

# **Mesa K Remnant Mining Project**

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**Robe River Mining Company Pty Ltd**

**Report and Recommendations  
of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 1283  
March 2008**

### **Environmental Impact Assessment Process Timelines**

<b>Date</b>	<b>Progress stages</b>	<b>Time (weeks)</b>
<b>19/04/07</b>	<b>Referral received</b>	
<b>07/06/07</b>	<b>Intention to set EPS Level of Assessment advertised (no appeals)</b>	<b>7</b>
<b>26/02/08</b>	<b>Proponent's Final EPS document received by EPA</b>	<b>38</b>
<b>25/03/08</b>	<b>EPA report to the Minister for the Environment</b>	<b>4</b>

**Report Released: 25/03/08**

**Appeals Close: 08/04/08**

**Assessment No. 1728**

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# 1. Introduction and background

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the proposal by Robe River Mining Company Pty Ltd to undertake mining of remnant iron ore in the previously mined Mesa K deposit. The proposal is located in the Robe Valley area of the Pilbara Region, Western Australia, approximately 11 km south-west of the town of Pannawonica (Figure 1). The Mesa K deposit was previously mined from February 1988 to May 1995 under an approved Notice of Intent and approvals pursuant to the *Iron Ore (Robe River) Agreement Act 1964* (Strategen, 2008).

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

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

The EPA may include in the report any other advice and recommendations as it sees fit.

The EPA was advised of the proposal in April 2007. Based on the information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal, as described, could be managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on 7 May 2007 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS document which accompanies this report. The EPS document sets out the details of the proposal, potential environmental impacts and appropriate commitments to manage those impacts. The EPA notes that the proponent has consulted with relevant stakeholders.

The EPA considers that the proposal can be managed to meet the EPA's environmental objectives, subject to the EPA's recommended conditions being made legally binding.

The EPA therefore has determined, under Section 40 of the EP Act, that the level of assessment for the proposal is EPS, and this report provides the EPA advice and recommendations in accordance with Section 44 of the EP Act.

## 2. The proposal

The proposal is described in detail in the proponent's EPS document (Strategen, 2008). The proponent proposes to mine the remnant iron ore in the previously mined Mesa K deposit located on Mining Lease AML 70/00248 Sec 104. The Mesa K deposit was previously mined from 1988 to 1995, producing approximately 48.2 million tonnes (Mt) of pisolite ore. The Mesa J iron ore mining operation, managed by the proponent, is also located on Mining Lease AML 70/00248 Sec 104. The proposed Mesa K Remnant

Mining Project is intended to meet the shortfall of dry ore produced from Mesa J and will be operated as a satellite project to the current Mesa J operation. The proposal will utilise the existing Mesa J equipment fleet, personnel and infrastructure.

As stated in the EPS (Strategen, 2008) the proposal will involve:

- mining of remnant ore in five existing open cut pits: Gravel Yard pit, Central pit, West-South pit, West-North pit and Gully pit (Figure 2);
- mining by conventional drill and blast, load and haul occurring concurrently with Mesa J mainly through the dry months of May to December, utilising equipment fleet, personnel and other resources from Mesa J;
- haulage of Run of Mine (ROM) ore by truck from Mesa K to Mesa J using the existing mine access road (any additional roads required for access at Mesa K will be constructed in previously disturbed areas);
- minor realignment and widening of the existing mine access road from Mesa K to Mesa J;
- establishment of transportable office, portable crib room, toilets, septic tank, water tank and generators (Figure 2); and
- sourcing of water and fuel from existing Mesa J facilities.

A copy of the EPS is available from Robe River Company Pty Ltd or on Rio Tinto's web site at <http://www.riotintoironore.com/ENG/media/337.asp>. A CD version of the EPS is enclosed with this report.

The key components of the proposal are summarised in Table 1 below:

**Table 1: Summary of key proposal characteristics**

Element	Description
General	
Project life	Approximately 2 – 3 years
Ore deposit	Approximately 12 – 13 Mt high grade ore Approximately 6 Mt low grade ore
Area of new disturbance	Approximately 10 ha clearing of native vegetation
Mine and mining	
Ore type	Pisolite iron ore
Ore location	Above watertable
Stripping ratio	The ratio of waste and low grade ore to high grade ore will be approximately 1:1
Waste rock disposal	Initially directed to surface waste dumps and, thereafter, used in progressive backfilling of mine pits as far as practicable
Product transport	
Product transport	By existing mine access road from Mesa K to Mesa J (4km), then via existing rail infrastructure from Mesa J to Cape Lambert
Infrastructure	
Power	On-site portable generator (diesel powered)
Access roads	Upgrade of existing mine access road from Mesa K to Mesa J
Other facilities	Transportable office, portable crib room, toilets, septic tank and water tank at Mesa K
Water	
Water use	Water requirements are low and will be limited to the purposes of dust suppression, crib room and ablutions. Water will be supplied from the existing Mesa J operation via trucks and will be stored in on-site water tanks. Potable water will

	be supplied separately. Supply will be within the current licence limits for Mesa J.
<b>Workforce</b>	
Workforce	Existing Mesa J workforce
Accommodation	Existing accommodation in Pannawonica

