Report and recommendations of the Environmental Protection Authority

Cyclone Mineral Sands Project

Lost Sands Pty Ltd

Report 1575

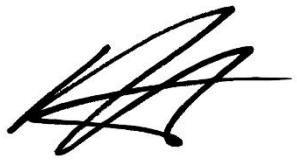
August 2016

Public Environmental Review
Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
25/03/2013	Level of assessment set	
21/08/2013	Final Environmental Scoping Document (ESD) approved	22
29/06/2015	Public Environmental Review (PER) document released for public review	97
03/08/2015	Public review period for PER document closed	5
7/4/2016	Final proponent Response to Submissions document received	36
21/04/2016	EPA meeting	2
03/08/2016	EPA report provided to the Minister for Environment	15
08/08/2016	Publication of EPA report (three working days after report provided to the Minister)	3 days
22/08/2016	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the project and are usually agreed with the proponent soon after the level of assessment is determined.

In this case, the Environmental Protection Authority did not meet its timeline objective in the completion of the assessment and provision of a report to the Minister.



Dr Tom Hatton
Chairman

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1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on outcomes of the EPA's environmental impact assessment of the proposal by Lost Sands Pty Ltd (Lost Sands) to develop and operate the Cyclone Mineral Sands Mine. The Minister has nominated Lost Sands Pty Ltd as the proponent responsible for the proposal.

Section 44 of the *Environmental Protection Act 1986* (EP Act) requires that the EPA prepare a report on the outcome of its assessment of a proposal and provide this assessment report to the Minister for Environment. The report must set out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment; and
- the EPA's recommendations as to whether or not the proposal may be implemented, and, if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

The EPA may also include any other information, advice and recommendations in the assessment report as it thinks fit.

The aims of environmental impact assessment and the principles of environmental impact assessment considered by the EPA in its assessment of this proposal are set out in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012.*

The proponent referred the proposal to the EPA on 21 February 2013. On 25 March 2013 the EPA set the level of assessment at Public Environmental Review (PER) with a five-week public review period. The Environmental Scoping Document (ESD) for the proposal was approved on 21 August 2013 and the PER was released for public review from 29 June 2015 to 3 August 2015.

Appendix 6 contains a summary of submissions from the public review period and the proponent's response to submissions (on CD at the back of this report and at www.epa.wa.gov.au). Relevant significant environmental issues identified from this process have been taken into account by the EPA during its assessment of the proposal.

This report provides the EPA advice and recommendations in accordance with section 44 of the EP Act.

2. The proposal

2.1 Proposal summary

Lost Sands Pty Ltd (Lost Sands) proposes to develop and operate the Cyclone Mineral Sands Project, located on the northern margin of the Eucla Basin, approximately 317 kilometres (km) north of Eucla and 220 km north of the Trans-Australia Railway (Figure 1).

The proposal is for a mining operation to produce zircon and two high titanium mineral products. Figure 2 shows the conceptual layout of the mine including open cut pits, mining and processing infrastructure, airstrip, camp and bore fields.

The proposal is located in the Great Victoria Desert bioregion. The bioregion is located to the north of the Nullarbor Plain and stretches from the southern rangelands of Western Australia across the border into the western half of South Australia. The proposal includes a haul road through the Great Victoria Desert Nature Reserve (GVDNR).

The haul road would connect the mine site to the Forrest rail siding on the Trans-Australia Railway (Figure 1). The haul road would be unsealed, requiring the use of binders and dust suppressants. It is anticipated that there would be, on average, 12 truck movements in any 24-hour period. The proposal includes the rehabilitation of the haul road once the mining operation ceases.

The main characteristics of the proposal are summarised in Tables 1 and 2, consistent with Environmental Assessment Guideline No. 1 (EAG 14) *Defining the Key Characteristics of a Proposal*. A detailed description of the proposal is provided in section 1 of the PER document (Lost Sands, 2015).

Table 1: Summary of key proposal characteristics

Proposal Title	Cyclone Mineral Sands Project
Short Description	The proposal is for the construction and operation of the Cyclone Mineral Sand Mine 317 km north of Eucla. The proposal includes open cut mine pits, supporting infrastructure (including tailings storage, processing facilities, water storage, offices, accommodation camp and airstrip, construction and operation of a borefield for water supply, and construction and operation of a 240 km haul road through the Great Victoria Desert Nature Reserve from the mine to the Forrest rail siding.

Table 2: Location and proposed extent of physical and operational elements

Element	Location	Proposed Extent
Mine and supporting infrastructure	Figure 2	Clearing of no more than 805 hectares (ha) within the 1,028 ha Mine Area Development Envelope.
Haul Road	Figure 1	Clearing of no more than 467 ha within the 2,561 ha Haul Road Development Envelope, including clearing of no more than 306 ha within the Great Victoria Desert Nature Reserve.
Water supply		Abstraction of up to 7.9 gigalitres per annum of groundwater

The potential impacts of the proposal on the environment identified by the proponent in the PER document (Lost Sands, 2015) and their proposed management are summarised in Table ES2 in the PER document.

2.2 Great Victoria Desert Nature Reserve

The (Great Victoria Desert Nature Reserve) GVDNR covers an area of 24,957 km^2 (Lost Sands 2015), within the 418,750 km^2 Great Victoria Desert bioregion (Commonwealth 2008), representing approximately six per cent of the bioregion. In 1970, the GVDNR was set up as reserve number A 30490, a Class A Nature Reserve. In 1974, the *Conservation through Reserves Committee Report* endorsed the status and vesting of the reserve for the purpose of Conservation of Flora and Fauna (EPA 1974).

As indicated in Section 1, the EPA is required by section 44 of the EP Act to report on the key environmental factors identified in the course of the assessment. Land tenure, in this case a conservation reserve, is not, of itself, an environmental factor. However, in assessing impacts to a conservation reserve, the EPA considers the values for which the conservation reserve was established.

The values of the GVDNR identified in the *Conservation through Reserves Committee Report* included:

- geological formations of the Nullabor area, including limestone, sandstone and salt pans, traversed by east-west sand dunes;
- rich and varied vegetation, including grasslands and open woodlands;
- floral diversity, including Eucalyptus, Acacia and Eremophila; and
- terrestrial fauna including mygalomorph spiders, frogs, reptiles, birds and some mammals (including the Marsupial Mole).

2.3 Consultation

Seven agency submissions and two public submissions were received during the public review period. The key issues raised relate to:

- **Flora and Vegetation**: quantification of direct and indirect impacts to flora and vegetation associated with the construction and operation of the haul road;
- **Terrestrial Fauna**: quantification of indirect impacts associated with the construction and operation of the haul road; and
- **Rehabilitation and Decommissioning**: feasibility of revegetation of the haul road.

The issues raised were addressed by the proponent in the Response to Submissions document that was accepted by the EPA on 7 April 2016 (Lost Sands 2016, Appendix 6).

In assessing this proposal and considering the submissions, the EPA notes that the proponent has sought to avoid, minimise, and rehabilitate environmental impacts associated with the proposal by:

- conducting an options analysis for the haul road and assessing and selecting the preferred road alignment based on environmental and heritage considerations;
- designing the haul road alignment to avoid sensitive vegetation and terrestrial fauna habitat; and
- minimising clearing associated with the proposal.

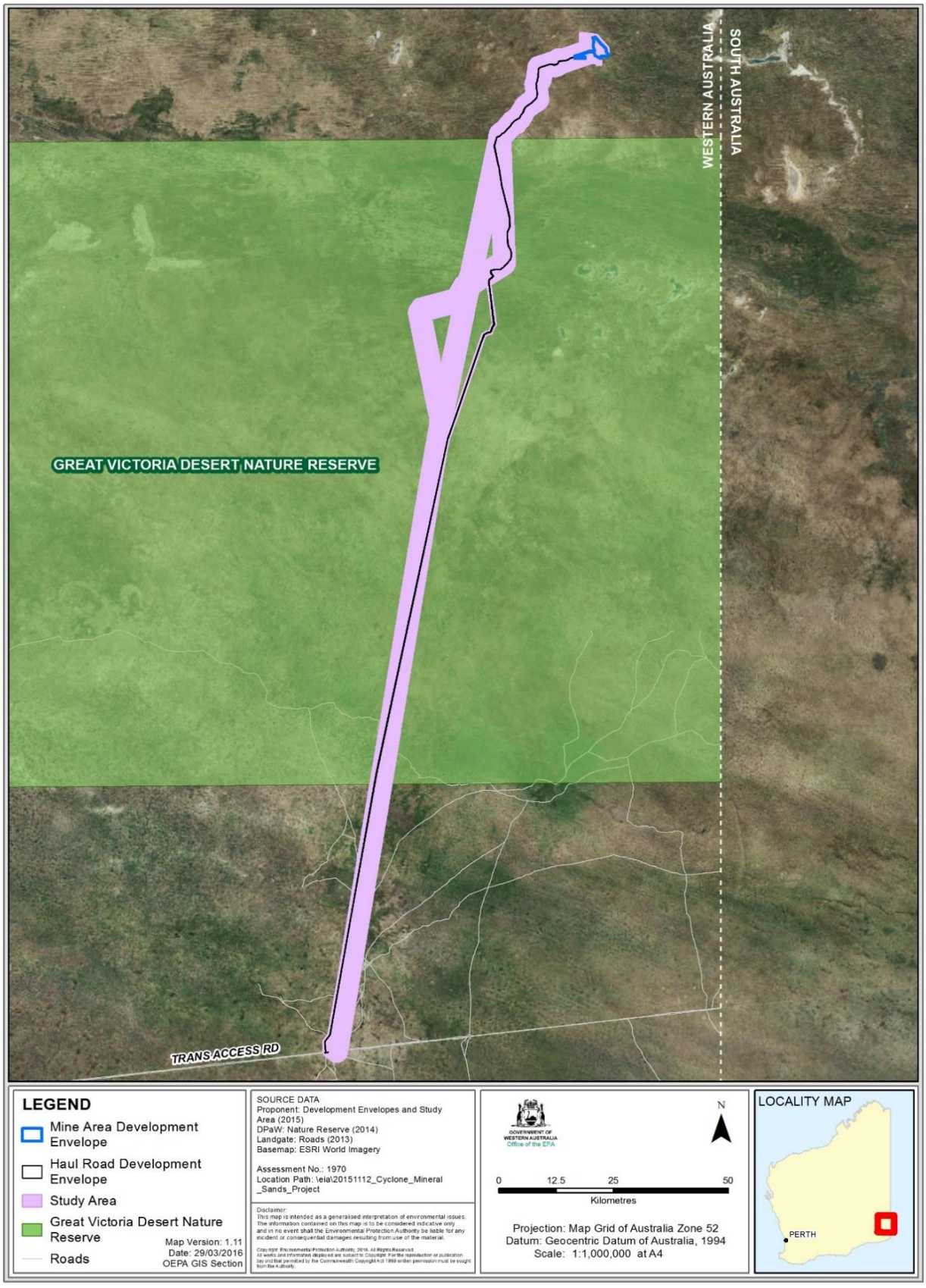

Figure 1: Proposal location, development envelopes and study area

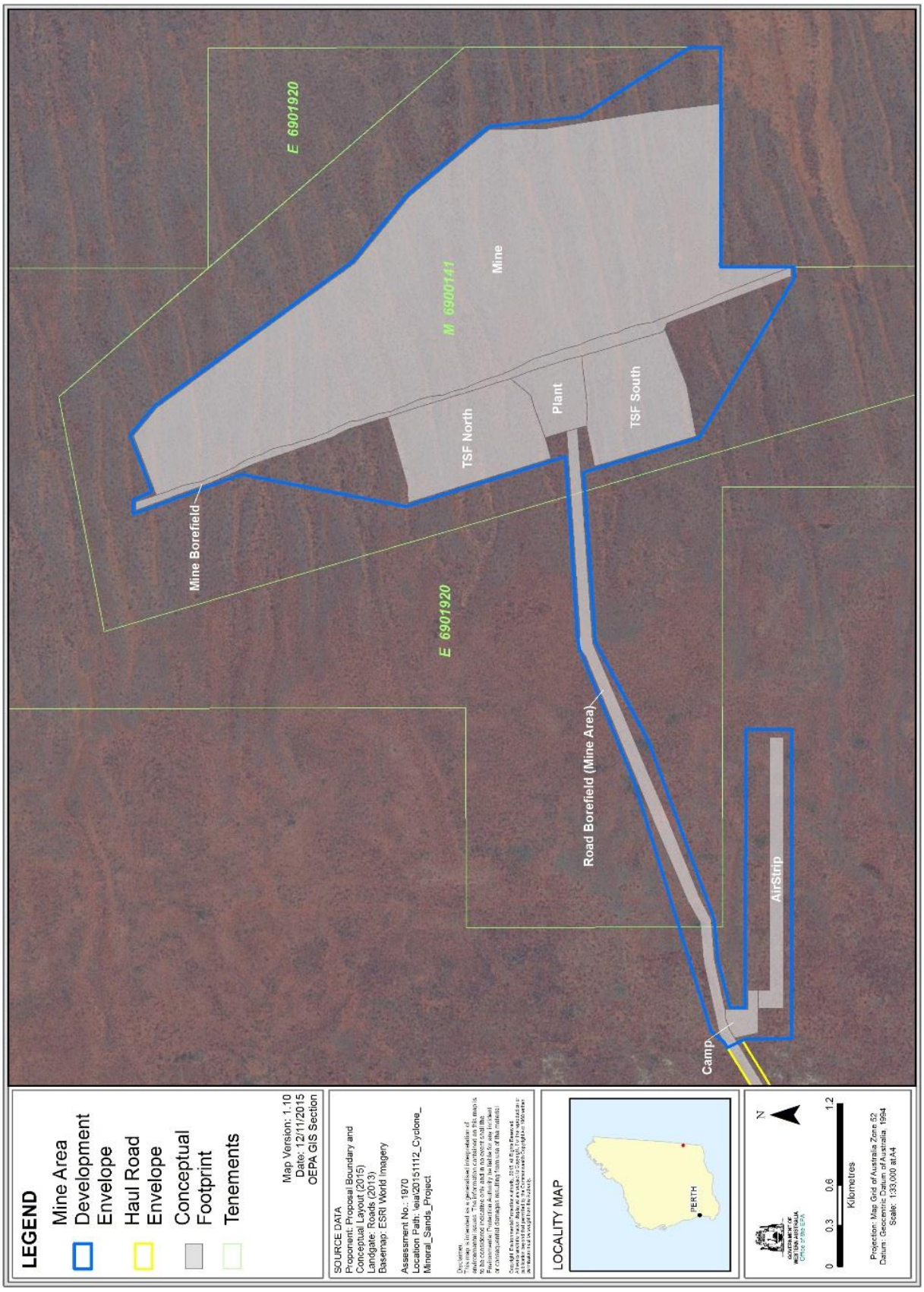

Figure 2: Mine Area Development Envelope and conceptual footprint

3. Key environmental factors

In undertaking its assessment of this proposal and preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the EP Act to the extent relevant to the particular matter being considered. Appendix 3 provides a summary of the principles and how the EPA applied these principles in its assessment.

