Carina Iron Ore Project

Polaris Metals Pty Ltd

Report and recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia

Report 1368
October 2010

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
02/04/09	Level of Assessment set (date appeals process completed)	
15/03/10	Proponent Document Released for Public Comment	77
12/04/10	Public Comment Period Closed	4
29/07/10	Final Proponent response to the issues raised	18
19/09/10	Condition consultation	2
06/10/10	EPA Report to the Minister for Environment and publication	10*
20/10/10	Close of appeals period	2

***STATEMENT OF TIMELINES**

Timelines for assessment may vary according to the complexity of the project and are usually agreed with proponents soon after the level of assessment is determined. In this case, the Environmental Protection Authority met its agreed timeline objective of 10 weeks for the completion of the assessment.

Paul Vogel
Chairman
6 October 2010

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Summary and recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for Environment on the proposal by Polaris Metals Pty Ltd to develop the Carina Iron Ore Project (CIOP) on the Yendilberin Hills located approximately 60 kilometres (km) north-east of Koolyanobbing in the Goldfields region.

The CIOP proposal includes an open cut mine, an approximate 50 km haul road linking the mine to a rail siding adjacent to the Trans Australian Railway, dry processing plant located at the rail siding and an accommodation village also located near the rail siding.

Section 44 of the *Environmental Protection Act 1986* (EP Act) requires the EPA to report to the Minister for 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; 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 include in the report any other advice and recommendations as it sees fit.

The EPA is also required to have regard for the principles set out in section 4A of the EP Act.

Key environmental factors and principles

The proposal has discrete areas of development including the minesite, haul road and the rail siding, and accommodation village. The proposal has therefore been assessed based on each component and its environmental factors. The EPA has decided that the following key environmental factors relevant to the proposal required detailed evaluation in the report:

(a) mine – the impacts on flora and vegetation, fauna and the rehabilitation and closure of the mine;

(b) haul road alignment – impacts to flora and vegetation, and fauna; and

(c) rail siding and accommodation village – the impacts on flora and vegetation.

There were a number of other factors which were relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The following principles were considered by the EPA in relation to the proposal:

(a) The precautionary principle;

(b) The principle of intergenerational equity; and

(c) The principle of waste minimisation.

Conclusion

The EPA has considered the proposal by Polaris Metals Pty Ltd to develop the CIOP proposal. The proposal is located in an area containing significant environment values including endemic, rare and restricted flora species and significant vegetation communities.

The EPA notes that Government has recently announced its intention to create conservation and mining reserves and conservation parks which recognise both the significant conservation values of the Mt Manning area and development of mineral resources of strategic value. This announcement included that portions of the ex-Jaurdi pastoral lease where the proposal is located are proposed to become the Jaurdi Conservation Park (JCP) as a conservation and mining reserve.

The proposal is located over a linear distance with discrete areas of development. The EPA has assessed the environmental factors relevant to the mine, haul road, and rail siding and accommodation village components of the proposal.

Mine and Associated Infrastructure

There are limitations in the quality of vegetation and flora survey data provided by the proponent on which to assess the proposal. The Department of Environment and Conservation (DEC) has provided regional information that has allowed the impacts of the proposal on vegetation to be adequately considered.

The proposal is unlikely to impact Declared Rare Flora (DRF) or significantly impact priority flora. It will impact on two important vegetation communities (S2 and W22) that are likely to be at the limit of their known distribution. The EPA notes however that the S2 vegetation community is also present on the crest of the remainder of the Yendilberin Hills where development is not proposed. The proponent has relocated the waste dump to reduce impact on the W22 vegetation community. The residual impact on the S2 vegetation community is approximately 7.6%, and for the W22 it is approximately 12 %. The EPA has recommended a condition to ensure protection of vegetation so that the impacts of mining do not extend beyond that proposed by the proponent. It is the EPA's opinion that the impacts on flora vegetation can be managed to meet the EPA's objectives.

There is Potentially Acid Forming (PAF) material present within the area to be mined. The EPA has recommended conditions to ensure this material is properly identified and encapsulated within the waste dump. Conditions have also been recommended to ensure that weeds are managed and the mine is rehabilitated to acceptable standards.

Haul Road

The proposed alignment contains several priority flora species which includes one species (*Spartothamnella* sp. Helena & Aurora Range) that may be upgraded to a DRF listing. The EPA notes that in anticipation of this species being listed as a DRF, the proponent has modified the proposed haul road alignment to avoid this species. The EPA supports this approach. The proposal is unlikely to significantly impact vegetation communities or populations of priority flora species given the linear nature of the haul road. The clearing of habitat is unlikely to significantly impact fauna species or populations in the area. The EPA's conditions for the protection of vegetation will ensure the impacts of clearing of vegetation and fauna habitat is limited to within the corridor of the haul road.

The ongoing impacts of the haul road, once it is constructed, on flora and fauna values, need to be carefully managed. This includes potential impacts from dust and from saline water used in dust suppression on vegetation, introduction of weeds and ensuring the haul road is managed to reduce the risk of road kills on native fauna. The EPA's conditions address monitoring and management to ensure the health of vegetation adjacent to the haul road is maintained. Management of the impacts to fauna is addressed through a condition which requires the proponent to develop strategies to avoid fauna deaths and to monitor fauna mortalities with a view to revising the strategies depending on the outcome of monitoring. Weed management, decommissioning and rehabilitation of the haul road are also required through conditions.

Rail Siding and Accommodation Facilities
The proponent has made a decision to locate the rail siding and accommodation village outside the boundaries of the proposed JCP. The EPA supports this decision of the proponent.

The rail siding is unlikely to impact on DRF species identified during the flora and vegetation surveying. The EPA considers that due to its relatively small size (approx. 50 ha), development of the rail siding is unlikely to have a significant impact on flora and vegetation values.

In relation to the accommodation village the EPA considers that given it is also of relatively small size (approx. 10 ha) it is unlikely to have a significant impact. The proponent has committed to undertake follow-up surveys at a more optimal time of the year to quantify and provide an improved knowledge of significant flora in the area. The EPA has recommended this commitment be formalised into a condition to ensure there is appropriate quantification of the potential impacts on flora values of the region.

The EPA's conditions relating to weed management, decommissioning and rehabilitation will apply to the accommodation village and components of the rail siding.

The processing facilities located at the rail siding will be subject to Part V of the *Environmental Protection Act 1986* works approval and licencing requirements. Waste water treatment facilities, if they are of sufficient capacity, will also be subject to works approval and licensing.

All components of the CIOP proposal are within an area that will continue to be managed for its conservation values. The proponent has committed to develop a Project Environmental Management Plan to address potential ancillary impacts of mining. The EPA has recommended this plan as a condition of approval. The objectives of the plan are to ensure that the adverse impacts from mining and associated activities do not unnecessarily threaten conservation values within the mining lease and prevent impacts outside of the mining lease. The plan is recommended to be developed in consultation with the Department of Environment and Conservation (DEC) as the land manager for the area.

The EPA has concluded that the proposal can be managed to meet the EPA's objectives subject to the conditions being implemented.

The EPA has also provided Other Advice regarding the need for coordination of infrastructure provision in the proposed conservation and mining reserve. This assessment has highlighted that there are clearly opportunities to coordinate

infrastructure provision to achieve improved environmental outcomes while still providing the infrastructure necessary to support mining of strategic mineral resources. In the absence of a coordinated and strategic approach to infrastructure provision there is an increased likelihood of significant environmental values being unnecessarily impacted. The EPA is of the view that examination of infrastructure requirements should be an early priority for planning of the conservation and mining reserves and mechanisms should be put in place to require the sharing of infrastructure.

The Department of Mines and Petroleum (DMP) has provided advice to the EPA that there is capacity for the *Mining Act 1978* to provide a mechanism for this to occur. The suggested approach is that a condition of grant be placed on the Miscellaneous Licence that will apply for this proposal stating that once the haul road is constructed the tenement holder is to provide third party access if requested by the Minister for Mines and Petroleum. The EPA recommends that the Minister for Environment explore this opportunity with the Minister for Mines and Petroleum. The EPA considers this is necessary to ensure Government's objectives of protection of environmental values and development of strategic mineral resources are both achieved.

The EPA has also provided other advice about the upgrading of the Jaurdi airstrip, even though the proponent advised the EPA during the assessment that the upgrading was no longer part of its proposal. The EPA is aware that although earlier advice had been provided by the DEC regarding a minor extension to the runway to allow for intermittent use for exploration and emergency situations, this advice does not apply to expansions necessary to accommodate fly in fly out (FIFO) operations nor has approval for ancillary infrastructure such as fuel storage, carparks and airstrip aprons that would be necessary for a sustained FIFO operations been given. This also includes that the access road (owned by WestNet) along the railway is likely to require significant upgrading to accommodate regular use. All of these activities related to the upgrading of the Jaurdi airstrip potentially impact on the proposed JCP and have not been accounted for, and should be properly considered. This may include development of an airport at an appropriate alternative site if it is determined to be an environmentally better outcome. The EPA will write separately to the DMP bringing this matter to its attention.

Recommendations

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

1. That the Minister notes that the proposal being assessed is Carina Iron Ore Project;
2. That the Minister considers the report on the key environmental factors and principles as set out in Section 4;
3. That the Minister notes that the EPA has concluded that it is likely that the proposal can be managed to meet the EPA's objectives, provided there is satisfactory implementation by the proponent of the conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Conditions

Having considered the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Polaris Metals Pty Ltd to develop the Carina Iron Ore Project is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) Protection of vegetation to ensure the mining and associated infrastructure are contained to the areas identified in the assessment and that mining activities that have the potential to have offsite impacts on vegetation, such as dust and saline water used for dust suppression, are monitored and managed.

(b) Monitoring and management of mining activities to limit fauna mortality.

(c) Additional flora surveys to improve the knowledge of the presence and abundance of priority flora species.

(d) Undertake baseline troglofauna surveys to improve knowledge of troglofauna population in the region to inform future management of mining operations.

(e) As the mining operations are within an area that will continue to be managed for its conservation values a Project Environmental Management Plan is required to ensure that mining and associated activities do not threaten conservation values. This plan will address matters such as disease and weed hygiene management, feral animals, fire prevention and response, and company protocols to authorise disturbance and clearance within the mining lease.

(f) Prevention of introduction of new weed species and monitoring to ensure weed cover does not increase as a result of mining operations.

(g) Rehabilitation of the mining areas and associated infrastructure.

(h) Mine closure and decommissioning.

Contents

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the key environmental factors and principles for the proposal by Polaris Metals Pty Ltd to develop the Carina Iron Ore Project (CIOP).

The CIOP proposal is located approximately 60 kilometres (km) north-east of Koolyanobbing in the Goldfields region of Western Australia (WA). The minesite is located wholly within Mining Lease M77/1244 (Figure 1).

The proposal involves mining of hematite direct shipping ore (DSO) from a single open pit on the Yendilberin Hills, which form part of the Finnerty Range. The Finnerty Range is one of the 29 Banded Ironstone Formation (BIF) Ranges considered in the *Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton* (DEC & DoIR, 2007) (BIF Review).

The proposal also includes development of an approximate 50 km road for access and mine haulage, linking the mine to a rail siding and processing plant adjacent to the Trans Australian Railway. An accommodation village is also proposed near the rail siding.

The proposal was referred to the EPA by Polaris Metals NL, now trading as Polaris Metals Pty Ltd (Polaris) on 16 September 2008, and set at a level of assessment (LoA) of PER with a 4 week public review period in November 2008. Three appeals were received on the LoA. The Minister for Environment dismissed all grounds of appeal on 2 April 2009.

The CIOP proposal is part of Stage 1 of Polaris' greater Yilgarn Iron Ore Project (YIOP) (Figure 2). Stage 1 of the YIOP also includes development of the Chamaeleon deposit located approximately 12 km north-west of Carina, however development of Chamaeleon is not part of this proposal or the EPA's assessment. Stage 2 of the YIOP includes development on the adjacent Helena and Aurora Ranges (including the Bungalbin Hills). The proponent has not referred the larger YIOP proposal to the EPA.

The proposal lies within the former Jaurdi pastoral lease. The pastoral lease was purchased by the Department of Environment and Conservation (DEC) (then known as the Department of Conservation and Land Management (CALM)) in 1989 for addition into the conservation reserve system (Figure 1).

On 1 September 2010 Government announced new conservation and mining arrangements for the Mt Manning area. This included that portions of the ex-Jaurdi pastoral lease are proposed to become the Jaurdi Conservation Park (JCP) and a conservation and mining reserve.

The Jaurdi area and surrounds (i.e. Mt Manning, Helena and Aurora Ranges, Bungalbin Hills etc) fall within the Great Western Woodlands (GWW) (Figure 1). The GWW is an area recognised as being "one of the very few large, intact landscapes remaining in temperate Australia" (Watson *et. al.* 2008).

The GWW are recognised as "the largest and most intact eucalypt woodland left in southern Australia and as such provides a unique link to the ancient continent of Gondwana" (Watson et al. 2008).

Figure 1: Locality Map

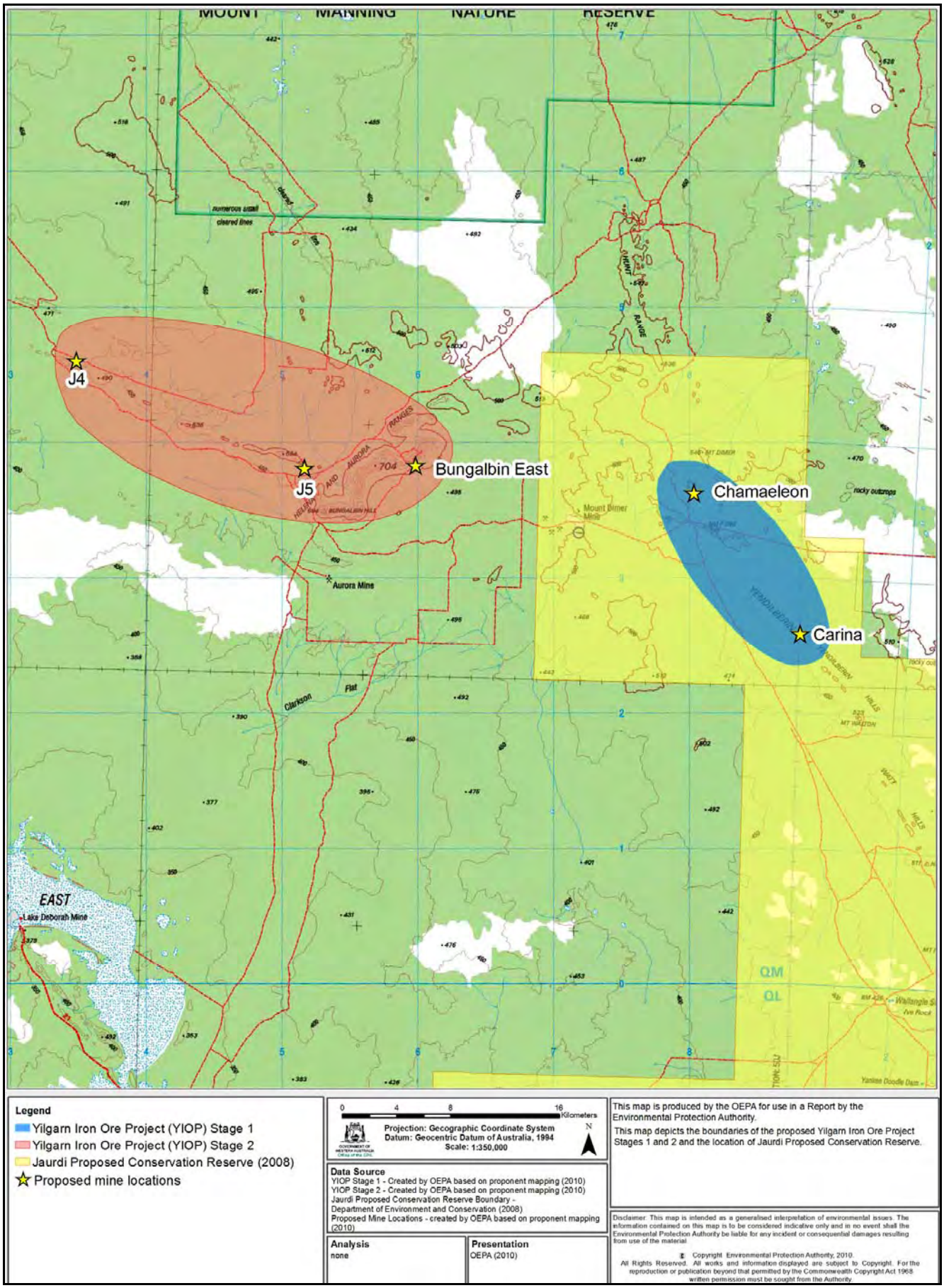

Figure 2: Yilgran Iron Ore Project development stages

The proposed mine site is located approximately 15 km south-west of the Class V Mount Walton East Intractable Waste Facility (IWF) (Figure 7). Access to the IWF is along approximately 96 km of unsealed road from the Great Eastern Highway. The IWF access road is subject to a Management Order vested with the Minister for Works limiting access only to permitted users.

Further details of the proposal are presented in Section 2 of this report. Section 3 provides the context for this assessment, while Section 4 discusses the key environmental factors and principles for the proposal. The Conditions to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 5. Section 6 provides Other Advice by the EPA and Section 7 presents the EPA's Recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

2. The proposal

The CIOP proposal is to develop an iron ore mine on the Yendilberin Hills located approximately 60 km north-east of Koolyanobbing in the Goldfields region (Figure 1).

The CIOP proposal components (Figure 3) include:

- open cut mining of a single pit and associated mine infrastructure (i.e. waste dump, run of mill (ROM) pad);
- development of an approximate 50 km haul road for ore haulage to the rail siding and for access to the minesite;
- development of train loading facilities to access the existing Trans Australian Railway;
- crushing and screening plant, stockpile areas and associated facilities (i.e. workshop, hard stand areas) located at the rail siding; and
- accommodation village and associated facilities (i.e. water treatment plants, power generation units) located near the rail siding.

The CIOP proposal footprint would require approximately 460 hectares (ha) of vegetation clearing.

A section of the IWF access road would be utilised by the proponent for access to the proposed rail siding and accommodation village, and also for worker commute traffic.

The life of mine (LoM) is expected to be 5 years based on an estimated 21.4 million tonnes (Mt) of minable iron ore. The proponent has stated that if further exploration identifies additional resource nearby that can be blended with the Carina ore, the LoM may be extended by an additional 5 years (with a reduced annual mining rate). Mining of any identified additional resources does not form part of this proposal.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 3 of the PER (Polaris Metals NL, March 2010).

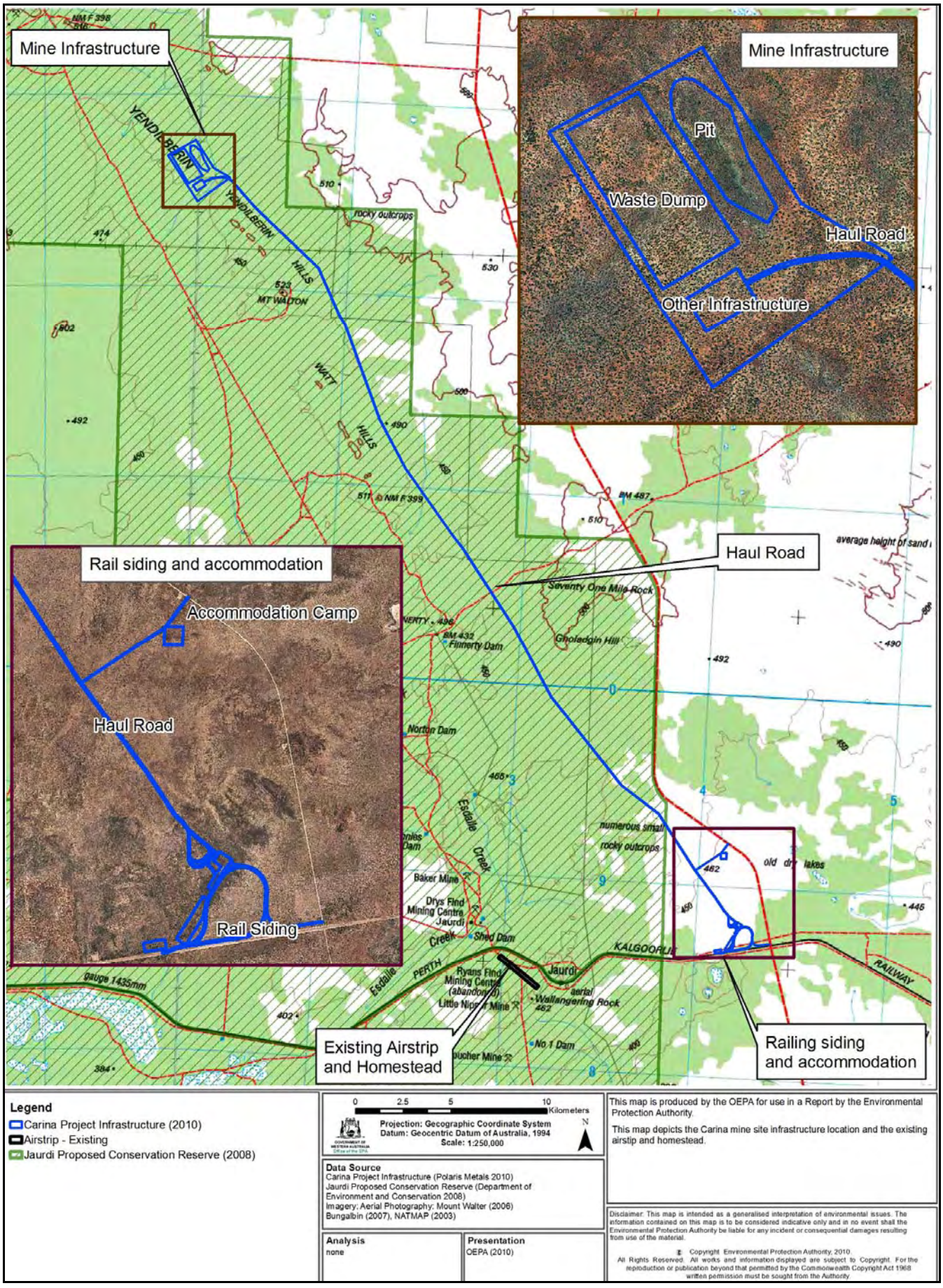

Figure 3: Carina Iron Ore Project project components

Table 1: Summary of key proposal characteristics

Element	Description
General	
Project Life	Up to 10 years
Area of disturbance	Up to 460 ha comprising: • open pit – 60 ha; • waste dump – 140 ha; • ROM pad and mine infrastructure – 50 ha; • haul road – 150 ha; • rail siding and infrastructure – 42.5 ha; • rail siding borrow pits – 7.5 ha; and • accommodation village and associated infrastructure – 10 ha
Resource	21.4 Mt DSO
Mining	
Type	Mining of hematite DSO below the water table
Pit	Single open pit with dimensions of 1500 m long, 380 m wide and 170 m deep
Mining rate	Up to 4 Mt/a
Waste dump	Single waste dump with dimensions of 1720 m long, 810 m wide and 35 m high
Waste rock	Up to 22.8 million bcm (equivalent million lcm)
Potentially Acid Forming (PAF) material	1 – 2% by volume (PAF material is to be encapsulated in the waste dump)
Pit dewatering	Up to 411 ML/a (1126 kL/d)
Infrastructure	
Water supply	Combination of water sources: • pit dewatering; • water from local bores piped to filling stations along the haul road; and • bores at the rail siding
Water consumption	Up to 678 ML/a
Power supply	Diesel powered generators at the minesite and main work centre (rail siding)
Product transportation	Trucked via road from the minesite to the rail siding, then taken via rail for port export
Site access	Via the Mt Walton East Intractable Waste Facility (IWF) access road to the rail siding

Abbreviations:

bcm	bank cubic metres	m	metre
DSO	direct shipping ore	ML/a	million litres per annum
ha	hectare	Mt	million tonnes
kL/d	kilolitres per day	Mt/a	million tonnes per annum
lcm	loose cubic metres		

Since release of the PER, a number of modifications to the proposal have been made by the proponent. These include:

- The proposal originally included development of an airstrip to transport mine workers to the site. This component has since been withdrawn from the proposal.
- The PER indicated 2 options for development of mine infrastructure. The proponent has chosen Infrastructure Option 1 (southern location) for the siting of infrastructure at the minesite.