**Abbreviations**

Mt million tonnes

Mtpa million tonnes per annum

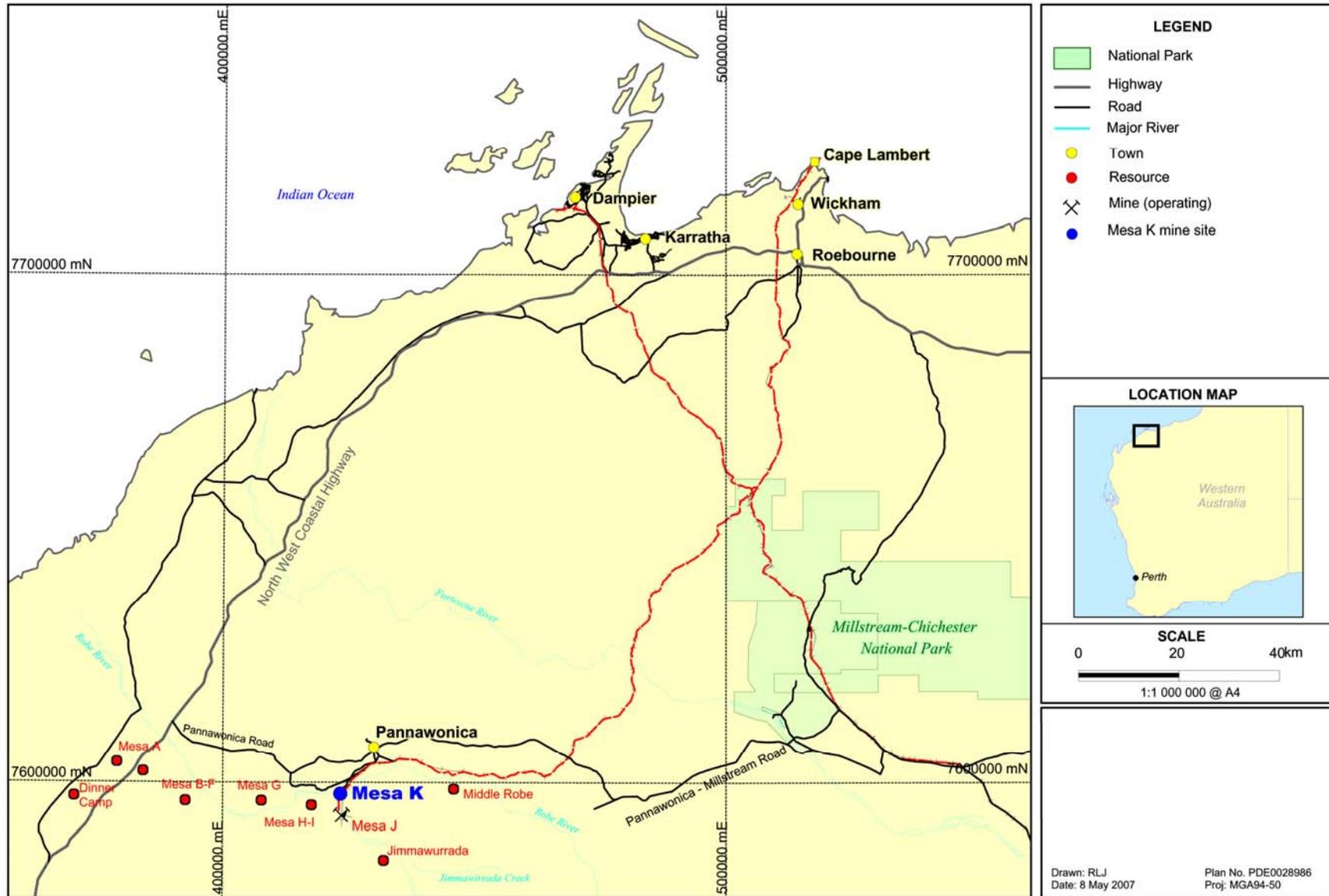
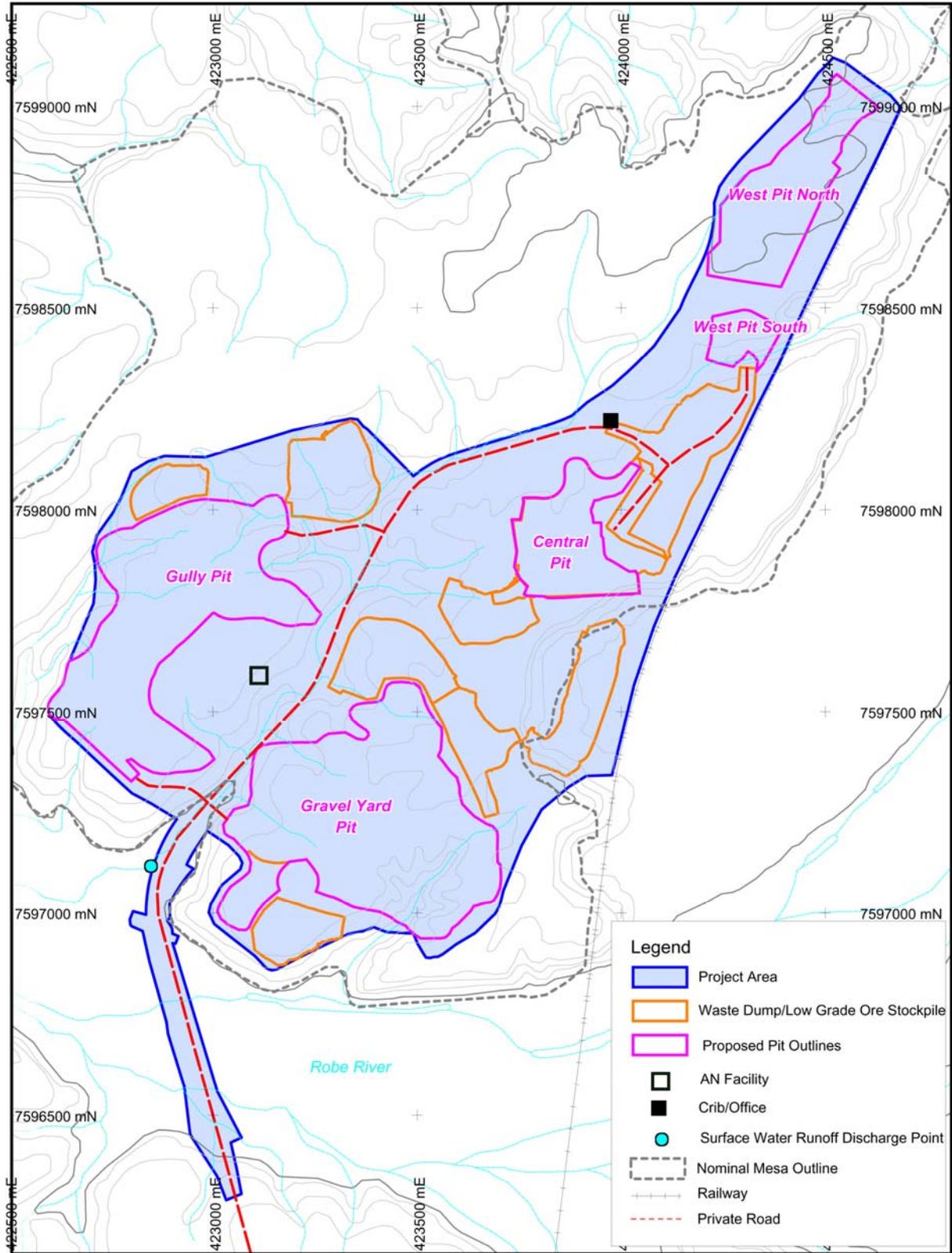


Figure 1: Regional location of Mesa K mine site



*Figure 2: Mesa K conceptual mine site layout*

The potential impacts of the proposal are discussed by the proponent in the EPS document (Strategen, 2008).

### **3. Consultation**

During the preparation of the EPS document, the proponent has undertaken consultation with government agencies and key stakeholders.

The main issues raised in consultation related to:

- subterranean fauna and habitat retention;
- flora and vegetation;
- retention of the southern escarpment adjacent to the Robe River;
- aboriginal heritage; and
- mine closure and rehabilitation.

Table 4 of the EPS document (Strategen, 2008) details the agencies, groups and organisations consulted, the issues raised, comments received and the proponent's responses.

The EPA considers that the consultation process has been appropriate and that reasonable steps have been taken to inform the community and stakeholders on the proposed development.

### **4. Key environmental factors**

It is the EPA's opinion that the following key environmental factors relevant to the proposal require evaluation in this report:

- (a) Subterranean fauna (troglofauna)
- (b) Closure planning and rehabilitation

The key environmental factors are discussed in Sections 4.1 and 4.2 of this report. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

#### **4.1 Fauna**

##### **Description**

###### *Terrestrial fauna*

The edges of Mesa K and similar mesas are characterised by the presence of caves and overhangs, which are potentially important habitats for cave-dwelling bat species. The southern escarpment of Mesa K contains at least two caves that support a number of bat species. Due to their shallow nature, neither of these caves are thought to constitute a significant maternity roost for any bat species of conservation significance. It is considered likely that the southern escarpment also provides important habitat for the endangered Northern Quoll and short-range endemic invertebrates (Strategen, 2008).

### *Subterranean fauna*

Subterranean fauna are predominantly invertebrate animals that inhabit underground habitats. These fauna include stygofauna (obligate groundwater-dwelling aquatic fauna) and troglofauna (obligate terrestrial fauna that inhabit air chambers in underground caves or small, humid, air-filled voids) (Strategen, 2008).

Sampling for subterranean fauna undertaken by Biota Environmental Sciences in 2003 at Mesa A (approximately 40km west of Mesa K) unexpectedly recorded four troglobitic taxa within voids in the pisolite resource. Troglofauna had not previously been documented from mesa formations in the mainland Pilbara Region (Strategen, 2008).

Troglofauna communities have since been found to be widely distributed within the Robe Valley (Strategen, 2008).

The proposed remnant mining of Mesa K does not involve mining below the water table or groundwater abstraction.

Sampling for troglofauna at Mesa K was carried out by Biota Environmental Sciences using the same approach as the 2003 sampling program at Mesa A.

Seven orders (Schizomida, Pseudoscorpionida, Scolopendrida, Polydesmida, Polyxenida, Coleoptera, and Diplura) of troglobitic fauna have been recorded at Mesa K, totalling 178 individuals, during four separate phases of sampling from 2004 - 2007. The results from Phases 1 - 4 are detailed in the proponent's EPS document (Strategen, 2008).

The troglofauna recorded at Mesa K were identified as 10 individual taxa. All of the 10 taxa recorded are treated as being endemic (i.e. unique) to Mesa K.

Five of the collected taxa were either singletons<sup>1</sup> or were collected only within the preliminary nominal pit boundaries at the completion of four phases of sampling:

1. *Lagynochthonius* sp. nov. (Pseudoscorpionida): drill hole MEK1689.
2. *Indohya* sp. nov. (Pseudoscorpionida): drill hole MEK1696.
3. *Cryptops* sp. 1 (Scolopendrida): drill hole MEK1570.
4. *Heterojapyx* sp. nov. (Diplura): drill hole MEK1478.
5. *Polyxenida* sp. indet. (Polyxenida): drill holes MEK1551 and MEK1556.