Having regard to:

- the proponent's PER document;
- public and agency comments on the PER document;
- the proponent's response to submissions;
- the EPA's own inquires;
- Environmental Assessment Guideline No. 8 *Environmental Principles, Factors and Objectives* (EPA, 2015a); and
- Environmental Assessment Guideline No. 9 (EAG 9) *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA, 2015b),

the EPA identified the following key environmental factors during the course of its assessment:

1. **Flora and Vegetation** – direct impact to flora and vegetation from the clearing of native vegetation within the development envelopes, and indirect impacts from weeds, changes to surface water flows, dust, and changes to fire regimes, associated with the haul road; and
2. **Terrestrial Fauna** – impacts to terrestrial fauna habitat as a result of clearing and potential impacts from fragmentation of habitat, vehicle strike increases in feral animals and changes to fire regimes, associated with the haul road.

The EPA also identified the following integrating factors during its assessment:

3. **Rehabilitation and Decommissioning** – potential long term impacts to flora and vegetation and terrestrial fauna values in the GVDNR if rehabilitation is not successful; and
4. **Offsets** – to counterbalance the significant residual impact to the GVDNR.

Other environmental factors relevant to the proposal which the EPA determined not to be key environmental factors are discussed in the PER document (Lost Sands, 2015).

Appendix 3 contains the environmental factors identified through the course of the assessment and the EPA's evaluation of whether an environmental factor is a key environmental factor for the proposal.

The EPA's assessment of the proposal's impacts on the key environmental factors and integrating factors, and a discussion of the application of relevant

policy and guidance, is provided in Sections 3.1 – 3.4. These sections outline the EPA's conclusions as to whether the or not the proposal can be managed to meet the EPA's objective for a particular factor and, if so, the recommended conditions and procedures that should apply if the proposal is implemented.

In assessing this proposal, the EPA has also considered relevant published EPA policies and guidelines. Appendix 4 lists the relevant policies and guidance documents for each of the key environmental factors and integrating factors for this assessment and identifies the relevant matters discussed in, and principles derived from, each policy and guidance document. The EPA has discussed the application of the relevant policy and guidance for each factor in Section 3.

The EPA notes that the following policy and guidance replaced or amended policy and guidance referred to in the ESD:

- Environmental Assessment Guideline No. 8 *Environmental Principles, Factors and Objectives* (EPA 2015a); and
- Environmental Assessment Guideline No. 9 *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA 2015b);
- *Guidelines for preparing mine closure plans* (DMP & EPA 2015);
- Environmental Protection Bulletin No. 19 – *EPA involvement in mine closure* (EPA 2015);
- *WA Environmental Offset Guidelines* (Government of Western Australia 2014); and
- Environmental Protection Bulletin No.1 – *Environmental Offsets* (EPA 2014c).

The proponent considered the current *Guidelines for preparing mine closure plans* and *WA Environmental Offset Guidelines* in its PER. The PER did not discuss the current versions of the other policy and guidance listed above.

The EPA considered the above current policy and guidance (i.e. policy and guidance amended since the ESD was released) in its assessment.

The EPA notes that other published policies and guidelines were considered.

3.1 Flora and Vegetation

EPA objective

The EPA's environmental objective for this factor is *to maintain representation, diversity, viability and ecological function at the species, population and community level.*

Relevant EPA policy and guidance

The EPA policy and guidance applicable to Flora and Vegetation for this assessment and relevant matters discussed in the policy and guidance are outlined in Appendix 4. The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- Guidance Statement No. 51 – *Terrestrial flora and vegetation surveys for environmental impact assessment in Western Australia* (EPA 2004a);
- Position Statement No. 2 – *Environmental protection of native vegetation in Western Australia* (EPA 2000); andEPA
- Position Statement No. 3 – *Terrestrial biological surveys as an element of biodiversity protection* (EPA 2002).

EPA assessment

The proposal would impact flora and vegetation through the direct clearing of up to 1,272 ha of native vegetation, including up to 306 ha within the GVDNR. There is also the potential for indirect impacts to native vegetation as a result of increases to the extent and diversity of weed populations, changes to surface water flows, dust deposition, changes to fire regimes, and increased access to remote areas by humans and feral animals.

Flora and Vegetation surveys were undertaken by the proponent within a 134,535 ha study area which includes the Mine Area Development Envelope and the Haul Road Development Envelope (Figure 1). No Declared Rare Flora (DRF), Threatened Ecological Communities (TECs), or Priority Ecological Communities (PECs) were identified in the study area.

The EPA considers that the survey methodology used by the proponent is consistent with EPA guidance (Guidance Statement 51 and Position Statement 3) and is sufficient to enable the EPA to assess the impact of the proposal on Flora and Vegetation. The relevant matters for each of these policies are included in Appendix 4.

Mine

Up to 805 ha of native vegetation would be cleared within the Mine Area Development Envelope for the elements outlined in Table 1.

No conservation significant flora species were recorded in the Mine Area Development Envelope. Vegetation in the Mine Area Development Envelope is generally in 'Very Good to Excellent' condition. Four vegetation units were recorded in the Mine Area Development Envelope.

Vegetation unit 9 (Eucalyptus steppe on Northern red sand dune) and vegetation unit 14 (Eucalyptus and Acacia on Northern Dune swale) have 31% and 12.5% of their recorded extent in the study area within the proposed disturbance footprint. However, both of these vegetation units are widespread outside the study area as only a small proportion (1.4%) of the study area is within the B42 land system, which is characterised by dune fields such as those exemplified by vegetation associations 9 and 14 (Lost Sands 2015). No vegetation unit would be reduced to below 30% of the pre-clearing extent, a consideration of Position Statement No. 2.

Given the lack of significant flora and vegetation in the Mine Area Development Envelope and its location outside any conservation area or nature reserve, the EPA considers that clearing within the Mine Area Development Envelope is unlikely to have a significant impact on flora and vegetation.

Haul road

Up to 467 ha of native vegetation would be cleared for the proposed haul road. Of this, 306 ha would be within the Great Victoria Desert Nature Reserve, a Class A nature reserve created for the purpose of Conservation of Flora and Fauna in 1970 (EPA 1974).

Ten flora taxa of conservation significance were recorded in the haul road study area (Outback Ecology 2014a):

- Three species previously unknown or unrecorded in Western Australia: (*Austrosipa nullanulla*, *Eucalyptus vokesensis* and *Microcorys* sp. 1);
- two Priority 1 species (*Eremophila decussata*, and *Dampiera ?eriantha*,);
- one Priority 2 species (*Eremophila undulata*); and
- five Priority 3 species (*Acacia eremophila* (numerous nerved variant), *Eucalyptus canescens* subsp. *canescens*, *E. canescens* subsp. *beadelii*, *Eucalyptus pimpiniana* and *Lepidium fasciculatum*).

Only three of the conservation significant species, *Acacia eremophila* (numerous nerved variant), *Eucalyptus canescens* subsp. *canescens,* and *Eucalyptus pimpiniana* were identified within the proposed Haul Road Development Envelope. Each of these Priority 3 species were found to be widespread in the area. Direct impacts to each of these three species are not expected to be significant, as less than one per cent of the individuals recorded within the study area occur in the proposed disturbance footprint and would be impacted (Lost Sands 2015).

A number of the priority species listed above are closely associated with the sand dune habitat which is a key feature of the Great Victoria Desert, with particular regard to *Eucalyptus pimpiniana, Eremophila undulata,* and *Acacia eremophila* (numerous nerved variant).

Forty vegetation units were described in the study area. Of these, 27 occur within the Haul Road Development Envelope. These have been grouped into broader vegetation types including Mulga woodlands, Casuarina woodlands, and Mixed Eucalyptus Mallee woodlands.

No vegetation association recorded in the Haul Road Development Envelope would have more than five per cent of their recorded extent (within the study area) impacted. Vegetation in the Haul Road Development Envelope is generally in 'Very Good to Excellent' (near pristine) condition in the Great Victoria Desert section of the haul road, including the section within the GVDNR, and Degraded to Very Good in the Nullarbor Plain section of the haul road (Outback Ecology 2014a).

Consistent with Position Statement 2, during the preliminary design of the proposal, the proponent conducted an options analysis to avoid direct impacts to flora and vegetation where feasible, by selecting the haul road route to minimise clearing and avoid sensitive sand dune habitat as far as possible.

Direct impacts to conservation significant flora species would be minimised during the construction of the haul road by identifying suitable habitat through targeted surveys and tagging significant species prior to the commencement of clearing, where possible.

The proponent completed a broad assessment of indirect impacts which is included in the proponent's Response to Submissions document (Lost Sands 2016). This assessment identified potential indirect impacts to vegetation from the generation of dust, increases in weed density and diversity, changes to surface water hydrology and quality, and changes to fire regimes. The indirect impacts to flora and vegetation as a result of the construction of the haul road are difficult to quantify as the detailed design of the haul road has not yet been completed. As the proposed route would go through the GVDNR, a Class A Nature Reserve, the EPA expects that the proposal would be managed to prevent long-term impacts to the values of the reserve.

The proponent has prepared a number of management plans to manage and minimise direct and indirect impacts associated with the construction, operation and management of the haul road. The Department of Parks and Wildlife (Parks and Wildlife) provided advice during the assessment that there is insufficient detail regarding the proposed design and management actions to assess whether the proposal could be managed to have a minimal impact on the values of the nature reserve.

The EPA considers that given the direct impact to the reserve is relatively small (306 ha or 0.012% of the reserve area) and temporary (as the haul road would

be rehabilitated once mining ceased) the proposal could be managed to prevent long-term impacts to the values of the reserve.

While the proponent has carried out Level 2 Flora and Vegetation surveys in accordance with EPA Guidance Statement 51 (EPA 2004a), and these surveys are sufficient to assess the impacts of the proposal, more detailed surveys are required to inform the haul road design and rehabilitation process. The EPA recommends that a condition be imposed requiring the proponent to plan and conduct a baseline survey for the haul road that would inform the final alignment of the haul road, give effect to commitments made to avoid significant species, provide a baseline for monitoring potential impacts, and inform rehabilitation completion criteria (see Section 3.3).

Given the location of the proposed haul road within the GVDNR, the EPA considers that monitoring, management, and mitigation actions for the proposal should be developed and implemented according to best practice standards, in consultation with Parks and Wildlife, to provide a high level of confidence that impacts associated with the construction and operation of the proposed haul road would be managed to prevent long-term impacts to the values of the reserve.

As detailed design of the haul road has not yet commenced, the EPA recommends that a condition be imposed requiring the proponent to develop a plan for the design, construction and operation of the haul road, on advice from Parks and Wildlife, prior to commencement of ground disturbing activities within the GVDNR. Parks and Wildlife advised that the draft conditions appear to effectively address many of the aspects of the department's advice provided during the assessment.

The plan should include provisions consistent with a Management-based Condition Environmental Management Plan (as outlined in *Environmental Assessment Guideline No. 17 – for Preparation of management plans under Part IV of the Environmental Protection Act 1986* (EAG 17) (EPA 2015c)) to address the following:

- minimising clearing of vegetation by establishing management actions to be undertaken prior to clearing;
- minimising the disruption of surface water flows to prevent impacts associated with drainage shadows and ponding;
- defining the source of borrow and demonstrating that no borrow pits would be located within the GVDNR;
- providing clear monitoring, management and mitigation actions to be conducted within the GVDNR during the construction and operation of the haul road in relation to:
    - weeds;
    - dust;
    - fire regimes;
    - increased access by humans; and
    - increased access by feral animals.

Given the flora and vegetation values of the GVDNR, the EPA considers that loss of native vegetation within the nature reserve constitutes a significant residual impact. Consistent with the residual impact significance model in the *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014), a significant residual impact to areas reserved under statute for the purpose of conservation will require an offset (see 3.4 Offsets).

Summary

Having particular regard to the:

a) relevant EPA policy and guidance pertaining to flora and vegetation;

b) absence of DRF, TECs and PECs in the proposal development envelopes;

c) relatively small scale of the direct impact of clearing in the reserve; and

d) the values of the reserve, including the conservation of flora,

the EPA considers that the impacts to Flora and Vegetation are acceptable and the proposal can be managed to meet the EPA's objectives for Flora and Vegetation provided:

- a condition is imposed requiring the proponent to plan and conduct a baseline survey to inform the design of the haul road;
- a condition is imposed requiring the proponent to develop and implement a plan for the design, construction and operation of the haul road, which includes the management of flora and vegetation; and
- a condition is imposed for an offset to counterbalance the significant residual impact to the Great Victoria Desert Nature Reserve.