The potential impacts of the proposal initially predicted by the proponent in the PER document (Polaris, 2010) and their proposed management are summarised in Table 4 (Executive Summary) of the proponent's document.

3. Assessment context

The BIF Ranges of the Midwest and Goldfields have been identified as having significant environmental values. The BIF Ranges are particularly important due to the presence of endemic, rare and restricted flora species and vegetation communities. The BIF Ranges also host a varied assemblage of fauna species (DEC & DoIR, 2007). Endemic species are those that are confined to a specific geographic area, and not found elsewhere (DEC & DoIR, 2007).

In September 2007 the BIF Review was released. The document was prepared in order to provide "strategic level advice for Government for consideration of biodiversity conservation actions for the BIF ranges in the Yilgarn Craton with a specific focus on the Midwest and the Goldfields regions" (DEC & DoIR, 2007).

The CIOP proposal also lies within the GWW boundary. The GWW is a large expanse of natural 'woodland' in south-western Australia comprising almost 16 million ha, and is one of the few remaining large, intact landscapes in temperate Australia (Watson *et. al.* 2008). The majority of the GWW sits over the Yilgarn Craton, which is one of the oldest land masses in the world (Watson *et. al.* 2008).

The GWW hosts over 4200 different taxa, which includes undescribed species, hybrids and varieties (Watson *et. al.* 2008). It is estimated that almost half of these species are endemic to south-western Australia (Watson *et. al.* 2008). The southern portion of the GWW forms part of the south-western Australia 'biodiversity hotspot' which is internationally recognised (Watson *et. al.* 2008).

The State Government has committed funds to better manage and protect the GWW and is in the process of developing a biodiversity conservation strategy for the GWW to ensure the long-term conservation of the unique natural and cultural values of this important wilderness area.

EPA Report No. 1256 (May, 2007) *Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve*, section 16(e) advice in relation to the Yendilberin and Watt Hills/Jaurdi Conservation Park, recognised the area as having high environmental values and recommended that "Further investigations of the current Conservation Park recommendations to ensure adequate conservation of rare and endemic flora and other significant factors" (EPA, 2007).

The Jaurdi area was included by the DEC in the tenure and conservation reserve creation process under part of the larger Gascoyne Murchison Strategy (DEC, 2008).

This strategy included the acquisition of whole or part pastoral leases for conservation purposes. The Jaurdi area was chosen for inclusion into the reserve system as it was a good example of intact arid-zone woodland vegetation as it was never extensively stocked (CALM, 1994).

On 1 September 2010 Government announced new conservation and mining arrangements for the Mt Manning area. This included that portions of the ex Jaurdi pastoral lease are proposed to become the Jaurdi Conservation Park and a conservation and mining reserve.

It is the view of the EPA that the impacts of mining need to be considered in the context of avoiding unnecessary loss of conservation values. While there is no, or very limited, discretion in the location of orebodies, there is significant opportunity to coordinate infrastructure provision to service the mining and exploration in this region, manage shared access and position infrastructure so that there is no unnecessary disturbance of conservation values. In any environmental assessment of mining operations it should be properly demonstrated that the environmental values are not unnecessarily compromised by mining.

4. Key environmental factors and principles

Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the key factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as groundwater supply and noise are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The EPA notes that the proposal has discrete areas of development linked by linear infrastructure. The proposal has therefore been assessed based on each component and its environmental factors.

The EPA has decided that the following key environmental factors relevant to the proposal required detailed evaluation in the report:

(a) mine – the impacts on flora and vegetation, fauna and the rehabilitation and closure of the mine;

(b) haul road – impacts of flora and vegetation, and fauna; and

(c) rail siding and accommodation village – the impacts on flora and vegetation.

The above key factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics.

Details on the key environmental factors and their assessment are contained in Sections 4.1 - 4.3. 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.

The following principles were considered by the EPA in relation to the proposal:

(a) The precautionary principle;

(b) The principle of intergenerational equity; and

(c) The principle of waste minimisation.

4.1 Mine

Description

The CIOP proposal area is located within the Coolgardie Botanical District as defined by Beard (Beard, 1990), which corresponds to the Interim Biogeographic Regionalisation for Australia (IBRA) Coolgardie 2 Bioregion (COO2 – Southern Cross subregion) (Cowan *et al.* 2001). The IBRA Southern Cross subregion is characterised as having high species and ecosystem diversity, as it is the biogeographic interzone between the Coolgardie and Murchison biogeographic regions (Cowan *et al.* 2001).

The CIOP proposal involves development of a single open pit on the northern section of the Yendilberin Hills, which form part of the Finnerty Range. The Finnerty Range was identified and considered in the BIF Review.

The mining area which includes the pit, waste dump, run of mill (ROM) area and associated infrastructure would be approximately 250 ha in size.

Flora and vegetation

A vegetation survey of Exploration Lease E77/1115 was undertaken between May – June 2008. A Declared Rare and Priority Flora survey of Mining Lease M77/1244 was undertaken between 30 March – 2 April 2009 (Figure 4).

A total of 237 taxa (including subspecies and varieties) were recorded during the surveys. Two (2) introduced flora species were recorded inside E77/1115, these being *Erodium cicutarium* and *Erodium botrys*. No Declared Rare Flora (DRF) were identified during surveying, however 6 Priority Flora (PF) species were recorded inside E77/1115.

The PF species recorded within E77/1115 include *Spartothamnella* sp. Helena & Aurora Range (P.G. Armstrong 155-109) which is currently listed as a P3, but this species has the potential to be listed as DRF.

Of the six remaining PF species recorded, one would be directly impacted from development of the minesite, specifically *Daviesia purpurascens* (P4). A total of 87 individual plants were recorded inside M77/1244 and many individuals occur in areas proposed to be developed. This species is located in vegetation community W22 at the southern end of the proposed pit and in the mine infrastructure area (Figure 4).

Twenty five (25) vegetation communities were identified and mapped during surveying. Of the 25 vegetation communities identified, 5 would be directly impacted from the development of the minesite. No Threatened Ecological Communities (TEC) were observed in the survey area.

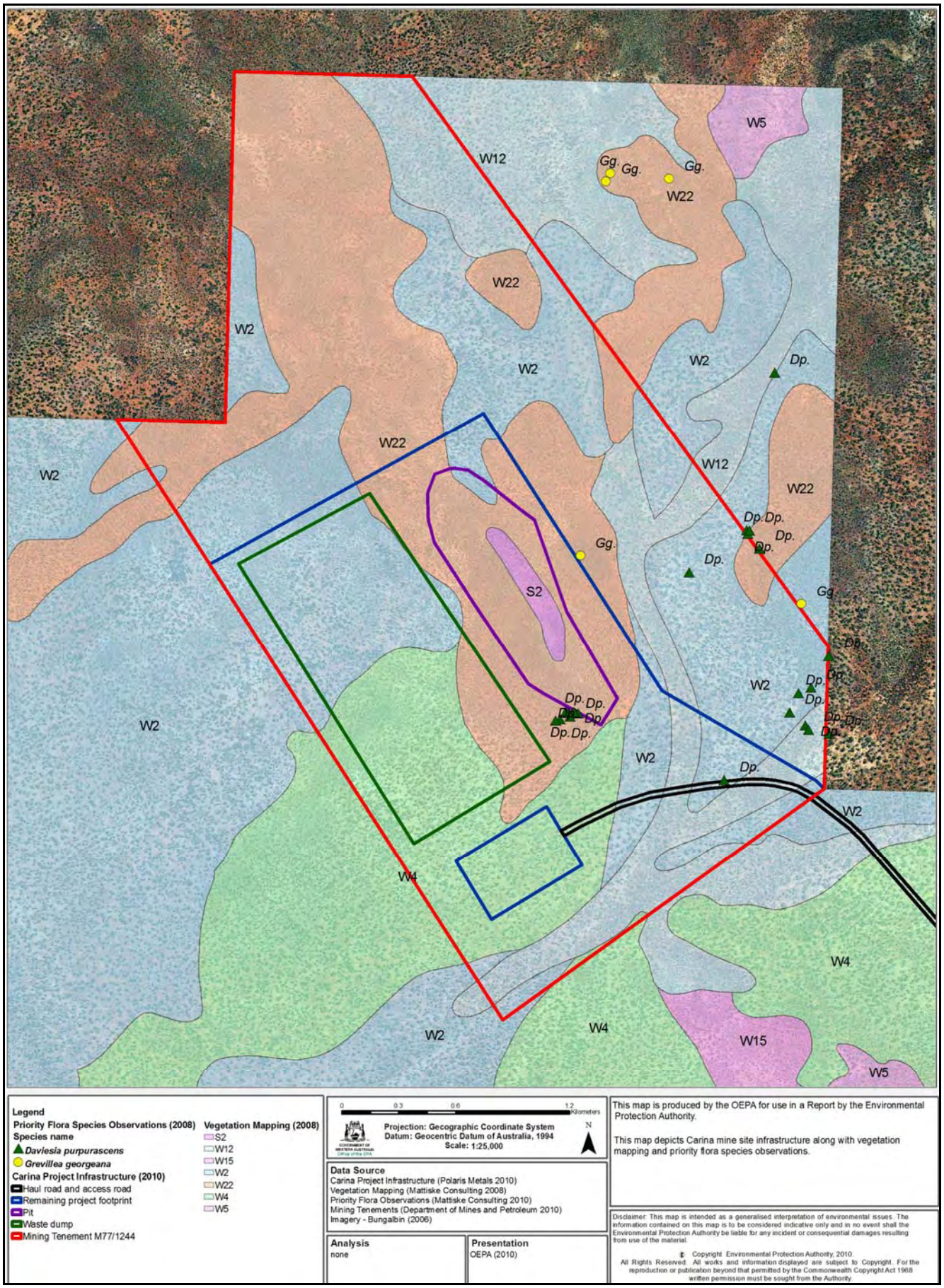

Figure 4: Minesite and associated flora and vegetation mapping

The crest, sides and foot of the hill proposed to be mined contains potentially significant vegetation. Vegetation community S2 occurs on the crests of the Yendilberin Hills and most closely relates to the BIF description of the "Finnerty Range vegetation complexes (banded ironstone formation)" Priority Ecological Community (PEC), which is classified as Priority 1. Vegetation community W22 occurs on the sides and at the foot of the proposed mining area. Vegetation communities W12, W4 and W2 occur in the immediate surrounding area.

Priority 1 PECs are "those with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range" (DEC, 2007b).

The Finnerty Range PEC refers to the vegetation associated with the BIF on the Yendilberin Hills, running from Mt Dimer in the north to Mt Finnerty in the south (Coffey, D. 2010, email, 26 July). The identified threat to the Finnerty Range PEC is mining (Figure 5).

Vegetation surveys undertaken for the proposal have mapped a total of 113.7 ha of S2 vegetation. The development of the proposed pit would result in direct disturbance of 8.6 ha (7.6%) of the S2 vegetation community. The proponent has stated that vegetation surveying undertaken on the northern exploration leases E77/946 and E77/1418 has mapped an additional 382 ha, however this data was not provided by the proponent and therefore cannot be verified.

The vegetation survey undertaken for the proposal has mapped a total of 543.9 ha of vegetation community W22. Development of the proposed minesite would impact approximately 65.2 ha (12%) of the W22 vegetation community.

Fauna and habitat

The Carina proposal lies close to the boundary between the Eremaean and the South-West Botanical Province, described as the 'mulga – eucalypt line' (Burbidge *et al.* 1995). As a result, this interzone area includes a range of fauna species that are at their south-west and north-east limits of their distribution (Burbidge *et al.* 1995).

A Level 2 fauna survey was undertaken for the CIOP proposal consisting of two sampling sessions: 19 – 26 June 2008 and 26 October – 1 November 2008. Six individual sampling sites (CR1 – CR6) were established around the proposed mine (Figure 6). Sampling sites were chosen based on dominant plant community and soil association and concentrated on areas in proximity to areas likely to be disturbed for mining and infrastructure. In some cases, areas were subject to active drilling at the time of the survey.

Site CR3 is located inside the proposed pit area, sites CR2 – CR6 are located in areas outside of proposed development areas.

Six comparison sites (CM1 – CM6) were established at the Chamaeleon prospect, located approximately 12 km north-west of the proposed Carina minesite (Figure 6). An additional comparison site was established at a dam located approximately 8 km north-west of the proposed Carina minesite.

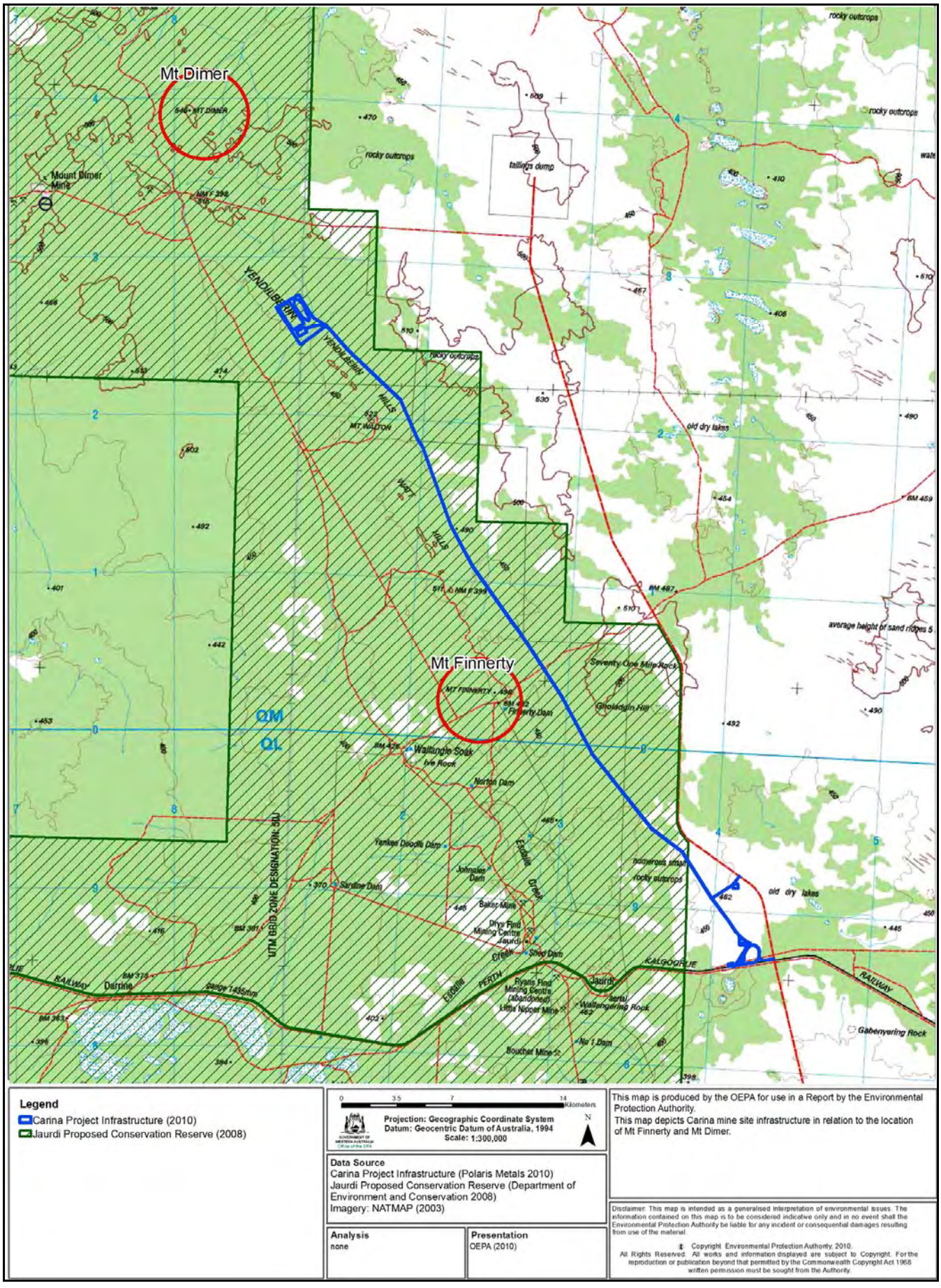

Figure 5: Carina Iron Ore Project proposal relative to the Finnerty Range

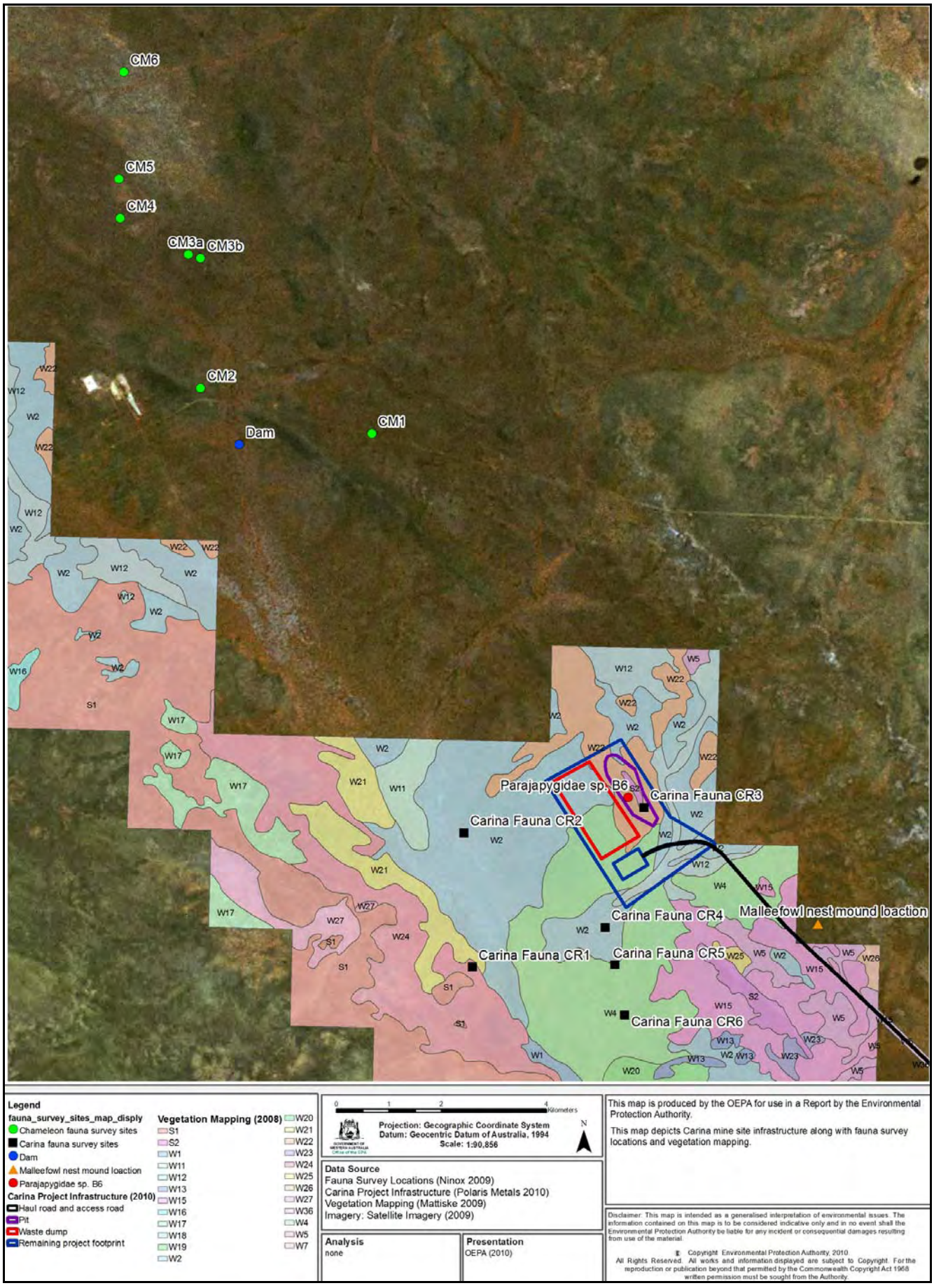

Figure 6: Fauna sampling and sites and comparison sites

The fauna survey included investigations for invertebrate fauna and specifically targeted groups of Short Range Endemic (SRE) species, these being:

- myglomorph spiders;
- scorpions;
- pseudoscorpions;
- millipedes; and
- molluscs.

The results of the vertebrate fauna survey recorded no frog species, 22 reptile species, 59 bird species, 4 non-volant mammal species, 8 bat species and 5 introduced mammal species.

The results of the June invertebrate fauna investigation recorded 5 genera of spider and 2 genera of scorpion. The October invertebrate fauna investigations recorded more fauna types including: spiders, scorpions, pseudoscorpions and millipedes. Six species of land snails were also recorded during the June and October investigations.

Subterranean fauna surveys were undertaken between August – October 2008 and April – June 2009. A third round of scrape samples was undertaken at the comparison site at the Chamaeleon prospect in September 2009.

The results of the subterranean fauna surveys recorded no stygofauna species in the first round of sampling, therefore no further sampling was undertaken. Six (6) troglofauna species were identified at Carina. A single individual from the Order Diplura was identified from within the proposed pit only (Figure 6).

Mine Closure and Rehabilitation

The CIOP proposal would disturb approximately 250 ha of land at the minesite.

The proposed open pit would be approximately 1500 m long, 380 m wide and 170 m deep, which equates to a surface area of approximately 60 ha.

The pit floor is below the ground water level, therefore dewatering would be required to maintain dry working conditions. Groundwater is approximately 38 m below the ground surface at the southern end of the deposit, and approximately 67 m below the ground surface in the elevated central part of the deposit.

At completion of mining the Carina open pit would gradually fill with water to form a pit lake. Sampling during exploration drilling has indicated that the groundwater has a Total Dissolved Salt (TDS) value of approximately 25,000 milligrams per litre (mg/L).

The proposed waste dump would be approximately 1720 m long, 810 m wide and 35 m high, which equates to a surface area of approximately 140 ha. The surrounding Yendilberin Hills are approximately 35 m high.

It is proposed to encapsulate any potentially acid forming (PAF) material inside cells in the waste dump. It is also proposed to dispose of surplus dewater into an evaporation pond inside the waste dump footprint.