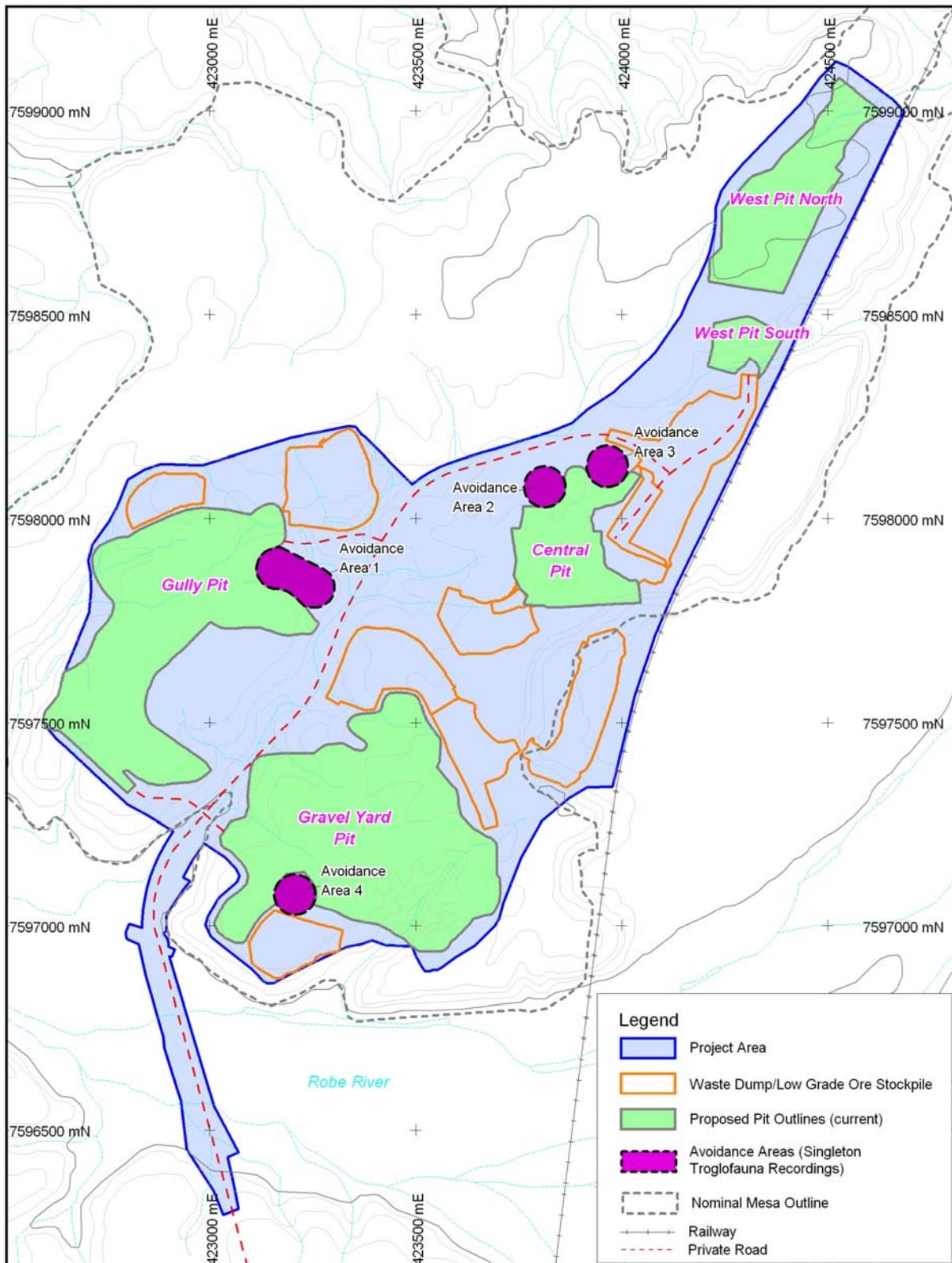
Following troglofauna sampling and identification, Robe revised the preliminary nominal pit boundaries to ensure each of the singleton species is now outside the actual proposed pit boundaries (Figure 3). A 50 m radius buffer around the singleton species has also been proposed where disturbance will be avoided (Figure 4).

A fifth phase of the troglofauna sampling at Mesa K has recently been undertaken, focusing on areas outside the proposed mining area. The fifth phase of sampling did not record any new singleton troglofauna species, however another *Cryptops* sp. 1 individual was recorded, reducing the number of singletons to four. As the results of the fifth phase of sampling were not available in full during preparation of the EPS, Robe has applied the precautionary principle and treated the initial recording of *Cryptops* sp. 1 as a singleton species.

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<sup>1</sup> Singletons are taxa that are represented by only one individual.





**Figure 4: Singleton troglofauna locations and associated avoidance areas**

Troglobitic fauna at Mesa K would be directly impacted through the removal of habitat and loss of individuals by mining of remnant ore in five existing open cut pits: Gravel Yard pit, Central pit, West-South pit, West-North pit and Gully pit. The Mesa K pisolite surface outline is approximately 254 ha (Strategen, 2008). Of this, approximately 90 ha (35%) will be disturbed by the proposal, of which 7 ha is new disturbance within the pisolite outline.

The above water table pisolite resource at Mesa K (which represents the potential troglofauna habitat) is approximately 180 Mt. Robe proposes to disturb approximately 22 Mt of this resource, which equates to disturbance to less than 15 per cent (by volume) of the potential troglofauna habitat (i.e. approximately 85% of potential troglofauna habitat will be retained (Strategen, 2008).

### **Assessment**

The EPA's environmental objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge.

The southern escarpment is likely to be the only significant potential habitat of the Northern Quoll and short-range endemic invertebrates and contains the two surveyed caves which recorded an itinerant individual of the Orange Leaf-nosed Bat. The EPA notes that the southern escarpment will not be disturbed by the proposal and will be protected by a substantial buffer between the edge of the mesa and adjacent mining areas. The EPA therefore considers the proposal will not impact upon the conservation status of these species.

The EPA notes that mining is not proposed below the water tables and therefore considers that operations at Mesa K will not adversely affect stygofauna.

The EPA acknowledges the considerable sampling effort and research undertaken by the proponent to investigate the distribution and abundance of troglobitic fauna at Mesa K, and across the wider Robe Valley region.

All taxa recorded at Mesa K are being treated as endemic to Mesa K, as it can not currently be demonstrated that any occur in the other mesas sampled. The troglofauna documented at Mesa K therefore represent a newly-recorded component of the subterranean fauna of Western Australia. Other similar subterranean fauna communities occur in other mesas within the Robe River valley and many other locations in Western Australia such as Cape Range and Barrow Island. Some of the troglobitic species occurring at Cape Range, Barrow Island and Mesa A are formally listed as Threatened Fauna. It is likely that troglobitic species occurring in Mesa K could be assigned a similar conservation status (Biota, 2007c).

The EPA notes that the proponent has submitted a mine plan that avoids all singleton troglobitic species and provides habitat of all known troglobitic fauna species at Mesa K. The proponent has attempted to minimise new disturbance to the surface of Mesa K and retain substantial habitat to protect the current troglobitic community.

Considerably more troglofauna were collected from historically disturbed areas than from relatively undisturbed areas. The information provided by the proponent about the persistence of troglobitic fauna species at Mesa K after previous mining is relevant. As there is no pre-mining baseline information available, it is impossible to ensure that all species originally present at Mesa K have survived post-mining. However the fact that a number of troglofauna species have been found at Mesa K, even in areas where there has been no active rehabilitation, provides greater confidence as to the resilience of troglobitic fauna species.

The EPA notes that the proponent has committed to a 50 m radius buffer around the five singletons. When assessing the proponent's previous proposal for Mesa A, the EPA considered 50 m to be an adequate distance based on the information provided. The EPA is of the opinion that for the Mesa K Remnant Mining Project, the proposed 50 m buffer is also adequate. However there is an opportunity to gather further information on appropriate separation distances of mining and troglofauna habitat for informed future decision making and to validate impact predictions. Therefore, the EPA considers that a monitoring program with the objective of investigating the environmental factors which influence the suitability and maintenance of appropriate subterranean habitat for troglobitic fauna should be undertaken. This monitoring should be carried out while mining is proceeding, and for a period of time after mine closure. A condition to establish a troglofauna monitoring regime has been recommended (Condition 6-2).

The EPA acknowledges that the exclusion areas for the singleton species are not exposed on all sides and therefore will allow some further protection from lowered humidity through evaporation. In addition, the proponent proposes to partly backfill pits as a measure to reduce the potential for changes to habitat microclimate which may result from exposed openings in the mine pit wall. Backfilling of the Central pit and the southern leg of the Gravel Yard pit will assist in the protection of habitat and minimise the potential disruption to core biophysical factors, including humidity. Active and progressive rehabilitation will be carried out at Mesa K using native plant species of local provenance to provide optimal conditions for long-term survival of troglobitic species. For these reasons the EPA is of the view that the troglofauna habitat should be adequately protected.

A judgement also needs to be made as to whether the area and configuration of habitat to be retained is adequate to ensure the long-term survival of all species after mine closure. Taking into account that there will only be 7 ha of new disturbance to the ore and 85% of the current troglobitic fauna habitat retained, it is the EPA's judgement that the proposal is capable of meeting its environmental objective with regard to subterranean fauna.

## **Summary**

Having particular regard to the:

- the size of the retained portions of the mesa are considered sufficient to maintain suitable habitat for the existing troglofauna species;

- singleton troglofauna occurrences have been excluded from the mining area, with a sufficient buffer, to ensure that they are not affected by mining activities; and
- the evidence that a diverse troglobitic community at Mesa K persists after previous mining;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor provided that conditions are imposed requiring:

- the proponent to avoid disturbance in areas where singleton troglofauna were recorded; and
- the proponent to carry out troglofauna monitoring during mining and for a period after mine closure to provide more information about the effects of mining on troglofauna and on the impact of troglobitic fauna populations after mining ceases.