3.2 Terrestrial Fauna

EPA objective

The EPA's environmental objective for this factor is *to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*

Relevant EPA policy and guidance

The EPA policy and guidance applicable to Terrestrial Fauna for this assessment and relevant matters discussed in the policy and guidance are outlined in Appendix 4. The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- Position Statement No. 3 – *Terrestrial biological surveys as an element of biodiversity protection* (EPA 2002a);
- Guidance Statement No. 56 – *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004b);

- Guidance Statement No. 20 – *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia* (EPA 2009); and
- *Technical Guide on Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2002b).

EPA assessment

The proposal would impact terrestrial fauna through direct clearing of fauna habitat, and possible fragmentation of habitat and indirect impacts to habitat from changes to surface water flows, erosion and dust, associated with the haul road component of the proposal. There is also potential that the proposal would impact Terrestrial Fauna through altered fire regimes, vehicle strike, noise and vibration, and increased presence of introduced fauna.

Surveys for Short Range Endemic (SRE) species conducted within the study area recorded 210 invertebrate specimens from 32 species, including millipedes, scorpions, snails and mygalomorph spiders. Twenty-two species were considered to be potential SRE species, however each of these was either collected from multiple habitats in the study area, or from habitats which are considered to be widespread within and outside the study area (Lost Sands, 2015). SREs are therefore not considered to be relevant to this assessment.

The EPA's view is that the proponent has conducted terrestrial fauna surveys in accordance with the above policies and guidance.

Mine

As noted in Section 3.1, up to 805 ha of native vegetation would be cleared within the Mine Area Development Envelope. The main impact to terrestrial fauna associated with the mine would be the loss of habitat for terrestrial fauna.

Two Priority Four species and one species which is listed as protected under International Agreements were identified in the Mine Area Development Envelope. (Outback Ecology 2014b):

- Brush-tailed Mulgara (*Dasycercus blythi*): Parks and Wildlife list status: Priority Four;
- Southern Marsupial Mole *(Notorryctes typhlops)*: Parks and Wildlife list status: Priority Four; and
- Rainbow bee-eater *(Merops ornatus)*: Parks and Wildlife list status: IA; migratory and protected under international agreements.

Two habitat types were identified in the Mine Area Development Envelope, the Dunefield and Mulga/Mallee woodland. Both of these habitat types are considered likely to support fauna of conservation significance, however both are widespread throughout the study area. Direct impacts to these habitats as a result of the proposal (including the haul road) would be 3.1% and 0.6%

respectively of the area mapped within the study area (Outback Ecology 2014b).

The Southern Marsupial Mole is found in the sand dune crests of the Dunefield habitat, and is unlikely to occur in other habitat types. Records identifying the Southern Marsupial Mole over 300 km from the proposed mine site indicate that this species is widespread in the bioregion (Outback Ecology 2014b). The proposal would disturb less than 4.8% of the sand dune crests mapped in the study area.

The EPA considers that loss of habitat associated with the mine is unlikely to significantly impact any conservation significant fauna species.

Haul road

As noted in Section 3.1 Flora and Vegetation, up to 306 ha of the 467 ha of clearing associated with the construction of the haul road would be within the GVDNR, a Class A Nature Reserve created in 1974 for the conservation of Flora and Fauna. The *Conservation Reserves in Western Australia Report* (EPA 1974) notes that this area could act as a corridor connecting the fauna of eastern and western Australia.

Nineteen species of conservation significance are expected to occur in the study area (including both the Mine Area and the Haul Road development envelopes). Seven of the expected conservation significant species were recorded in the vicinity of the proposed haul road; including:

- Maleefowl (*Leipoa ocellata*): *Wildlife Conservation Act 1950* (WC Act) Status: Vulnerable;
- Great Desert Skink (*Liopholis kintorei*): WC Act Status: Vulnerable;
- Peregrine falcon (*Falco peregrinus*): (WC Act Status: Other specially protected fauna).
- Woma (*Aspidites ramsayi*; southwest subpop.): Parks and Wildlife list status: Priority One;
- Southern Marsupial Mole (*Notoryctes typhlops*): Parks and Wildlife list status: Priority Four;
- Princess Parrot; (*Polytelis alexandrae*): Parks and Wildlife list status: Priority Four;
- Naretha Blue Bonnet (*Northiella haematogaster narethae*): Parks and Wildlife list status: Priority Four.

Eight habitat types were mapped in the Haul Road Development Envelope:

- Dune Field;
- Mulga/Mallee Woodland;
- Sheoak Woodland;
- Claypan;
- Mallee over Spinifex;

- Acacia Woodland over Bluebush;
- Treeless Plain; and
- Treeless stony Plain.

Four of these (Dune Field, Mulga/Mallee, Sheoak Woodland, and Mallee over Spinifex) are significant as they are likely to support fauna of conservation significance. However, no more than 3.1% of any habitat type within the study area would be directly impacted by the proposal. The EPA considers that loss of habitat associated with the construction of the haul road is not likely to significantly impact any conservation significant fauna species.

There is the potential for the direct loss of individual fauna during clearing associated with the construction of the haul road due to vehicle and machinery strike. There is also the potential for indirect impacts to occur as a result of noise and vibration, and light during construction of the haul road. This impact would be temporary and it is likely that fauna would return to the area on completion of construction.

There is the potential for impacts to terrestrial fauna as a result of vehicle strike during the operation of the haul road. It is difficult to quantify impacts associated with vehicle strike, however a number of vulnerable or conservation significant species occur in the vicinity of the haul road. These include the Malleefowl, the Great Desert Skink, and the Woma.

The EPA notes that the haul road would bisect the reserve. Clearing for the haul road would be an average of 20 m wide and the trafficable width of the road would be approximately six metres wide, for 97.5% of the 150 km road length within the reserve. The other 2.5% would involve doubling the clearing to 40m for a maximum length of 50 m every two kilometres for passing, overtaking and turning bays. The EPA considers that there is unlikely to be a significant impact in relation to the fragmentation of habitat, due to the size of the areas west and east of the proposed haul road.

Parks and Wildlife provided advice during the assessment that that there is insufficient detail regarding the proposed design and management actions to assess whether impacts to Terrestrial Fauna associated with the haul road could be managed to have a minimal impact on the values of the nature reserve.

As noted in Section 3.1, as detailed design of the haul road has not yet commenced, the EPA recommends that a condition be imposed requiring the proponent to develop a plan for the design, construction and operation of the haul road on advice from Parks and Wildlife, prior to the commencement of ground disturbing activities. Parks and Wildlife advised that the draft conditions appear to effectively address many of the aspects of the department's advice provided during the assessment.

The plan should include provisions consistent with a Management-based Condition Environmental Management Plan (as outlined in EAG 17 (EPA

2015c)) to address the following (in addition to the requirements outlined in section 3.1 Flora and Vegetation):

- managing light, noise and vibration during haul road construction; and
- minimising vehicle strike on native animals.

Given the terrestrial fauna values of the GVDNR, the EPA considers that loss of terrestrial fauna habitat within the nature reserve constitutes a significant residual impact. Consistent with the residual impact significance model in the *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014), a significant residual impact to areas reserved under statute for the purpose of conservation will require an offset (see Section 3.4 Offsets).

Summary

Having particular regard to the:

a) relevant EPA policy and guidance pertaining to terrestrial fauna;

b) relatively small scale of the clearing of terrestrial fauna habitat in the reserve (average of 20 m wide and 150 km long within the reserve);

c) widespread nature of the habitat types to be disturbed; and

d) the values of the reserve, including the conservation of fauna,

the EPA considers that the impacts to Terrestrial Fauna are acceptable and proposal can be managed to meet the EPA's objectives for Terrestrial Fauna, provided:

- a condition is imposed requiring the proponent to develop and implement a plan for the design, construction and operation of the haul road, which includes the management of terrestrial fauna; and
- a condition is imposed for an offset to counterbalance the significant residual impact to the Great Victoria Desert Nature Reserve.

3.3 Rehabilitation and Decommissioning (Integrating factor)

EPA Objective

The EPA's environmental objective for this factor is to *ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner*.

Relevant EPA policy and guidance

The EPA policy and guidance applicable to Rehabilitation and Decommissioning for this assessment and relevant matters discussed in the policy and guidance are outlined in Appendix 4. The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- *Guidelines for preparing mine closure plans* (DMP & EPA 2015);

- Guidance Statement No. 6 – *Rehabilitation of terrestrial ecosystems* (EPA 2006); and
- Environmental Protection Bulletin No. 19 – *EPA involvement in mine closure* (EPA 2015).

The ESD referred to the 2011 version of the *Guidelines for preparing mine closure plans*. Key updates to the 2015 version of the *Guidelines for preparing mine closure plans* include making the mine closure plan requirements at each stage of a mining operation clearer, reflecting a risk-based approach, and clarifying the general structure and content of Mine Closure Plans. The proponent acknowledges the 2015 version in the PER (Lost Sands 2015).

The changes to Environmental Protection Bulletin No. 19 in the revised 2015 version reflect the changes to the factor and objective for Rehabilitation and Decommissioning, consistent with the updates to the revised Environmental Assessment Guideline No. 8 *Environmental Principles, Factors and Objectives* (EPA, 2015a).

The EPA considered the current versions of Environmental Protection Bulletin No. 19 and the *Guidelines for preparing mine closure plans* in its assessment as they set out the EPA's current policy position, and the content, in relation to the EPA's assessment, is not materially different from the versions referred to in the PER.

Consistent with Environmental Protection Bulletin No. 19, the EPA will assess mine closure if an environmental asset with some special or unique characteristic is being impacted and needs to be returned to a desired outcome post-mining. This can include where a mining proposal occurs on an area with an existing conservation purpose. The EPA assessed Rehabilitation and Decommissioning as the proposal includes a haul road through the GVDNR.

EPA assessment

The PER document indicates that the expected life of the proposal is ten years, following which the mine site and haul road are proposed to be rehabilitated consistent with agreed outcomes and land uses. However, the EPA notes that the mine may continue beyond ten years which would increase the time that the haul road was in operation in the GVDNR and would delay the closing and decommissioning of the haul road.

Mine

Initial waste generated would be used in construction of tailings storage facilities and roads. Subsequent waste rock would be backfilled into pits throughout the life of the mine, therefore there will be no permanent waste rock landforms as a result of the proposal. As the proposal would not intercept the water table, pit lakes are not expected to form.

Soil testing indicates that surface soils are non-sodic, however some mine waste materials are highly sodic. Sodic soils have an increased tendency to disperse upon wetting and are therefore more prone to hardsetting at the soil surface, and erosion when placed on the slopes of constructed landforms (Outback Ecology 2015).

Due to the low levels of radioactive elements, and the low likelihood of the mobilisation of radionuclides, it is not anticipated that there would be any impacts once mining ceases as a result of mobilisation of radionuclides from the tailings storage facilities or waste rock storage. Tailings would be covered with overburdened waste and salvaged surface soil to facilitate rehabilitation.

The proponent has prepared a preliminary mine closure plan (MCP). The proponent notes in the PER that the preliminary MCP augments the information in the PER and is not a standalone MCP (Lost Sands 2015). The proponent acknowledges that this plan would be further developed through the preparation of a detailed MCP, consistent with the *Guidelines for Preparing Mine Closure Plans* (DMP & EPA 2015).

Given the relatively small scale of the proposal and the nature of the surface soils and expected tailings and waste rock products, the EPA's view is that the preliminary MCP and information in the PER is adequate for the Environmental Impact Assessment stage of the proposal, for the mine component of the proposal.

The EPA expects that the detailed MCP should include:

- further detail on the sodicity of material to be used in waste landforms and rehabilitation activities, such as reconstructing soil profiles; and
- further analysis of the potential for radiation to impact the environment.

Haul road

The haul road would be decommissioned and rehabilitated over a period of five years once mining operations cease.

While the proponent has carried out Level 2 Flora and Vegetation surveys in accordance with EPA Guidance Statement 51, the EPA considers that these surveys do not sufficiently inform the haul road design or rehabilitation process.

There is a lack of site specific information available to inform rehabilitation actions due to the remote nature of the area to be disturbed and the lack of existing rehabilitation projects in the area. To address this matter, Lost Sands proposes to conduct a number of trials, which would then inform rehabilitation actions. These trials would investigate a range of factors which could include:

- soil structure, composition and chemistry;
- topsoil storage and spreading;
- seed viability and germination; and

- seed longevity, collection timing and effects of storage conditions.

The trials would assist Lost Sands in determining correct procedures for seed collection, handling, storage and use (Lost Sands 2016). The EPA considers that these trials are critical to the success of the rehabilitation of the haul road and expects that the trials would start shortly after the commencement of ground disturbing activities.

The proponent's preliminary mine closure plan includes the decommissioning and rehabilitation of the haul road. The proponent aims to return the environmental values of the haul road within five years of rehabilitating the road (Lost Sands 2015). This plan proposes qualitative completion criteria, and indicates that quantitative completion criteria would be developed as the mine approaches closure. Completion criteria would be measured against local target ecosystems. This is consistent with the relevant matters in *Guidelines for preparing mine closure plans* (DMP & EPA 2015) and Guidance Statement No. 6 – *Rehabilitation of Terrestrial Ecosystems (EPA 2006),*

The proponent has proposed management actions (in addition to rehabilitation trials) to be implemented during the construction and operation of the proposal, to contribute to the successful decommissioning and rehabilitation of the haul road. These would include:

- stockpiling of topsoil and vegetative matter in windrows on either side of the proposed road;
- maintaining an inventory of available topsoil and cover material;
- collecting Priority Flora species seeds from known distribution areas for cleaning, storage and use during rehabilitation; and
- undertaking trials on the viability and germination of seeds to inform rehabilitation activities.

Parks and Wildlife provided advice during the assessment that that there is insufficient detail in the proponent's proposed rehabilitation plan (provided as part of the preliminary mine closure plan) to assess whether the haul road component of the proposal could be rehabilitated to a standard appropriate for the values of the GVDNR, due to the lack of site specific rehabilitation information to inform completion criteria.