The proponent proposes to manage flora, vegetation, fauna and rehabilitation via a Project Environmental Management Plan (PEMP), which includes a vegetation management procedure, fauna management procedure and a rehabilitation plan.

Submissions

Key comments in submissions focused on:

- the adequacy of the botanical surveys undertaken and the accuracy of the vegetation mapping provided;
- impact to flora and fauna associated with BIF ranges;
- the use of saline water for dust suppression and its potential impacts on vegetation;
- management of indirect impacts affecting flora and vegetation health;
- the management of PAF and other waste materials and the design of the waste dump;
- concern raised regarding not backfilling the open pit resulting in the formation of a pit lake;
- concern raised regarding impact from development on the conservation values of the proposed JCP.

Assessment

The EPA's environmental objectives are:

- to maintain the abundance, diversity, geographic distribution and productivity of flora, vegetation, fauna and habitat at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge;
- to protect the environmental values of areas identified as having significant environmental attributes; and
- to ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values.

When considering the trend of vegetation associated with BIF, it can be reasonably deduced that the current mapped extent of S2 and W22 vegetation communities represents the limit of their distribution.

The EPA notes however that the S2 vegetation community is also present on the crest of the remainder of the Yendilberin Hills where development is not proposed. It should also be noted that since flora surveying of the minesite was undertaken, the proponent has relocated the waste dump to reduce impact on the W22 vegetation community which also contained a large population of the P3 flora species *Grevillea georgeana*. The EPA notes that the residual impact on the S2 vegetation community is approximately 7.6%, and for the W22 it is approximately 12 %.

In regard to the P4 flora species *Daviesia purpurascens*, up to 31 (~36%) of the individuals recorded inside M77/1244 would be impacted by the proposed mining depending on final mine design. The EPA notes that this species is also present at other locations in the Carina survey area and is known from other locations in the Goldfields, South-West and Midwest regions.

The survey methodology used to map the vegetation across the CIOP proposal area and E77/1115 involved sampling and recording of flora within 1,964m^2 survey sites (Mattiske, 2008). Site selection was based on differences in structure and floristics of the communities in the project area (Mattiske, 2008).

In contrast, surveys undertaken by the DEC in the Jaurdi area involved establishment of fifty three (53) 20 m x 20 m quadrats across the Watt Hills, Yendilberin Hills and Hunt Range (Gibson and Lyons, 2001). The quadrat locations were intended to cover the major geographical, geomorphological and floristic variation found across the study area (Gibson and Lyons, 2001). The approach undertaken by the DEC is

consistent with EPA Guidance Statement No. 51: *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (June, 2004).

The method used for CIOP proposal surveying is an older style that relies on vegetation structure to determine vegetation units, whereas the method applied by the DEC involves plot data which records all species present inside established quadrats.

Statistical based analysis of detailed floristics allows for consistent, repeatable, objective comparison of vegetation data collected from quadrats. Comparison of structural vegetation units is likely to be much more subjective.

As the methodology used for the vegetation mapping for the proposal area was incompatible with the recommended methodology undertaken by the DEC for its surveys on other parts of the Range, it is difficult to assess the likely impacts of the proposed mining development on flora and vegetation.

The proponent's vegetation survey information suggests a low similarity between the vegetation present at the CIOP area, and the vegetation surveyed by the DEC on the Finnerty Range 7 – 10 km to the north and south. The proponent has asserted that impact to the S2 vegetation community as a result of development of the minesite would be low, as only 7.6% of the S2 vegetation in E77/1115 would be impacted, and it therefore believes that it is well represented in the local area.

The proponent has also asserted that the S2 vegetation community is likely to occur outside of the survey area as indicated by the extent of the Finnerty Range PEC. However, the proponent's rationale for this statement is unclear, when by its own analysis it was determined that the S2 vegetation community has a low similarity to the DEC survey data to the north and south.

Advice from the DEC concurs that the vegetation at the CIOP minesite has low similarity to the DEC survey data. However, vegetation associated with BIF ranges has been well documented as having rapid species changeover across small geographic distances, so it is not a surprising finding that the vegetation 7 – 10 km north and south of the CIOP proposal area is different. Furthermore, it is the view of the DEC that the S2 and W22 vegetation communities occur over a limited area and would not be expected to be regionally common.

Acceptance of incomplete or incompatible data has implications in regard to the assessment of the true nature and extent of the likely impacts from development on vegetation communities associated with BIF Ranges. In providing comment on the limitations of the vegetation mapping for the CIOP proposal, the DEC has also provided examples of high quality vegetation mapping undertaken for recent mining developments on BIF Ranges, such as the Karara Iron Ore Project and Koolyanobbing Iron Ore Project – Mt Jackson J1 Deposit.

Notwithstanding the poor quality survey data, the EPA notes that the proponent has modified its proposal to limit the impacts on the significant vegetation communities, to an acceptable level and that the proposal is unlikely to impact DRF or significantly impact priority flora. It is the EPA's opinion that the impacts on vegetation can be managed to meet the EPA's objectives.

The potential environmental impacts will be managed in accordance with the key characteristics table which limits the extent of mining, including placement of mine infrastructure, consistent with modifications made by the proponent during the

assessment, and condition 5 to ensure protection of vegetation through limiting the impacts of mining to the extent proposed by the proponent.

Having regard to the proponent's vertebrate fauna surveys, a large number of reptiles were only recorded as a single specimen, therefore reptiles were not considered an abundant group. Sites CR4 and CR5 recorded the most reptiles, however the skink *Cyclodomorphus melanops elongates* (Spinifex Slender Blue-tongue) was recorded at site CR3 which corresponds to its habitat requirements. *Cyclodomorphus melanops elongates* has been identified as a species with a particular affinity with BIF ranges (DEC, 2007a).

Birds were the most abundant group identified from surveying with 56 species recorded from systematic sampling and 3 species observed opportunistically. Five (5) species of conservation significant birds were recorded during the fauna surveys. All sites recorded bird species, with sites CR1 and CR3 the most abundant.

Very few non-volant native mammals were recorded, and only from sites CR1 and CR3, plus one opportunistic sighting. Two (2) species of mammal were recorded at site CR3, being *Sminthopsis dolichura* (Little Long-tailed Dunnart) and *Cercartetus concinnus* (Western Pygmy Possum).

Bats were sampled by the use of an Anabat ultrasonic call detector placed at several locations around the proposed minesite. Analysis of recordings identified 8 species of bat. This included an unidentified *Nyctophilus* sp., which is possibly *Nyctophilus timoriensis* (Greater Long-eared Bat) listed as a Priority 4 species by the DEC.
Even though the 1 reptile and 2 mammal species recorded at site CR3 are associated with rocky habitats, the EPA notes that all have been recorded at other localities in WA. The reptile *Cyclodomorphus melanops elongates* has been recorded on the Jack Hills and the Helena and Aurora Range. The mammals *Cercartetus concinnus* and *Sminthopsis dolichura* have both been recorded on the Helena and Aurora Range.

Having regard to invertebrate fauna, none of the scorpions or land snails recorded are considered to be SRE species. A single pseudoscorpion nymph of the genus *Synsphyronus* collected at the Dam site may represent an SRE species.

In regard to spiders, the proponent has indicated that there was difficulty in identifying some of the female and juvenile specimens and therefore it was not possible to determine definitively if some specimens represent SRE species. The spider *Missulena 'occatoria-group'* recorded at sites CR1 and CR2 may represent an SRE species, however a full taxonomic revision of the *Missulena* genus in WA is necessary to confirm its status (Ninox, 2009).

In regard to millipedes, it is possible that a juvenile millipede of the genus *Atelomastix* collected at the Dam site is an undescribed species. An adult specimen of this species was also collected at site CM4. This species has not been reported from any other locality in WA before, however it is closely related to *Atelomastix bamfordi* reported from the Mt Jackson area located approximately 100 km west of the CIOP proposal area (Ninox, 2009).

The most abundant and diverse group of millipedes in WA is the genus *Antichiropus*, with all but one species known to be SRE species (Ninox, 2009). The millipede of genus *Antichiropus* recorded at site CR3 and at site CM5, is conspecific with a species currently only known from the Mt Gibson area, known as *Antichiropus* sp. nov. ('Mt Gibson 1'), located approximately 300 km north-west of the CIOP proposal

area (Ninox, 2009). As *Antichiropus* sp. nov. ('Mt Gibson 1') is only known from these two localities, although widely spaced, it is considered an SRE species (Ninox, 2009). Site CR3 is considered to be important habitat for the *Antichiropus* millipede.

In considering the millipede *Antichiropus* sp. nov. ('Mt Gibson 1'), the recording of this species at sites CR3 and CM5 represents a significant range extension for the species.

Having regard to subterranean fauna, four of the six troglofauna species recorded, were found inside the proposed pit area. However, three of those four species were also found at the comparison site at Chamaeleon. The fourth species, *Parajapygidae* sp. B6 (Order Diplura), was a single individual found only in the centre of the proposed pit. The other two species were found in areas outside of the proposed development area.

The EPA notes that advice received regarding an explanation as to why *Parajapygidae* sp. B6 was only recorded within the proposed pit boundary, stated that it was "due to its low abundance" (Bennelongia, 2009). Additionally, advice has suggested that the mafic schist in which the individual was found is a widespread habitat in the greater project area (Bennelongia, 2009).

The EPA also notes the proponent's intention to undertake additional surveys in geological target areas located between Carina and Chamaeleon to add to the regional knowledge base, and its associated Commitment 5 "to undertake further troglofauna surveys in the region, to improve knowledge of troglofauna populations in the region and those found at Carina...".

The proponent has published its intent to develop the larger YIOP proposal. The EPA has recommended the proponent's Commitment 5 as a condition of the proposal proceeding, to ensure there is better knowledge about the impacts of mining on troglofauna both to inform management of the CIOP proposal and potentially other operations proposed as part of the YIOP. This is addressed in condition 8.

Having regard to fauna habitat, the EPA notes that site CR3 is the only area that would be directly impacted by the development of the CIOP proposal. Sites CM4, CM5 and the Dam site where potentially significant SRE species were recorded, are not proposed to be disturbed as part of the CIOP proposal. The habitat type at site CR3 is also present on the remainder of the Yendilberin Hills, which are not proposed to be developed as part of the CIOP.

The EPA has concluded that the impacts of fauna can be managed to meet the EPA's objective as their remains habitat elsewhere in the region. The EPA has recommended a condition to ensure additional information on troglofauna is gathered to fill a knowledge gap on these species.

In relation to mine closure and rehabilitation, groundwater modelling has indicated that both sides and the southern end of the ore body are bound by basalt, whereas the northern end of the orebody appears to grade into unaltered BIF and chert (Rockwater, 2009). Investigations have shown the orebody to be locally cavernous which indicates a high permeability, whereas the adjoining basalt is relatively unfractured (Rockwater, 2009). Therefore, as the orebody is depleted, so to a large extent is the source of groundwater (Rockwater, 2009).

Due to the low rate of water input from groundwater inflow and rainfall, and the high evaporation rate, at the completion of mining the pit will act as a sink. An increase in

salinity of the pit lake is expected to occur over time as a result of evapo-concentration.

There is some potential for leakage of hyper-saline water into the surrounding aquifer from the northern section of the orebody. However, the groundwater in the surrounding aquifer is saline and is not used for any purpose.

PAF material would be managed by encapsulation in cells inside the waste dump. The encapsulation cells would have a 1 m thick cell floor and be a minimum 3 m above the natural ground surface. The encapsulation cell roof would be 1 m thick and would be 3 m below the top surface of the waste dump.

As the groundwater in the proposal area is saline, discharge of surplus dewater into waterways would likely result in adverse impact to the surrounding vegetation. Therefore, the proponent intends to discharge surplus dewater and other treated waste water into an evaporation pond located in the footprint of the waste dump. The exact location of the evaporation pond has not been determined, but would be approximately 15 ha in size.

To manage potential erosion of the waste dump, the proponent proposes to direct peak storm flow off of the crown and berm of the waste dump using landform ramps, and channeling this water into the open pit.

The EPA advises that the encapsulation cells would need to be appropriately situated inside the waste dump to ensure that the PAF material would not become affected by ingress of water and oxygen. Therefore, placement of the evaporation pond in relation to the encapsulation cells to avoid contamination and metaliferous drainage is a critical component of the detailed mine planning.

In view of the above the EPA has conditions to address:

- Rehabilitation of the mine to ensure that it is progressive and that rehabilitation completion are criteria are established (condition 11).
- Preliminary and final closure and decommissioning requirements to address management of PAF material and other potentially polluting materials, the siting of the evaporation pond and final closure of the mine (condition 12).

The EPA also notes the proponent proposes to manage potential ancillary impacts of mining via a Project Environmental Management Plan (PEMP). As mining is proposed in an area that will continue to be managed for its conservation values the EPA has recommend that this plan be formalised as a condition. The objectives of the plan are to ensure that the adverse impacts from mining and associated activities do not unnecessarily threaten conservation values within the mining lease and prevent impacts outside of the mining lease. The plan is recommend to be developed in consultation with the DEC as the land manager for the area. It will address amongst other things:

- Hygiene management measures to prevent the introduction of weeds and dieback disease.
- Management of feral animals.
- Company protocols to authorise disturbance and clearance of vegetation.
- Limiting and authorising access to areas within the mining lease.
- Fire prevention and response.
- Management and monitoring of saline water used for dust suppression.

Summary

Having particular regard to the:

(a) potentially significant vegetation associated with the BIF range that would be impacted;

(b) mine infrastructure that has been relocated to limit the impacts on significant vegetation and to avoid impacting a Priority 3 flora species;

(c) vegetation in the area that will be impacted is also present on the remainder of the Yendilberin Hills;

(d) the vegetation survey methodology was limited and did not allow for statistical analysis of data from other parts of the Finnerty Range;

(e) advice of the DEC regarding the potential extent of impacts on significant vegetation;

(f) impacts on important habitat associated with the BIF range;

(g) habitat inside the proposal area is also present on the remainder of the Yendilberin Hills;

(h) fauna associated with BIF habitat that would be impacted;

(i) location of fauna inside the proposal area have been recorded at other locations outside of proposed development areas, with the exception of the troglofauna singleton;

(j) additional troglofauna surveys that will be undertaken;

(k) formation of a pit lake at the completion of mining; and

(l) potentially acid forming material being encapsulated inside the waste dump,

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

- Protect vegetation to ensure the mining and associated infrastructure are contained to the areas identified in the assessment and that mining activities that have the potential to have offsite impacts on vegetation, such as dust and saline water used for dust suppression, are monitored and managed (condition 5).
- Undertake additional flora surveys to improve the knowledge of the presence and abundance of priority flora species (condition 7) .
- Undertake baseline troglofauna surveys to improve knowledge of troglofauna population in the region to inform future management of mining operations (condition 8).
- Prepare and Implement a Project Environmental Management Plan to ensure that mining and associated activities do not threaten conservation values (condition 9).
- Prevent the introduction of new weed species and monitoring to ensure weed cover does not increase as a result of mining operations (condition 10) .
- Rehabilitate the mining areas and associated infrastructure and undertake mine closure and decommissioning (conditions 11 and 12).

4.2 Haul road alignment

Description

The proposed haul road alignment is approximately 50 km long and 30 m wide which equates to clearing of approximately 150 ha of native vegetation. The proposed alignment runs along the eastern edge of the Finnerty Range and traverses through an area consisting predominantly of *Eucalypt* woodland.

The proposed haul road alignment and rail siding area was surveyed between 8 – 12 June 2009. A 60 m wide corridor along the proposed 50 km transport route was surveyed. The methodology used was the same as that for E77/1115, however involved a 30 m radius of survey locations along the alignment (Mattiske, 2009).

In relation to the flora investigations, a total of 269 taxa (including subspecies and varieties) were recorded along the proposed haul road during the survey. No DRF species were recorded, however 10 PF species were recorded consisting of:

- 3x P1;
- 1x P2;
- 5x P3; and
- 1x P4.

The PF species identified along the proposed haul road alignment include the 2 PF species that were recorded within the minesite area, and *Spartothamnella* sp. Helena & Aurora Range (P.G. Armstrong 155-109) which has the potential to be listed as a DRF.

In addition to the 10 PF species, 2 species of *Lepidosperma* were recorded within the proposed haul road alignment, both of which are likely to be listed as PF, these are *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) and *Lepidosperma* sp. Mt. Finnerty (S. McNee LCS 9486). Neither species are listed on DEC's Florabase.

Lepidosperma sp. Aurora Sandplain (R.L. Barrett 2809B) was located in vegetation communities S12 and S13 and were recorded relatively close together. *Lepidosperma* sp. Mt. Finnerty (S. McNee LCS 9486) was located in vegetation communities W34 and S15, and had a relatively wide spacing between the 2 locations.

At present *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) is only known from a single population located to the north of the Helena and Aurora Ranges. Similarly *Lepidosperma* sp. Mt. Finnerty (S. McNee LCS 9486) is only known from a single location on the Hunt/Watt/Yendilberin Hills. The recent recording of this species is adjacent to its current known extent.

Nineteen (19) vegetation communities were defined and mapped in the proposed haul road alignment during the survey. The most common vegetation communities were sclerophyll woodland (13), followed by scrub communities (5) and a single thicket community. No TECs were observed during the survey. The vegetation condition along the proposed alignment is in excellent to pristine condition in accordance with the Keighery Vegetation Condition Rating Scale (Keighery, 1994).

Vegetation communities S12 and S13 are contiguous and likely to be the same vegetation community. These were differentiated by the degree of fire burn which has resulted in differences of vegetation which is most likely associated with post-fire

succession changes in vegetation pattern (Mattiske, 2009). The S12 and S13 vegetation communities are located at the southern end of the proposed haul road within the last 10 km to the rail siding area.

Of the 19 vegetation communities defined along the proposed haul road alignment, 3 are also present in the minesite area (W2, W4 and W12). Ten (10) of the vegetation communities defined along the proposed haul road alignment contain PF species (W1, W5, W15, W30, W32, W34, S12, S13, S15 and T2).

Vegetation community S12 had the greatest number of PF including P1 (1), P2 (1), P3 (2) and P4 (1) species. Additionally, vegetation community S12 contains the flora species *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B).

The proponent intends to use groundwater drawn from bores located near to the haul road to manage dust. The groundwater in the proposal area is saline with a TDS value of approximately 25,000 mg/L and its use for dust suppression can potentially impact vegetation adjacent to the haul road.

In relation to fauna investigations, no specific fauna survey information for the proposed haul road was provided for the proposal. However, a malleefowl (*Leipoa ocellata*) mound (nest) was observed during the vegetation surveying of E77/1115 in May 2008. *Leipoa ocellata* is a CS1 – Schedule 1 (Vulnerable) species listed under both WA *Wildlife Conservation Act 1950* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

The malleefowl mound was located approximately 0.5 km east of E77/1115 (Ninox, 2009) (Figure 6). Additionally, malleefowl have been observed within the Chamaeleon area and recent footprints were recorded at site CM1 (Ninox, 2009). As part of its Response to Submissions the proponent has reported that malleefowl have been observed along the existing IWF access road.

The proposed alignment is approximately parallel to the IWF access road and therefore duplicates existing infrastructure and potentially unnecessarily impacts the conservation values through clearing, fragmentation and fauna impacts.

In relation to haul road options, the Environmental Scoping Document (ESD) for the CIOP proposal specified that two options for the haul road would be considered as part of the PER: Option 1 (Darrine) and Option 2 (Mt Walton). A third option was also included after consultation with stakeholders: Option 3 (Carina East) (Figure 7).

Very little information was provided in regard to the haul road options. The PER stated that Option 1 was abandoned after consultation with the DEC, who objected to development of a rail siding and processing facilities at the Darrine site, and instead preferred the use of Option 2.

The PER indicated that Option 3 was abandoned after consultation with the Department of Treasury and Finance – Building Management and Works (BMW), who advised that in its view the IWF access road was not to be used for mine haulage traffic.

The PER also stated that the majority of the 45 km length of the IWF access road between the proposed minesite and rail siding occurred on deep sands that are not suitable for sustained heavy haulage of ore, without costly earthworks to build a base-course of sufficient strength.

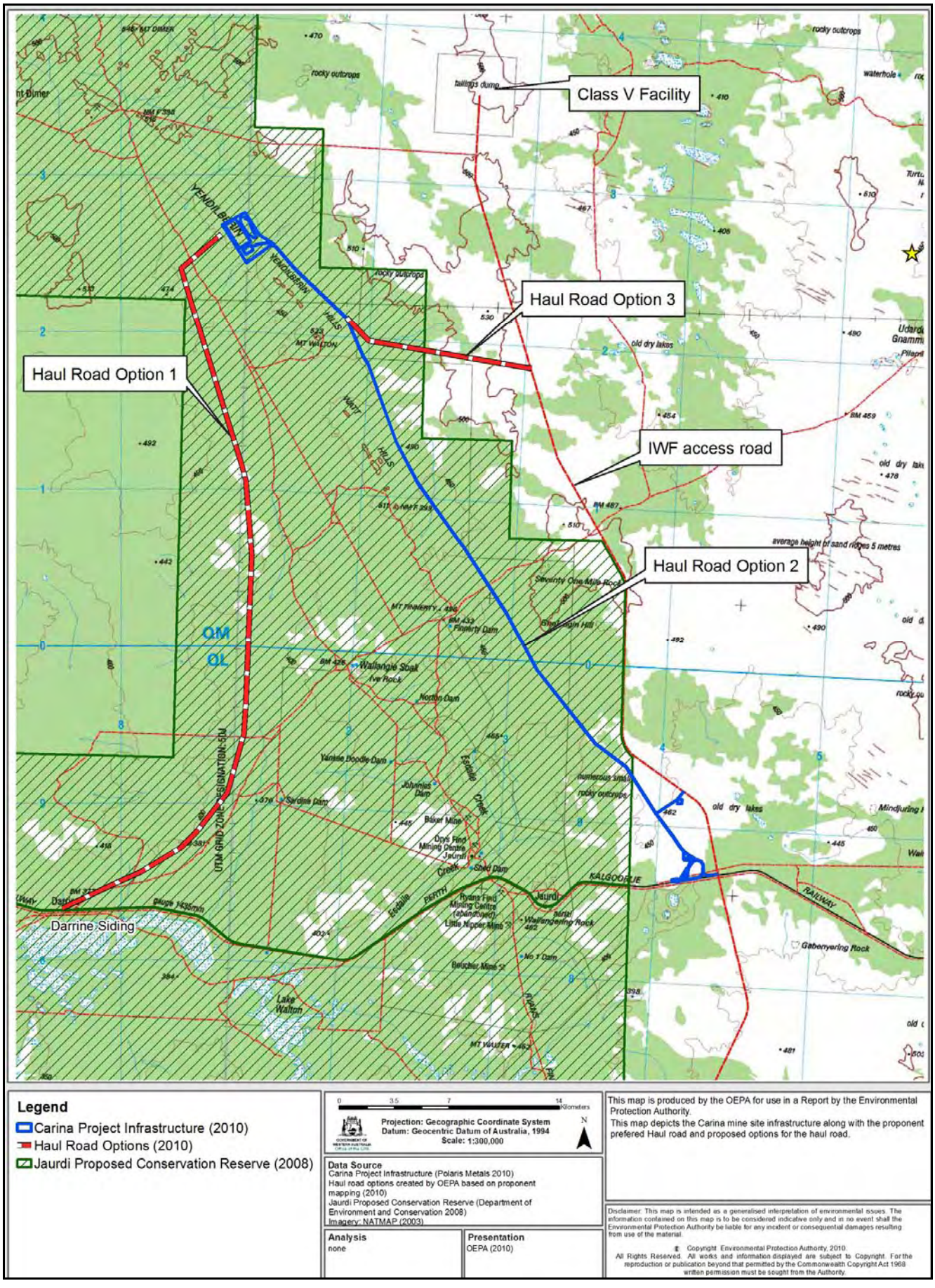

Figure 7: Haul Road alignment options

The PER stated that the section of the IWF access road between the proposed minesite and rail siding crosses undulating sand dunes which causes more wear and tear on the road and vehicles. The proponent has subsequently put a forward a view in its response to submissions that the use of the IWF as a haul road presents a safety hazard.