## **4.2 Closure planning and rehabilitation**

### **Description**

The landscape in and around the project area is characterised by two mesa (Mesas J and K) on either side of a valley, through which the Robe River flows. As a landform, Mesa K is a partial mesa that abuts adjacent mesa landforms and hills. Mesa K has escarpments on the southern and eastern sides. The eastern escarpment has been substantially disturbed by previous mining activity, whilst the southern escarpment is largely undisturbed by previous mining activity (Strategen, 2008). The mine site has been partially rehabilitated, although access to the open cut pits and remnant ore was retained. Disturbance to previously undisturbed areas will be minimised and will comprise approximately 10 ha.

The proponent has developed the Draft Mesa K Remnant Mining Project Preliminary Rehabilitation Plan (PRP), which outlines the procedures for closure and rehabilitation at Mesa K, to best practice industry standards. Mesa K and the PRP will be incorporated into the Pilbara Iron Greater Pannawonica Operations Closure Study which is currently undergoing internal review and being developed in accordance with relevant legislation and best practice guidelines.

The proponent's closure objectives include:

- To relinquish to the community a tidy, safe and uncontaminated site;
- To construct landforms that are stable, free-draining, non-polluting and aesthetically compatible with the surrounding landscape; and
- To establish sustainable endemic vegetation communities that are consistent with reconstructed landforms and surrounding vegetation and are suitable for the support of pastoralism.

Rehabilitation of the project area will be undertaken in accordance with the procedures and timeline outlined in the PRP which involves the following five phases:

- recovery and stockpiling of cleared vegetation and topsoil in advance of mining for use on rehabilitation areas;
- battering slopes to an angle <20 degrees (angle depends on the nature of the material being shaped);
- re-spreading topsoil and deep rigging of soil surfaces;
- seeding using local provenance seed where possible; and
- monitoring establishment of plants and development of ecosystem processes.

Limited waste material will be generated during the operation of the Mesa K Remnant Mining Project. The waste volume available will not be sufficient to backfill all pit voids. A selective void backfilling strategy has been developed to maximise the environmental benefits of backfilling, within the constraints of safe, practicable mining (Figure 5). Depths of the remaining pit voids will vary in the approximate range of 20-35 m below the surrounding surface. Following the completion of mining, pit voids will be made safe, access will be blocked and the pit floors will be contour ripped and seeded. Where topsoil is available it will be used. Pit access roads will be rehabilitated when no longer required.

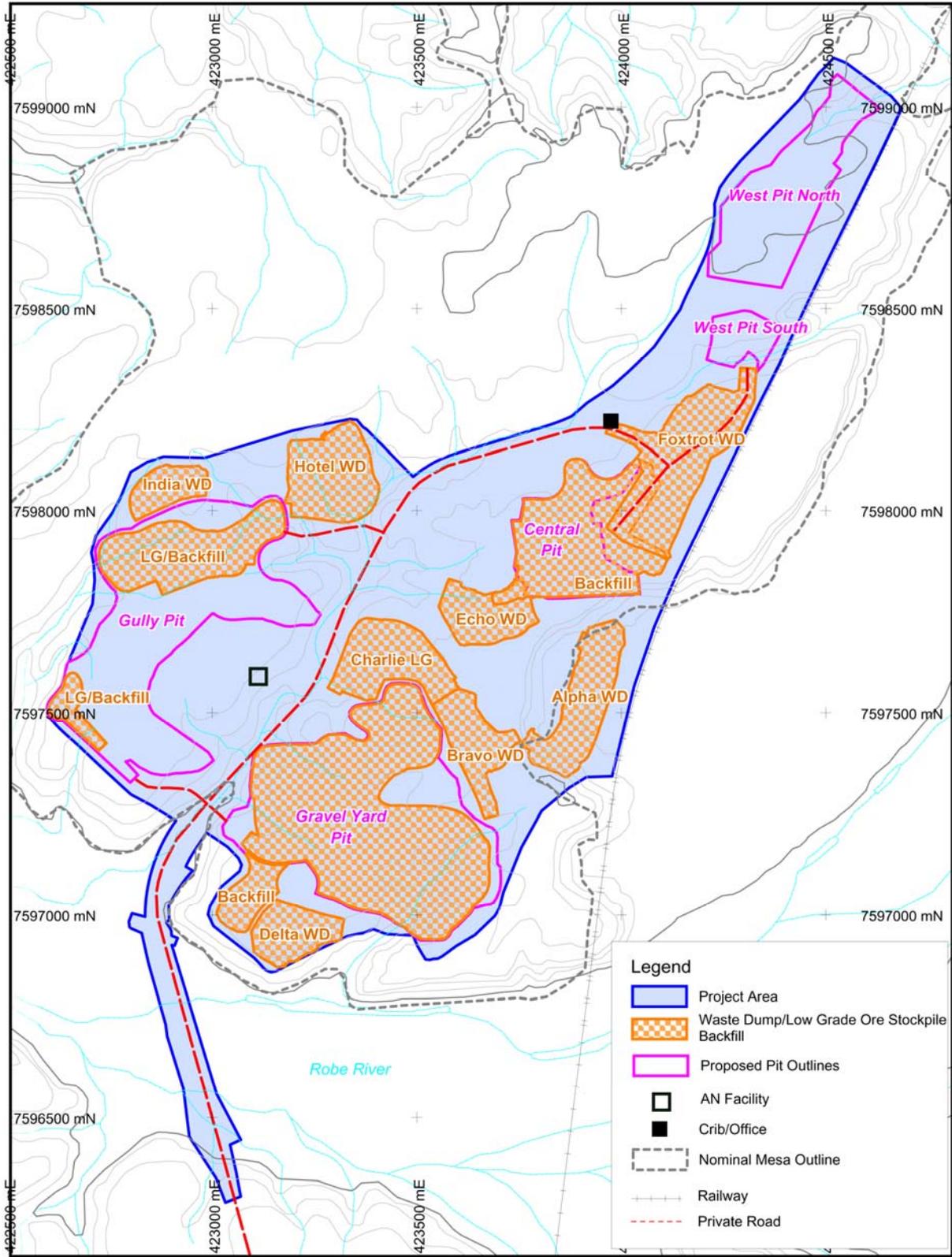
Monitoring of site rehabilitation will be undertaken to measure the progress of rehabilitation and ensure that objectives and targets within the PRP are being met.

### **Assessment**

The EPA's environmental objectives for this factor are to:

- maintain landscape and landform integrity, ecological functions and environmental values;
- protect landforms or geological features of heritage significance or of outstanding scenic or scientific value;
- to ensure that self-sustaining native vegetation communities are returned after mining, which in species composition and ecological function are as close to as possible to naturally occurring analogue sites; and
- ensure as far as practicable that rehabilitation achieves a stable and functioning landform that is consistent with the surrounding landscape and other environmental values.

The EPA acknowledges that the proponent has committed to finalising the PRP included with the EPS and implementing the PRP prior to commencement of productive mining. Mesa K and the PRP will be incorporated into the Greater Pannawonica Closure Study prior to completion of mining at Mesa K. The EPA notes the relatively short project life of the Mesa K Remnant Mining proposal of 2 – 3 years.



**Figure 5: Mesa K conceptual rehabilitation areas**

The PRP includes rehabilitation strategies designed to contribute to maintenance free closure over the long term. The EPA supports the objective of the PRP to ensure mine rehabilitation and closure planning commences in the early stages of project planning and is integrated with mine development planning and operations.

Key components of rehabilitation for the Mesa K Remnant Mining Project are:

- minimising further disturbance to the site wherever possible, primarily by locating structures within previously disturbed areas;
- utilising existing and proposed pit voids for the backfilling of waste rock and storage of low grade material where possible;
- the removal and disposal of infrastructure not required for other uses;
- rehabilitation of remaining disturbances; and
- post-rehabilitation maintenance and monitoring.

The PRP includes a schedule for timing of closure, rehabilitation and monitoring. The PRP will be regularly reviewed during site operations to ensure it remains accurate and relevant.

The EPA notes that a selective void backfilling strategy will be undertaken and pits progressively backfilled and rehabilitated throughout the life of the mine to protect retained habitat and biophysical processes, however, this would only be partial due to the limited qualities of backfill material available. Following the completion of mining, pit voids will be made safe, access will be blocked and the pit floors will be contour ripped and seeded.

The EPA acknowledges that the proponent has undertaken rehabilitation for previous areas in the Robe Valley, including mesas J, K, L and M. The proponent's environmental performance in rehabilitation has been recognised through the award of a certificate of merit in the 1997 Golden Gecko Awards for mine site rehabilitation work conducted at Mesa K.

The EPA notes that all waste dumps would be constructed in accordance with the Pilbara Iron Landform Design Guidelines which include: minimising dump heights; shaping of dumps to blend in with the surrounding natural topography; construction to meet the requirements of the final rehabilitation design; and inclusion of drainage and erosion management features. The waste dumps have been designed to address legacy issues from historical mining wherever possible. Dump heights are designed to be no higher than the adjacent topography.

The EPA notes that monitoring of site rehabilitation will be undertaken and will continue for several years following the completion of rehabilitation until a safe and stable landform is present which supports self-sustaining native vegetation communities.