To develop suitable quantitative completion criteria for the rehabilitation of the haul road, baseline flora and vegetation surveys would be required. As noted in Section 3.1, the EPA recommends that a condition be imposed requiring the proponent to plan and conduct a baseline survey for the rehabilitation of the haul road (see Section 3.3). These baseline surveys would include details of the flora and vegetation units in each section of the haul road and the identification of suitable analogue sites to assist with the monitoring and assessment of rehabilitation progress against completion criteria.

As noted in Section 3.2, clearing for the haul road would be an average of 20 m wide and the trafficable width of the road would be approximately six metres wide, for 97.5% of the 150 km road length within the reserve. The other 2.5% would involve doubling the clearing to 40 m for a maximum length of 50 m every two kilometres for passing, overtaking and turning bays.

The EPA considers that the uncertainty regarding the rehabilitation of the haul road can be addressed through the implementation of the baseline survey condition and a condition requiring the proponent to prepare a rehabilitation and decommissioning plan for the haul road and implement and monitor the rehabilitation of the haul road following the closure of the mine. Parks and Wildlife advised that the draft conditions appear to effectively address many of the aspects of the department's advice provided during the assessment. The plan should include provisions consistent with a Management-based Condition Environmental Management Plan (as outlined in EAG 17 (EPA 2015c)).

Summary

Having particular regard to:

a) relevant EPA policy and guidance pertaining to rehabilitation and decommissioning;

b) the linear nature of the rehabilitation required; and

c) the proponent's proposed rehabilitation trials and rehabilitation actions,

the EPA considers that the proposal can be managed to meet the EPA's objectives for Rehabilitation and Decommissioning provided that:

- a Mine Closure Plan is prepared for the mine component of the proposal, in accordance with the *Guidelines for Preparing Mine Closure Plans,* May 2015 (or any subsequent revisions of the guidelines) and requires the Mine Closure Plan to be reviewed and revised at intervals not exceeding three years. This can be achieved through the required approval of the mining proposal under the *Mining Act 1978* (Mining Act);
- a condition is imposed requiring the proponent to plan and conduct a baseline survey to inform completion criteria for the haul road; and
- a condition is imposed requiring the proponent to prepare and implement a rehabilitation and decommissioning plan for the haul road.

The DMP advised that the associated risks of the mine could be adequately regulated and managed under the Mining Act.

According to Environmental Protection Bulletin No. 19, the EPA will regulate mine closure (and recommend a condition requiring a MCP) if it assessed Rehabilitation and Decommissioning as a key integrating factor. The EPA notes that a Mine Closure Plan prepared in accordance with the *Guidelines for preparing mine closure plans* is a statutory obligation (not a discretionary decision) under the Mining Act and that the *Guidelines for preparing mine closure plans* is a joint document prepared by the DMP and EPA to meet both

Mining Act and EP Act regulatory requirements. The EPA's view is that the requirements of the condition relating to a MCP for the mine component of this proposal can be adequately regulated through the Mining Act, rather than a condition under Part IV of the EP Act.

Consistent with Environmental Protection Bulletin No. 19, where the EPA has assessed rehabilitation and decommissioning, the EPA will impose a condition in relation to rehabilitation and decommissioning, in addition to the Mining Act mining proposal process. The EPA's view is that, due to the potential long-term impacts to the GVDNR from the haul road, the haul road component of the proposal should be regulated under Part IV of the EP Act, in addition to the approval process for Mine Closure Plans under the Mining Act.

3.4 Offsets

EPA objective

The EPA's environmental objective for this factor is *to counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.*

Relevant EPA policy and guidance

The EPA Policy and Guidance applicable to the Offsets and the relevant considerations are outlined in Appendix 4. The EPA Policy and guidance considered by the EPA to be relevant to Offsets for this assessment are:

- *WA Environmental Offsets Policy* (Government of Western Australia 2011);
- *WA Environmental Offset Guidelines* (Government of Western Australia 2014); and
- Environmental Protection Bulletin 1 - *Environmental Offsets*, (EPA 2014a).

The ESD referred to Position Statement 9 *Environmental Offsets* (EPA 2006) which was revoked following the EPA adoption of the above Government offsets policy and guidelines, and a draft *Environmental Assessment Guideline - Offsets*. The ESD also referred to the 2008 version of Environmental Protection Bulletin No.1, which was updated in 2014. The EPA required the proponent to prepare the PER having regard to current policy and guidance. The proponent refers to the *WA Environmental Offset Guidelines* and the 2014 version of Environmental Protection Bulletin 1 in the PER.

EPA assessment

Consistent with the relevant offset policies and guidance, the proponent has addressed the mitigation hierarchy outlined in the *WA Environmental Offset Guidelines* (Government of Western Australia 2014) by identifying measures to avoid, minimise and rehabilitate environmental impacts. The EPA has assessed

these mitigation measures under the relevant environmental factor (see sections 3.1 Flora and Vegetation and 3.2 Terrestrial Fauna).

Consistent with the residual impact significance model in the *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014), a significant residual impact to areas reserved under statute for the purpose of conservation will require an offset.

As noted in Section 2, the values of the GVDNR relate primarily to flora and vegetation, and terrestrial fauna, and the purpose of the reserve is the Conservation of Flora and Fauna.

Given the impacts that the proposed haul road would have on the values of the GVDNR, the EPA considers that an appropriate offset includes on-ground management actions to improve the environmental values of the reserve. Key threats to the values of the reserve include feral animals (especially camels) and fire.

Offset activities which could be conducted to improve the values of the GVDNR include:

- the development and implementation of a Feral Control Plan to minimise impacts to native ecosystems as a result of overgrazing;
- a co-operative fire management/response plan in collaboration with Parks and Wildlife and the Pila Nguru traditional owners; and
- weed management surveys and programs.

These activities would be in accordance with the *Environmental Offsets Policy* (Government of Western Australia, 2011) in that they represent a direct offset which takes account of, and contributes to, the ongoing management of a reserve.

Parks and Wildlife is the State government agency responsible for management of the nature reserve and has the appropriate expertise, infrastructure, and long term interest in the reserve to plan, coordinate and undertake such programs. The Tjuntjuntjara community was established within the GVDNR for the Pila Nguru traditional owners in the 1980s (Lost Sands 2015). Any management programs within the reserve would be expected to involve the engagement and participation of the Pila Nguru.

Consistent with Principle 3 of the Offsets Policy, environmental offsets should be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted. The EPA recommends that Lost Sands would contribute funds required for the development and implementation of a proposed offset program for the duration of the operation of the mine and the haul road.

Parks and Wildlife considers that a funded program managed directly by Parks and Wildlife in conjunction with the relevant Aboriginal People would be the most effective way to ensure the maximum environmental benefit is provided to

the nature reserve and its environmental values. Parks and Wildlife has advised that this would include funding of supervisory and/or operational position/s within Parks and Wildlife, contracts with the Tjuntjuntjurra community and on-ground management costs.

The EPA considers that management programs could be used to suitably offset the proposal's significant residual impact associated with the clearing of up to 306 hectares in the GVDNR, to improve the values of the reserve.

Based on advice from Parks and Wildlife on the estimated cost of coordinating and implementing a management program suitable to offset impacts to the values of the GVDNR, and considering the *WA Environmental Offsets Policy* (Government of Western Australia, 2011), the EPA considers that a contribution of 3.6 million dollars would be cost effective, relevant and proportionate to the significance of the environmental values being impacted.

The EPA recommends that a condition be imposed requiring the proponent to contribute funds to Parks and Wildlife for the purpose of implementing a management program within the GVDNR that would include the following activities:

- control of feral animals;
- control of the spread of weeds; and
- fire management.

Management actions within the GVDNR would be able to deliver long-term strategic outcomes. The EPA's preference is to recommend specific offset conditions to the Minister rather than identifying the need for an offset plan to be developed post-approval (Environmental Protection Bulletin 1). However, for this proposal, while the EPA has recommended a condition requiring an offsets plan, the condition contains specific requirements to achieve the environmental outcome. The proponent's offsets plan would be required to demonstrate that the management actions will be based on sound environmental information with a focus on achieving environmental outcomes. This is consistent with the principles in the *WA Environmental Offsets Policy* (Government of Western Australia, 2011).

Summary

Having particular regard to:

a) relevant EPA and endorsed WA Government policy and guidance pertaining to offsets;

b) the significant residual impact to the GVDNR; and

c) the conservation offset activities proposed by the proponent and Parks and Wildlife within the Great Victoria Desert Nature Reserve,

the EPA considers that the proposal can be managed to meet the EPA's objectives for Flora and Vegetation, Terrestrial Fauna and Offsets provided a

condition is imposed to counterbalance the significant residual impact to the Great Victoria Desert Nature Reserve.

4. Conditions

Section 44 of the EP Act requires that this assessment report must set out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment; and
- the EPA's recommendations as to whether or not the proposal may be implemented and, if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

4.1 Recommended conditions

The EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Lost Sands Pty Ltd to develop and operate the Cyclone Mineral Sands Project is approved for implementation.

These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

a) a condition requiring the proponent to plan and conduct a flora and vegetation baseline survey to inform the haul road design and quantitative completion criteria for rehabilitation of the haul road;

b) a condition requiring the proponent to develop and implement a plan for the design, construction and operation of the haul road, to manage, monitor and mitigate impacts to Flora and Vegetation and Terrestrial Fauna from the haul road in the Class A Great Victoria Desert Nature Reserve;

c) a condition requiring the proponent to prepare and implement a rehabilitation and decommissioning plan for the haul road; and

d) a condition requiring the proponent to provide offsets to counterbalance the significant residual impact to the Class A Great Victoria Desert Nature Reserve.

4.2 Consultation

In developing these conditions, the EPA consulted with the proponent, Parks and Wildlife and the Department of Mines and Petroleum on matters of fact, technical feasibility and potential difficulties with implementation.

5. Recommendations

That the Minister for Environment notes:

1. that the proposal assessed is to develop and operate the Cyclone Mineral Sands Project, which includes a haul road through the Class A Great Victoria Desert Nature Reserve;
2. the key environmental factors identified by the EPA in the course of its assessment set out in Section 3; and
3. the EPA has concluded that the proposal may be implemented to meet the EPA's objectives, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures set out in Appendix 5 and summarised in Section 4.

Appendix 1

List of Submitters

Organisations:

Department of Parks and Wildlife
Department of Mines and Petroleum
Department of Environment Regulation
Department of Aboriginal Affairs
Department of Water
Conservation Commission
Radiological Council
Wildflower Society of WA

Individuals:

1 Anonymous submission

Appendix 2

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Appendix 3

Summary of Identification of Key Environmental Factors and Principles

Summary of identification of key environmental factors

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
LAND			
Flora and Vegetation	Direct loss through clearing of up to 1,272 ha of native vegetation, including up to 306 ha for the haul road within the Great Victoria Desert Nature Reserve (GVDNR). Potential indirect impacts to native vegetation associated with the Haul Road from increases to the extent and diversity of weed populations, changes to surface water flows, dust deposition, changes to fire regimes, and increased access to remote areas by vehicles and feral animals.	*Government Agencies* Government submissions focussed on impacts to Flora and Vegetation values of the GVDNR. • The design of the haul road is not finalised, therefore indirect impacts including dust, changes to surface water and increases in weed species cannot be quantified. • Monitoring and Management of indirect impacts have not been adequately described in the PER or the appended haul road management plan. • Further development of weed monitoring and management actions is required. *Non-Government Organisation and Public Comments* • Quantitative estimates of native vegetation to be impacted by modification of surface water, spread of weeds, dust deposition, use of dust suppressants and alteration of fire regime should be provided. • A discussion of management, monitoring and mitigation actions for Flora and	Flora and Vegetation was identified as a preliminary key environmental factor in the Environmental Scoping Document for the proposal. Having regard to the scale of vegetation clearing to be undertaken and the potential for impacts to the values of the Great Victoria Desert Nature Reserve (GVDNR), the **EPA identified Flora and Vegetation as a Key Environmental factor.**

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
		vegetation outside the GVDNR should be provided. • Justification for the timing of baseline Flora and Vegetation monitoring should be provided.	
Terrestrial fauna	Clearing of up to 1,272 ha of habitat, including up to 306 ha within the GVDNR. Indirect impacts to habitat from changes to surface water flows, erosion and dust, associated with the haul road component of the proposal. Potential impacts from fire, vehicle strike, noise and vibration, and increased presence of introduced fauna.	*Government Agencies* • Indirect impacts addressed in the Haul Road Management Plan should include changed fauna behaviour, vehicle strike, and introduced fauna. • A discussion of speed limits in areas of high conservation significant fauna habitat should be discussed. • Management actions to prevent introduced fauna access to the nature reserve should be provided. • A commitment to preparing a significant fauna species management plan and an introduced fauna management plan should be provided.	Terrestrial Fauna was identified as a preliminary key environmental factor in the Environmental Scoping Document for the proposal. Having regard to the scale of clearing of fauna habitat to be undertaken and the potential for impacts to the values of the GVDNR, the **EPA identified Terrestrial fauna as a Key Environmental factor.**
Subterranean Fauna	There are unlikely to be any significant impacts on subterranean fauna: • there is unlikely to be suitable subterranean	No submissions were received in relation to this factor.	Subterranean fauna was identified as a preliminary key environmental factor in the Environmental Scoping Document for the proposal.