It was also assumed by the proponent that as the IWF access road traverses sandplain country it would contain more significant flora species, however no investigation of the flora and vegetation along the IWF access road was undertaken. The proponent advised that due to the above reasons, Option 2, involving a new haul road, was chosen as the preferred haul road route.

Submissions

Key comments in submissions focused on:

- duplication of existing transport infrastructure (IWF access road) and the impacts associated with the development of a new road;
- the adequacy of the botanical surveys undertaken and the accuracy of the vegetation mapping provided;
- concern raised regarding the use of saline water for dust suppression;
- concern raised regarding management of indirect impacts of dust affecting flora and vegetation health; and
- concern raised regarding impact of development on the conservation values of the proposed JCP.

Assessment

The EPA's environmental objectives are:

- to maintain the abundance, diversity, geographic distribution and productivity of flora, vegetation, fauna and habitat at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge;
- to maintain the integrity, ecological functions and environmental values of the soil and landform; and
- to protect the environmental values of areas identified as having significant environmental attributes.

Duplication of the existing transport infrastructure resulting in unnecessary impacts to conservation values was raised in submissions during the public review period. As part of the Response to Submissions phase of the assessment, the EPA requested additional information in relation to the investigations undertaken by the proponent regarding use of the IWF access road. The proponent was also requested to provide calculations for the quantity of clearing required in order to develop Option 3 versus the quantity clearing required to develop Option 2 to justify some of the claims made by the proponent during the assessment.

The proponent provided the following information regarding the clearing comparisons of the two options:

<u>Option 3:</u>

- widening of section of IWF road – 36 km x 15 m = 54 ha
- new section connecting road to mine – 19 km x 30 m = 57 ha
- new section connecting road to rail siding – 2 km x 30 m = 6 ha
- gravel pits for roadbase – 47 km x 12 m x 0.35 m = ~20 ha
- access roads to gravel pits – 10 km x 6 m = 6 ha

Total = 143 ha

Option 2:

- 48 km x 30 m Total = 144 ha

The proponent claims that no gravel pits or other disturbance would be required for its preferred alignment as the haul road will be constructed from cut and fill along its length, within the proposed disturbance corridor of 30 m.

The DEC also advised that it did not provide 'support' for Option 2 as indicated by the proponent and only indicated it as a preference to Option 1, as it would result in less infrastructure development inside the proposed JCP. Consistent with its advice on the PER and from its public submission, the DEC maintains that development of Option 2 would potentially duplicate the existing IWF access road and therefore may result in unnecessary vegetation clearing and unnecessary adverse impact to the conservation values.

The EPA also sought additional information from BMW in relation to the potential use of the IWF road for haulage purposes and the potential extent of future disposal campaigns to the IWF.

In considering whether the proponent has properly explored the potential use of existing infrastructure to avoid and limit impacts on environmental values, the EPA does not accept the reasons provided by the proponent. The claim that the creation of a new road will impact a similar amount (area) of vegetation are not substantiated given that the proponent has likely overestimated the amount of gravel required to upgrade the road and hence has similarly overestimated the area of clearing required for gravel pits. This is on the basis that existing portions of the IWF road are underlain by gravel and do not require upgrading to the extent contended by the proponent. Assertions by the proponent that upgrading the road is likely to impact more significant vegetation are also not substantiated by any survey information. The proponent has not adequately accounted for the threats to fauna from the new haul road. Overall the proponent has not taken account of the additional impacts of fragmentation caused by a new road as opposed to widening and upgrading an existing road.

Safety is an important matter and road upgrades would have to satisfy any relevant standards and requirements. It is accepted that the IWF road would need to be modified to meet necessary safety standards with some consequential impacts on the environment. Given that it is a permitted road, access can also potentially be limited to vehicles and personnel who are authorised and appropriately trained to use a road where heavy haulage is permitted.

Notwithstanding the above, the EPA is advised by BMW that the duration of waste disposal campaigns to the IWF can be in the order of several weeks and hence the use of the IWF road for mining heavy haulage purposes may conflict with these campaigns. It remains the EPA's view that the proponent did not adequately explore the sharing of existing infrastructure, however on the basis that potential intended uses may not be compatible, the EPA has considered the environmental impacts of the proposed haul road further.

Having regard to flora and vegetation, the EPA notes that the proposed alignment contains several PF species which includes 1 (*Spartothamnella* sp. Helena & Aurora Range) that may be upgraded to a DRF listing. The EPA also notes that 2 restricted *Lepidosperma* species likely to be listed as PF taxa would potentially be impacted by the proposed development. Several vegetation communities associated with PF species would also be impacted by the proposed development.

In regard to the PF species *Spartothamnella* sp. Helena & Aurora Range (P.G. Armstrong 155-109), the EPA notes that in anticipation of this species being listed as a DRF, the proponent has modified the proposed haul road alignment to avoid this taxa. The EPA supports this approach.

The proposal is unlikely to significantly impact vegetation communities or priority flora species given the linear nature of the haul road.

In relation to fauna values, the EPA notes that no specific fauna survey information for the proposed haul road was provided for the assessment. The EPA also notes that a malleefowl mound is located within proximity to the proposed haul road. Malleefowl are known from a wide range of habitat types and have been observed elsewhere in the greater YIOP area. The clearing of habitat is unlikely to significantly impact fauna species or populations in the area.

The EPA has judged the impacts of clearing of vegetation and habitat for fauna can be managed to meet the EPA's objectives provided the extent of clearing is limited to that predicted by the proponent. The EPA's condition 5 limits the extent of disturbance.

The ongoing impacts of the haul road, once it is constructed, on flora and fauna values, need to be carefully managed. This includes potential impacts from dust and from saline water used in dust suppression on vegetation, introduction of weeds and ensuring the haul road is managed to reduce the risk of road kills on native fauna. The EPA's condition 5 addresses monitoring of the health of vegetation adjacent to the haul road in relation to the impacts of dust and saline water application. This condition also requires management measures in the event that impacts on vegetation health are detected through the monitoring.

Management of the impacts to fauna are addressed through condition 6 which requires the proponent to develop strategies to avoid fauna deaths and to monitor fauna mortalities with a view to revising the strategies depending on the outcome of monitoring. Weed management is addressed in condition 10.

Condition 9 requiring the preparation and implementation of a Project Environmental Management Plan to ensure that mining and associated activities do not threaten conservation values, will also apply to the haul road.

It is expected that the haul road will be decommissioned and rehabilitated. This is addressed in conditions 11 and 12.

The EPA is aware that given the mineral prospectivity in this area there is potential for additional infrastructure requirements to support mining and exploration activities The need to coordinate the provision of infrastructure and ensure that this haul road can be used by others to limit additional unnecessary disturbance of conservation values is discussed further in Other Advice.

Summary

Having particular regard to the:

(a) potential impacts on several priority flora species;

(b) modifications of the proposed haul road alignment to avoid a potential Declared Rare Flora species;

(c) limitations of the vegetation survey methodology that did not allow for statistical analysis of data from other parts of the Finnerty Range;

(d) linear nature of infrastructure and given the relatively small width of the corridor in which the haul road will be constructed it is not expected that the haul road will significantly impact any vegetation community;

(e) lack of specific fauna investigations for the proposed haul road alignment;

(f) malleefowl mound that was identified within proximity to the proposed haul road alignment, and malleefowl have been observed at the Chamaeleon prospect and along the IWF access road and are likely to use the area,

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

- Protect vegetation to ensure the haul road is contained to the corridor proposed and offsite impacts on vegetation, such as dust and saline water used for dust suppression, are monitored and managed (condition 5).
- Monitor and manage mining activities to limit fauna mortality (condition 6).
- Prevent the introduction of new weed species and monitoring to ensure weed cover does not increase as a result of mining operations (condition 10).
- Prepare and Implement a Project Environmental Management Plan to ensure that mining and associated activities do not threaten conservation values (condition 9).
- Undertake closure and decommissioning and rehabilitate the haul road (conditions 11 and 12).

4.3 Rail siding and accommodation village

Description

The location of the rail siding and accommodation village are shown on Figure 3.

A vegetation survey of the proposed rail siding and accommodation village was undertaken between 17 – 20 January 2010.

A combined total of 177 taxa were recorded during this survey, and from previous work undertaken for the haul road and rail siding in June 2009.

No DRF were identified during surveying, however 7 PF species and 4 other flora species of conservation significance were identified during the surveys. The 4 flora species of conservation significance being, *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B), *Lepidosperma* sp. Lake King, *Lepidosperma* sp. MWP12, and *Leucopogon* sp. Mt Walton, are all proposed as Priority taxa. None of these species are listed on DEC's Florabase.

No introduced flora species were identified during the flora surveys. No TECs were observed in the survey area. Five (5) vegetation communities were identified and mapped during surveying, 2 of which also occur along the proposed haul road (S11 and S12). All 5 of the vegetation communities identified would be impacted by the development of the rail siding, accommodation village and associated access track.

In regard to the PF species recorded, 3 occur within the rail siding area and include a P1 species, 4 occur within the accommodation village area and include 3 of the undescribed flora species of conservation significance, and 3 occur along the access track and includes a P1 species and the remaining undescribed *Lepidosperma* sp., which is a possible new species.

Six (6) of the 7 PF species recorded at the rail siding, accommodation village and associated access track were recorded along the proposed haul road alignment, and 1 species is also located at the minesite (*Daviesia purpurascens*).

From recent advice, the EPA understands that when the flora survey for the accommodation village was conducted, an error in the survey location was made, therefore the investigation was undertaken in the wrong area.

The proponent has advised that a follow-up survey of the actual accommodation village site was undertaken in May 2010, and new vegetation mapping GIS data was provided. However, advice from the proponent stated that at the time of survey most of the vegetation was burnt. The EPA has not received this latest survey report and therefore cannot verify any of this information or comment on the accuracy of the latest vegetation mapping.

In relation to fauna investigations, no specific fauna survey information for the proposed accommodation village was provided for the proposal.

The proponent has also advised that it intends to retain some of the rail infrastructure i.e. rail loop, which is approximately 12.5 ha in area at the completion of mining but the accommodation village is to be decommissioned.

Submissions

Key comments in submissions focused on:

- issues surrounding the adequacy of the botanical surveys undertaken and the accuracy of the vegetation mapping provided;
- concern raised regarding the use of saline water for dust suppression; and
- concern raised regarding management of indirect impacts affecting flora and vegetation health.

Assessment

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

The EPA supports the decision of the proponent to locate the rail siding and accommodation village outside the boundaries of the proposed JCP.

In relation to the rail siding the EPA also notes, that no DRF species were identified during the flora and vegetation surveying. The EPA considers that due to its relatively small size (approx. 50 ha), development of the rail siding is unlikely to have a significant impact on flora and vegetation values.

It is disappointing that errors have been made and only identified very late in the assessment process in relation to flora surveys of the accommodation village. However, the EPA considers that given the relatively small size of the accommodation village (approx. 10 ha) it is also unlikely to have a significant impact.

The EPA also notes that the proponent has stated that the configuration of accommodation village can be located within the tenement to avoid significant flora species, thereby reducing or mitigating direct impacts.

The proponent has committed to undertake follow-up surveys at a more optimal time of the year to quantify significant flora in the wider area, and its associated Commitment 4 “to undertake further botanical surveys in the sandplain vegetation type, to improve knowledge of significant flora populations in the region...”. The EPA has recommended this commitment be formalised into a condition to ensure there is appropriate quantification of the potential impacts on flora values of the region (condition 7).

Condition 9 requiring the preparation and implementation a Project Environmental Management Plan to ensure that mining and associated activities do not threaten conservation values, will also apply to the rail siding and accommodation facilities as will condition 6 relating to weed management, and conditions 11 and 12 requiring decommissioning and rehabilitation of the accommodation village and components of the rail siding when they are no longer required.

The processing facilities located at the rail siding will be subject to Part V of the *Environmental Protection Act 1986* works approval and licencing requirements. Waste water treatment facilities, if they are of sufficient capacity, will also be subject to works approval and licensing.

Summary

Having particular regard to the:

(a) significant flora species that would potentially be impacted;

(b) footprints of both the rail siding and accommodation village being relatively small;

(c) final footprint of the rail siding and accommodation village that can be modified to reduce or mitigate impact on significant flora species;

(d) additional flora surveys for undescribed species that will be conducted; and

(e) lack of specific fauna investigations for the proposed rail siding and accommodation village areas;

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

- Protect vegetation to ensure the rail, processing and accommodation facilities are contained to the areas proposed (condition 5).
- Prevent the introduction of new weed species and monitoring to ensure weed cover does not increase (condition 10).
- Prepare and Implement a Project Environmental Management Plan to ensure that mining and associated activities do not threaten conservation values (condition 9).
- Undertake closure and decommissioning and rehabilitate the rail siding and accommodation facilities (conditions 11 and 12).

4.4 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the *Environmental Protection Act (1986).* Appendix 3 contains a summary of the EPA's consideration of the principles.

5. Conditions

Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

5.1 Recommended conditions

Having considered the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Polaris Metals Pty Ltd to develop the CIOP, is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) Protection of vegetation to ensure the mining and associated infrastructure are contained to the areas identified in the assessment and that mining activities that have the potential to have offsite impacts on vegetation, such as dust and saline water used for dust suppression, are monitored and managed.

(b) Monitoring and management of mining activities to limit fauna mortality.

(c) Additional flora surveys to improve the knowledge of the presence and abundance of priority flora species.

(d) Undertake baseline troglofauna surveys to improve knowledge of troglofauna population in the region to inform future management of mining operations.

(e) As the mining operations are within in an area that will continue to be managed for its conservation values a Project Environmental Management Plan is required to ensure that mining and associated activities do not threaten conservation values. This plan will address matters such as disease and weed hygiene management, feral animals, fire prevention and response, and company protocols to authorise disturbance and clearance within the mining lease.

(f) Prevention of introduction of new weed species and monitoring to ensure weed cover does not increase as a result of mining operations.

(g) Rehabilitation of the mining areas and associated infrastructure.

(h) Mine closure and decommissioning.

It should be noted that other regulatory mechanisms relevant to the proposal are:

- Part V of the *Environmental Protection Act 1986* – Works Approval and operating Licence;
- *Rights in Water and Irrigation Act 1914* – Groundwater Licence;
- *Mining Act 1978* – Mining Proposal.

5.2 Consultation

In developing these conditions, the EPA consulted with the proponent and the Department of Environment and Conservation in respect of matters of fact and matters of technical or implementation significance.

6. Other Advice

Government has recently announced its intention to create a conservation and mining reserve and the JCP which recognises both the significant conservation values of the Mt Manning area and development of mineral resources of strategic value. The EPA is also aware of the considerable exploration activity and future potential for mining on the Finnerty Range. As part of this assessment, the DMP provided advice to the EPA confirming this to be the case.

This assessment has highlighted that there are clearly opportunities to coordinate infrastructure provision to achieve improved environmental outcomes while still providing the infrastructure necessary to support mining of strategic mineral resources. In the absence of a coordinated and strategic approach to infrastructure provision there is an increased likelihood of significant environmental values being unnecessarily impacted. The EPA is of the view that examination of infrastructure requirements should be an early priority for planning of the conservation and mining reserves and mechanisms should be put in place to require the sharing of infrastructure.

In this regard the EPA explored with the proponent its willingness to make its infrastructure available for common use. There remain questions about whether infrastructure will be shared. As the State is making available land in an area that has significant conservation values, it is the EPA's view that there should be a requirement for sharing of infrastructure. The DMP has advised the EPA that there is capacity for the *Mining Act 1978* to provide a mechanism for this to occur. The suggested approach is that a condition of grant be placed on the Miscellaneous Licence that will apply for this proposal stating that once the haul road is constructed the tenement holder is to provide third party access if requested by the Minister for Mines and Petroleum. The EPA recommends that the Minister for Environment explore this opportunity with the Minister for Mines and Petroleum. The EPA considers this is necessary to ensure Government's objectives of protection of environmental values and development of strategic mineral resources are both achieved.

In this context the proponent has also alluded to additional development inside the proposed JCP boundary, specifically, the upgrading of the Jaurdi airstrip (Figure 3).

The PER and the ESD for the CIOP proposal specified that neither the existing airstrips at Mt Dimer nor the Jaurdi Station were suitable for fly-in fly-out (FIFO) purposes as both were not long enough to support the required aircraft, and low lying topography rendered access tracks impassable in even mild rainfall conditions.

The proponent also stated that due to the distance between the existing airstrips and the proposed accommodation village, the required lengthening of the airstrip and required improvement of the access tracks, establishment of a new airstrip near to the minesite would constitute less land clearing. Therefore, the ESD stipulated that a suitable location for a new airstrip would be selected for the PER. The potential other locations for airstrips are shown on Figure 7.

As with the haul road, the PER provided very little information in regard to the airstrip options and analysis. The proponent stated in the PER that two alternate locations for a 'new' airstrip were considered, however no detail was provided. The proponent stated that as the new airstrip locations were in areas of undulating sand the works required to build the airstrip to Civil Aviation Safety Authority (CASA) standards made this option unviable. Instead, the proponent stipulated a preference for the upgrading of the Jaurdi airstrip.

This assertion is in contradiction of Polaris's advice to the DEC during the PER assessment, dated 18 January 2010, which outlined changes to the CIOP proposal and included relocation of all processing facilities, accommodation village and airstrip from the minesite (which is contain inside the JCP) to the proposed rail siding area at the intersection of the IWF access road.

The use of the Jaurdi airstrip for FIFO operation was raised in submissions during the public review period. As part of the Response to Submissions phase of the assessment, the EPA requested additional advice in relation to the investigations undertaken by the proponent regarding the airstrip options.

The proponent subsequently informed the EPA in a letter dated 21 May 2010 that it was withdrawing the airstrip component from the proposal and hence, it is not part of the EPA's assessment.

The EPA is aware that although earlier advice had been provided by the DEC regarding a minor extension to the runway to allow for intermittent use for exploration and emergency situations, this advice does not apply to expansions necessary to accommodate FIFO operations nor has approval been given for ancillary infrastructure such as fuel storage, carparks and airstrip aprons that would be necessary for a sustained FIFO operations. This also includes that the access road (owned by WestNet) along the railway which is likely to require significant upgrading to accommodate regular use. All of these activities related to the upgrading of the Jaurdi airstrip potentially impact on the proposed JCP and have not been accounted for and should be properly considered. This may include development of an airport at an appropriate alternative site if it is determined to be an environmentally better outcome. The EPA will write separately to the DMP bringing this matter to its attention.

7. Recommendations

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

1. That the Minister notes that the proposal being assessed is Carina Iron Ore Project;
2. That the Minister considers the report on the key environmental factors and principles as set out in Section 4;
3. That the Minister notes that the EPA has concluded that it is likely that the proposal can be managed to meet the EPA's objectives, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations:

State Government
Department of Environment and Conservation (DEC)
Department of Indigenous Affairs (DIA)
Department of Mines and Petroleum (DMP)
Department of State Development (DSD)
Department of Water (DoW)
Fremantle Port Authority (FPA)

Local Government
Shire of Esperance (S.o.Esperance)

Non-Government Organisations
Conservation Council of Western Australia (CCWA)
Wildflower Society of Western Australia (WFSWA)
Western 4w Driver Magazine (4WD)

Individuals:

Anonymous

Appendix 2

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Letter from Dave Geraghty on behalf of Polaris Metals NL to Norm Caporn, Department of Environment and Conservation, dated **18 January 2010**.

Letter from Ian Kealley on behalf of CALM to Christopher Reed, Reed resources Ltd, dated **6 December 2005** entitled *Jaurdi airstrip upgrade*.

Letter from Terri Newman on behalf of the Department of Regional Development and Lands to Nyomi Bowers, Office of the Environmental Protection Authority, dated **14 July 2010** entitled *Reserve 44102 Mt Walton Road – Shire of Coolgardie, Enquiry Regarding Management Order*.

Letter from Paul Rokich on behalf of Polaris Metals NL to Nyomi Bowers, Office of the Environmental Protection Authority, dated **18 May 2010** entitled *Carina Iron Ore Mine – Assessment No. 1756*.

Letter from Paul Rokich on behalf of Polaris Metals NL to Nyomi Bowers, Office of the Environmental Protection Authority, dated **2 June 2010** entitled *Carina Iron Ore Mine – Assessment No. 1756*.

Letter from Paul Rokich on behalf of Polaris Metals NL to Mark Jefferies, Office of the Environmental Protection Authority, dated **22 June 2010** entitled *Carina Iron Ore Mine – Assessment No. 1756*.

Letter from Rick Rodgers on behalf of the Department of Mines and Petroleum to Leigh Taylor, Polaris Metals Pty Ltd, dated **10 August 2010** entitled *Multi Use Potential of Polaris Metals Proposed Carina Haul Road*.

Letter from Leigh Taylor on behalf of Polaris Metals Pty Ltd to Xuan Nguyen, Department of Mines and Petroleum, dated **6 August 2010** entitled *Multi Use Potential of Polaris Metals Proposed Carina Haul Road*.