## **Summary**

Having particular regard to:

- the proponent's Draft Mesa K Remnant Mining Project Preliminary Rehabilitation Plan and commitment to finalise and implement this Plan;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor provided that conditions are imposed by the Minister requiring:

- the proponent to achieve stable, self-sustaining and functioning landform(s) that is consistent with surrounding landscape and maintain(s) key environmental values over the long-term.

## **5. Recommended conditions and commitment**

Having considered the proponent's commitment and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed of the proposal by Robe River Mining Company Pty Ltd for Mesa K Remnant Mining Project is approved for implementation. These conditions are presented in Appendix 2.

## **6. Other Advice**

### *Cumulative impacts*

The EPA notes that there is an increasing number of proposals for resource extraction in the Robe Valley area of the Pilbara Region. The EPA also notes that the proposal for Mesa K Remnant Mining is for a limited scale mining operation and the impacts on biodiversity and other environmental values are therefore considered acceptable.

The EPA notes that the proponent Robe River Mining Pty Ltd (as part of Pilbara Iron) is in the process of preparing a Robe Valley regional troglofauna research program, which will be implemented in 2008. This will address the measurement of biophysical parameters required for the persistence of troglofauna, down-hole camera work and further trapping and molecular studies to better understand taxon level distributions and phylogeographic patterns in this fauna. The Draft Mesa K Remnant Mining Project Environmental Management Plan states that Mesa K will be included as a study site in this program. The EPA supports such initiatives to better inform project design and environmental assessment and management.

The EPA also acknowledges that the proposal will only impact on 15% (by volume) of potential troglofauna habitat, which will result in approximately 85% of the potential troglofauna habitat being retained.

## **7. Conclusions**

The EPA has considered the proposal by Robe River Mining Pty Ltd to undertake remnant mining at the previously mined Mesa K deposit, 11 km south-west of the town of Pannawonica.

The EPA notes that the troglobitic fauna recorded from Mesa K are of high conservation significance and represent a newly-recorded component of the subterranean fauna of Western Australia. The proponent has undertaken extensive

troglobitic fauna studies in the Robe Valley region and has found that due to the isolated nature of individual mesa formations in the Robe Valley, troglobitic fauna recorded at each mesa appear to be endemic (i.e. unique to) to that particular mesa. Ten individual taxa were recorded at Mesa K and five of the collected taxa were singletons or were collected within only the preliminary nominal pit boundaries at the completion of four phases of sampling. The EPA notes that the proponent has revised the preliminary nominal pit boundaries to ensure that each singleton species is now outside the actual proposed pit boundaries and includes a 50 m radius buffer around each drill hole. The EPA notes the retention of the majority of the pisolite resource as a contiguous system and efficient use of existing infrastructure and location of new infrastructure in disturbed areas.

The EPA acknowledges that the extensive research and sampling conducted by the proponent has significantly contributed to the knowledge of troglobitic fauna, both at Mesa K and in the wider Robe Valley region. The EPA supports the inclusion of Mesa K as a study site in the Robe Valley regional troglofauna research program.

The EPA notes that the proponent has prepared a Draft Mesa K Remnant Mining Project Environmental Management Plan which includes specific management actions to protect subterranean fauna at Mesa K.

The EPA notes that the proponent maintains that it will progressively rehabilitate disturbed areas to protect habitat and contribute to biophysical processes, including carbon and nutrient cycling. The EPA acknowledges that the proponent has prepared a Draft Mesa K Remnant Mining Project Preliminary Rehabilitation Plan which will be finalised and implemented prior to the commencement of productive mining. Mesa K and the Mesa K Preliminary Rehabilitation Plan will be incorporated into the Pilbara Iron Greater Pannawonica Operations Closure Study which is currently undergoing internal review and being developed in accordance with relevant legislation and best practice guidelines.

The EPA has therefore concluded that the proposal can be managed to meet the EPA's environmental objectives, provided there is satisfactory implementation by the proponent of their commitments and the recommended conditions set out in Appendix 2.

## **8. Recommendations**

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for remnant iron ore mining at Mesa K in the Pilbara;
2. That the Minister considers the report on the key environmental factors as set out in Section 4;
3. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's environmental objectives, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 2; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.



## **Appendix 1**

### **References**

Strategen (2008). *Mesa K Remnant Mining Project – Environmental Protection Statement*, January 2008.

Biota Environmental Sciences (2007a). A vegetation and Flora Survey of the Mesa K Mine Site, near Pannawonica, unpublished report prepared for Robe River Mining Company Pty Ltd, March 2007.

Biota Environmental Sciences (2007b). *Mesa K Targeted Fauna Survey*, unpublished report prepared for Pilbara Iron, April 2007.

Biota Environmental Sciences (2007c). *Mesa K Remnant Mining Project Troglobitic Fauna Survey*, unpublished report prepared for Pilbara Iron, June 2007.

Robe River Mining Company Pty Ltd (2008). *Mesa K Remnant Mining Project Preliminary Rehabilitation Plan*, January 2008.

Strategen (2008). *Mesa K Remnant Mining Project Environmental Management Plan*, February 2008.

**Appendix 2**  
**Recommended Environmental Conditions**

RECOMMENDED ENVIRONMENTAL CONDITIONS

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED  
(PURSUANT TO THE PROVISIONS OF THE  
ENVIRONMENTAL PROTECTION ACT 1986**

MESA K REMNANT MINING PROJECT, 11KM SOUTH-WEST OF THE TOWN OF  
PANNAWONICA, SHIRE OF ASHBURTON

**Proposal:** To undertake mining of up to 12 – 13 Mt of remnant iron ore in the previously mined Mesa K deposit to meet the shortfall of dry ore produced from Mesa J. The proposal will utilise the existing Mesa J equipment fleet, personnel and infrastructure.

**Proponent:** Robe River Mining Company Pty Ltd

**Proponent Address:** 152-158 St Georges Terrace, Perth 6000

**Assessment number:** 1728

**Report of the Environmental Protection Authority:** Bulletin 1283

The proposal referred to in the above report of the Environmental Protection Authority may be implemented. The implementation of that proposal is subject to the following conditions and procedures:

**1 Proposal Implementation**

1-1 The proponent shall implement the proposal as assessed by the Environmental Protection Authority and described in schedule 1 of this statement subject to the condition and procedures of this statement.

**2 Proponent Nomination and Contact Details**

2-1 The proponent for the time being nominated by the Minister for the Environment under sections 38(6) or 38(7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal.

2-2 The proponent shall notify the Chief Executive Officer of the Department of Environment and Conservation (CEO) of any change of the name and address of the proponent for the serving of a notice or other correspondence within 30 days of such change.

### **3 Time Limit of Authorisation**

3-1 The authorisation to implement the proposal provided for in this statement shall lapse and be void within five years after the date of this statement if the proposal to which this statement relates is not substantially commenced.

3-2 The proponent shall provide the CEO with written evidence which demonstrates that the proposal has substantially commenced on or before the expiration of five years from the date of this statement.

### **4 Compliance Reporting**

4-1 The proponent shall submit to the CEO environmental compliance reports annually reporting on the previous twelve-month period, unless required by the CEO to report more frequently.

4-2 The environmental compliance reports shall address each element of an audit program approved by the CEO and shall be prepared and submitted in a format acceptable to the CEO.

4-3 The environmental compliance reports shall:

1. be endorsed by signature of the proponent's chief executive officer or a person, approved in writing by the CEO, delegated to sign on behalf of the proponent's chief executive officer;
2. state whether the proponent has complied with each condition and procedure contained in this statement;
3. provide verifiable evidence of compliance with each condition and procedure contained in this statement;
4. state whether the proponent has complied with each key action contained in any environmental management plan or program required by this statement;
5. provide verifiable evidence of conformance with each key action contained in any environmental management plan or program required by this statement;
6. identify all non-compliances and non-conformances and describe the corrective and preventative actions taken in relation to each non-compliance or non-conformance;
7. provide an assessment of the effectiveness of all corrective and preventative actions taken; and
8. describe the state of implementation of the proposal.

4-4 The proponent shall make the environmental compliance reports required by condition 4-1 publicly available in a manner approved by the CEO.

## **5 Performance Review and Reporting**

- 5-1 The proponent shall submit to the CEO a Performance Review Report at the conclusion of the first, second, third and fifth years after the start of production and then, at such intervals as the CEO may regard as reasonable, which addresses:
- a. the major environmental risks and impacts, the performance objectives, standards and criteria related to these, the success of risk reduction/impact mitigation measures and results of monitoring related to management of the major risks and impacts;
  - b. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable; and
  - c. significant improvements gained in environmental management that could be applied to this and other similar projects.

