 3,440 ha, most of which will be rehabilitated over the life of the Project (excluding the Pit Void – 400ha). The impact on biodiversity and ecological function cannot be fully mitigated. While there will be a localised impact on biodiversity (i.e. loss of fauna from within clearance areas), it is not anticipated that the Project will have a major or ongoing impact on flora/ fauna biodiversity, provided that sufficient management measures are implemented. The environmental assets include critical assets (biodiversity) as the species are protected under the *Wildlife Conservation Act* 1950 (WC Act), EPBC Act and are generally thought to be of conservation significance.

Section C: Significant impacts (describe the significant adverse environmental impacts related to the proposal or scheme before mitigation measures are applied)

Possible impacts to biodiversity will occur if habitat suitable to support conservation interest species is removed, or the site layout results in habitat fragmentation. The proposed Operational Area is located in an area with little existing disturbance or degradation (with the exception of fire), and local habitats are regionally well represented, it is not anticipated that the Project will have a significant effect on the biodiversity of the adjacent areas or the region.

Localised impacts to some threatened and priority species and their habitat are unavoidable, for example, some loss of individuals and habitat that exist under the footprint of critical infrastructure that cannot be moved (such as the resource area). These include species protected under the *Wildlife Conservation Act 1950* (WC Act), EPBC Act and other species which are generally thought to be of conservation significance (e.g. putative short range endemic species or Priority species recognised by the DEC) such as:

- Marsupial Mole - *Notoryctes typhlops* (or *caurinus*) (both listed as Schedule 1 under the WC Act, Endangered under the EPBC Act);
- Malleefowl - *Leipoa ocellata* (Schedule 1 under the WC Act, Vulnerable/ Migratory under the EPBC Act);,
- Potential habitat of the Sandhill Dunnart - *Sminthopsis psammophila* (Schedule 1 under the WC Act, Endangered under the EPBC Act); and
- Priority Flora species and potential Priority Ecological Communities (Listed by DEC)

One of the key environmental challenges for the Project is the issue of increased access to the region as a direct result of improved road access via the Pinjin Infrastructure Corridor.

The Project may have adverse impacts on the conservation of biodiversity and ecosystem functionality. Threatened species, their natural habitats and threatened ecological communities require special measures to preserve biodiversity within the region.

The PER (TJV 2009) describes in detail the environmental impacts associated with the proposal.

Section D: Mitigation measures (describe all measures to Avoid, Minimise, Rectify and Reduce)

The Joint Venture has undertaken a number of design modifications that will have the effect of avoiding environmental impacts or reducing the environmental impacts that would have occurred under a "Business as Usual" approach. Fundamental design criteria adopted are:

- avoid direct impacts to Declared Rare Flora;
- minimise impacts on ecological communities of conservation interest;
- minimise impacts to fauna protected under the *State Wildlife Conservation Act 1950* (WC Act) and *Environmental and Biodiversity Conservation Act 1999* (EPBC Act);
- minimise impacts to Threatened and Priority Flora and Fauna;
- minimise impacts on Priority Ecological Communities;
- design an energy and water efficient mine and processing plant;
- minimize greenhouse emissions associated with the Project;
- listen to, and incorporate, stakeholder feedback for the Project;
- consider closure requirements during all design stages;
- design the waste landform (a series of interconnected waste dumps) to blend into the natural environment;
- design the infrastructure to cope with a 1:100 yr 72 hr rainfall event; and,
- ensure compliance with industry codes and recognised standards such as the International Cyanide Management Code, Australian Standards, Environmental Management Standards (ISO14001) and Safety Management Standards (OHSAS18001).

Modifications incorporated into the Project design to avoid and minimise impacts on the biodiversity values of the region include but are not limited:

- Discounted the upgrading of the existing access tracks because it would result in the removal of the only confirmed occurrence of *Eucalyptus articulata* and dissect the Yellow Sandplain Priority Ecological Communities (PEC) of the Great Victoria Desert located north of the Queen Victoria Spring Nature

Reserve. This would have resulted in a smaller clearing footprint while having a significant unacceptable impact on environment.