Letter from Leigh Taylor on behalf of Polaris Metals Pty Ltd to Colin Murray, Office of the Environmental Protection Authority, dated **19 August 2010** entitled *RE: Multi Use Potential of Polaris Metals Proposed Carina Haul Road (Assessment no. 1756).*

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Appendix 3

Summary of identification of key environmental factors and principles

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
BIOPHYSICAL			
Flora and Vegetation	A vegetation survey of Exploration Lease E77/1115 was undertaken between May – June 2008. A Declared Rare and Priority Flora survey of M77/1244 was undertaken between 30 March – 2 April 2009 A total of 237 taxa were recoded during these surveys which included 6 PF and 2 introduced flora. No DRF were identified during surveying. One (1) PF species - *Daviesia purpurascens* (P4) would be directly impacted from development of the minesite. This species is located in vegetation community W22. Five (5) vegetation communities would be directly impacted from the development of the minesite. The S2 and W22 are considered to be significant	<u>Government Organisations</u> • DEC considers that the proponent should utilise the existing Mt Walton Intractable Waste Facility accress road as the haul road; • DEC considers that in the event that haul route as proposed in the PER is found to be environmentally acceptable and subsequently approved, detailed planning of the final alignment, including suitable locations of borrow pits, should be taken in the advice of, and in agreement, with DEC; • DEC notes that the proponent has not delineated an area that will be subject to indirect impacts or developed a monitoring program for this area; • DEC suggests that a condition be applied that ensures impacts on native vegetation are limited to an agreed direct and indirect disturbance footprint, using trigger levels for applying contingency measures; • DEC suggests that a defined buffer, in which the vegetation condition and health may decline to agreed limits, be delineated around areas approved for disturbance; <u>Non-Government Organisations</u> • WFSWA notes that the PER refers to nine flora surveys undertaken for the proposal, yet only 4 were provided as appendices to the document. WFSWA is concerned at the lack of corroborating technical information available with the PER; • WFSWA notes that some of the flora surveys were conducted outside of optimum surveying times; • WFSWA notes some disparity in the PER text in relation to the findings of the vegetation surveys undertaken for the proposal and previous surveys conducted by the DEC near to the proposal area;	**Factor considered to be a relevant environmental factor and is discussed under sections "Minesite", "Rail Siding and Accommodation Village" and "Haul Road Alignment".**

	as they are associated with the BIF and contain priority species. Development of the proposed pit would result in direct disturbance of 8.6 ha (7.6%) of S2 and 65.2 ha (12%) of W22. The proposed haul road alignment and rail siding area was surveyed between 8 – 12 June 2009. Another vegetation survey of the proposed rail siding and accommodation village was undertaken between 17 – 20 January 2010. A combined total of 177 taxa were recorded during these surveys. Seven (7) PF and 4 flora species of conservation significance would potentially be impacted by development of the rail siding and accommodation village. Five (5) vegetation communities would be impacted by development of the rail siding and accommodation village.	• WFSWA disagrees with the proposed weed management being restricted to 'introduction and spread of significant species'; • WFSWA consider the predicted outcome of *No introduction or spread of significant weeds* to be unacceptable. The proponent should commit to not introducing any weeds and controlling the two currently recorded; • WFSWA notes that the issue of fire has not been addressed and considers this a major shortcoming. <u>Public</u> • Inappropriate time of year for field survey in many cases; • The potential for insufficient time available to consultants to adequately assess and map large areas, often with poor access on the ground; • Surveys for significant flora being conducted at too great an interval (transects 100m apart) to be effective; • Incomplete taxonomic treatment of many species encountered (possibly due to unsufficient material being available due to surveys at an inappropriate time of the year; • The lack of detailed impact assessment on species and communities with conservation significance means that this is not well presented in any supporting documentation; • Lack of a vegetation map in the vegetation section; • The vegetation mapping (Appendix 4) exhibits large and relatively simple patterns. Smaller polugons and a more complex pattern of vegetation would be expected in this area.	

	Ten (10) PF and 2 flora species of conservation significance would potentially be impacted by development of the proposed haul road. Nineteen (19) vegetation communities would be impacted by development of the proposed haul road.		
Priority Ecological Community	Vegetation community S2 occurs on the crests of the Yendilberin Hills and most closely relates to the BIF description of the "Finnerty Range vegetation complexes (banded ironstone formation)" PEC, which is classified as Priority 1. Vegetation community W22 occurs on the sides and foot of the proposed mining area and contains PF species. Vegetation communities W12, W4 and W2 occur in the immediate surrounding area. The Finnerty Range PEC refers to the vegetation associated with the BIF on the Yendilberin Hills, running	<u>Non-Government Organisations</u> • CCWA notes that the ridgeline vegetation community at Carina has a low similarity to the Finnerty Range vegetation complexes (banded ironstone formation) Priority Ecological Community (PEC), and at present none of the Finnerty Range is in secure conservation reserve; • CCWA notes that at present there is no clear understanding as to the level of loss that can be sustained on banded ironstone formation (BIF) ranges without compromising local ecosystems. <u>Public</u> • Inappropriate and incomplete assessment of potential Priority Ecological Community issues related to the project area.	**Factor considered to be a relevant environmental factor and is discussed under "Minesite".**

	from Mt Dimer in the north to Mt Finnerty in the south. The identified threat to the Finnerty Range PEC is mining.		
Vertebrate Fauna	A Level 2 fauna survey was undertaken for the CIOP proposal consisting of two sampling sessions: 19 – 26 June 2008 and 26 October – 1 November 2008. Six sampling sites (CR1 – CR6) were established around the proposed mine and were chosen based on dominant plant community and soil association. Survey effort was concentrated on areas in proximity to areas likely to be disturbed for mining and infrastructure. Site CR3 is located inside the proposed pit area, sites CR2 – CR6 are located in areas outside of proposed development areas. Six comparison sites (CM1 – CM6) were established at the Chamaeleon prospect, located approximately 12 km north-west of Carina, plus an	No submissions	**Factor considered to be a relevant environmental factor and is discussed under "Minesite".**

	additional site at a dam located between Carina and Chamaeleon. The results of the vertebrate fauna survey recorded no frog species, 22 reptile species, 59 bird species, 4 non-volant mammal species, 8 bat species and 5 introduced mammal species.		
Invertebrate Fauna	Fauna surveys undertaken for the CIOP proposal included investigations for invertebrate fauna and specifically targeted groups of SRE species. The results of the June invertebrate fauna investigation recorded 5 genera of spider and 2 genera of scorpion. The October invertebrate fauna investigations recorded more species and individuals: spiders, scorpions, pseudoscorpions, millipedes and land snails.	No submissions	**Factor considered to be a relevant environmental factor and is discussed under "Minesite".**
Subterranean Fauna	Subterranean fauna surveys were undertaken between August – October 2008 and	<u>Non-Government Organisations</u> • CCWA notes that BIF ranges have been found to host unique and restricted troglofauna species, and that singleton samples	**Factor considered to be a relevant environmental factor and is discussed under**

	April – June 2009. A third round of scrape samples was undertaken at the comparison site at the Chamaeleon prospect in September 2009. The results of the subterranean fauna surveys recorded no stygofauna species in the first round of sampling, therefore no further sampling was undertaken. Six (6) troglofauna species were identified. A single individual from the Order Diplura was identified within the proposed pit only.	are regularly found in surveys. As such, CCWA suggests that methodologies chosen may be inadequate for identifying troglofauna species found within BIFs; • CCWA is concerned that assumptions made in the subterranean fauna assessment report were not made strictly on a scientific basis, and that the findings go against the Precautionary Principle; • CCWA notes that impacts of mining and land clearing on habitat is poorly understood. CCWA is concerned that Polaris did not undertake an assessment of the impact a mine void may have on the suitability of surrounding habitat for troglofauna; • CCWA is of the view that surveys should be completed to a point where a conservative impact assessment shows that habitat loss will be within an acceptable, quantified limit.	**"Minesite".**
Groundwater	The annual water requirement for the proposal is 678 ML/a. Water is to be sourced from a combination of: • Pit dewatering; • Water from local bores piped to filling stations along the haul road; and • Bores at the rail siding. The standing water level at the proposed minesite is	<u>Government Organisations</u> • DoW advises that it has previously provided comment on the proposal, and it appears that the issues previously raised have been addressed.	**Any bores for the proposal are subject to the *Rights in Water and Irrigation Act 1914.*** **Factor does not require further EPA evaluation.**

	approximately 412 m AHD. This equates to approximately 38 m below the ground surface at the southern end of the deposit, and approximately 67 m below the ground surface in the elevated central part of the deposit. Sampling during exploration drilling has indicated that the groundwater has a TDS value of approximately 25 000 mg/L.		
POLLUTION			
Waste materials	It is proposed to encapsulate any PAF material encountered during mining inside cells in the waste dump. It is also proposed to dispose of surplus dewater into an evaporation pond located inside the waste dump footprint.	<u>Government Organisations</u> • DMP notes that Polaris has not provided details as to where inside the waste dump the encapsulation of potentially acid forming (PAF) material would be located to ensure that it would not become affected by ingress of water and oxygen; • DMP advises that Polaris is required to provide a mine schedule of when PAF material is to be mined, and details as to how it will be managed; • DMP advises that placement of saline material within the waste dump also needs to be considered.	**Factor considered to be a relevant environmental factor and is discussed under "Minesite".**
Mine infrastructure	The CIOP proposal consists of 4 main components: minesite, haul road, rail siding and accommodation village. The specifics of the project	<u>Government Organisations</u> • DMP is concerned that an acceptable outcome for the waste dump may be unachievable due to a lack of suitable material to cover and armour the waste dump. DMP advises that Polaris will need to demonstrate its ability to deliver a safe, stable landform with the waste materials available;	The potential environmental impacts associated with project infrastructure will be managed in accordance with the key characteristics table which limits the extent of mining. This

	components include: • Development of an approx. 48 km haul road for ore haulage to the rail siding and for access to the minesite; • Development of train loading facilities to access the existing Trans Australian Railway; • Dry processing plant and associated facilities (i.e. workshop, hard stand areas) located at the rail siding; and • Accommodation village and associated facilities (i.e. water treatment plants, power generation units, landfill) to be located near the rail siding.	• DMP notes that Polaris has not provided details as to how incorporation of the evaporation basin into the waste dump will be constructed to ensure that containment of PAF material inside the facility is not compromised. DMP advises that from a risk perspective it may be prudent to have a separate evaporation basin and waste dump; • DMP notes that no locations for topsoil stockpiles were provided. DMP advises that topsoil stockpiles need to be located away from areas likely to flood. DMP recommends that all permanent infrastructure be located outside of flood prone areas; • DMP advises that Polaris need to adhere to any buffer distances required by various legislation in regard to infrastructure placement; • DMP advises that activities approved under the *Mining Act 1978* need to be in line with the disturbance footprint approved under Part IV of the *Environmental Protection Act 1986*. <u>Local Government</u> • S.o.Esperance advises that should Polaris want to use the Port of Esperance for shipping, upgrades of the through-put capacity of the Port would be required; • S.o.Esperance advises that should Polaris want to use the Port of Esperance for shipping, upgrades to the rail and road infrastructure may be required to manage increased traffic into the Port.	includes placement of mine infrastructure, consistent with modifications made by the proponent during the assessment. The proposal is also subject to management via other approval mechanisms such as Part V Works Approval and Licensing, Groundwater Licensing, Mining Proposal approval etc. **Factor does not require further EPA evaluation.**
Dust/Noise	There are potential impacts relating to noise and dust from the mine site, haul road and rail siding loading and processing facilities.	No submissions	Impacts related to dust associated with the mine and haul road are addressed under the relevant environmental factors in sections 4.1 and 4.2. Dust associated with the rail siding and processing facilities

			can be managed under Part V of the *Environmental Protection Act 1986.* Noise are subject to the *Environmental Protection (Noise) Regulations 1997.* **Factor does not require further EPA evaluation**
SOCIAL SURROUNDINGS			
Heritage	Proposal has the potential to impact on at least one archeological heritage site.	<u>Government Organisations</u> • DIA notes that the survey appeared to only cover the proposed open pit and immediate surrounds; • DIA advises Polaris to conduct archaeological and ethnographic heritage surveys over all proposed development areas in order to inform of any Aboriginal heritage value that may be located within such areas; • DIA advises that should surveys reveal anything of Aboriginal heritage value in areas proposed for development, consent under section 18 of the *Aboriginal Heritage Act 1972* may need to be obtained in order to disturb the site(s); • DIA notes that indigenous peoples were consulted in regard to past drilling programs in the Carina area. The DIA recommends that Polaris consults the same groups of people in regard to development of a mine at Carina.	The proposal is subject to the requires of the *Aboriginal Heritage Act 1972.* **Factor does not require further EPA evaluation.**
Visual amenity, landscape and recreation values	Mining operations and waste dump may be visible from local vantage points.	<u>Non-Government Organisations</u> • 4WD states that the Goldfields woodlands north and east of Southern Cross is an area of significant visitation by 4WD travelers; • 4WD notes that the Helena and Aurora Range is special for it's views from the top car parking area; • 4WD is of the view that the public should be able to visit these	**Not considered to be a relevant factor requiring further EPA evaluation.**

		places without further mining activity threatening public access; • 4WD notes that the Helena and Aurora Range have significant heritage value in regard to woodline tracks and camp sites, some of which have already been impacted by mining exploration; • 4WD is of the view that greater visitor activity should be allowed in the Mt Manning Nature Reserve, Helena and Aurora Range and on the Jaurdi Station area; • 4WD is of the view that the Banded Ironstone Formation Ranges (BIF) are a unique part of Western Australia's (WA) geology and that the Yilgarn area is unique on a global scale. 4WD is of the view that the landscape values of this area are to important to be exploited by mining.	
Conservation values	The proposal involves mining on the Yendilberin Hills, which form part of the Finnerty Range. The Finnerty Range is one of the 29 BIF Ranges considered in the BIF Review. The proposal lies within the proposed JCP, formally a pastoral lease purchased by CALM in 1989 for addition into the conservation reserve system. The Jaurdi area was chosen for reservation as it is a good example of intact arid-zone woodland vegetation. Negotiations are underway between the DEC and DMP	<u>Government Organisations</u> • DEC considers that additional management measures regarding bushfire, weed and feral animals should be developed and agreed to by DEC; • DEC does not support the proposal to extend and use the existing airstrip in the proposed Jaurdi Conservation Park for commercial fly in fly out operations and considers that the proponent locates the airstrip on unallocated Crown land off existing and proposed reserves; <u>Non-Government Organisations</u> • CCWA notes that the Jaurdi area has been recognised for it's landscape and biodiversity values and has been recommended for inclusion into the State's conservation reserve system. CCWA is of the view that this area should not be should be set aside for conservation; • WFSWA notes that the proposal area is within an area long recognised as having high conservation values, and is of the view that the extent of environmental impact that would result from mining is to high in comparison to the low economic value of the resources at Carina;	**Factor considered to be a relevant environmental factor and is discussed under "Assessment Context".**

	to resolve tenure. EPA Report No. 1256 (May, 2007) for the Mt Manning area recognised the 'Yendilberin, Watt Hills, JCP' area as having high environmental values, and recommended that further investigations be undertaken to ensure adequate conservation of significant values. The Jaurdi area and surrounds (i.e. Mt Manning, Helena and Aurora Ranges, Bungalbin Hills etc) fall within the GWW. The GWW is approximately 16 million ha in area and is recognised as being one of the last, large and intact landscapes remaining in southern Australia. The State has acknowledged the GWW as being an environmentally significant area worthy of protection and has committed to develop a biodiversity conservation strategy for it. The State Government has also committed to provide	• WFSWA notes that the the proponent is only proposing that a minimum bond rate be applied and considers that the EPA should as a minimum double the bond rate given the values of the area. • CCWA and WFSWA are of the view that protection of BIF ranges should adhere to the recommendations in the BIF Review until it is either rejected or replaced.	

	$3.8 million to manage and protect the GWW to ensure long-term conservation of the natural and cultural values of this important wilderness area.		
Mine Closure and Rehabilitation	The CIOP proposal would disturb approximately 220 ha of land at the minesite. The proposed open pit would be approximately 1500 m long, 380 m wide and 170 m deep, which equates to a surface area of approximately 60 ha. The proposed waste dump would be approximately 1720 m long, 810 m wide and 35 m high, which equates to a surface area of approximately 140 ha. The surrounding Yendilberin Hills are approximately 35 m high. At completion of mining the Carina open pit would gradually fill with water to form a pit lake. As part of this current proposal, the proponent does	<u>Government Organisations</u> • DEC notes that the current proposal will leave a permanent water-filled void at closure that presents a residual risk to conservation values; • DEC proposes that a condition be applied to ensure that the mine void is backfilled to a level that will prevent the formation of permanent surface water; • In the event that a permanent water-filled void is found to be acceptable, DEC suggests conditions regarding fencing to restrict access, minimise impacts of grazing, and avoiding long-term impacts on water quality; • DEC suggests a condition be applied that requires the development and monitoring of achievement of completion criteria developed with advise from DEC. <u>Non-Government Organisations</u> • CCWA notes that Polaris has not included provisions for backfilling of the open pit, and that a permanent mine void will result from mining. CCWA objects to leaving a mine void as it will have negative impact on the landscape and biodiversity values of the area, which has been designated for conservation; • CCWA is concerned that a permanent pit lake will act as an attractant to feral animals seeking a water source; • CCWA are of the view that the mine void should be backfilled to above the water table and rehabilitated with local vegetation; • CCWA does not accept Polaris reasoning that it is to costly to back-fill the mine void and questions the economics of the	**Factor considered to be a relevant environmental factor and is discussed under "Minesite".**

	not intend to backfill the open pit. The proponent has committed to review the possibility to backfilling the pit with mine waste over the life of the mine.	CIOP proposal if exploitation of the mineral resource at Carina does not make enough profit to enable proper rehabilitation upon cessation of mining, given the high environmental values of the area; • WFSWA are of the view that the Conceptual Mine Closure Plan for the proposal does not address the EPA's Principle of Intergenerational Equity; • WFSWA notes the inadequate attention to the management of topsoil and characterisation of mine rock waste in the initial mine planning stages. • WFSWA considers that the target of >5% cover for weeds is unacceptable and should be no weeds in revegetated areas. <u>Public</u> • Lack of soil profile assessments prior to clearing of vegetation and a deficient rehabilitation management plan.	
Offsets	The proponent has not proposed offsets.	<u>Government Organisations</u> • DEC considers that if the proposal is found acceptable and approved, offsets should be applied to mitigate residual impacts on the proposed Jaurdi Conservation Park and that DEC is given the opportunity to comment on any offset proposal prior to completion of the EPA assessment. <u>Non-Government Organisations</u> • CCWA are of the view that any approval to impact species found at Carina should be matched by a commitment to protect some of the associated BIF (including troglofauna habitat) in accordance with the recommendations in the BIF Review.	The significance of the environmental impacts are evaluated in sections 4.1 to 4.3.

Summary of identification of key environmental factors and principles

PRINCIPLES		
Principle	**Relevant Yes/No**	**If yes, Consideration**
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.*	Yes	In considering this principle, the EPA notes that the proposal potentially impacts vegetation communities of limited distribution. The proponent has modified its proposal to limit impacts on important vegetation communities. Conditions have been included to limit the impacts to these communities.
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.	Yes	In considering this principle, the EPA notes that there is uncertainty in regard to the proposed rehabilitation works and if they would be adequate to ensure impacts are managed and the health, diversity and productivity of the land is restored upon completion of mining. A condition requiring progressive rehabilitation which includes completion criteria is recommended to ensure that the mine is manged in the longer term to ,.
3. The principle of the conservation of biological diversity and ecological integrity		
Conservation of biological diversity and ecological integrity should be a fundamental consideration.	Yes	In considering this principle, the EPA notes that: • the Yendilberin Hills supports unique biodiversity conservation values; and • the proposal will impact these values through direct and indirect means. Conditions have been included to manage impacts to significant flora, vegetation and fauna species noting that the area is to be managed in the longer term for its conservation values.

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 maximize benefits and/or minimize costs to develop their own solution and responses to environmental problems.*	No	N/A
5. The principle of waste minimisation		
All reasonable and practicable measures should be taken to minimize the generation of waste and its discharge into the environment.	Yes	In considering this principle, the EPA notes that potentially acid forming waste will be deposited in the waste dump in addition to inert waste rock; and Conditions have been recommended to ensure waste materials are appropriately disposed of.

Appendix 4

Identified Decision-making Authorities
and
Recommended Environmental Conditions

Identified Decision-making Authorities

Section 44(2) of the *Environmental Protection Act 1986* (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 for this consultation:

Decision-making Authority	Approval
1. Minister for Water	*Right in Water and Irrigation Act 1914* - Water Abstraction Licence
2. Department of Environment and Conservation	*Environmental Protection Act 1985* - Works Approval and Licence
3. Minister for Mines and Petroleum	*Mining Act 1978*
4. Department of Mines and Petroleum	*Mining Act 1978*

Note: In this instance, agreement is only required with DMA #1 and 3 since these DMAs are a Minister.

RECOMMENDED ENVIRONMENTAL CONDITIONS

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

CARINA IRON ORE MINE, APPROXIMATELY 60 KILOMETRES NORTH-EAST OF KOOLYANOBBING, SHIRE OF YILGARN

Proposal: The proposal is to construct and operate an iron ore mine in the Goldfields region of Western Australia. The proposal involves mining of hematite direct shipping ore (DSO) from a single open pit on the Yendilberin Hills, which form part of the Finnerty Range.

The proposal is further documented in schedule 1 of this statement.

Proponent: Polaris Metals Pty Ltd

Proponent Address: Level 2, 1109 Hay Street
WEST PERTH WA 6005

Assessment Number: 1756

Report of the Environmental Protection Authority: Report 1368

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 documented and described in schedule 1 of this statement subject to the conditions and procedures of this statement.

2 Proponent Nomination and Contact Details

2-1 The proponent for the time being nominated by the Minister for 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 any change of the name and address of the proponent for the serving of notices 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 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 Chief Executive Officer 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 prepare and maintain a compliance assessment plan to the satisfaction of the Chief Executive Officer.

4-2 The proponent shall submit to the Chief Executive Officer the compliance assessment plan required by condition 4-1 at least six months prior to the first compliance report required by condition 4-6, or prior to implementation, whichever is sooner.

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 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 Chief Executive Officer.

4-5 The proponent shall advise the Chief Executive Officer of any potential non-compliance within seven days of that non-compliance being known.

4-6 The proponent shall submit to the Chief Executive the first compliance assessment report fifteen months from the date of issue of this Statement addressing the twelve month period from the date of issue of this Statement and then annually from the date of submission of the first compliance assessment report.

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 Protection of vegetation

5-1 The proponent shall implement the proposal so that it does not adversely affect vegetation, in particular S2 and W22 vegetation communities, outside the proposal boundary as shown in Figure 2 attached and delineated by AMG co-ordinates listed in Schedule 2.

5-2 The proponent shall ensure that the implementation of the proposal does not result in (through either direct or indirect impacts) a loss of more than 8.6 ha of the S2 vegetation community and 66 ha of the W22 vegetation community.

5-3 The proponent shall monitor prior to disturbance and every 12 months the health and condition of vegetation located within 1 kilometre of the proposal boundary as shown in Figure 2 attached and delineated by AMG co-ordinates listed in Schedule 2. This monitoring is to be carried out to the satisfaction of the Chief Executive Officer on advice of the Department of Environment and Conservation.

5-4 Should the potential impact sites show a 25 per cent (or greater) decline in cover or productivity, the proponent shall provide a report to the Chief Executive Officer within 21 days of the decline being identified which:

1 describes the decline;

2 provides information which allows determination of the likely root cause of the decline; and

3 if likely to be caused by activities undertaken in implementing the proposal, states the actions and associated timelines proposed to remediate the decline.

5-5 The proponent shall, on approval of the Chief Executive Officer, implement the actions identified in 5-4 (3) and continue to implement such actions until the Chief Executive Officer determines that the remedial actions may cease.

6 Fauna mortality

6-1 Prior to ground disturbing activities the proponent shall prepare and submit strategies to avoid fauna deaths in areas of mining, the haul road, the rail siding and other areas associated with the proposal on advice of Department of Environment and Conservation to the satisfaction of the Chief Executive Officer.

6-2 The proponent shall implement the strategies as required by condition 6-1.

6-3 Prior to ground disturbing activities the proponent shall prepare and implement a Fauna Mortality Register for conservation significant species in the proposal area on advice of Department of Environment and Conservation to the satisfaction of the Chief Executive Officer.

6-4 The proponent shall produce a report with details of fauna mortalities including the cause, location, number and type of species to the Chief Executive Officer as part of the compliance assessment report required by condition 4-6 and provide a report to the Department of Environment and Conservation.