## **6 Protection of troglofauna**

- 6-1 The proponent shall implement the proposal to avoid disturbance of areas where troglofauna taxa represented by only one individual have been recorded as shown in Figure 4 attached and delineated by AMG coordinates listed in Schedule 2.
- 6-2 The proponent shall establish a monitoring regime to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority to demonstrate the effectiveness of the disturbance avoidance areas as shown in Figure 4 attached and delineated by AMG coordinates listed in Schedule 2.

## **7 Rehabilitation**

- 7-1 The proponent shall implement the proposal to achieve stable, self-sustaining and functioning landform(s) that is/are consistent with the surrounding landscape and maintain(s) key environmental values over the long-term.

### **Notes**

1. The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment and Conservation.
2. The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment and Conservation over the fulfilment of the requirements of the conditions.

**The Proposal (Assessment No. 1728)**

**General Description**

The proposal is to mine the remnant iron ore in the previously mined Mesa K deposit located on Mining Lease AML 70/00248 Sec 104. The Mesa K deposit was previously mined from 1988 to 1995, producing approximately 48.2 Mt of pisolite ore. The Mesa J iron ore mining operation, managed by the proponent, is also located on Mining Lease AML 70/00248 Sec 104. The proposed Mesa K Remnant Mining Project is intended to meet the shortfall of dry ore produced from Mesa J and will be operated as a satellite project to the current Mesa J operation. The proposal will utilise the existing Mesa J equipment fleet, personnel and infrastructure.

The proposal is described in the following document – *Mesa K Remnant Mining Project Environmental Protection Statement, January 2008*.

**Summary Description**

A summary of the key proposal characteristics is presented in Table 1.

**Table 1 – Summary of Key Proposal Characteristics**

<b>Element</b>	<b>Description</b>
<b>General</b>	
Project life	Approximately 2 – 3 years
Ore deposit	Approximately 12 – 13 Mt high grade ore Approximately 6 Mt low grade ore
Area of new disturbance	Approximately 10 ha clearing of native vegetation
<b>Mine and mining</b>	
Ore type	Pisolite iron ore
Ore location	Above watertable
Stripping ratio	The ratio of waste and low grade ore to high grade ore will be approximately 1:1
Waste rock disposal	Initially directed to surface waste dumps and, thereafter, used in progressive backfilling of mine pits as far as practicable
<b>Product transport</b>	
Product transport	By existing mine access road from Mesa K to Mesa J (4km), then via existing rail infrastructure from Mesa J to Cape Lambert
<b>Infrastructure</b>	
Power	On-site portable generator (diesel powered)
Access roads	Upgrade of existing mine access road from Mesa K to Mesa J.
Other facilities	Transportable office, portable crib room, toilets, septic tank and water tank at Mesa K
<b>Water</b>	
Water use	Water requirements are low and will be limited to the purposes of dust suppression, crib room and ablutions. Water will be supplied from the existing Mesa J operation via trucks and will be stored in on-site water tanks. Potable water will be supplied separately. Supply will be within the current licence limits for Mesa J.

Workforce	
Workforce	Existing Mesa J workforce
Accommodation	Existing accommodation in Pannawonica

**Abbreviations**

Mt million tonnes

Mtpa million tonnes per annum

**Figures (attached):**

Figure 1 – Regional location

Figure 2 – Conceptual Mine Site Layout

Figure 3 - Locations where troglofauna recorded at Mesa K

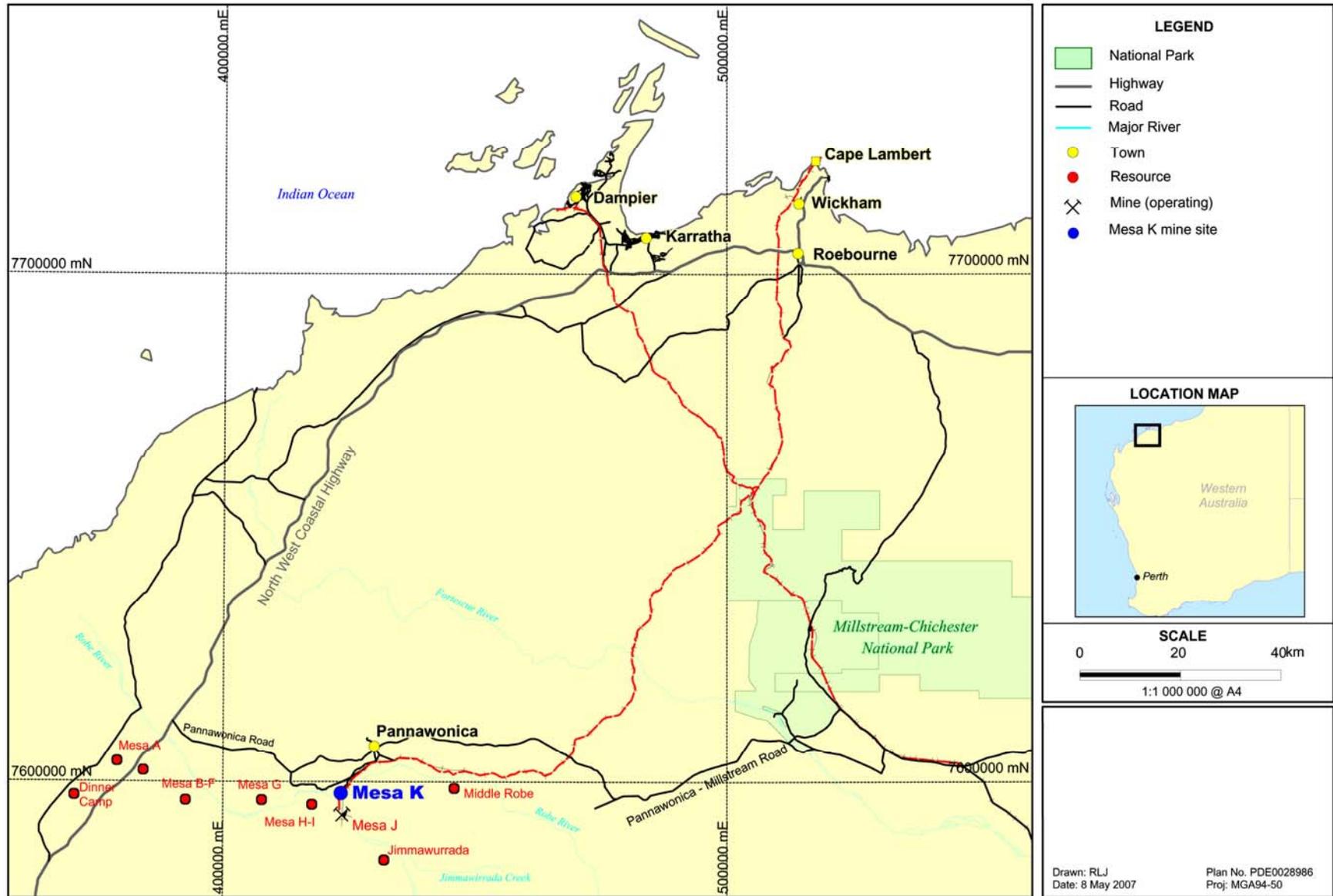
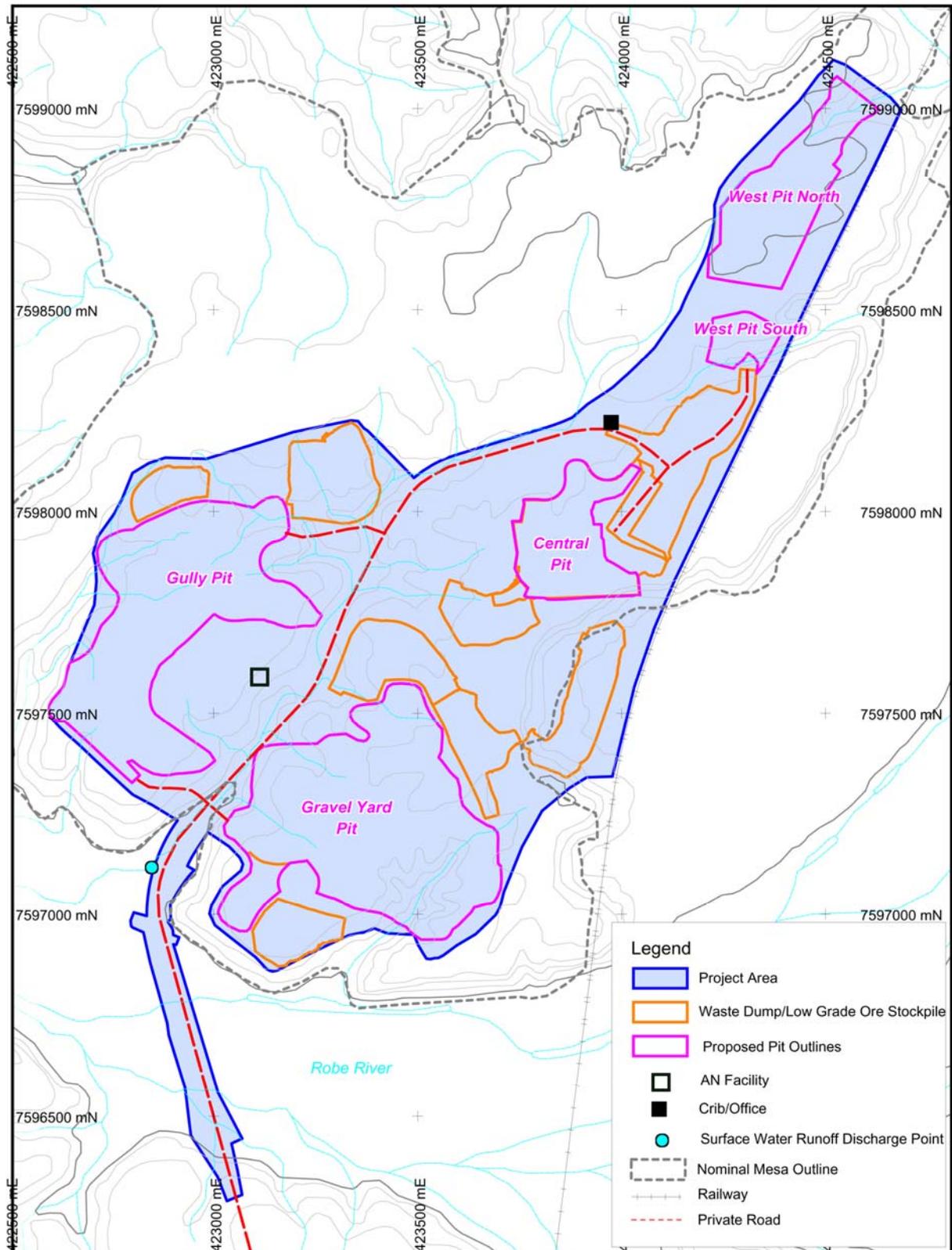
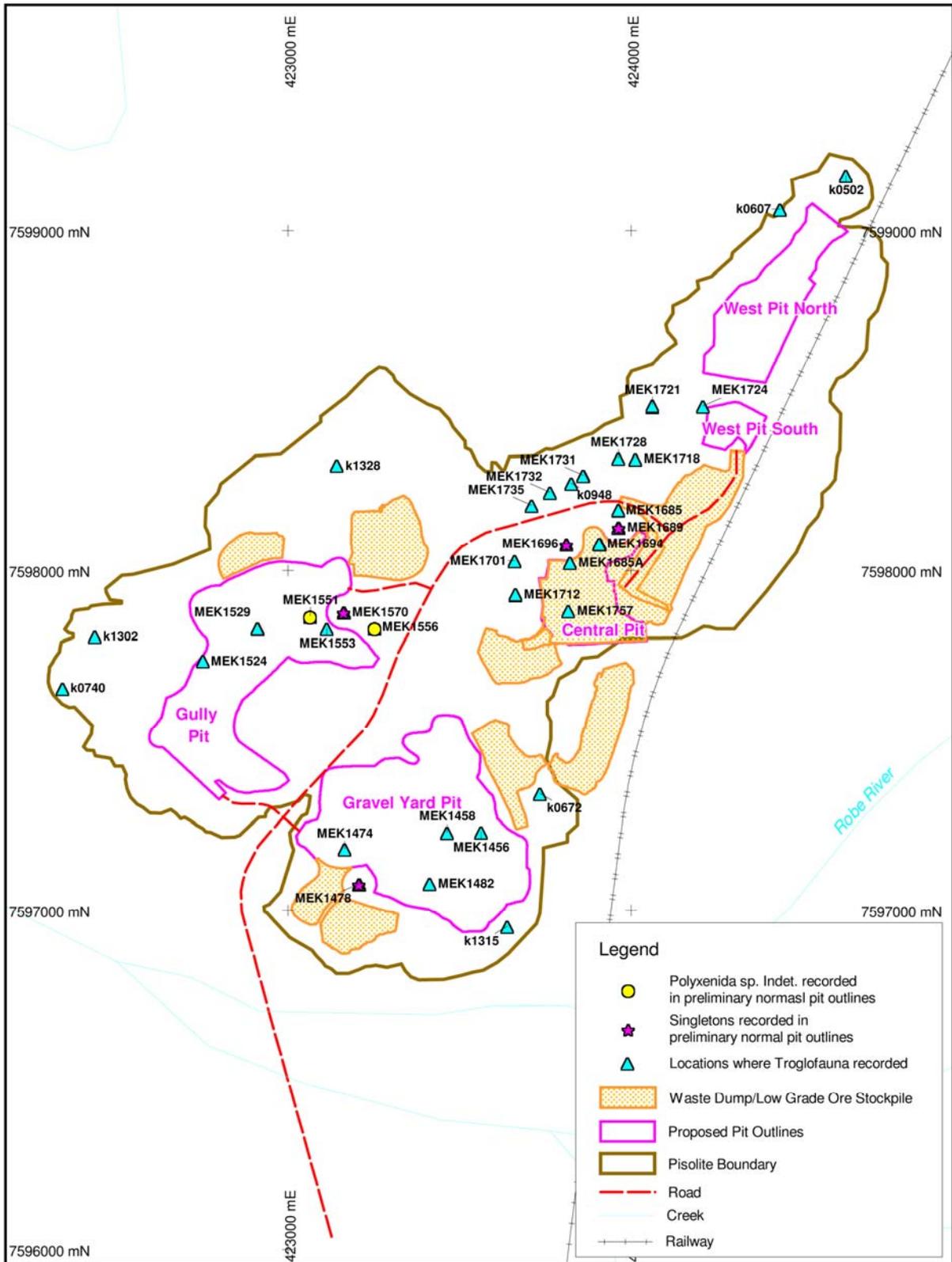