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
	fauna habitat in the Mine Area Development Envelope. • The impacts associated with the haul road would be minimal.		The proponent has conducted desktop and field studies of Subterranean Fauna habitat in accordance with *Environmental Assessment Guideline No. 12 (EAG 12) – Consideration of subterranean fauna in environmental impact assessment in Western Australia*, (EPA 2013b) and Guidance Statement 54a – *Sampling methods and Survey Considerations for Subterranean Fauna in Western Australia* (EPA 2007). *Troglofauna* These studies demonstrate that no habitat suitable for Troglofauna is likely to be present in the Mine Area Development Envelope. The southern sector of the Haul Road Development Envelope is likely to contain suitable habitat for troglofauna, however road construction would have little below ground effect and impacts to troglofauna are therefore likely to be limited. Further, habitat in the area is

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			relatively uniform and has a wide distribution. *Stygofauna* The mine is not proposed to intersect the water table and therefore would not impact stygofauna species. The proposed borefield is located in an area with low prospectivity for stygofauna and is therefore not expected to have a significant impact to stygofauna species. Having regard to Environmental Assessment Guideline 12 – *Consideration of subterranean fauna in EIA in WA* (EPA, 2013b), Guidance Statement No. 54a - *Sampling methods and survey considerations for subterranean fauna in Western Australia* (EPA 2007) and EAG 9 - *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA, 2015b) and given:

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			• the lack of suitable subterranean fauna habitat in the Mine Area Development Envelope; and • the low level of impact associated with the construction of roads in the southern section of the Haul Road Development Envelope, the EPA considers that it is unlikely that the proposal would have a significant impact on subterranean fauna and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Subterranean Fauna as a key environmental factor** at the conclusion of its assessment.
WATER			
Hydrological Processes	Abstraction of groundwater from the proposed borefield. Interception and diversion of surface water flows around mine pits and infrastructure.	*Government Agencies* • Detailed designs for the two major and four minor drainage crossings of the haul road within the GVDNR should be provided.	Hydrological Processes was identified as a preliminary key environmental factor in the Environmental Scoping Document for the proposal. Impacts to Native Vegetation due to interception of surface water by the haul road are discussed in Section 3.1 – Flora and Vegetation.

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
	Changes to surface water flows due to interruption of natural drainage lines as a result of the construction of the haul road.	*Non-Government Organisation and Public Comments* • Further discussion and quantification of indirect impacts associated with the modification of surface flows should be provided.	Impacts to Terrestrial Fauna as a result of habitat loss from changes in surface water flows are discussed in Section 3.2 – Terrestrial Fauna. Interception and diversion of surface water around the proposed pits may create a drainage shadow to the west of the Mine Area Development Envelope. The proponent estimates that this may extend 1 km from the pit boundary. Given the small percentage of the regional catchment represented by the project area, and the lack of significant surface water features in the local catchment area, alterations to surface water flows as a result of the proposal are unlikely to be significant. The proponent has conducted desktop studies and reviews of existing information and considers that the deep aquifers from which groundwater would be abstracted are unlikely to have any connectivity with the shallow aquifers

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			used for water supply by the Tjunttjuntjara Aboriginal Community and Ilkurlka Roadhouse or other distant communities. Having regard to EAG 9 - *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA 2015b) and given the: • depth to groundwater and lack of groundwater users in the mine area; • lack of surface water flows in the project area; and • small percentage of the local catchment represented by the project area, the EPA considers that it is unlikely that the proposal would have a significant impact on hydrological processes and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Hydrological Processes as a**

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			key environmental factor at the conclusion of its assessment. The EPA notes that potential impacts from groundwater abstraction on the environment, other users and the aquifer can be managed by the Department of Water under *the Rights in Water and Irrigation Act 1914* (RiWI Act) as part of the water licensing process. The EPA also notes that surface water impacts associated with the mine can be regulated and managed by the Department of Mines and Petroleum under the *Mining Act 1978.*
Inland Waters Environmental Quality	Runoff from tailings storage. Contamination as a result of hydrocarbon or chemical spills. Mobilisation of chemical stabilisers applied to road	No submissions were received in relation to this factor.	Inland Waters Environmental Quality was not identified as a preliminary environmental factor at Level of Assessment, and was not included as a key factor in the ESD for this proposal. However, questions were raised during the assessment in relation to this factor and therefore further information was sought and provided by the proponent in

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
	surface into surface water during flood events.		the Response to Submissions (Lost Sands 2016). The EPA notes that the dust suppression agents to be used in preparation of the haul road are likely to be benign and would not be mobilised in water following application to the road. The EPA also notes that there is a lack of flowing water in the proposal area. Having regard to EAG 9 - *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA 2015b) and given the: • lack of surface water flows in the project area; and • the benign nature of the proposed dust suppression agents, the EPA considers that it is unlikely that the proposal would have a significant impact on inland waters environmental quality and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Inland Waters**

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			Environmental Quality as a key environmental factor at the conclusion of its assessment. The EPA notes that a works approval and licenses would be required *under Part V of the Environmental Protection Act 1986*, and that impacts to surface water quality as a result of hydrocarbon spills and tailings storage would be managed under these approvals.
PEOPLE			
Human Health	Potential for radiation in the mineral sands product, feedstock and tailings to impact human health.	*Government Agencies* • It is understood that radiation levels are expected to be low and may not be captured under the Radiation Safety Act. However, as a mineral sands mine, a radiation plan would need to be developed and pre-mining radiation surveys conducted. This would be required by the State Mining Engineer. It would be prudent to submit this to the Radiological Council for review. • Data has been provided for the uranium and thorium content in tailings, but not in	Human Health was not identified as a preliminary environmental factor at Level of Assessment, and was not included as a key factor in the ESD for this proposal. However, as one submission was provided in relation to this factor, the EPA gave some consideration to Human Health. The proponent has provided additional data on uranium and thorium content in feedstock and heavy mineral

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
		the feedstock and heavy mineral concentrate.	concentrate, which are as expected for a mineral sands mine. Lost Sands has also committed to a pre-mining radiation survey and development of a radiation plan in accordance with the *Radiation Safety Act 1975* and the WA Radiation Safety Regulations 1983. Having regard to the • low levels of uranium and thorium expected to be present in tailings, feedstock and heavy mineral concentrate, the EPA considers that it is unlikely that the proposal would have a significant impact on human health and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Human Health as a key environmental factor** at the conclusion of its assessment. The EPA notes that radiation is regulated by the Radiological Council under the *Radiation Safety Act 1975* and the WA Radiation Safety Regulations 1983.

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
Heritage	No sites of significant heritage value have been identified in the Mine Area Development Envelope. Three clay pans are located to the west and east of the proposed haul road which may have some cultural significance.	*Government Agencies* • The Department of Aboriginal Affairs (DAA) notes that extensive consultation has occurred with the native title holders (Pila Nguru) for the area and that the proposed developments are unlikely to impact upon Aboriginal heritage sites. • The DAA notes that the Forrest (central) haul roadis the preferred alignment for the Pila Nguru and suggests if another alignment option is chosen that the developer meets with the DAA to discuss this matter further and clarify obligations which may exist under the *Aboriginal Heritage Act 1972* (AHA). • The heritage management measures in the PER have been noted. DAA notes the proposed management to occur, should significant archaeological items be located in the project area. DAA would strongly suggest that if significant archaeological objects are located in the project area, that advice is sought from DAA prior to any salvage of these objects occurring, to assist in ensuring the requirements of the AHA continue to be met.	Heritage was identified as a preliminary key environmental factor in the Environmental Scoping Document. The proponent conducted an options analysis for the haul road and selected the preferred road alignment based on environmental and heritage considerations. The proposal that the EPA has assessed is for the Forrest (Central) route. Having regard to Guidance Statement No. 41 – *Assessment of aboriginal heritage* (EPA 2004) and EAG 9 - *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA 2015b) and given that: • no sites of significant heritage value have been identified in the Mine Area Development Envelope; • the proposed haul road route was developed in consultation with Traditional Owners in the area, and is the preferred route of the Traditional Owners of the area; and

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
		• The Conservation Commission noted that an assessment of management considerations for potential impacts to Aboriginal Culture and Heritage is important from a CALM Act perspective and to ensure that historical and cultural associations are not adversely affected.	• the haul road is not expected to impact any areas of cultural significance, the EPA considers that it is unlikely that the proposal would have a significant impact on heritage values and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Heritage as a key environmental factor** at the conclusion of its assessment. The EPA notes that the proponent has signed the *Cyclone Zircon Project Native Title and Mining Agreement* with the Pila Nguru Aboriginal Corporation (RNTBC) representing the Spinifex People, the Traditional Owners of the land containing the proposal. The EPA also notes that any heritage sites or artefacts identified during the construction of the mine would be managed under the *Aboriginal Heritage Act 1972.*

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
Amenity	Ore concentrate would be trucked south on a constructed haul road to the Forrest rail siding on the Trans - Australian Railway. There is the potential for noise and dust impacts to users of the six residential buildings at Forrest located 350 metres from the haul road in the vicinity of the Forrest Siding.	No submissions were received in relation to this factor.	Amenity was identified as a preliminary key environmental factor in the Environmental Scoping Document. Forrest consists of a rail siding on the Trans-Australian Railway, an airstrip and six dwellings (which are all affiliated with the airport business) and an Australian Rail Track Corporation (ARTC) worker's rest house (Lost Sands 2015). The proponent notes in the PER that there are no permanent residents at Forrest. The proponent conducted a dust assessment which considered the sensitive environmental receptors at the rail siding (Metreo 2014). The PER indicates that settleable dust is unlikely to be a nuisance and visible dust plumes along the road are expected to be minor. The PER states that there have not been any previous dust issues at the Forrest rail siding, noting that there has only been minor activity for many years.

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			The proponent conducted a noise assessment (Lloyd George, 2014) which indicates that noise levels at residences at Forrest are likely to comply with the Environmental Protection (Noise) Regulations 1997 (Noise Regulations) provided that the haul road is located a minimum of 150 m from sensitive receptors. Noise from the rail siding is predicted to comply with the regulations at all times at the permanent residences, and there is the potential for exceedances at temporary accommodation. The EPA notes that the proposal must comply with the Noise Regulations, subsidiary legislation of the EP Act, or receive an exemption under regulation 17. Regulation 8 contains assigned levels that must be complied with. Having regard to Environmental Assessment Guideline No. 13 - *Consideration of environmental impacts from noise* (EPA 2014), and

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			Environmental Assessment Guideline 9 - *Application of a Significance Framework in the Environmental Impact Assessment Process* (EPA 2015b) and given that: • settleable dust is unlikely to be a nuisance and visible dust plumes along the road are expected to be minor; • noise levels at residences at Forrest are likely to comply with the Noise Regulations provided that the haul road is located a minimum of 150 m from sensitive receptors; • noise can be dealt with under the Noise Regulations, the EPA considers that it is unlikely that the proposal would have a significant impact on amenity and the proposal can meet the objectives for this factor. Accordingly, **the EPA did not identify Amenity as a key environmental factor** at the conclusion of its assessment. The EPA notes that the ESD and the PER refers to draft Guidance Statement No. 8. *Environmental Noise* (EPA 2007),

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
			which was replaced by Environmental Assessment Guideline No. 13 in September 2014. The EPA considered the current guidance in its assessment, as it reflects the EPA's current policy position and was in place when the PER was released for public review. The EPA notes that the objectives in draft Guidance Statement 8 are consistent with the objectives in the current Environmental Assessment Guideline No. 13.
INTEGRATING FACTORS			
Rehabilitation and Decommissioning	Impacts to the flora and fauna values of the Great Victoria Desert nature Reserve in the event that rehabilitation and decommissioning is not able to be completed to a standard consistent with the existing values of the reserve.	*Government Agencies* • Additional discussion regarding closure outcomes for the full length of the haul road in the reserve should be provided as a preliminary basis for appropriate closure criteria. • The implications of binding materials and dust suppressant on rehabilitation and closure outcomes should be discussed. • There are considerable uncertainties associated with rehabilitation in this region. • Approval of the proposal should be subject to an unconditional performance bond or	Rehabilitation and Decommissioning was identified as a preliminary key integrating factor in the Environmental Scoping Document for the proposal. Having regard to the values of the Great Victoria Desert Nature Reserve, and the uncertainty regarding the likely success of rehabilitation in the bioregion, the **EPA identified Rehabilitation and Decommissioning as a key integrating factor.**

Environmental factors	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of whether a factor is a key environmental factor
		similar financial security to address the full costs of closure and rehabilitation. • The Preliminary Mine Closure plan would be required to be revised in accordance with the Guidelines for preparing mine closure plans. Financial provisioning for closure would be expected to be further developed prior to submission. • Additional discussion regarding the implications of a decision to retain the haul road should be provided, including consultation and information requirements for each step in the decision making process, and standards of the haul road for handover.	
Offsets	Significant residual impact associated with the clearing of up to 306 hectares of native vegetation (including fauna habitat) within the GVDNR, and with associated indirect impacts within the GVDNR.	*Government Agencies* • Additional discussion is required regarding how and at what stage offsets would be further developed. • Further discussion is required regarding the timeframe over which offsets would be applied.	Offsets was identified as a preliminary key integrating factor in the Environmental Scoping Document for the proposal. Having regard to the environmental values of the Great Victoria Desert Nature Reserve, which was set up as a reserve for the conservation of flora and fauna, the **EPA identified Offsets as a key integrating factor.**

Summary of identification of principles

Principle	Consideration
Environmental principles of the EP Act	
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In application of this precautionary principle, decisions should be guided by –* *a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *b) an assessment of the risk-weighted consequences of various options.*	In considering this Principle, the EPA notes that Flora and Vegetation, and Terrestrial Fauna will be impacted by this proposal, particularly from the clearing of 306 ha of native vegetation for the haul road within the Great Victoria Desert Nature Reserve (GVDNR). The assessment of these impacts is included in this report. From its assessment of this proposal, the EPA has concluded that there is not a threat of serious or irreversible harm, due to: • limited impacts on conservation significant flora and fauna species and their habitat; and • the likely reversibility of the impacts following rehabilitation of the haul road. The EPA has recommended conditions relating to the design, construction, management and rehabilitation of the haul road to improve scientific certainty and the likelihood of successful rehabilitation of the haul road.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	In considering this Principle, the EPA notes that the proponent has considered the mitigation hierarchy in the *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014) to avoid, minimise, rehabilitate and offset impacts, including: • examination of route options for the haul road to select a preferred route that minimises clearing in sensitive areas; and • a commitment to undertake rehabilitation trials to reduce knowledge gaps associated with rehabilitation methods in the bioregion.