6-5 The proponent shall review and revise the strategies required by condition 6-1 as required by the Chief Executive Officer.

7 Flora Survey

7-1 Within 18 months of ground disturbance the proponent shall undertake a flora survey within the areas delineated by AMG co-ordinates provided in Schedule 3 that are located within the yellow sandplain vegetation type to determine the presence and abundance of priority flora species present.

7-2 The survey will be conducted in accordance with Environmental Protection Authority Guidance Statement 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia June 2004 or its revisions and to the satisfaction of the Chief Executive Officer.

7-3 Within 24 months of ground disturbing activities the proponent shall submit the results of the survey required by condition 7-1 to the requirements of the Chief Executive Officer on advice of the Department of Environment and Conservation.

7-4 The proponent shall make the results of the survey required by 7-3 publicly available in a manner approved by the Chief Executive Officer.

8 Troglofauna

8-1 The proponent shall undertake a baseline troglofauna survey within 15 kilometres of the Project Boundary (as shown in Figure 2 attached and delineated by AMG co-ordinates listed in Schedule 2) in similar geological formations to validate predictions of habitat connectivity and improve knowledge of troglofauna populations in the region to inform future management of mining and associated operations.

8-2 The baseline troglofauna survey shall be undertaken in accordance with the draft Environmental Protection Authority Guidance Statement 54a Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australian August 2007 or its revisions and to the satisfaction of the Chief Executive Officer.

8-3 Within 30 months of ground disturbing activities the proponent shall prepare and submit a technical report based on the results of the survey required by condition 8-1 to the requirements of the Chief Executive Officer on advice of the Department of Environment and Conservation.

8-4 The proponent shall make the report required by 8-3 publicly available in a manner approved by the Chief Executive Officer.

9 Project Environmental Management Plan

9-1 The proponent shall prepare a Project Environmental Management Plan to the satisfaction of the Department of Environment and Conservation. The objectives of the plan are to ensure that the adverse impacts from mining and associated activities do not unnecessarily threaten conservation values within the mining lease and prevent impacts outside of the mining lease.

The project environmental management plan will address:

1 Hygiene management measures to prevent the introduction of weeds and dieback disease.

2 Management of feral animals.

3 Company protocols to authorise disturbance and clearance of vegetation.

4 Limiting and authorising access to areas within the mining lease.

5 Fire prevention and response.

6 Management and monitoring of saline water used for dust suppression.

9-2 The proponent shall implement the Project Environmental Management Plan required by condition 9-1.

9-3 The proponent shall review and revise the Project Environmental Management Plan required by condition 9-1 at intervals not exceeding three years.

9-4 The proponent shall report to the Chief Executive Officer on implementation of the Project Environmental Management Plan every two years from the date of commencing ground disturbing activities.

9-5 The proponent shall make the Project Environmental Management Plan required by condition 9-1 publicly available in a manner approved by the Chief Executive Officer.

10 Weeds

10-1 The proponent shall ensure that:

1 No new species of weeds (including both declared weeds and environmental weeds) are introduced into the proposal area as a result of the implementation of the proposal.

2 Prior to ground disturbing activities the proponent shall undertake a baseline weed survey to determine the species and extent of weeds (including both declared weeds and environmental weeds) present within the proposal area to the requirements of the Chief Executive Officer on advice of the Department of Environment and Conservation.

3 Within 12 months of the date of publication of this statement the proponent shall establish at least three reference sites on undisturbed land (not impacted by the proposal) at each of the mine, haul road, rail siding and accommodation facilities. Reference sites are to be chosen in consultation with the Department of Environment and Conservation. The reference sites are to be monitored every 2 years to determine whether changes in weed cover and type within and up to 1 kilometre from the Project Boundary (as shown in Figure 2 attached and delineated by AMG co-ordinates listed in Schedule 2) are as a result of project implementation or broader regional changes.

4 The species and extent of weed cover within the proposal area shall not exceed that identified in the baseline survey identified in condition 10-1(2) or exceed that existing on comparable, nearby land, determined by 10-1(3) which has not been disturbed during implementation of the proposal, whichever is less.

NOTE: Environmental weeds are plants that establish themselves in natural ecosystems (marine, aquatic and terrestrial) and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade. Impacts of environmental weeds on ecosystem function include:

· resource competition
· prevention of seedling recruitment
· alteration to geomorphological processes
· alteration of hydrological cycle
· changes to soil nutrient status
· alteration of fire regime
· changes to the abundance of indigenous fauna, and
· genetic changes

(Carr et al., 1992; Humphries et al., 1993, Csurhes and Edwards, 1998).

11 Rehabilitation

11-1 The proponent shall undertake progressive rehabilitation over the life of the proposal to achieve the following outcomes:

1 The waste material landforms shall be non-polluting and shall be constructed so that their stability, surface drainage, resistance to erosion and ability to support local native vegetation are similar to undisturbed natural analogue landforms as demonstrated by Ecosystem Function Analysis or other methodology acceptable to the Chief Executive Officer.

2 The waste material landforms and other areas disturbed through implementation of the proposal (excluding mine pits), shall be progressively rehabilitated with vegetation composed of native plant species of local provenance.

3 Within 12 months of the date of publication of this statement the proponent shall conduct surveys of each of the vegetation communities that will be impacted by the proposal to collect adequate information in preparation for setting completion criteria for rehabilitation to the requirements of the Chief Executive Officer on advice of the Department of Environment and Conservation.

4 The methodology of the survey required in condition 11-1(3) shall be prepared in consultation and to the satisfaction of the Department of Environment and Conservation.

5 Within 18 months of mining commencing the proponent will develop completion criteria for rehabilitation to the requirements of the Chief Executive Officer on advice from the Department of Environment and Conservation.

6 The percentage cover of living self sustaining native vegetation in all rehabilitation areas shall be comparable to that of undisturbed natural analogue sites as demonstrated by Ecosystem Function Analysis and species diversity as demonstrated by other methodology acceptable to the Chief Executive Officer.

7 No new species of weeds (including both declared weeds and environmental weeds) are introduced into the rehabilitated areas as a result of the implementation of the proposal.

8 The cover of weeds (including both declared weeds and environmental weeds) in rehabilitated areas shall not exceed that identified in the baseline survey condition 10-1(2) and or exceed that existing on comparable, nearby land, determined by 10-1(3) which has not been disturbed during implementation of the proposal, whichever is less.

11-2 The proponent shall monitor progressively the rehabilitation for a range of sites against the criteria developed pursuant to condition 11-1(5) with appropriately timed surveys as agreed with the Department of Environment and Conservation, until the completion criteria are met. The surveys shall be conducted annually unless otherwise agreed by the Chief Executive Officer, on advice from the Department of Environment and Conservation.

11-3 The proponent shall include the results of the rehabilitation monitoring required pursuant to condition 11-2 in the compliance assessment report referred to in condition 4-6 commencing from the date rehabilitation was commenced. The report shall address the following:

1 The progress made towards meeting the completion criteria developed pursuant to condition 11-1(5); and

2 Contingency management measures in the event that the completion criteria required by condition 11-1(5) are unlikely to be met.

11-4 The proponent shall make the monitoring reports required by condition 11-2 publicly available in a manner approved by the Chief Executive Officer.

NOTE: The methodology for Ecosystem Function Analysis is set out in Tongway DJ and Hindley 2004 *Landscape Function Analysis – Procedures for*

Monitoring and Assessing Landscapes, Commonwealth Scientific and Industrial Research Organisation Sustainable Ecosystems, Canberra.

12 Conceptual Closure Strategy

12-1 Prior to construction of the waste dump, the proponent shall submit a detailed and project-specific Mine Plan and Preliminary Closure Strategy to the requirements of the Chief Executive Officer on advice of the Department of Mines and Petroleum and Department of Environment and Conservation.

12-2 The Mine Plan and Preliminary Closure Strategy shall include detailed results of geochemical and geophysical characterisation of materials, in particular the potential for acid drainage, metalliferous drainage, and of the occurrence of dispersive materials and asbestiform minerals. Testing for materials with potential to cause acid and/or metalliferous drainage shall include static and kinetic testing carried out using techniques and timeframes consistent with national and international standards (*Leading Practice Sustainable Development Program for the Mining Industry – Managing Acid and Metalliferous Drainage 2009* – Department of Industry, Tourism and Resources; The Global Acid Rock Drainage Guide 2009 – International Network for Acid Prevention).

12-3 The Mine Plan and Preliminary Closure Strategy shall provide detailed technical information on proposed management measures to prevent pollution, environmental harm or human health impacts during implementation of the proposal and after mine completion and closure.

12-4 The Mine Plan and Preliminary Closure Strategy shall include maps and diagrams showing the proposed placement, dimensions, design and proposed methods of construction and closure of waste disposal facilities, mine pits and evaporation pond.

12-5 The Mine Plan and Preliminary Closure Strategy shall demonstrate that waste disposal facilities will be located, designed and constructed to ensure that they are non-polluting and so that their final shape, height, stability and ability to support native vegetation are comparable to natural landforms in the area.

12-6 The proponent shall implement the Mine Plan and Preliminary Closure Strategy referred to in conditions 12-1 to 12-5.

13 Final Closure and Decommissioning Plan

13-1 At least 3 years prior to mine completion, the proponent shall prepare and submit a Final Closure and Decommissioning Plan to the requirements of the Chief Executive Officer, on advice of the

Department of Environment and Conservation and Department of Mines and Petroleum.

13-2 The Final Closure and Decommissioning Plan shall be prepared consistent with:

1 ANZMEC/MCA 2000, *Strategic Framework for Mine Closure Planning*; and

2 Department of Industry Tourism and Resources 2006 *Mine Closure and Completion* (Leading Practice Sustainable Development Program for the Mining Industry), Commonwealth Government, Canberra;

13-3 The Final Closure and Decommissioning Plan shall provide detailed technical information on the following:

1 Final closure of all areas disturbed through implementation of the proposal so that they are safe, stable and non-polluting.

2 Details of a monitoring program to be carried out to inform final closure procedures for the pit void such that the standing water body does not cause environmental harm by:
   i. attracting native fauna which may be subsequently harmed; or
   ii. attracting fauna which may harm native fauna populations and/or surrounding native vegetation.

3 Management actions to be undertaken based on the findings under condition 13-3-2.

4 Decommissioning of all plant and equipment.

5 Disposal of waste materials;

6 Final rehabilitation of:
- the minesite including waste material landforms and other areas outside the mine pit;
- the haul road and accommodation facilities.

7 Management and monitoring following mine completion.

8 Inventory of all contaminated sites and proposed management.

Notes

1. The Chief Executive Officer may seek advice from other agencies or organisations, as required.

2. The Minister for Environment will determine any dispute between the proponent and the Office of the Environmental Protection Authority over the fulfilment of the requirements of the conditions.

Schedule 1

The Proposal (Assessment No. 1756)

The proposal is to construct and operate an iron ore mine in the Goldfields region of Western Australia. The proposal involves mining of hematite direct shipping ore (DSO) from a single open pit on the Yendilberin Hills, which form part of the Finnerty Range.

The location of the various project components is shown in Figure 1.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in section 3 of the proponent's Public Environmental Review Carina Iron Ore Mine: Yilgarn Region WA Polaris metals NL (March 2010).

Table 1: Summary of key proposal characteristics

Element	Description
General	
Project Life	Up to 10 years
Area of disturbance	Up to 460 ha comprising: • Open pit – 60 ha; • Waste dump – 140 ha; • ROM pad and mine infrastructure – 50 ha; • Haul road – 150 ha; • Rail siding and infrastructure – 42.5 ha; • Rail siding borrow pits – 7.5 ha; and • Accommodation village and associated infrastructure – 10 ha
Resource	21.4 Mt DSO
Mining	
Type	Mining of hematite DSO below the water table
Pit	Single open pit with dimensions of 1500 m long, 380 m wide, 170 m deep
Mining rate	Up to 4 Mt/a
Waste dump	Single waste dump with dimensions of 1720 m long, 810 m wide, 35 m high
Waste rock	Up to 22.8 million bcm (equivalent million lcm)
Potentially Acid Forming (PAF) material	1 – 2% by volume (PAF material is to be encapsulated in the waste dump)
Pit dewatering	Up to 411 ML/a (1126 kL/d)
Infrastructure	
Water supply	Combination of water sources: • Pit dewatering;

Element	Description
	• Water from local bores piped to filling stations along the haul road; and • Bores at the rail siding
Water consumption	Up to 678 ML/a
Power supply	Diesel powered generators at the minesite and main work centre (rail siding)
Product transportation	Trucked via road from the minesite to the rail siding, then taken via rail to the Port of Fremantle (Kwinana)
Site access	Via the Mt Walton East Intractable Waste Facility (IWF) access road to the rail siding

Abbreviations:

bcm	bank cubic metres	m	metre
DSO	direct shipping ore	ML/a	million litres per annum
ha	hectare	Mt	million tonnes
kL/d	kilolitres per day	Mt/a	million tonnes per annum
lcm	loose cubic metres		

Figure 1 Mine Site Components.
Figure 2 Project Boundary

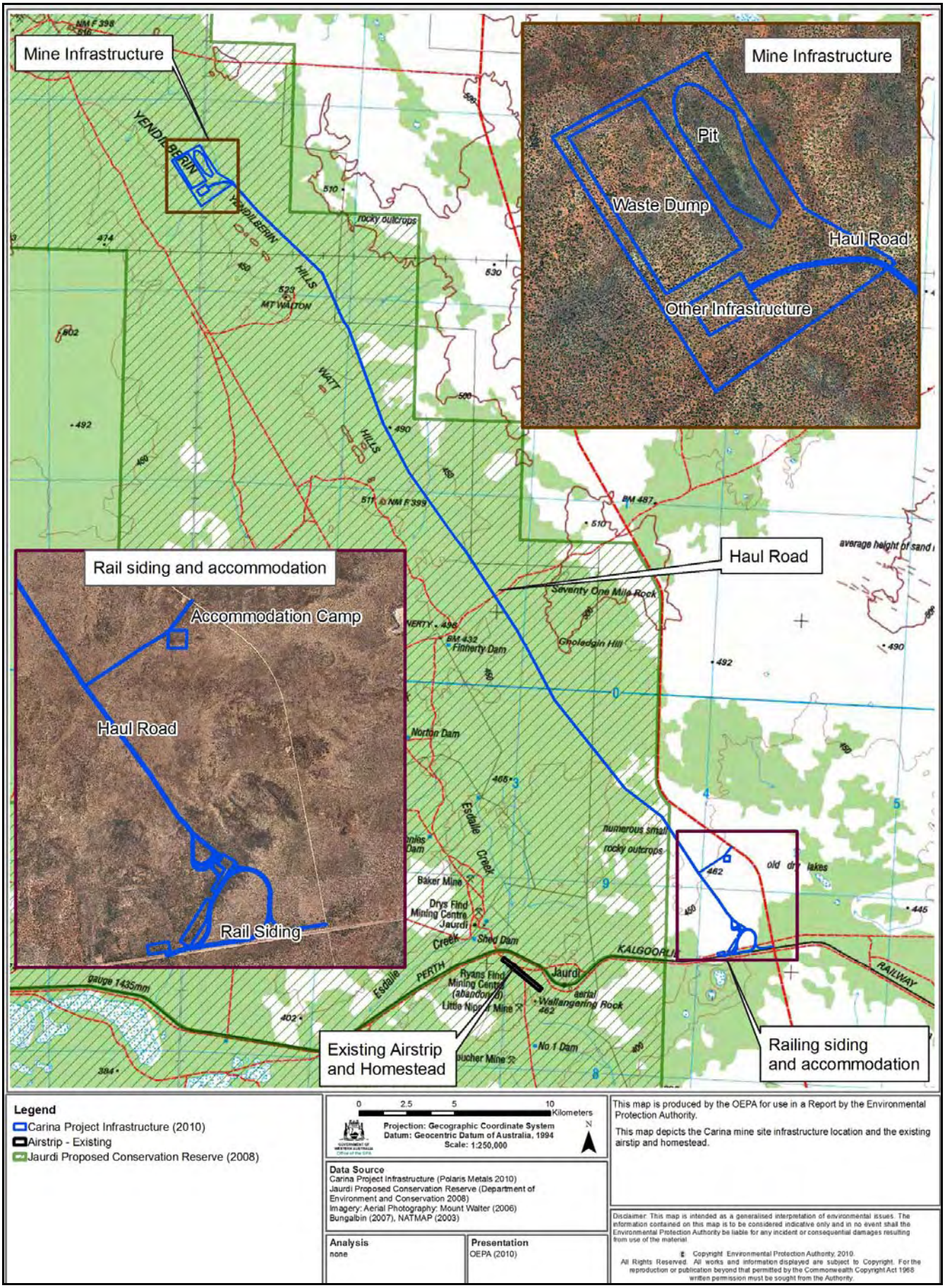


Figure 1 Mine Site Components.

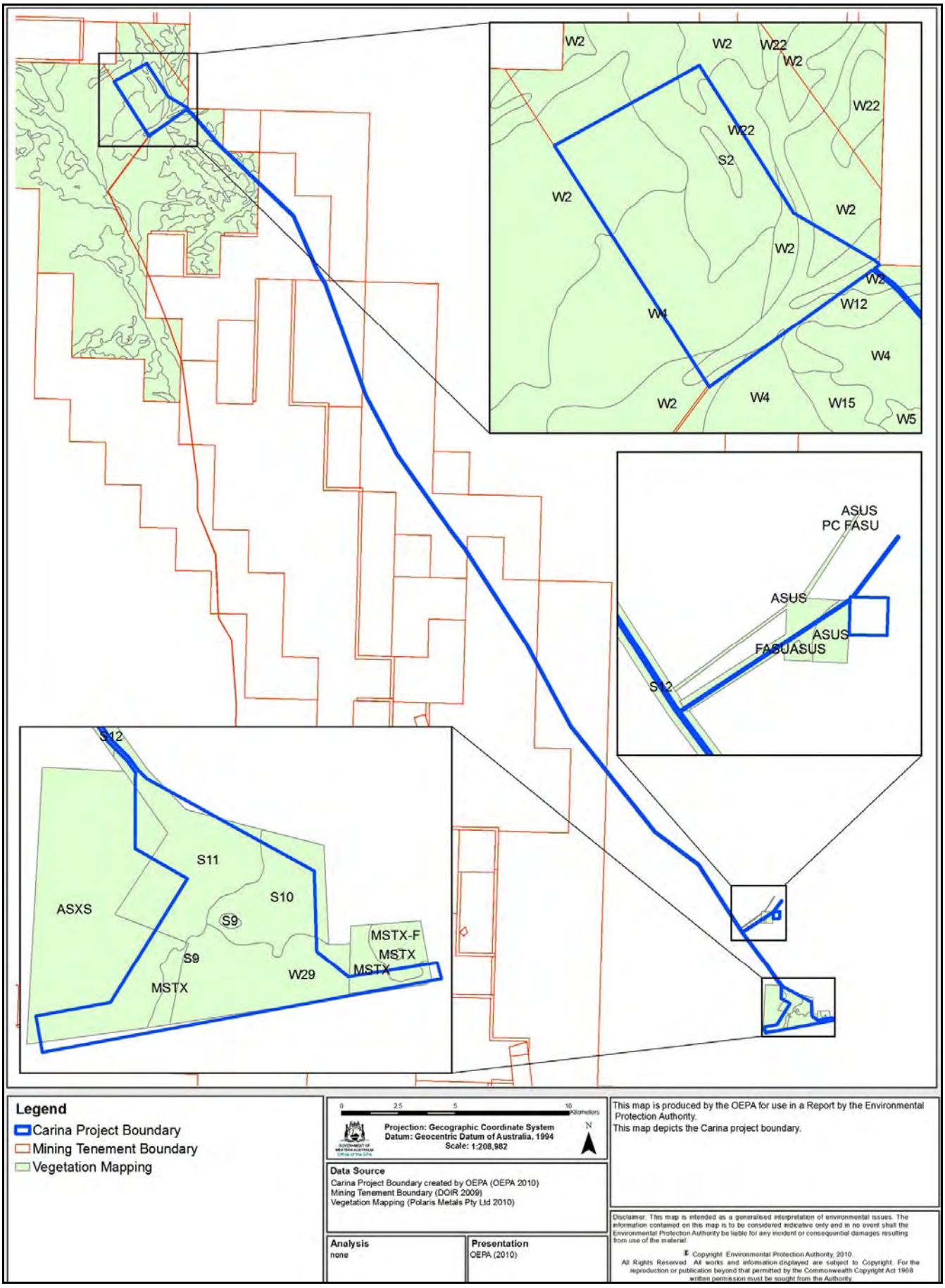


Figure 2 Project Boundary

Schedule 2

Eastings	Northings
213556.85	6625719.04
213510.01	6625681.38
213704.33	6625546.83
213704.59	6625546.64
213705.30	6625546.09
213705.35	6625546.04
213776.31	6625485.78
213776.92	6625485.23
213777.29	6625484.86
213826.13	6625434.33
215008.03	6624211.68
218457.66	6621262.00
218458.25	6621261.47
218458.88	6621260.82
218459.48	6621260.12
218460.04	6621259.38
218460.55	6621258.60
218461.02	6621257.78
218461.21	6621257.41
219660.70	6618858.44
220010.06	6618359.25
220010.56	6618358.48
220011.03	6618357.66
220011.45	6618356.81
220011.65	6618356.38
222061.19	6613507.52
223560.13	6611009.28
226160.38	6607709.07
226756.18	6607014.15
226756.50	6607013.76
226756.92	6607013.22
229659.89	6603009.57
229660.03	6603009.37
229660.54	6603008.59
229660.58	6603008.54
231809.86	6599459.69
235757.83	6595011.98
237756.46	6593662.90
237756.88	6593662.61
237757.58	6593662.05
237758.25	6593661.45

Eastings	Northings
241463.60	6592276.23
241463.92	6592276.28
241464.25	6592276.31
241464.57	6592276.32
241464.90	6592276.31
241465.22	6592276.28
241465.55	6592276.23
241465.87	6592276.15
241466.18	6592276.06
241466.49	6592275.94
241466.78	6592275.81
241467.07	6592275.65
241467.35	6592275.48
241467.62	6592275.29
241467.87	6592275.08
241468.11	6592274.86
241468.33	6592274.62
241468.54	6592274.37
241468.73	6592274.10
241468.90	6592273.82
241469.06	6592273.53
241469.19	6592273.24
241469.31	6592272.93
241469.40	6592272.62
241469.48	6592272.30
241469.53	6592271.98
241469.56	6592271.65
241469.57	6592271.32
241469.56	6592271.00
241469.53	6592270.67
241469.48	6592270.35
241469.40	6592270.03
241469.31	6592269.72
241469.19	6592269.41
241469.06	6592269.11
241468.90	6592268.82
241468.73	6592268.55
241468.72	6592268.53
241140.35	6591780.68
241412.05	6591787.24
241419.30	6591487.21