Figure 1: Regional location of Mesa K mine site



**Figure 2: Mesa K conceptual mine site layout**



*Figure 3: Locations where troglofauna were recorded at Mesa K*

## Schedule 2

### The Proposal (Assessment No. 1728)

AMG coordinates for troglofauna avoidance areas

Avoidance Area 1		Avoidance Area 2		Avoidance Area 3		Avoidance Area 4	
Eastings	Northings	Eastings	Northings	Eastings	Northings	Eastings	Northings
423167.1	7597930	423863.3	7598078	424014.9	7598128	423256.4	7597077
423182.6	7597923	423863.2	7598081	424014.9	7598131	423256.3	7597080
423273.6	7597876	423862.9	7598084	424014.6	7598134	423256	7597083
423287.9	7597867	423862.4	7598087	424014.1	7598137	423255.5	7597086
423294	7597859	423861.7	7598090	424013.4	7598140	423254.9	7597089
423300.4	7597846	423860.9	7598093	424012.6	7598143	423254	7597092
423302.7	7597834	423859.8	7598096	424011.5	7598146	423253	7597095
423302.6	7597827	423858.6	7598099	424010.3	7598149	423251.7	7597098
423301.2	7597818	423857.2	7598102	424008.9	7598152	423250.3	7597101
423299.4	7597813	423855.6	7598105	424007.3	7598154	423248.8	7597104
423298.5	7597810	423853.9	7598107	424005.6	7598157	423247	7597106
423296.9	7597807	423852	7598110	424003.7	7598159	423245.2	7597109
423291.2	7597797	423850	7598112	424001.7	7598162	423243.1	7597111
423284.6	7597793	423847.8	7598114	423999.5	7598164	423240.9	7597113
423281.9	7597791	423845.5	7598116	423997.2	7598166	423238.6	7597115
423276.3	7597787	423843	7598118	423994.7	7598168	423236.2	7597117
423268.3	7597784	423840.5	7598120	423992.2	7598170	423233.6	7597119
423264.1	7597782	423837.8	7598122	423989.5	7598171	423231	7597121
423258.3	7597781	423835.1	7598123	423986.8	7598173	423228.2	7597122
423233.1	7597782	423832.2	7598124	423983.9	7598174	423225.4	7597123
423209.9	7597804	423829.3	7598125	423981	7598175	423222.5	7597124
423204.9	7597809	423826.4	7598126	423978	7598176	423219.5	7597125
423193	7597818	423823.3	7598127	423975	7598177	423216.5	7597126
423189.5	7597820	423820.3	7598128	423972	7598177	423213.4	7597127
423177.7	7597825	423817.2	7598128	423968.9	7598178	423210.3	7597127
423172	7597826	423814.1	7598128	423965.8	7598178	423207.2	7597127
423163	7597827	423811	7598128	423962.7	7598178	423204.1	7597127
423152.1	7597828	423807.9	7598128	423959.6	7598177	423201	7597127
423142.9	7597831	423804.8	7598127	423956.5	7598177	423197.9	7597126
423131.7	7597838	423801.7	7598127	423953.4	7598176	423194.9	7597126
423125.3	7597844	423798.7	7598126	423950.4	7598176	423191.9	7597125
423121.3	7597850	423795.8	7598125	423947.5	7598175	423188.9	7597124
423117.7	7597856	423792.9	7598124	423944.6	7598173	423186.1	7597123
423115.3	7597862	423790.1	7598122	423941.8	7598172	423183.3	7597121
423113.9	7597869	423787.4	7598121	423939.1	7598171	423180.6	7597120
423113.4	7597876	423784.8	7598119	423936.5	7598169	423178	7597118
423113.6	7597883	423782.3	7598117	423934	7598167	423175.5	7597116
423117	7597895	423779.9	7598115	423931.6	7598165	423173.1	7597114
423120.9	7597903	423777.7	7598113	423929.4	7598163	423170.8	7597112
423125.6	7597910	423775.6	7598111	423927.3	7598161	423168.7	7597110
423134.6	7597918	423773.6	7598108	423925.3	7598158	423166.8	7597107
423142.2	7597922	423771.8	7598106	423923.5	7598156	423164.9	7597105
423150.1	7597925	423770.2	7598103	423921.8	7598153	423163.3	7597102