Principle	Consideration
	In assessing this proposal the EPA has recommended that conditions be imposed on the proponent in relation to managing impacts on flora and vegetation and terrestrial fauna, to ensure that the that the health, diversity and productivity of the environment is maintained, including a condition relating to the rehabilitation of the haul road within the GVDNR. The EPA has also recommended offsets to improve the values of the GVDNR for the conservation of Flora and Fauna in the bioregion. The EPA also notes that the DMP will require a Mine Closure Plan under the *Mining Act 1978* consistent with the *Guidelines for preparing mine closure plans* (DMP & EPA 2015) to ensure that the post-mine environment is ecologically sustainable. From its assessment of this proposal, the EPA has concluded that the health, diversity and productivity of the environment can be maintained and enhanced for the benefit of future generations.
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	In considering this Principle, The EPA notes that Flora and Vegetation, and Terrestrial Fauna will be impacted by this proposal particularly from the clearing of 306 ha of native vegetation for the haul road within the GVDNR. The assessment of these impacts is included in this report. The EPA has concluded that the proposal would not compromise the biological diversity or ecological integrity of this bioregion, due to: • limited impacts on conservation significant flora and fauna species and their habitat; and • the linear nature of impacts from the haul road. The EPA has recommended a condition relating to the rehabilitation of the haul road, and a condition requiring the proponent to provide an offset for

Principle	Consideration
	clearing within the GVDNR to improve the values of the GVDNR for the conservation of Flora and Fauna in the bioregion. Through this assessment, the EPA has demonstrated that the conservation of biological diversity and ecological integrity was a fundamental consideration.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.*	In considering this principle, the EPA notes that the proponent would bear certain costs relating to waste and pollution, including avoidance and containment. The proponent would also be responsible for the costs relating to rehabilitation and decommissioning. The EPA has demonstrated due regard to this principle during the assessment of this proposal.
5. The principle of waste minimisation	In considering this Principle, the EPA notes that initial waste rock would be used in the construction of tailings storage facilities and roads. Subsequent waste rock would be backfilled into pits throughout the life of the mine,

Principle	Consideration
All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	therefore there will be no permanent waste rock landforms as a result of the proposal. The EPA also notes that waste generated at the mine site would be regulated and managed under Works Approval and License required under Part V of the *Environmental Protection Act 1986.*
Environmental principles of the EPA	
1. Best practice *When designing proposals and implementing environmental mitigation and managment actions, the contemporary best practice measures available at the time of implementation should be applied.*	In considering this Principle, the EPA has recommended conditions to ensure that best practice measures are used in the design, construction, operation and rehabilitation of the Haul Road within the GVDNR.
2. Continuous Improvement *The implementation of environmental practices should aim for continuous improvement in environmental performance.*	In considering this Principle, the EPA notes that the proponent has committed to a number of rehabilitation trials to decrease knowledge gaps relating to rehabilitation in the bioregion. The EPA has recommended a condition to ensure this is undertaken. The EPA has recommended conditions requiring the development of environmental management plans. As outlined in EAG 17 - *Preparation of management plans under Part IV of the Environmental Protection Act 1986* (EPA, 2015), the EPA encourages adaptive management and continual improvement through environmental management plans. The EPA considers that the recommended conditions (including offsets), if implemented, would enable adaptive management continual improvement in environmental performance to occur, particularly in relation to the management of weeds, dust, feral animals and fire.

Appendix 4

Relevant EPA policies and guidance and identified matters

The EPA reviewed its policies and guidance documents for each environmental factor to determine their relevance to the assessment of the proposal. The EPA has outlined the relevant matters discussed in each policy and guidance document for the key environmental factors below.

1. Flora and vegetation

The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- Guidance Statement No. 51 – *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in WA* (EPA, 2004a);
- Position Statement No. 2 – *Environmental protection of native vegetation in Western Australia* (EPA 2000); and
- Position Statement No. 3 – *Terrestrial biological surveys as an element of biodiversity protection* (EPA 2002).

The EPA notes that the *Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment* was released in December 2015. This was after flora and vegetation surveys were undertaken for the proposal (and after the proponent's Response to Submissions on the PER), therefore the EPA did not consider this document for the assessment.

Guidance Statement No. 51 – Terrestrial flora and vegetation surveys for environmental impact assessment in WA

Relevant matters discussed in Guidance Statement No. 51 for this assessment include the following objectives:

1. Surveys are planned and designed appropriately.
2. The analysis, interpretation and reporting is of a suitable quality and consistent methodology to enable the EPA to judge the impacts of proposals on flora and vegetation.
3. The environment, in particular significant flora and vegetation biodiversity is identified and protected.

Position Statement No. 2 – Environmental protection of native vegetation in Western Australia

Relevant matters discussed in Position Statement No. 2 for this assessment include the following, in relation to the EPA's consideration of biological diversity in assessing a proposal:

1. A comparison of development scenarios, or options, to evaluate protection of biodiversity at the species and ecosystem levels, and demonstration that all reasonable steps have been taken to avoid disturbing native vegetation.
2. No known species of plant or animal is caused to become extinct as a consequence of the development and the risks to threatened species are considered to be acceptable.

3. No association or community of indigenous plants or animals ceases to exist as a result of the project.
4. There would be an expectation that a proposal would demonstrate that the vegetation removal would not compromise any vegetation type by taking it below the “threshold level” of 30% of the pre-clearing extent of the vegetation type.
5. Where a proposal would result in a reduction below the 30% level, the EPA would expect alternative mechanisms to be put forward to address the protection of biodiversity.
6. There is a comprehensive, adequate and secure representation of scarce endangered habitats within the project area and/or in areas which are biologically comparable to the project area, protected in secure reserves.
7. The on-site and off-site impacts of the project are identified and the proponent demonstrates that these impacts can be managed.

Position Statement No. 3 – Terrestrial biological surveys as an element of biodiversity protection

Relevant matters discussed in Position Statement No. 3 for this assessment include the following:

1. The EPA expects proponents to demonstrate in their proposals that all reasonable measures have been undertaken to avoid impacts on biodiversity. Where some impact on biodiversity cannot be avoided, it is for the proponent to demonstrate that the impact will not result in unacceptable loss.
2. The EPA expects proponents to ensure that terrestrial biological surveys provide sufficient information to address both biodiversity conservation and ecological function values within the context of the type of proposal being considered and the relevant EPA objectives for protection of the environment.
3. The EPA requires that the quality of information and scope of field surveys meets the standards, requirements and protocols as determined and published by the EPA.
4. The EPA expects proponents to ensure that terrestrial biological surveys provide sufficient information to address both biodiversity conservation and ecological function values within the context of the type of proposal being considered and the relevant EPA objectives for protection of the environment.
5. In the absence of information that could provide the EPA with assurance that biodiversity will be protected, the EPA will adopt the precautionary principle.

Position Statement No. 3 refers to definitions, principles and objectives in the first national biodiversity strategy *National Strategy for the Conservation of Australia’s Biological Diversity* (Commonwealth of Australia, 1996). The EPA notes that the most recent version of the strategy, *Australia’s Biodiversity Conservation Strategy 2010–2030* (Commonwealth of Australia, 2010), refers to a shortened definition of biological diversity and contains different principles. The 2010 Strategy also notes that a review of the 1996 Strategy found it difficult to objectively measure performance against the qualitative objectives in the 1996 Strategy and that there have been shifts in environmental management approaches regarding biodiversity conservation.

Therefore, the EPA has not considered the matters relating to the 1996 Strategy to be relevant for this assessment.

2. Terrestrial Fauna

The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- Position Statement 3 – *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (EPA 2002);
- Guidance Statement 56 – *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004);
- Guidance Statement 20 – *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia* (EPA 2009);and
- Technical Guide on Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment.

Position Statement No. 3 – Terrestrial biological surveys as an Element of Biodiversity Protection

Relevant matters discussed in Position Statement No. 3 for this assessment include the following:

1. The EPA expects proponents to demonstrate in their proposals that all reasonable measures have been undertaken to avoid impacts on biodiversity. Where some impact on biodiversity cannot be avoided, it is for the proponent to demonstrate that the impact will not result in unacceptable loss.
2. The EPA expects proponents to ensure that terrestrial biological surveys provide sufficient information to address both biodiversity conservation and ecological function values within the context of the type of proposal being considered and the relevant EPA objectives for protection of the environment.
3. The EPA requires that the quality of information and scope of field surveys meets the standards, requirements and protocols as determined and published by the EPA.
4. The EPA expects proponents to ensure that terrestrial biological surveys provide sufficient information to address both biodiversity conservation and ecological function values within the context of the type of proposal being considered and the relevant EPA objectives for protection of the environment.
5. In the absence of information that could provide the EPA with assurance that biodiversity will be protected, the EPA will adopt the precautionary principle.

Position Statement No. 3 refers to definitions, principles and objectives in the first national biodiversity strategy *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia, 1996). The EPA notes that the most recent version of the strategy, *Australia's Biodiversity Conservation Strategy 2010–2030* (Commonwealth of Australia, 2010), refers to a shortened definition of biological diversity and contains different principles. The 2010 Strategy also notes that a review

of the 1996 Strategy found it difficult to objectively measure performance against the qualitative objectives in the 1996 Strategy and that there have been shifts in environmental management approaches regarding biodiversity conservation. Therefore, the EPA has not considered the matters relating to the 1996 Strategy to be relevant for this assessment.

Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia

Relevant matters discussed in Guidance Statement No. 56 for this assessment include the following:

1. Survey effort and methods are planned and designed appropriately.
2. The analysis, interpretation and reporting is of a suitable quality and consistent methodology to enable the EPA to judge the impacts of proposals on fauna and faunal assemblages.
3. The environment, in particular significant fauna and faunal assemblages, is identified and protected through best practice.

Guidance Statement No. 20 – Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in WA

Relevant matters discussed in Guidance Statement No. 20 for this assessment include the following:

1. The proponent provides sufficient information through habitat assessment, sampling, and within the constraints of reasonably available knowledge, to assess the risk that the conservation status of a SRE taxon would be adversely affected as a result of the proposal.
2. Where a SRE taxon is listed as Specially Protected, the risk assessment and sampling data would need to provide sufficient contextual information on habitat, distribution and abundance to allow a decision to be made as to whether or not approval could be given for the species to be 'taken' pursuant to the *Wildlife Conservation Act 1950*.

Technical Guide on Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment

Relevant matters discussed in the Technical Guide for this assessment include the following:

1. Ensure adequate data of a high standard is obtained for environmental impact assessment; and
2. Surveys need to be conducted by practitioners with the appropriate level of expertise to conduct an acceptable survey.

3. Rehabilitation and Decommissioning

The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

- *Guidelines for preparing mine closure plans* (DMP & EPA 2015);
- Guidance Statement No. 6 – *Rehabilitation of terrestrial ecosystems* (EPA 2006); and
- Environmental Protection Bulletin No. 19 – *EPA involvement in mine closure* (EPA 2015).

The EPA notes that Guidance Statement No. 6 – *Rehabilitation of Terrestrial Ecosystems* was prepared in 2006 to guide the preparation of documentation for the environmental impact assessment process of EPA and to help produce management plans to rehabilitate vegetation. The more recent *Guidelines for preparing mine closure plans* (2011 and revised 2015) also guides the preparation of Environmental Impact Assessment documentation and mine closure plans (which include the rehabilitation of vegetation) for mining proposals. The EPA considers that for the mine component of the proposal, the more recent *Guidelines for preparing mine closure plans* is more relevant to its assessment than Guidance Statement No. 6.

Guidelines for preparing mine closure plans

Relevant matters discussed in the *Guidelines for preparing mine closure plans* for this assessment include the following:

1. Mine closure planning should be an integral part of mine development and operations planning and it is a progressive process.
2. The EPA requires that Mine Closure Plans be prepared in accordance with the guidelines.
3. Where mining projects are subject to the Mining Act, and Rehabilitation and Decommissioning is considered a Key Integrating Factor by the EPA, both DMP and the EPA will assess the Mine Closure Plan.
4. Where the EPA concludes that Rehabilitation and Decommissioning is a Key Integrating Factor in its EPA report on the proposal, the EPA will recommend a condition requiring a Mine Closure Plan to be prepared that is consistent with these guidelines.

Guidance Statement No. 6 – Rehabilitation of Terrestrial Ecosystems

Relevant matters discussed in Guidance Statement No. 6 for this assessment include the following:

1. Information about the diversity of plants and their capacity to recruit from seeds.
2. The setting of rehabilitation objectives that take into account the complexity of constraints to effective rehabilitation.
3. The setting of completion criteria that are attainable in realistic timeframes and ensure rehabilitation objectives have been met.

4. The use of similar rehabilitation objectives and completion criteria within particular industries and within geographical regions when appropriate.
5. Life of mine approaches are required where financial and logistical planning required for effective rehabilitation occurs early in the life of projects (ANZMEC 2000).

Environmental Protection Bulletin No. 19 – EPA involvement in mine closure

Relevant matters discussed in Environmental Protection Bulletin No. 19 for this assessment include the following:

1. DMP and the EPA may both assess mine closure when an impact or risk is significant. The EPA is most likely to consider an impact or risk significant when an environmental asset with special or unique characteristic is being impacted, or a certain aspect of mine closure poses a high environmental risk.
2. Where Rehabilitation and Decommissioning is seen as a key integrating factor, the EPA will assess mine closure. A condition will be recommended to require a Mine Closure Plan to be prepared in accordance with the guidelines.