Eastings	Northings
241644.88	6588529.20
241571.59	6588619.43
241430.15	6588747.00
241429.94	6588747.21
241429.30	6588747.86
241428.71	6588748.56
241428.40	6588748.97
240940.47	6589407.98
239767.11	6590818.04
239766.92	6590818.29
239766.47	6590818.87
237741.57	6593638.43
235743.55	6594987.09
235743.13	6594987.38
235742.42	6594987.94
235741.76	6594988.54
235741.12	6594989.20
235741.01	6594989.32
231791.02	6599439.32
231790.53	6599439.90
231789.97	6599440.64
231789.46	6599441.42
231789.43	6599441.48
229639.75	6602990.95
226737.49	6606993.61
226141.87	6607688.31
226141.55	6607688.69
226141.49	6607688.77
223540.47	6610989.96
223539.97	6610990.62
223539.46	6610991.40
223539.39	6610991.53
222039.37	6613491.54
222038.98	6613492.23
222038.56	6613493.09
222038.37	6613493.52
219989.03	6618341.87
219639.95	6618840.65
219639.45	6618841.41
219638.98	6618842.23
219638.79	6618842.60

237758.88	6593660.79		241119.25	6591479.96		218440.15	6621239.88
Eastings	**Northings**		**Eastings**	**Northings**		**Eastings**	**Northings**
237759.48	6593660.09		241112.76	6591748.56		214992.21	6624188.10
237759.92	6593659.51		239824.30	6590792.28		214991.63	6624188.63
239785.99	6590838.33		240959.28	6589428.35		214991.26	6624189.00
239817.90	6590799.98		240959.48	6589428.10		213808.91	6625412.12
241112.46	6591760.79		240959.79	6589427.70		213760.54	6625462.16
241112.00	6591779.99		241447.16	6588769.43		213690.59	6625521.56
241128.09	6591780.38		241586.77	6588643.42		213494.02	6625657.69
241460.42	6592274.12		241663.96	6588548.39		213485.47	6625661.60
241460.61	6592274.37		241728.51	6588488.59		213440.02	6625625.03
241460.81	6592274.62		243006.98	6587867.79		213440.03	6625625.02
241461.04	6592274.86		243058.49	6587271.06		211932.66	6624412.25
241461.28	6592275.08		243304.44	6587096.32		211931.28	6624411.15
241461.53	6592275.29		243954.82	6587234.97		210263.06	6626730.97
241461.79	6592275.48		243993.55	6587117.16		211660.80	6627602.53
241462.07	6592275.65		241069.56	6586412.34		212676.00	6626188.00
241462.36	6592275.81		241006.67	6586677.93		213509.26	6625760.33
241462.66	6592275.94		241553.67	6586811.03		213509.26	6625760.33
241462.97	6592276.06		242072.88	6587762.50		213556.85	6625719.04
241463.28	6592276.15		241673.15	6587964.63			

Note: MGA94 Zone 51

Schedule 3

	MGA94 Zone 51								
	Northwest corner		Northeast corner		Southwest corner		Southeast corner		Comment
	Eastings	Northings	Eastings	Northings	mE	mN	mE	mN	
Area 1	241000	6591000	242000	6591000	241000	6590000	242000	6590000	close to village and haul road
Area 2	239000	6590000	240000	6590000	239000	6589000	240000	6589000	close to haul road
Area 3	239000	6595000	240000	6595000	239000	6594000	240000	6594000	2km away from village, not impacted
Area 4	238000	6601000	239000	6601000	238000	6600000	239000	6600000	8km away from village

Appendix 5

Summary of Submissions and
Proponent's Response to Submissions

A3060 76

21/05/10

POLARIS

METALS NL

CARINA IRON ORE MINE: RESPONSE TO PUBLIC SUBMISSIONS

MAY 2010

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

Polaris Metals NL (Polaris) proposes to develop the Carina iron ore deposit, located approximately 60 kilometres (km) northeast of Koolyanobbing and 100 kilometres northeast of Southern Cross. Development and operation of the Carina deposit is scheduled to commence from end of 2010. The project involves the following components;

- open cut mining from a single pit,
- ore haulage approximately 50 kilometres to a siding on the existing trans Australian railway,
- dry crushing and screening, and
- train loading at the siding.

The mining rate is largely determined by available port and rail capacity. A mining rate ramping up to 4 Million tonnes per annum (Mtpa) is anticipated. The Carina deposit reserves identified so far provide an estimated 21.4 million tonnes of mineable iron ore, with an expected mine life based on that reserve of 5 years.

Polaris referred the Carina project to the Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA) on 8 October 2008. On 5 November 2008, DEWHA advised Polaris that the project was not a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999*.

Polaris referred the Carina project to the West Australian Environmental Protection Authority (EPA) on 15 September 2008. On 3 November 2008, the EPA published its decision to assess the project at a Public Environmental Review (PER) level of assessment, with a 4 week review period.

Three appeals were received against this determination. On 2 April 2009, the Minister for Environment and Youth dismissed all appeals, retaining the PER with 4 week review period.

The Scoping Document was approved by the EPA on 6 August 2009.

The final PER document was approved for public release 15 March 2010

1.1 PER PUBLIC REVIEW

Polaris has prepared a Public Environmental Review (PER) for the proposed Carina iron ore mine.

Following agreement on the scope and content of the draft PER document by the Office of the Environmental Protection Authority (OEPA), public submissions were invited for a 4 week period commencing on Monday 15 March 2010 and closing on Monday 12 April 2010 (Appendix 1).

In accordance with s40(6)(b) of the *Environmental Protection Act 1986* (WA), the OEPA requested that Polaris consider and respond to the public submissions received. This document identifies Polaris' response to the relevant issues raised in the public submissions.

1.1.1 Document availability

The PER document was made publicly available in the following manner:

- Digital copies could be downloaded from the website at www.polarismetals.com.au
- Digital copies (on compact disc) could be obtained free from Polaris' Perth office;
- Hard copies could be purchased for $10 from Polaris' Perth office;
- Hard copies could be viewed in libraries as listed in the table in Section 1.1.2.

1.1.2 Document distribution

Documents were sent to a range of stakeholders and public locations. These were:

	No. of copies
Battye library	2
Yilgarn library and shire	3
Coolgardie library and shire	3
State library	2
Esperance shire	1
City of Fremantle	1
Department of Mines and Petroleum	1
Department of Environment and Conservation	4
Department of Indigenous Affairs	1
Public Transport Authority	1
Department of Treasury and Finance – Building Management and Works	1
Department of State Development	1
Department of Transport	1
Department of Lands	1
Department of Water	1
Fremantle Port Authority	1
Westnet Rail	1
Esperance Port Authority	1
Conservation Council of WA	1
Wildflower Society of WA	1
Wilderness Society of WA	1
The Central West Goldfields People	1
The Gubrun People and the Kelamaia Kabu(d)n People	1
Goldfields Land and Sea Council	1

1.1.3 Submissions received

A total of 9 submissions were received by the OEPA and forwarded to Polaris on 16 and 19 April, with a request to summarise the submissions and respond to relevant matters. Table 1 shows the submissions received.

Table 1: Submissions received

No.	Submitter	Date received by OEPA
1	Department of Mines and Petroleum	15 April 2010
2	Department of Environment and Conservation	12 April 2010
3	Department of Aboriginal Affairs	24 March 2010
4	Department of Water	7 April 2010
5	Shire of Esperance	19 April 2010
6	Conservation Council of WA	Not stamped
7	Wildflower Society of WA	Not stamped
8	Western Four Wheel Driver Magazine	Not stamped
9	Anonymous	Not stamped

1.1.4 Changes to the proposal

PER table 8 listed the major project components, with a total indicative disturbance area of 500ha. During the assessment process, a number of alternatives to project components, their location and disturbance area were examined, as shown in PER Table 2. This resulted in a reduction of 40 ha over the indicative disturbance area, for a final project disturbance of 460ha.

These changes are:

1. Relocate the crushing plant and main power generation from the mine infrastructure area to the rail siding infrastructure area. This consolidates ore processing, stockpiling and load out in one location and allows a reduction in the mine infrastructure footprint area.
2. Relocate the accommodation village from close to the mine work centre to close to the rail siding work centre.
3. Remove airstrip from project components. Polaris' preferred option is to extend and co-use the existing Jaurdi station airstrip with another mineral exploration company. This other company has lodged a miscellaneous licence application over the subject area and will construct and operate the airstrip. This infrastructure component has been removed from the Carina project.

1.1.5 Amended key characteristics table

Table 2 provides a revised key project characteristics table which identifies maximum disturbance areas associated with project components.

Table 2: Revised key project characteristics

Project description	
Major components	Open pit - 60ha mine waste landform – 140ha 220. ROM and mine infrastructure – 20ha Ancillary clearing around mine (tracks, stockpiles, pit bunds) – 30ha Haul road – 150ha Rail siding and infrastructure – 50ha Ancillary infrastructure: siding precinct (accommodation village, access roads) – 10ha **Total 460 ha**
Mineral resource	Direct shipping ore (DSO) – hematite / goethite.
Processing type	Dry crushing and screening.
Date of commencement	End of 2010
Life of pit	5 – 10 years.
Date of completion	2016 – 2021
Mine	
Tenements	Exploration tenement E77/1115 Mining lease M77/1244. Haul Road Miscellaneous license L15/305 Access road Miscellaneous license L15/306 Accommodation village Miscellaneous license L15/303A North siding access road Miscellaneous license L15/311A South siding access road Miscellaneous license L15/310A Siding General Purpose lease G15/21A
Resource	21.4 Mt at an average grade of 59% Fe.
Mine waste volume	22.8 million bank cubic metres (bcm). This equates to 30.8 million loose cubic metres (lcm)
Mining rate	Up to 4 Million tonnes per year.
Stripping ratio (t:t)	1:2.88
Mining method	Conventional open pit, drill and blast, hydraulic excavation, load and haul.
Maximum project footprint	460 ha
PAF mine waste	The majority will be non acid forming (NAF). Approximately 1 to 2% by volume will be potential acid forming (PAF). This is to be encapsulated in the waste landform.

Infrastructure requirements	• Mine area (up to a maximum of 20ha): o ROM pad o Workshop and equipment park-up area o Site offices, ablutions and lunch room o Power generator o Potable water treatment and storage • Mine ancillary clearing (up to a maximum of 30ha) o Pit perimeter clearing o Topsoil and vegetation stockpiles o Internal haul roads and access roads • Siding area (up to a maximum of 50ha) o Crushing and screening plant. – 26ha o Workshop, offices and power generation – 4ha o Rail loop – 12.5ha o Borrow pits 7.5 ha • Siding infrastructure (up to a maximum of 10ha). o Accommodation village – 2.5ha. o Access roads – 7.5ha.
Stockpile requirements	• Vegetation stockpiles. • Topsoil stockpiles. • ROM ore stockpile. • Product stockpiles
Water use	Mine and immediate surrounds: 1,210 KL/d (442 ML/yr) Haul road and rail siding: 650KL/d (236ML/yr)
Potable water	Groundwater will be treated via a reverse osmosis plant for potable use.
Power source and requirements	Stand alone diesel powered generation facilities are proposed. Average demand of 4MW, with a maximum generating capacity of 5MW.
Hours of operation	24 hours a day, 7 days a week.
Ore haulage	
48 km unsealed haul road	200 tonne payload road trains operating 24/7
Rail siding	
Siding	Ore stockpiles and loading facility on the existing trans Australian railway
Train loading	FBL operation loading train consists of 90 cars (7,000 tonnes per train). Approximately 10 trains per week

2. RESPONSE TO SUBMISSIONS

2.1 DEPARTMENT OF MINES AND PETROLEUM (DMP)

2.1.1 Mining proposal

As the project requires approval under the *Mining Act 1978* prior to commencement, many of the technical mining issues and mine closure planning will be dealt with during the approval process via a mining proposal. Comments on the environmental aspects of the PER will be limited to elements most relevant to this assessment, The Department of Mines and Petroleum (DMP)

DMP has provided comments previously on the Draft PER, version 1 and 2.

Response

Polaris is also preparing a mining proposal and will submit this to the DMP. Responses to comments previously provided to the draft PER by government agencies (including DMP) have been provided to the OEPA.

2.1.2 Waste rock dump

DMP is concerned that an acceptable outcome for the Waste Rock Dump (WRD) may be unachievable due to the lack of suitable waste rock material to cover and armour the waste dump. Within the PEMP WRD section (Rehabilitation Plan), Polaris state that: "a sufficient quantity of laterite, gravel or similar rocky material is absent as an overburden layer in the mine waste profile".

In consideration of the above statements Polaris will need to demonstrate the ability to deliver a safe, stable, landform with the waste materials available.

Response

Two terms require clarification in this response:

Armour rock is required in sufficient quantity to cover the main waste type (mafic schist), which exhibit clay like properties and is unsuitable to comprise the final surface of the waste landform.

Overburden is laterite, gravel or similar rocky material which provides a growth medium and red soil cover over the landform.

Table 3 shows mine waste for pit bench levels of the Carina pit design shown in PER figures 6 and 7. Drilling logs show the base of weathering at an average depth of 70-80 metres below ground level (mbgl). This indicates mine waste below 410mRL will be fresh rock, providing approximately 18.5 million tonnes of rocky material (approximately 30% of total mine waste) as armour. Therefore, a sufficient quantity of rocky / competent material is available as armour, to stabilise the mafic schist waste in the landform.

However, this material is mainly a grey/green ultramafic rock, which will be visually conspicuous against the red soil types of the surrounding landscape.

Comment in the submission refers to text in the Rehabilitation Plan on the unknown quantity of red overburden available for rehabilitation. This material is required to sheet the armoured waste landform so that it blends into the surrounding landscape. This material will comprise a

combination of waste BIF and chert from the open pit plus laterite subsoils from the waste landform footprint.

In addition to visually blending the final waste landform in to the surrounding landscape, past experience in rehabilitating waste landforms indicate this material has superior soil properties over the white/grey clay of mafic schist or grey/green rocky ultramafic waste. This includes supporting microbial populations of nodulation bacteria for legume species such as Acacias. Such species routinely establish much better on these red soils than the other waste types.

At this point in time, sterilisation drilling of the waste landform footprint has not occurred, so it is unknown what quantity of suitable overburden material will be available from this location.

Outcome 1: Determine available quantity of overburden from the waste landform footprint when sterilisation drilling is undertaken.

Table 3 Carina pit optimisation

Bench (mRL)	Total Waste (t)	Unweathered rock (t)
495		
490	34,778	
485	139,383	
480	347,654	
475	990,967	
470	2,345,949	
465	3,972,793	
460	4,433,935	
455	4,196,094	
450	4,053,452	
445	3,922,973	
440	3,819,630	
435	3,337,544	
430	3,203,109	
425	3,071,537	
420	2,949,366	
415	2,490,029	
410	2,360,744	2,360,744
405	2,236,841	2,236,841
400	2,107,627	2,107,627
395	1,710,786	1,710,786
390	1,589,896	1,589,896
385	1,435,052	1,435,052
380	1,318,609	1,318,609
375	909,974	909,974
370	875,154	875,154
365	807,651	807,651
360	745,146	745,146
355	521,515	521,515
350	468,370	468,370
345	355,789	355,789
340	316,118	316,118
335	177,761	177,761
330	160,406	160,406
325	133,259	133,259
320	122,827	122,827
315	47,841	47,841
310	43,185	43,185
305	15,345	15,345
300	4,405	4,405
Total	**61,773,493**	**18,464,299**

2.1.3 Surplus saline water

An option to manage surplus saline water is for a 15ha evaporation basin to be constructed within the WRD footprint. The proponent has not explained how the evaporation basin will be incorporated into the WRD to ensure the containment of PAF material within the facility is not compromised. From a risk perspective it would be preferable to have a separate evaporation basin and WRD.

Appropriate mine waste volumes, schedules for placement and geotechnical considerations would be required to ensure that the final WRD design delivers a safe, stable and non-polluting landform with the waste materials available.

Response:

The waste landform is 120 hectares in area.

The anticipated area for the PAF encapsulation cell is 4 hectares. An inverted trapezoid of 200m square, sloping to a floor of 150m square by 10 metres deep provides a calculated volume of 350,000 m3, which is sufficient for the anticipated quantity of PAF material (point 2.1.4).

PER section 9.3.4 details how options to increase groundwater usage can reduce the net water surplus and therefore the size of the evaporation basin required. Groundwater is located at an average of 60 mbgl, so dry mining can commence at Carina without the requirement to dewater from the beginning of operations. Polaris intends to manage groundwater abstraction in the following manner:

1. Initially (first 3 – 6 months) regulate abstraction to match usage (ie: no surplus).
2. This allows time to collect site specific monitoring data to verify the groundwater model and also excavate sufficient mine waste to develop the waste landform to enable construction of evaporation basin(s).
3. As required, construct evaporation basins in cells of 2-3 hectares each, to a maximum of 10 hectares (ie: 3 or 4 cells). This allows matching abstraction with usage and evaporation of surplus while monitoring aquifer yield and the groundwater model.

This management approach is intended to tailor utilisation of evaporation basins on an 'as needed' basis, rather than building one large evaporation basin at the start, that may not be required. It also allows the opportunity to feedback monitoring data and usage in regulating abstraction over time.

The area required in the waste landform for evaporation basins is therefore variable, from between 3 – 10 hectares.

Polaris considers the size of the waste landform is sufficient to accommodate both features, with adequate separation so that risk of interaction is negligible.

Initial mine planning and design has occurred. Some components of this are shown in PER figures 6 and 7 and table 29. Other components are presented in Table 3 above.

Outcome 2: Detailed mine planning and scheduling is continuing and will be presented in the mining proposal. It is considered the management measures in the PER and supporting documents provide sufficient information on surplus water to show that the issue has been identified, quantified and measures / procedures documented to manage this factor.

2.1.4 PAF material

PAF material is to be contained within an encapsulation cell (3m above ground).

There is no mention as to where within the WRD the encapsulation of this undesirable material will be located to ensure this material does not become affected by the ingress of water and oxygen. Polaris will need to provide a mine schedule as to when this material will be mined and details on how this material will be handled if encountered and placed into the WRD.

Response

Drilling logs show the main source of PAF material is in the contact zone around a major fault on the western side of the ore body. The unoxidised sulfide material is found below the base of weathering (average 70-80 mbgl); ie in the bottom 50 m of the pit. It is variable in thickness both along strike and down dip but averages 5m. Pit wall exposure is approximately 1,100 m. This zone results in a calculated quantity of 275,000 m^3 which is approximately 1.2% of the 22.8 million m^3 of mine waste. This fault zone is considered to comprise the vast majority of PAF mine waste. Allowing for some minor additional zones, the estimated amount reported in the PER, pg 85 is 2%.

As the material is located in the lower levels of the mine, excavation of the upper levels will produce sufficient waste to construct the encapsulation cell prior to the PAF material being exposed.

Outcome 3: It is considered drilling log data, mine design and pit optimisation already undertaken provides sufficient information on total waste quantities to show that the issue has been identified, quantified and measures / procedures documented to manage this factor. Detailed mine planning and scheduling is continuing and will be presented in the mining proposal to provide more detail on this issue.

Testing for PAF and refining waste landform design during the life of mine is an accepted practice. However recently recommended conditions by the EPA (Report 1347, Feb 2010) for detailed PAF testing to be provided prior to commencing operations, is of concern to Polaris. The reason for this concern is as follows:

Table 4 is an extract of the recommended conditions in EPA report 1347, with salient portions highlighted.

Table 4: Recommended EPA report 1347 conditions

10-1	Prior to commencing ground-disturbing activity, the proponent shall submit a detailed and project-specific Conceptual Closure Strategy to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice of the Department of Environment and Conservation and the Department of Mines and Petroleum.
10-2	The Conceptual Closure Strategy shall include detailed results of geochemical and geophysical characterisation of materials, in particular the potential for acid drainage, metalliferous drainage, and of the occurrence of dispersive materials and asbestiform minerals. Testing for materials with potential to cause acid and/or metalliferous drainage shall include static and kinetic testing carried out using techniques and timeframes consistent with national and international standards (Leading Practice Sustainable Development Program for the Mining Industry – Managing Acid and Metalliferous Drainage 2009 – Department of Industry, Tourism and Resources; The Global Acid Rock Drainage Guide 2009 – International Network for Acid Prevention).

Relevant extracts from the reference Department of Industry, Tourism and Resources DITR *Managing Acid and Metalliferous Drainage* are as follows:

a) Initial tests may be relatively simple, increasing in complexity if AMD is identified as a problem. [pg17]
b) Improve density of NAPP data for block model if necessary, and conduct sufficient NAG test work to cross check NAPP data for key lithologies. [pg18]
c) The acid base account and net acid generating test provide an initial screening of AMD potential and determine the need for more detailed investigation. [pg28]
d) Static tests take a 'stocktake' of the minerals present and their potential to cause or alleviate AMD. Kinetic tests can be used to assess how AMD may develop over time. [pg28]
e) Kinetic leach tests need to operate for at least six months and typically 12 to 24 months before sufficient data are available for effective interpretation of the AMD characteristics of a material. [pg36]
f) The results of static and kinetic test work primarily provide information on the AMD characteristics of individual samples to enable the primary geochemical material types to be defined and quantified. As presented in Section 5.3.3, five primary AMD geochemical material types can be defined and further types may be defined based on metal content and leaching potential, and lag time to onset of AMD. [pg39]

Point (e) above shows the effect of the EPA recommended condition is to delay the commencement of the project for up to 2 years. Such a conflict could be resolved by amending the recommended condition to state within 2 years of commencing operations rather than prior to commencing operations.

Outcome 4: Wording of EPA recommended conditions should reflect practical outcomes at appropriate times of the life of mine. Polaris would welcome the opportunity to discuss and review draft conditions with the EPA.

2.1.5 Saline mine waste

The placement of saline material within the WRD will also require consideration.

Response

No detailed salt distribution assessment has been undertaken for mine waste types or profiles. It is fully acknowledged that for successful rehabilitation, salt content in the outer layers of the waste landform need to be managed.

Healthy eucalypt woodland is growing on the existing midslopes and plains of the open pit and waste landform footprint. This indicates salt content of subsoils within the root zone of these trees is not inhibitive to plant growth (estimated at 20-30 mbgl).

Groundwater is known to approximate sea water salt levels, so mine waste below approximately 60 mbgl will contain solubilised salt. This material will be placed at depth in the waste landform.

Outcome 5: Detailed mine scheduling and waste landform design will be included in the mining proposal. Mine waste within the root zone of existing woodland (20-30mbgl) will be placed on the outer layer of the waste landform.

2.1.6 Infrastructure buffer distances

Polaris will need to adhere to any required "stand-offs" or buffer distances that may be required under various legislation given that the proposed location of infrastructure is in the vicinity of the rail siding.

Response

Accepted. PER figure 9 shows the crushing /stockpile facility to be a minimum of 800 metres from the main rail line.

2.1.7 Pit zone of instability

Figure 5 "Carina Project" does not adequately illustrate whether the proposed WRD is outside the zone of instability associated with the pit.

Response

The current mine plan shows the waste landform to be 100m from the edge of the pit. Current information indicates this distance is sufficient to locate the waste landform beyond the zone of pit wall instability.

Diamond core drilling is continuing to obtain samples for further metallurgical and geotechnical analysis. These results will be presented in the mining proposal. If this work indicates the current separation distance to be insufficient, the waste landform will be relocated outside the zone of pit wall instability.

Outcome 6: Drilling is continuing to obtain samples for further metallurgical and geotechnical analysis. If the results show current separation distance between the pit and waste landform is insufficient, the waste landform will be relocated outside the zone of pit instability.