423161.7	7597929
423167.1	7597930

423768.7	7598101
423767.4	7598098
423766.2	7598095
423765.3	7598092
423764.5	7598089
423763.9	7598086
423763.5	7598083
423763.3	7598080
423763.3	7598077
423763.5	7598073
423763.9	7598070
423764.5	7598067
423765.3	7598064
423766.2	7598061
423767.4	7598058
423768.7	7598056
423770.2	7598053
423771.8	7598050
423773.6	7598048
423775.6	7598045
423777.7	7598043
423779.9	7598041
423782.3	7598039
423784.8	7598037
423787.4	7598035
423790.1	7598034
423792.9	7598032
423795.8	7598031
423798.7	7598030
423801.7	7598029
423804.8	7598029
423807.9	7598028
423811	7598028
423814.1	7598028
423817.2	7598028
423820.3	7598029
423823.3	7598029
423826.4	7598030
423829.3	7598031
423832.2	7598032
423835.1	7598033
423837.8	7598035
423840.5	7598036
423843	7598038
423845.5	7598040
423847.8	7598042
423850	7598044
423852	7598047
423853.9	7598049
423855.6	7598052
423857.2	7598054
423858.6	7598057

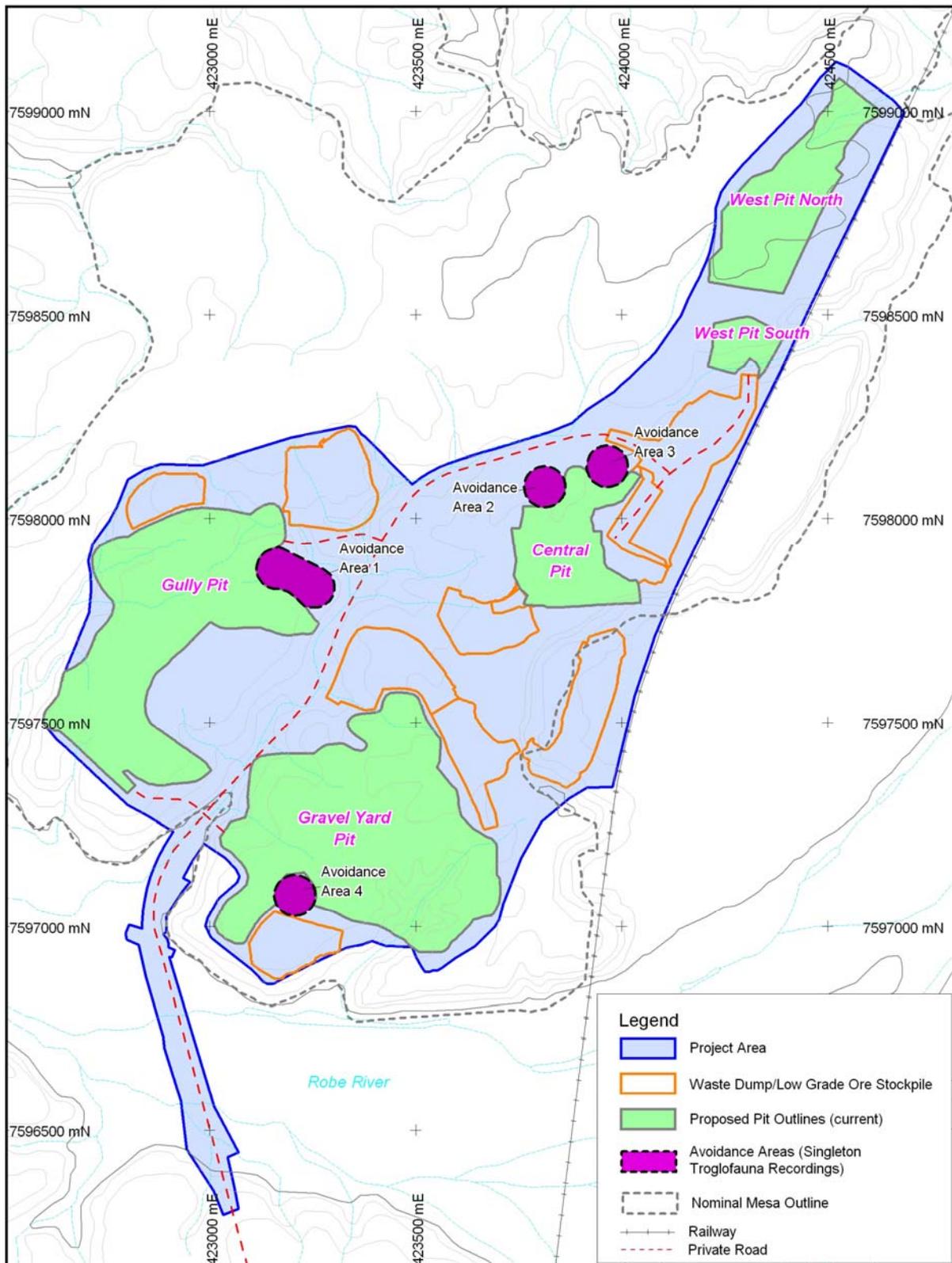
423920.3	7598150
423919	7598147
423917.9	7598145
423917	7598142
423916.2	7598139
423915.6	7598136
423915.2	7598132
423915	7598129
423915	7598126
423915.2	7598123
423915.6	7598120
423916.2	7598117
423917	7598114
423917.9	7598111
423919	7598108
423920.3	7598105
423921.8	7598103
423923.5	7598100
423925.3	7598097
423927.3	7598095
423929.4	7598093
423931.6	7598091
423934	7598089
423936.5	7598087
423939.1	7598085
423941.8	7598084
423944.6	7598082
423947.5	7598081
423950.4	7598080
423953.4	7598079
423956.5	7598079
423959.6	7598078
423962.7	7598078
423965.8	7598078
423968.9	7598078
423972	7598078
423975	7598079
423978	7598080
423981	7598080
423983.9	7598082
423986.8	7598083
423989.5	7598084
423992.2	7598086
423994.7	7598088
423997.2	7598090
423999.5	7598092
424001.7	7598094
424003.7	7598096
424005.6	7598099
424007.3	7598101
424008.9	7598104
424010.3	7598107

423161.8	7597100
423160.5	7597097
423159.4	7597094
423158.4	7597091
423157.6	7597088
423157.1	7597085
423156.7	7597082
423156.5	7597079
423156.5	7597076
423156.7	7597072
423157.1	7597069
423157.6	7597066
423158.4	7597063
423159.4	7597060
423160.5	7597057
423161.8	7597055
423163.3	7597052
423164.9	7597049
423166.8	7597047
423168.7	7597044
423170.8	7597042
423173.1	7597040
423175.5	7597038
423178	7597036
423180.6	7597034
423183.3	7597033
423186.1	7597031
423188.9	7597030
423191.9	7597029
423194.9	7597028
423197.9	7597028
423201	7597027
423204.1	7597027
423207.2	7597027
423210.3	7597027
423213.4	7597028
423216.5	7597028
423219.5	7597029
423222.5	7597030
423225.4	7597031
423228.2	7597032
423231	7597034
423233.6	7597035
423236.2	7597037
423238.6	7597039
423240.9	7597041
423243.1	7597043
423245.2	7597046
423247	7597048
423248.8	7597051
423250.3	7597053
423251.7	7597056

423859.8	7598060	424011.5	7598110	423253	7597059
423860.9	7598063	424012.6	7598113	423254	7597062
423861.7	7598066	424013.4	7598115	423254.9	7597065
423862.4	7598069	424014.1	7598119	423255.5	7597068
423862.9	7598072	424014.6	7598122	423256	7597071
423863.2	7598075	424014.9	7598125	423256.3	7597074
423863.3	7598078	424014.9	7598128	423256.4	7597077

**Figures (attached):**

Figure 4 – Singleton troglofauna locations and associated avoidance areas



**Figure 4: Singleton troglofauna locations and associated avoidance areas**