4. Offsets

The EPA considers that the following policy and guidance is relevant to its assessment of the proposal in relation to this factor:

1. *WA Environmental Offsets Policy* (Government of Western Australia 2011)
2. *WA Environmental Offset Guidelines* (Government of Western Australia 2014)
3. Environmental Protection Bulletin No.1 – *Environmental Offsets* (EPA 2014c)

WA Environmental Offsets Policy – Government of Western Australia

Relevant matters discussed in the Offsets Policy for this assessment include the following six principles in the Offsets Policy:

1. Environmental offsets will only be considered after avoidance and mitigation options have been pursued.
2. Environmental offsets are not appropriate for all projects (circumstances).
3. Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted.
4. Environmental offsets will be based on sound environmental information and knowledge.
5. Environmental offsets will be applied within a framework of adaptive management.
6. Environmental offsets will be focussed on longer term strategic outcomes.

WA Environmental Offset Guidelines - Government of Western Australia

The WA Environmental Offsets Guidelines complement the Offsets Policy by clarifying the determination and application of environmental offsets in Western Australia, with reference to the offsets principles in the Offsets Policy.

In addition to guidance on the application of the principles contained within the offsets Policy, the relevant matters discussed in the Offsets Guidelines for this assessment include the following:

1. Environmental offsets will only be applied where the residual impacts of a project are determined to be significant, after avoidance, minimisation and rehabilitation have been pursued.
2. Proponents must apply the mitigation hierarchy (avoid, minimise, rehabilitate and offset) to reduce the potential impacts of a proposal on the environment.
3. The Residual Impact Significance model outlines how significance is determined and when an offset is likely to be required, or may be required, in relation to the relevant EPA environmental factors.
4. An offset needs to be relevant not only to the environmental value being impacted but also to the associated attributes which may be lost or are at risk. Impacts to an environmental value are required to be offset by actions that benefit the same environmental value being impacted.

Environmental Protection Bulletin No. 1 – Environmental Offsets

Relevant matters discussed in Environmental Protection Bulletin No. 1 for this assessment include the following:

1. The EPA adopts the *WA Offsets Policy* and *WA Environmental Offsets Guidelines* for application through the environmental impact assessment process.
2. Where the EPA is of the view that a significant residual impact remains after avoidance, minimisation and rehabilitation efforts, the EPA will ensure that any offsets are recommended as conditions of approval in the EPA's report to the Minister for Environment, as well as including details on the rationale for the offset.
3. It is the EPA's preference to recommend specific offset conditions to the Minister rather than identifying the need for an offset plan to be developed post-approval.
4. As part of an Environmental Review document, proponents must include a section discussing how it has applied the mitigation hierarchy to its proposal. Offsets should be addressed in a separate section of the document, after the assessment of environmental factors.
5. If it is likely that a proposal will have a significant residual impact, the proponent should provide further details on the proposed offset, as outlined in the bulletin. The final decision on the need for and appropriateness of any offsets will be determined by the EPA at the end of the assessment process.

Appendix 5

Identified Decision-making Authorities
and
Recommended Environmental Conditions

Identified Decision-making Authorities

Section 44(2) of EP Act specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This Appendix contains the EPA's recommended conditions and procedures.

Section 45(1) requires the Minister for Environment to consult with decision-making authorities, and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following decision-making authorities have been identified:

Decision-making Authority	Approval
1. Minister for Environment	*Environmental Protection Act 1986*
2. Minister for Water	*Rights in Water and Irrigation Act 1914* – Water abstraction licence
3. Minister for Mines and Petroleum	*Mining Act 1978*
4. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* – Section 18 clearances
5. CEO, Department of Environment Regulation	*Environmental Protection Act 1986* - Works Approval and Licence
6. Mining Registrar, Department of Mines and Petroleum	*Mining Act 1978* – Grant of Miscellaneous Licences
7. Chief Dangerous Goods Officer, Department of Mines and Petroleum	*Dangerous Goods Safety Act 2004*
8. State Mining Engineer, Department of Mines and Petroleum	*Mines Safety and Inspection Act 1994*
9. CEO, Department of Parks and Wildlife	Conservation and Land Management Regulations 2002
10. Executive Director, Public Health, Department of Health	Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974
11. Shire of Laverton	*Building Act 2011* – planning approval
12. Shire of Menzies	*Building Act 2011* – planning approval
13. City of Kalgoorlie Boulder	*Building Act 2011* – planning approval

Note: In this instance, consultation and agreement is only required with DMAs No. 1 – No. 4 since these DMAs are Ministers.

Statement No. xxx

RECOMMENDED ENVIRONMENTAL CONDITIONS

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
***(Environmental Protection Act 1986*)**

CYCLONE MINERAL SANDS PROJECT

Proposal: Develop and operate the Cyclone Mineral Sands Mine, including open cut pits, mining and processing infrastructure, airstrip, accommodation camp, bore fields, and haul road from the mine site to the Forrest rail siding.

Proponent: Lost Sands Pty Ltd (Wholly owned subsidiary of Diatreme Resources Limited)
Australian Company Number 101 269 747

Proponent Address: Level 2, 87 Wickham Terrace
SPRING HILL, QLD 4000

Assessment Number: 1970

Report of the Environmental Protection Authority: 1575

Pursuant to section 45 of the *Environmental Protection Act 1986* it has been agreed that the proposal described and documented in Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

1 Proposal Implementation

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 in Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have been approved under the EP Act.

2 Contact Details

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Time Limit for Proposal Implementation

3-1 The proponent shall not commence implementation of the proposal after five (5) years from the date on this Statement, and any commencement, prior to this date, must be substantial.

3-2 Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

4 Compliance Reporting

4-1 The proponent shall prepare, submit and maintain a Compliance Assessment Plan to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation, whichever is sooner.

4-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.

4-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.

4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.

4-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

(1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;

(2) include a statement as to whether the proponent has complied with the conditions;

(3) identify all potential non-compliances and describe corrective and preventative actions taken;

(4) be made publicly available in accordance with the approved Compliance Assessment Plan; and

(5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

5 Public Availability of Data

5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps) relevant to the assessment of this proposal and implementation of this Statement.

5-2 If any data referred to in condition 5-1 contains particulars of:

(1) a secret formula or process; or

(2) confidential commercially sensitive information;

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

6 Haul Road - baseline flora and vegetation survey and road design and alignment

6-1 Prior to the commencement of ground disturbing activities the proponent shall prepare and submit to the CEO a baseline flora and vegetation survey plan on advice from Parks and Wildlife.

6-2 The survey plan shall:

(1) design an appropriate baseline survey to inform the final design and alignment of the Haul Road, to minimise impacts to conservation significant species and communities;

(2) identify, describe and spatially define the proposed baseline survey locations and reference/control sites for monitoring and rehabilitation purposes, and provide rationale for the location of the sites;

(3) describe how the information collected by the baseline survey will provide a suitable basis to monitor impacts to vegetation during operations and to monitor the progress of rehabilitation;

(4) detail the proposed frequency and timing of the surveys; and

(5) define information to be collected to inform the setting of completion criteria for the rehabilitation of the haul road.

6-3 After receiving notice in writing from the CEO, on advice from Parks and Wildlife, that the baseline flora and vegetation survey plan satisfies the requirements of condition 6-2, the proponent shall undertake the baseline survey in accordance with the survey plan.

6-4 On completion of the baseline survey, the proponent shall report to the CEO on the following, within 6 months of completion of the survey or as otherwise agreed in writing by the CEO:

(1) completion of the baseline survey in accordance with the survey plan;

(2) the results of the baseline survey; and

(3) the final design and alignment of the haul road.

6-5 After receiving notice in writing from the CEO, on advice from Parks and Wildlife, that the final design and alignment of the haul road is acceptable, the proponent may commence construction of the haul road in accordance with the the final design and alignment of the haul road required by condition 6-4(3).

7 Management-based Condition Environmental Management Plans

7-1 The proponent shall prepare and submit Condition Environmental Management Plans, in consultation with Parks and Wildlife, following submission of the baseline survey report required by condition 6, which the CEO has confirmed by notice in writing, satisfies the requirements of conditions 6-2, 6-3 and 6-4.

(1) prior to the commencement of ground disturbing activities, to demonstrate that the **environmental objective** in condition 8-1 will be met; and

(2) within 12 months of the commencement of construction of the haul road or as otherwise agreed in writing by the CEO, to demonstrate that the **environmental objective** in condition 9-1 will be met;

7-2 The Condition Environmental Management Plans shall:

(1) specify the **environmental objectives** to be achieved, as specified in conditions 8-1 and 9-1;

(2) specify risk-based **management actions** that will be implemented to demonstrate compliance with the environmental objectives specified in 8-1 and 9-1. Failure to implement one or more of the management actions represents non-compliance with these conditions;

(3) specify measurable **management targets** to determine the effectiveness of the risk-based management actions;

(4) specify **monitoring** to measure the effectiveness of management actions against management targets, including but not limited to, parameters to be measured, baseline data, monitoring locations, monitoring methods, and frequency, timing and intensity of monitoring;

(5) specify and describe methods for **analysis** of monitoring data and evaluation of monitoring results against environmental objectives and management targets;

(6) specify a process for **revision** of management actions and changes to proposal activities, in the event that the management targets are not achieved. The process shall include an investigation to determine the cause of the management targets being exceeded;

(7) provide the format and timing to demonstrate that conditions 8-1 and 9-1 have been met for the reporting period in the Compliance Assessment Report required by condition 4-6 including, but not limited to:

(a) verification of the implementation of management actions; and

(b) reporting on the effectiveness of management actions against management target(s).

7-3 After receiving notice in writing from the CEO, on advice from Parks and Wildlife, that the Condition Environmental Management Plans satisfy the requirements of condition 7-2 for conditions 8-1 and 9-1, the proponent shall:

(1) implement the provisions of the Condition Environmental Management Plans; and

(2) continue to implement the Condition Environmental Management Plan required under condition 8 until the CEO has confirmed by notice in writing, on the advice of the CEO and Parks and Wildlife, that the proponent has demonstrated the objectives specified in conditions 8-1 and 9-1 have been met.

7-4 In the event that monitoring, tests, surveys or investigations indicate exceedance of management targets specified in the Condition Environmental Management Plans, the proponent shall:

(1) report the exceedance in writing to the CEO within 21 days of the exceedance being identified;

(2) investigate to determine the cause of the management targets being exceeded;

(3) provide a report to the CEO within 90 days of the exceedance being reported as required by condition 7-4(1). The report shall include:

(a) cause of management targets being exceeded;

(b) the findings of the investigation required by conditions 7-4(2);

(c) details of revised and/or additional management actions to be implemented to prevent exceedance of the management target(s);

(d) relevant changes to proposal activities.

7-5 In the event that monitoring, tests, surveys or investigations indicate that one or more management actions specified in the Condition Environmental Management Plan have not been implemented, the proponent shall:

(1) report the failure to implement management action/s in writing to the CEO within 7 days of identification;

(2) investigate to determine the cause of the management action(s) not being implemented;

(3) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to the failure to implement management actions;

(4) provide a report to the CEO within 21 days of the reporting required by condition 7-5(1). The report shall include:

(a) cause for failure to implement management actions;

(b) the findings of the investigation required by conditions 7-5(2) and 7-5(3);

(c) relevant changes to proposal activities; and

(d) measures to prevent, control or abate the environmental harm which may have occurred.

7-6 The proponent:

(1) may review and revise the Condition Environmental Management Plans, and

(2) shall review and revise the Condition Environmental Management Plans as and when directed by the CEO.

7-7 The proponent shall implement the latest revision of the Condition Environmental Management Plans, which the CEO on advice of Parks and Wildlife has confirmed by notice in writing, satisfies the requirements of condition 7-2.

8 Haul Road design, construction, maintenance and operation

8-1 The proponent shall manage the implementation of the proposal to meet the following **environmental objective**:

(1) Design, construct and operate the Haul Road to minimise impacts on flora and vegetation, and terrestrial fauna values of the GVDNR.

8-2 The plan required by condition 7-1 shall include provisions required by 7-2 to manage impacts from the Haul Road that address the following, including, but not limited to:

(1) delineating the limits of approved direct and indirect impacts;

(2) minimising clearing of vegetation through the use of an internal clearing permit system for each section of the haul road, that includes management actions to be taken prior to clearing;

(3) maximising the potential for rehabilitation success (including topsoil collection and appropriate storage, seed collection, management and remediation (if required) of the soil profile, and rehabilitation trials);

(4) minimising the disruption of surface water flows to prevent impacts associated with drainage shadows, ponding, and erosion;

(5) defining the source of borrow and demonstrating that no borrow pits would be located within the GVDNR;

(6) managing potential impacts of any material that may be imported into the GVDNR;

(7) managing light, noise and vibration during haul road construction;

(8) minimising and managing the impacts of dust on vegetation during construction and operation of the haul road;

(9) preventing unauthorised access to the haul road, to avoid increased access to the GVDNR;

(10) minimising the spread or introduction of weeds within the GVDNR during construction and operation of the haul road, with the objective of no increase in the extent or number of weed species within the GVDNR as a result of implementation of this proposal at closure;

(11) managing access of feral animals to the GVDNR during construction and operation of the haul road to minimise impacts to the GVDNR;

(12) minimising the risk of vehicle strike on native animals;

(13) fire prevention, preparedness and management; and

(14) communication protocol with Parks and Wildlife regarding cooperative management of the haul road and the reserve.

9 Rehabilitation of the Haul Road within the Great Victoria Desert Nature Reserve (GVDNR)

9-1 The proponent shall manage the implementation of the proposal to meet the following **environmental objective**:

(1) The proponent shall ensure that the Haul Road is decommissioned and rehabilitated in an ecologically sustainable manner such that the post-haul road environment is ecologically stable, resilient and consistent with the purpose and values of the GVDNR.