- Designing the infrastructure corridor (such as the Mine Access Road and Communication Corridor) to avoid high conservation areas such as the "Sand Dunes" and by limiting impacts on the Yellow Sandplain PEC of the Great Victoria Desert by positioning the corridors on the known outer boundaries of the community. This has resulted in the corridors being longer with additional corners.
- Avoiding the dune field located west of the mining area for the tailings storage area. The dune provided an opportunity to establish a series of lined tailings facilities that would require very little earthworks for their establishment. Baseline flora and fauna surveys determined that these dunes represented a high biodiversity when compared to other areas near the project as they contained evidence of Marsupial Moles, populations of *Conospermum toddii (DRF)* and a significant proportion of priority flora species recorded in the region. As a result, the TJV located the tailings facility adjacent to the processing plant and one of the waste landforms. This facility will require the construction of all four walls significantly increasing the capital cost.
- The modification of the southwest waste landform to protect the habitat of the only recorded occurrence of *Aganippe* sp.4 observed within the Project area. This modification removed 65ha from this landform.
- Scheduling clearing activities to avoid, if possible, breeding / flowering times of conservation significant species.
- Adopting a project implementation strategy that will see the project progressively clear to prevent unnecessary clearing wherever possible and where possible temporary facilities required during construction will be established within the footprint of future facilities (such as construction laydown area being located within the stockpile footprint, temporary camps required for the Road being established on borrow areas).
- Selectively collect sand and other growth mediums and cleared vegetation from the cleared footprint and stockpile for progressive rehabilitation
- Establishing the Access Road as a private road that will require other users to enter into an agreement with the Joint Venture which will require compliance with the Project environmental and safety management obligations and requirements. This will include adherence to management strategies for weed, rubbish, feral animas, fire protection and reduce the potential indirect affect on Nature Reserves in the region.
- Development of management strategies for the construction and operational phases that cover clearing, weed and feral management, waste control, fire and personnel management to prevent indirect impact on regional biodiversity.
- Adopting a design and landscaping strategy for the village and project area that will make use of the insitu vegetation, prevent the introduction of non-local species and reduce the risk that weed species will be introduced.
- Incorporation of leading practice dust control in the plant to minimize the adverse impact of point source dust emissions on biodiversity rich areas such as the western dune field.
- Setting the waste landform slopes at 15° and returning at least 1m of topsoil/growth medium so that it is comparable with the natural environment to increase the likelihood of rehabilitation success and to reduce the erosion potential.

Table 2.1 (TJV 2010) summaries the avoidance and mitigation adopted by the Joint Venture for the Project.

Section E: Significant residual impacts (describe all the significant adverse residual impacts that remain after all mitigation attempts have been exhausted)

Biodiversity - the key environmental factors of the Project that cannot be fully managed or mitigated without the use of offsets are reduction in local biodiversity values through the clearing of native vegetation, impacts to priority flora and threatened fauna habitats and potential increased access to the region through improved road infrastructure and greenhouse emissions (refer Section 3.0 of this report). While there will be a localised impact on biodiversity (i.e. loss of fauna from within clearance areas), it is not anticipated that the Project will have a major or ongoing impact on flora/ fauna biodiversity, provided that sufficient management measures are implemented.

Possible impacts to biodiversity will occur if habitat suitable to support conservation interest species is removed, or the site layout results in habitat fragmentation. Considering that the proposed Operational Area is located in an area with little existing disturbance or degradation (with the exception of fire), and local habitats are regionally well represented, it is not anticipated that the Project will have a significant effect on the biodiversity of the adjacent

areas or the region.

Greenhouse - over the potential 15 year life of the Project, the average CO2-e/annum produced is 294 kt (if the Project reaches its full predicted extent), with a total over the 17 year life span (construction and operations) of approximately 4,500 kt CO2-e (refer Section 4.0, TJV 2010).

Section F: Proposed offsets for each significant residual impact (identify direct and contributing offsets). Include a description of the land tenure and zoning / reservation status of the proposed offset site. Identify any encumbrances or other restrictions on the land that may impact the implementation of the proposed offset and provide evidence demonstrating how these issues have been resolved.

The Great Victoria Desert Trust forms the centerpiece of the offsets strategy for both the Biodiversity and Greenhouse Offsets (likely to be administered via aligned trusts are likely to include the Greenhouse Reduction and Energy Efficiency Trust and the Great Victoria Desert Biodiversity Trust).

It is envisaged that the Trust would facilitate research, environmental education and on-ground conservation work that will benefit the wider Great Victoria Desert region during and after the life of the Project. The Trust will seek to collaborate with and/ or support other initiatives in the area, for example, supporting regional DEC staff or other appropriate organizations in undertaking baseline surveys. It is planned that the knowledge gained through the Trust would be released to the public and be available for use by the State and other stakeholders in the region.

Section G: Spatial data relating to offset site/s (see *EPA Guidance Statement No. 19: Environmental Offsets - Biodiversity*, Appendix 4)

Flora and vegetation surveys span some 230,000 ha, with the vegetation mapping associated with the Operational Area alone covering some 131,000 ha. These surveys clearly demonstrate the intact nature of the local environment and occurrence of all communities outside the proposed Project footprint.

Research under the Trust for conservation would be focused on the Project Biodiversity area as shown in Figure 3.1 (TJV 2010).

Section H: Relevant data sources and evidence of consultation (consultation with agencies, relevant stakeholders, community and references to sources of data / information). Include details of specific environmental, technical or other relevant advice and information obtained to assist in the formulation of the offset.

Since 2008 key State and Federal Agencies have been consulted on the Project proposed offset package, these include DEC's Environment Management Branch, DEWHA, DMP and DSD.