9-2 The provisions required by 7-2 for the plan required by condition 7-1 shall include, but not be limited to

(1) rehabilitation investigations, including trials to commence within 12 months of the commencement of ground disturbing activities or as otherwise agreed in writing by the CEO, to assist in determining the most effective and efficient means to revegetate areas of direct and indirect impact within the GVDNR;

(2) quantitative completion criteria that address, but are not limited to, landform, soil integrity, percentage cover, abundance, and species diversity of living self-sustaining native vegetation and weeds are developed from information collected during the rehabilitation trials

required by condition 9-2(1), and baseline flora and vegetation survey required by condition 6, to the satisfaction of the CEO on advice of Parks and Wildlife;

(3) management actions to prevent unauthorised access to the Haul Road during and following the completion of rehabilitation works;

(4) rehabilitation management actions to achieve targets for percentage cover, abundance, and species diversity of living self-sustaining native vegetation comparable to that of undisturbed natural analogue sites consistent with the completion criteria required by condition 9-2(2);

(5) actions (monitoring and management) required to prevent unauthorised access by people and feral animals following closure; and

(6) monitoring of the progress of rehabilitation required by condition 9-2(4) annually for the first 5 years after Operations cease and thereafter at a frequency agreed by the CEO, on advice of Parks and Wildlife.

9-3 The proponent shall prepare and submit to the CEO a performance report on the progress of the implementation of the plan required by condition 9-2 every 2 years or at a frequency agreed by the CEO and provide the report to Parks and Wildlife;

10 Offsets

10-1 In view of the significant residual impacts and risks to the GVDNR as a result of implementation of the proposal, the proponent shall provide direct funding of $3,600,000 AUD (excluding GST) to be paid at a rate of $360,000 AUD (excluding GST) per annum for 10 years following the commencement of operations (as defined in Table 3 of Schedule 1) to Parks and Wildlife or an alternative offset arrangement providing an equivalent outcome as determined by the Minister.

10-2 The proponent's contribution identified in condition 10-1 shall be paid annually, the first payment due 18 months after the commencement of ground disturbing activities in the GVDNR.

10-3 The **environmental outcome** of the offset contribution is to improve the environmental values of the GVDNR.

10-4 The proponent shall prepare an offsets plan to the satisfaction of the CEO, on advice of Parks and Wildlife, prior to the commencement of ground disturbing activities, to demonstrate that the **environmental outcome** in condition 10-3 will be met.

10-5 The plan shall specify the following:

(1) that the offset contribution is for the GVDNR and the area subject to the plan is the GVDNR;

(2) details of on-ground management actions, including but not limited to, fire management; biological surveys and weed control; and feral animal management.

(3) the funding schedule and financial arrangements including the amount of the offset contribution to be used for purposes including, but not limited to:

(a) salaries for supervisory and/or operational positions within Parks and Wildlife and funding of external contract positions, for the purpose of carrying out offset activities within the GVDNR;

(b) operation costs including vehicles, aircraft time and machine hire; and

(c) on-ground management actions, including but not limited to, fire management; biological surveys and weed control; and feral animal management.

(4) information on how the on-ground management actions required by condition 10-5(2) will be additional to current management activities and work programs for the GVDNR.

10-6 To demonstrate that the **environmental outcome** required by condition 10-3 has been met for the reporting period, the Proponent shall include evidence, prepared in consultation with Parks and Wildlife, in the Compliance Assessment Report required by condition 4-6 including, but not limited to:

(1) a description of the allocation of funds;

(2) verification of the implementation of the management actions within the GVDNR against the offsets plan required by condition 10-4; and

(3) information on the effectiveness of the management actions.

10-7 The real value of contributions described in conditions 10-1 will be maintained through annual indexation to the Perth Consumer Price Index, with the first adjustment to be applied to the first contribution and each subsequent contribution to be calculated from the previous year's amount.

Schedule 1

Table 1: Summary of the Proposal

Proposal Title	Cyclone Mineral Sands Project
Short Description	The proposal is for the construction and operation of the Cyclone Mineral Sand Mine 317 km north of Eucla. The proposal includes open cut mine pits, supporting infrastructure (including tailings storage, processing facilities, water storage, offices, accommodation camp and airstrip, construction and operation of a borefield for water supply, and construction and operation of a 240 km haul road through the Great Victoria Desert Nature Reserve from the mine to the Forrest rail siding for purposes limited to mining under this proposal.

Table 2: Location and authorised extent of physical and operational elements

Column 1	Column 2	Column 3
Element	**Location**	**Authorised Extent**
Mine and supporting infrastructure	Figure 2	Clearing of no more than 805 hectares (ha) of vegetation within the 1,028 ha Mine Area Development Envelope.
Haul Road	Figure 1	Clearing of no more than 467 ha of vegetation within the 2,561 ha Haul Road Development Envelope. The total clearing of 467 ha includes clearing of no more than 306 ha within the Great Victoria Desert Nature Reserve.

Table 3: Abbreviations and Definitions

Acronym or Abbreviation	Definition or Term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his delegate.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
GVDNR	Great Victoria Desert Nature Reserve (class A)
ha	Hectare
OEPA	Office of the Environmental Protection Authority

Acronym or Abbreviation	Definition or Term
Operations	Any year or part of a year following the commencement of ground disturbance, including years in which the mine is in care and maintenance, until the haul road is decommissioned.
Weed	"*Weed - Any species (native, or more frequently exotic to a region) "which has the potential to have detrimental effects on economic, social, or conservation values" (ARMCANZ, ANZECC and Forestry Ministers 1997)*
Haul Road	The section of road constructed by the proponent between the boundary of the Mine Area Development Envelope and the Forrest Rail siding, within the Haul Road Development Envelope as shown in Figure 1.
Parks and Wildlife	The Department of Parks and Wildlife, or the state government agency currently responsible for the management of the Great Victoria Desert Nature Reserve

Figures (attached)

Figure 1 Haul Road Development Envelope
Figure 2 Mine Area Development Envelope

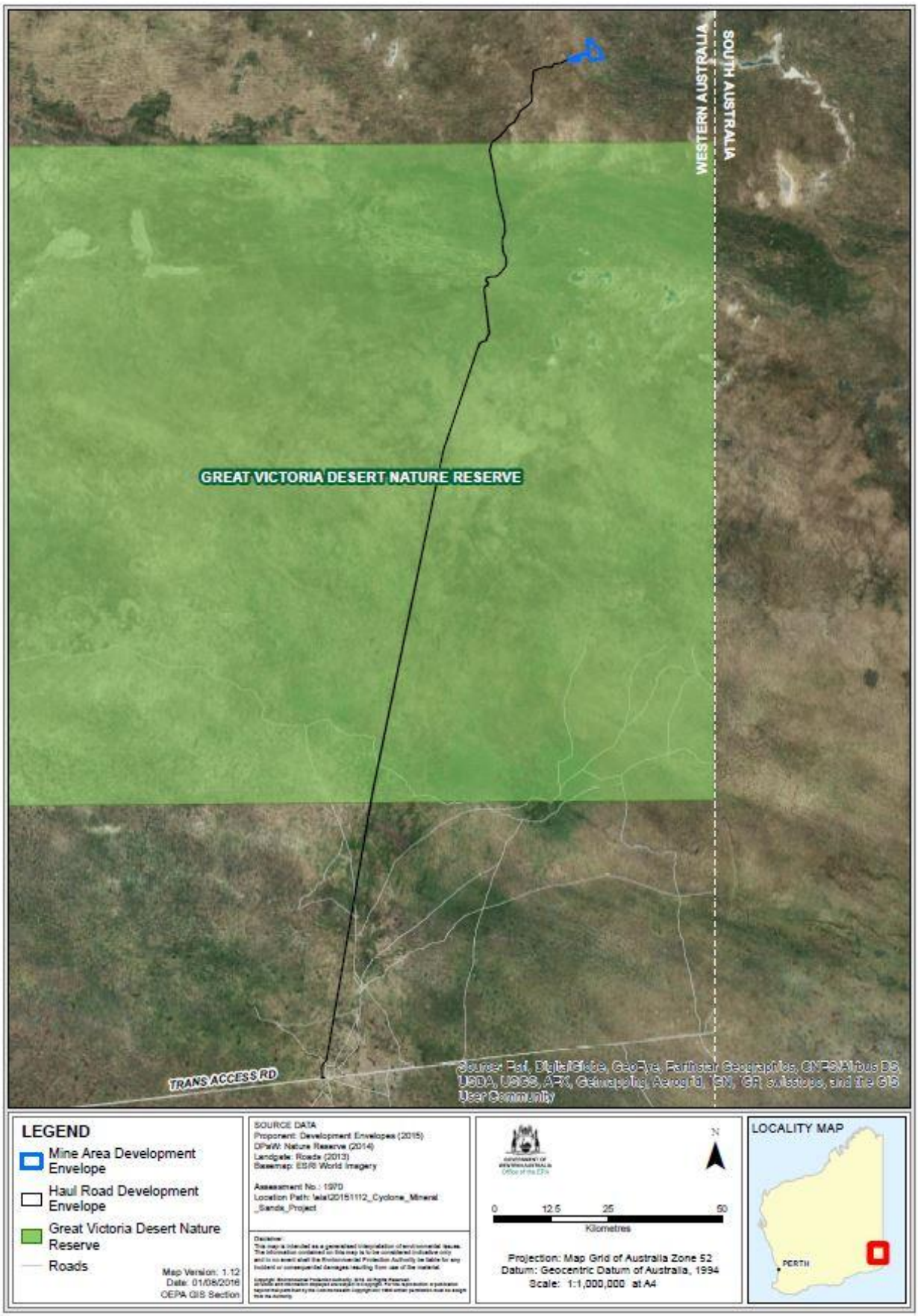

Figure 1: Haul Road Development Envelope

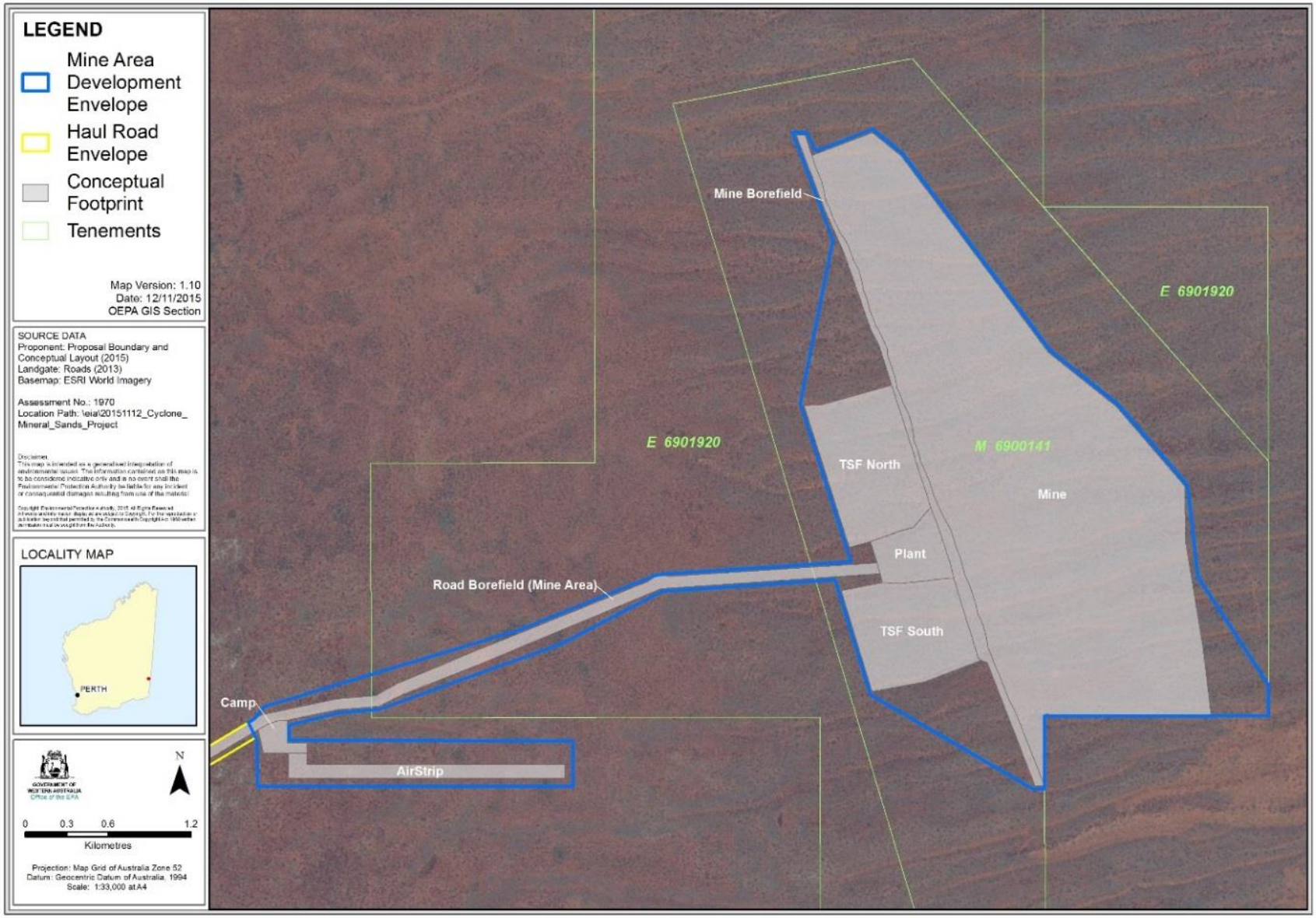

Figure 2: Mine Area Development Envelope

Schedule 2

Coordinates defining the two Cyclone Mineral Sands Project development envelopes are held by the Office of the Environmental Protection Authority:

- Mine Area Development Envelope – Document reference number 2016-1467008015102, dated 27 June 2016.
- Haul Road Development Envelope – Document reference number 2016-1467008014323, dated 27 June 2016.

Appendix 6

Summary of Submissions and
Proponent's Response to Submissions

Provided on CD in hardcopies of this report and on the EPA's website at www.epa.wa.gov.au