2.1.8 Topsoil

Topsoil is a valuable rehabilitation resource, no locations have been given for topsoil stockpiles, these stockpiles need to be located away from areas that are likely to be flooded.

Response

Accepted. Location of topsoil stockpiles is addressed in the following components of the PEMP:

- Vegetation Management Procedure – "All vegetation and topsoils stockpiles will be positioned away from any watercourses and drainage paths"

- Internal Clearing Form – "Drainage design conditions: Protect stockpiles from surface runoff and flooding".

2.1.9 Infrastructure location

Within the PER the locations of some key infrastructure are yet to be determined by Polaris. Proposed activities approved under the Mining Act 1978 will need to be within or in line with the disturbance footprint approved under Part IV of the Environmental Protection Act 1986.

Response

Key infrastructure components of the project are shown in the PER. These locations will also be consistent in the mining proposal. Exact location of some components has not yet been decided as follows:

- Detailed survey alignment of the haul road has not yet occurred. The road will be 30 metres wide, inside the miscellaneous licence corridor of 150 metres wide.
- Detailed survey boundary of the accommodation village has not yet occurred. The accommodation village is approximately 150m x 150m, within a miscellaneous licence area of 300m x 300m.
- Detail design of siding and rail components shown in PER figure 9 is still occurring. All facilities will be within the general purpose lease.

2.1.10 Flood zone

All permanent infrastructure (e.g. WRD) should be located outside the area flooded by a 1 in 100, 72 hr rainfall event.

Response

PER figure 14 shows this to be the case.

2.2 DEPARTMENT OF ENVIRONMENT AND CONSERVATION (DEC)

2.2.1 Managing conservation values

Issue: The management of direct and indirect impacts on the conservation values of the proposed Jaurdi Conservation Park has not been formalised.

Discussion: In addition to management measures already contained in the PEMP, bushfire, weed and feral animal management should also be included. These additional procedures should be included in a conservation management plan (or equivalent) as a condition of approval.

Recommendation 1: That a condition be applied that requires the proponent to prepare and implement a conservation management plan (or equivalent).

Response

As listed in the submission, the PEMP already contains most of the management procedures and checklists applicable. Weed and feral animals are also currently included, in the vegetation and fauna management procedures respectively. Bushfire is addressed in the Emergency Response Plan, which is predominantly safety focused and was not included in the PER supporting documents.

Outcome 7: Polaris would welcome input from DEC on any specific amendments to existing components or prepare additional management measures for inclusion into the PEMP. The revised PEMP will implement DEC Recommendation1.

2.2.2 Haul road

Issue: The proposed alignment of the haul route will duplicate an existing road and therefore increase impacts on the proposed Jaurdi Conservation Park.

Discussion: The proposed haul road will result in the clearing of 150 ha of native vegetation. The alternative of upgrading the existing Mt Walton Intractable Waste Facility (IWF) access road will result in a significantly smaller area of clearing within the proposed Jaurdi Conservation Park and associated sandplain and woodland vegetation communities.

The Department of Treasury and Finance - Building Management and Works (DTF) manages the IWF and access road. The road is not a public road. DTF has objected to the IWF access road being used as the haul road due primarily to safety concerns for the potential for accidents between mining vehicles and other vehicles. An agreement with DTF for the use of this road would be required.

Recommendation 2: That the proponent utilises the existing Mt Walton IWF access road as the haul route to minimise impacts on the proposed Jaurdi Conservation Park.

Recommendation 3: That in the event the haul route as proposed in the PER is approved, detailed planning of the final alignment, and borrow pits, should be undertaken.

Response

Polaris disagrees with this comment. The PER details Polaris's preferred haul road route.

The EPA approved Scoping Document clearly shows proposed haul roads to the two rail sidings under consideration, with the disturbance area required for this infrastructure also clearly identified in Table 1. No comment was provided to Polaris at this early stage in the process that the proposed haul road, clearly shown as not coinciding with the Mt Walton access road, or the 150 hectares proposed, would be considered unacceptable. It is understood government agency stakeholder was also sought by the EPA on the draft Scoping Document.

PER Section 6 details consultation held with key stakeholders, and specifically DEC (being one of the principle government agency stakeholders for this project). PER Table 22 lists meetings held over an 18 month period (4/2/2008 – 8/9/2009).

This comment was previously raised to PER draft 1. A detailed response was provided and incorporated into the final PER, in section 3.8.13, Figure 1 and Table 3. The response analysed alternative haul road options with pros and cons of each option.

The submission comment is based on the premise that the total area of clearing for the haul road can be significantly reduced by going out to an existing track (which extends the total kilometres travelled in the process). This premise is flawed. The response on this issue includes the following key factors:

1. The existing road is not a public road. It is a private access road to the Mt Walton Intractable Waste Facility, administered by the Department of Treasury and Finance - Building Management and Works (DTF). The DTF does not support the use of this road for ore haulage. Polaris concurs with this view.
2. A new road is still required to link the Carina mine with the Mt Walton access road (at any point).
3. The existing Mt Walton road is only half the width required for the haul road, so significant clearing to widen the existing road is still required.
4. The existing road traverses undulating sandplains. This sand is totally unsuitable for sustained heavy haulage trucks of 240 tonne gross vehicle mass. A large quantity of gravel is required, to construct a road base of sufficient strength to take these loads. Additional clearing to obtain this material would offset any clearing saved by using the existing road.
5. Calculation of areas involved in points 2, 3 and 4 above show the total disturbance area for haul road option 3 (PER Figure 1) is 142.74ha and option 2 is 144ha. This represents an initial reduction of only 1.26ha or 0.9%.
6. The calculations above are just for initial haul road construction. More gravel will be required during the life of mine to maintain option 3. Ongoing maintenance and repair of the road surface during the life of mine will be significantly higher over the sand profile. The relative length of haul road over deep sand in option 3 (47 km) compared to option 2 (8km) is a ratio of approximately 6:1. The minor reduction in initial clearing for option 3 will be further reduced over the life of mine, as more gravel will be needed to maintain this option. With an initial clearing difference of less than 2ha between, the two options, Polaris concludes it is highly likely there will be more clearing required for option 3 over the life of mine.
7. Botanical surveys of these sandplains have found them to be highly floristically diverse and contain a significant number of priority species, range extensions of known species and undescribed species. Polaris's preferred haul road route minimises the distance

traversed through these sandplains and has surveyed alternative alignments to identify the route with the least impact to these species.

Polaris reiterates its position that the view raised in the submission that option 3 will significantly reduce total clearing is an oversimplification. It does not account for all the criteria required to construct and maintain a heavy haulage road for 5 years. When all these factors are considered, the shortest route traversing the best landform (ie option 2) will result in the least total clearing required. For this, and other, reasons provided in the PER, Polaris fully supports the DTF position that the Mt Walton road is not suitable for ore haulage.

Polaris does not support Recommendation 2.

Polaris considers Recommendation 3 has already been implemented and is described in the PER.

2.2.3 Airstrip location

Issue: DEC does not support the proposal to extend and use the existing airstrip in the proposed Jaurdi Conservation Park for commercial fly in fly out (FIFO) operations as proposed.

Discussion: The proponent has indicated that "The requirement for an airstrip near the mine site has been avoided by Polaris' intention to extend and use the existing Jaurdi Station airstrip". No agreement has been reached between the proponent and DEC to use the airstrip for commercial FIFO operations. The Department has previously agreed with Reed Resources upgrading the airstrip to current Royal Flying Doctor Service standards for emergency use only during their exploration activities.

Recommendation 4: That the proponent locates their airstrip on unallocated Crown land (UCL), off existing and proposed reserves.

Response

Polaris does not agree with this comment. This comment has also been raised in the PER draft, with responses incorporated into section 3.8.14 of the final document.

Polaris considers extension and use of the existing Jaurdi airstrip represents the option with least overall environmental impact. Constructing a new airstrip in the locality will require approximately 20 hectares more clearing than extending the existing airstrip.

As stated in the submission, DEC correspondence to Reed Resources agreed to extension of the existing Jaurdi airstrip to 1,200m, to allow RFDS landings. A map attached to that correspondence indicated a number of partially offset alternative alignments. The cumulative length of all alternatives is 1,500m.

Mount Finnerty Pty Ltd (C/o Reed Resources) applied for miscellaneous licence L15/309 on 3/3/2010. The tenement covers the Jaurdi airstrip and sufficient area for airstrip extension. On grant, Mt Finnerty Pty Ltd will be the tenement holder.

Extension and use of the Jaurdi airstrip is an action by another company and is therefore not included in Polaris Metals Carina project. PER Table 2 shows 0 ha proposed for an airstrip when ancillary infrastructure is located at the siding work centre. PER Section 1.8.5.5 reflects this information. Polaris has modified the Carina proposal to not include an airstrip as part of the project assessment.

Polaris does not support Recommendation 4.

2.2.4 Indirect impacts

Issue: The proponent has not delineated an area that will be subject to indirect impacts or developed a monitoring program for this area.

Discussion: The extent of indirect impacts is not clearly documented in the PER and quantitative descriptions of impacts on significant flora and communities are unclear. DEC's experience with impacts of iron ore mining in the region indicates that areas outside the direct impact footprint are likely to be affected by indirect impacts.

Recommendation 5: That a condition be applied that ensures impacts on native vegetation are limited to an agreed direct and indirect disturbance footprint.

Recommendation 6: That a defined buffer, in which the vegetation condition and health may decline to agreed limits, be delineated.

Recommendation 7: That a condition be applied that stipulates trigger levels, which specify the level of acceptable decline in vegetation condition and health within the buffer.

Recommendation 8: That the proponent develops a vegetation condition and health monitoring program. This program should include reference sites against which to compare data, and provide for contingency measures where measurable change has reached identified trigger levels.

Recommendation 9: That a condition be developed that requires the proponent to report annually on the findings of the monitoring program.

Response

PER section 9.4.4.5 discusses indirect impacts. Indirect impacts are not universal to all projects, their extent can rarely be accurately predicted in advance and their effects are almost always determined by site specific factors. The example quoted in the PER lists one mortality of a target species 50 from a pit, while other plants remain health 15m from another pit. This indicates distance alone is not the parameter that defined impact in this case.

Polaris considers site specific monitoring is required, in order to establish meaningful parameters for this issue. Delineating an area/extent or trigger levels at this time is considered premature, as it would be an arbitrary value, not based on any objective evidence.

PER commitment 9 provides for a monitoring programme to be commenced, in order to be able to quantify targets and triggers for indirect impacts as raised in the submission. Detailed planning of the flora health monitoring program will need to be developed. Survey methodology, site selection and initial flora monitoring surveys are to be conducted prior to mine operation commencement to collect baseline data. This can be scheduled during spring 2011, to capture annual and ephemeral species.

The dust control procedure in the PEMP contains the following provisions:

1. Establish permanent monitoring sites for vegetation health, in locations adjacent to mine, haulage and rail siding work areas, as well as control sites, remote for work locations. Dust deposition gauges are to be located at each monitoring site.

2. Monitor dust deposition monthly and vegetation health quarterly over the first 12 months of operation.
3. After the first 12 months, report on results obtained and use this information to define interim dust target levels to ensure adjacent vegetation is not impacted by dust deposition.
4. Define an ongoing monitoring and review process in the annual environmental report.

Polaris considers the PER and PEMP already provide a management process that address the issues raised in Recommendations 5, 6, 7, 8 and 9.

2.2.5 Rehabilitation and closure

Issue: The current proposal will leave a permanent water-filled void at closure that presents a residual risk to conservation values.

Discussion: Any permanent water-filled voids left will continue to present a residual risk and management legacy for the State. In previous project assessments in the region, the EPA has recommended conditions in relation to water-filled voids, that should backfilling of the pit voids not be undertaken, the proponent would need to take measures to reduce the potential for feral animal populations increasing, in addition to monitoring vegetation health.

Recommendation 10: That a condition be applied to ensure that the mine void is backfilled to a level that will prevent the formation of permanent surface water.

Recommendation 11: In the event that a permanent water-filled void as proposed in the PER is found to be environmentally acceptable and subsequently approved, conditions to be applied to:

- require fencing (and funds to manage the fence in perpetuity) of the mine pit void post closure to restrict access by fauna;
- minimise the impacts of grazing resulting from an increase in fauna attracted to the water-filled void; and
- avoid potential long-term impacts on water quality.

Response

It should be noted there are existing unfenced historic mines in the locality with water filled mine voids.

Polaris considers the reference to an EPA condition set on another project, with a simplistic extrapolation that the same or similar condition be applied to this project, does not represent objective environmental assessment of actual factors associated with each project and whether conditions are relevant or warranted in each case.

EPA Report 1303 (Nov 2008) on the W2 pit by Portman Iron Ore Limited includes the following text (pg 11&12):

> "However it is recognised that there is only limited knowledge of the potential impacts on conservation areas of leaving mining pit voids. In the first instance a research program would assist in providing clarity on the potential impacts on fauna and flora from which some informed decisions could be made about the type of measures that are necessary to maintain important environmental values where they coincide with mining operations, and the cost of implementing them in the long term."

The most recent EPA report released for a similar project in the region is EPA Report 1347 (February 2010), on the Mt Jackson J1 Deposit by Cliffs Asia Pacific Iron Ore Pty Ltd. This report recommends a condition that requires the Final Closure and Decommissioning Plan to include a monitoring program and procedures to ensure the final pit void water body does not cause environmental harm, by attracting native fauna or attracting fauna which may harm native fauna or surrounding native vegetation.

This recent outcome demonstrates a significantly different outcome to pit backfilling, as proposed in DEC Recommendation 10.

Polaris does not support DEC Recommendation 10.

The PER details that Jaurdi station has been destocked now for 20 years. DEC has provided no evidence on feral animal numbers in the locality or that localised concentrated grazing is actually occurring. Proposing a condition that requires building a fence to keep out animals that aren't there does not appear to be a reasonable management measure. It is inconsistent with the EPA comment in Report 1303 that says in the first instance, a research (monitoring) program to quantify if the problem actually exists, would enable informed decisions to be made.

Polaris does not support DEC Recommendation 11.

Polaris's position on the final open pit void is detailed in PER section 9.7.4.3 with proposed outcomes provided as Commitments 7 and 8.

2.2.6 Closure and rehabilitation

Issue: The quality and security of closure and rehabilitation is not assured.

Discussion: Completion criteria need to be agreed for the proposal. Monitoring needs to be undertaken until completion criteria have been achieved. Further management actions may be required if monitoring shows that completion criteria are unlikely to be met.

Recommendation 12: That a condition be applied that requires the development and achievement of completion criteria.

Recommendation 13: That a condition be applied that requires monitoring and annual reporting of closure and rehabilitation actions.

Response

Consistent with all other mining operations in WA, the function of the rehabilitation plan (during operations) and the mine closure plan (at closure) is to provide a mechanism to implement this factor. Both are adaptive documents that are amended during the life of mine, based on monitoring results of progressive rehabilitation.

Development of completion criteria and progressive rehabilitation targets are covered in detail in the rehabilitation plan, which is part of the PEMP.

Polaris considers the PER, rehabilitation plan and CMCP already provide a management process that address issues raised in Recommendation 12 and 13.

2.2.7 Offsets

Issue: Offsets to mitigate the residual impacts on the proposed Jaurdi Conservation Park and the Department's management liability have not been proposed.

Discussion: The project will result in residual impacts and will also impact on DEC's capacity to manage the remaining banded iron formation range and the hinterland areas. There is a desire for offset funding for long-term management to be a negotiated outcome of any environment approval of this proposal.

Recommendation 14: That if the project is found to be environmentally acceptable and subsequently approved, offsets should be applied to mitigate residual impacts.

Recommendation 15: That DEC is given the opportunity to comment on any offset proposal.

Response

Polaris has considered the issue of offsets in PER section 9.0 and is of the view that an offset is not warranted for this project.

EPA (2008) Guidance Statement 19: *Environmental Offsets* states that significant environmental impacts must be avoided or minimised in the first instance, by applying the mitigation sequence in order. Of the five steps in the mitigation sequence, the first four are to be preferentially employed, so that residual impacts from a project are not significant. Offsets, the fifth step in the mitigation sequence may be considered, if after the above process, significant residual impacts still remain on Critical or High value assets.

As different project activities differ in scale and nature of impact, control measures are tailored to ensure they are relevant and effectively mitigate the risk of significant impact. Polaris has developed a Project Environmental Management Plan (PEMP) for the Carina project. The PEMP is designed to implement the first four steps in the mitigation sequence. The PEMP includes plans and procedures to avoid, minimise, rectify and reduce impacts to as low as practically possible.

For each environmental factor in the PER, the predicted outcomes section details how management measures will reduce any residual impact to low levels. The overall residual risk level for each factor is listed.

During the entire EIA consultation phase and comment period, DEC has provided no substantive information on what possible significant residual impacts could result from the project and how they may materially affect DEC's capacity to manage the area, both now and into the future. In the absence of specific information that shows a significant residual impact on significant factors, an unsubstantiated claim for long term funding, badged as an 'offset' is not supported.

2.3 DEPARTMENT OF INDIGENOUS AFFAIRS (DIA)

2.3.1 Section 18

One archaeological site has been identified within the area of the open pit boundary. Consent under section 18 of the Aboriginal Heritage Act 1972 (AHA) will be sought in order to disturb this site. Investigating the full significance of this site is in progress.

Response

The Carina Cave was discovered during the August 2009 Aboriginal Heritage survey of the Carina-Chamaeleon Corridor. This detail survey covered not only the ore body, but all areas that mine infrastructure may be needed within M77/1244. As a result of this find, an archaeological survey was undertaken in September 2009 across the entire exposed ore body which resulted in the cave being provisionally termed "Carina 2009/01". Carina 2009/1 was registered with the DIA September 2009. Permission was granted by the Traditional Owners of this area, Central West Goldfields People and Kelamaia Kabu(d) Group on the 6 September 2009. A Section 16 was applied for on 8 October 2009 to allow archaeological excavation of the cave floor to determine whether or not the cave was a significant archaeological site. Permission was granted by the DIA on 4 December 2009 for the excavation to proceed.

The archaeological excavation was planned to begin on the 24 April 2010, but the lack of accommodation at the Carina exploration camp meant the excavation was postponed until late May 2010 after the Carina infrastructure tenure Aboriginal Heritage surveys are completed.

2.3.2 Heritage surveys

The survey appears to have covered only the proposed area of the open pit and its immediate surrounds. As Polaris intends to construct a haul road of approximately 50 kilometres, it is advised that Polaris also conduct archaeological and ethnographic heritage surveys over the proposed haul road in order to inform itself of any Aboriginal heritage values that may be located within.

Response

Aboriginal Heritage survey to cover the Carina mine haul road (L15/305), accommodation village (L15/303), village access road (L15/306), loading/storage/rail siding (G15/21) and access (L15/310-L15/311) will commence on 27 April 2010. It is expected the survey will be completed in late May 2010.

2.3.3 Survey of mine area

It is noted that traditional owner representatives were consulted in 2007 regarding proposed exploration drilling at Carina. While no concerns were raised at this stage it is apparent that exploration drilling has been completed. It is suggested that the traditional owner representatives be consulted over Polaris' proposal to construct a mine at Carina

Response

In August 2009 an Aboriginal Heritage survey was conducted over the Carina mine area and the Carina-Chamaeleon Corridor. The aim of the survey was to clear the area necessary in M77/1244-I for the mining operations and further exploration targets within E77/946, E77/1115, E77/1275 (purchased from Southern Cross Goldfields Ltd on 30 June 2009), and E77/1418. The only site found within M77/1244 which required further investigation was the Carina cave site; Carina 2009/1.

2.4 DEPARTMENT OF WATER

2.4.1 Previous submission

The DoW has previously provided comment for the above document, and it appears that our issues have been addressed. Therefore, DoW has no further comment at this stage of the planning process.

Response

Comment noted

2.5 CONSERVATION COUNCIL OF WA

2.5.1 Proposed Jaurdi Conservation Park

The proposed Jaurdi Conservation Park, which encloses the Carina mine site, is described in the opening pages of the Polaris Metals Public Environmental Review of the Carina Iron Ore Mine as being recognised for its "inclusion in the State's conservation reserve system based on landscape and biodiversity values which are currently poorly represented, including flora and fauna of conservation significance". This statement then begs the question, why under any circumstance should mining be allowed on such an important site?

Response

The subject text refers to descriptions in EPA Bulletin 1256 of the proposed Jaurdi Conservation Park's inclusion in the proposed northern yilgarn conservation reserve system. There is no implication in the text that mining not be allowed within the proposed park.

2.5.2 Mine void backfilling

The failure to include provisions for backfilling the mine would have a number of negative impacts on the area.

The purpose of this proposed park is for conservation purposes; however, this is only possible if the pit is back filled, otherwise it will feature as a permanent mark of industrial development.

Response

Polaris disagrees with this submission. The submission links separate issues to form a flawed conclusion. Submission 2.2.5 also addresses this point.

There are existing historical open pit mines within the former Jaurdi pastoral lease. Figure 1 and Figure 2 show the Taipan and Mt Dimer mines respectively. Using the submitter's logic, with these permanent marks of industrial development already existing in the area, it is no longer possible to management the proposed park for conservation purposes.

Polaris considers the historic mines and the proposed Carina project have only small, localised impacts within the 289,776 hectares of the former Jaurdi pastoral lease. These are not considered a significant constraint to management of the overall area.

Figure 1: Taipan mine

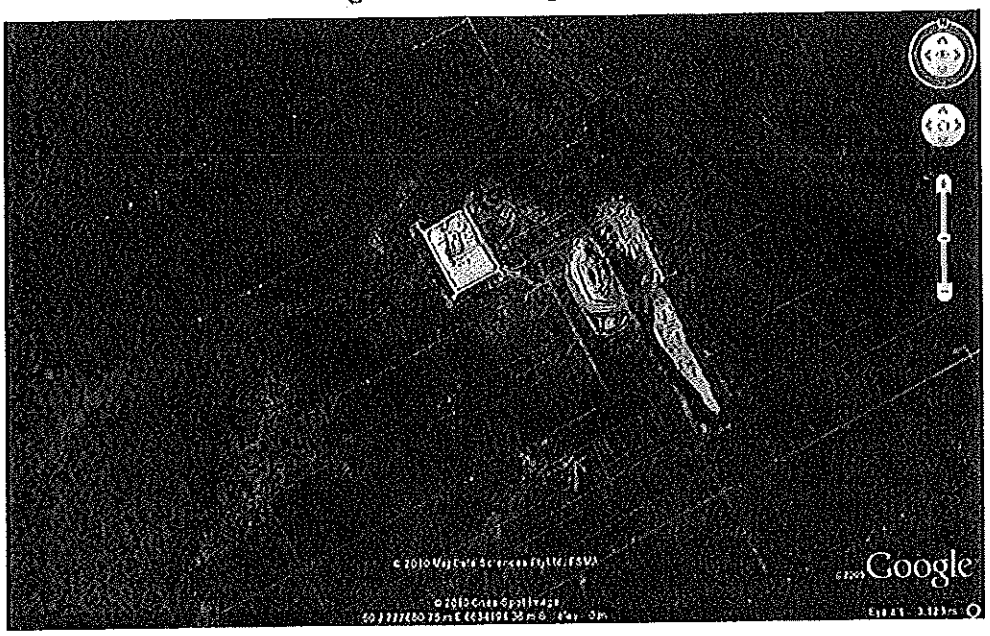
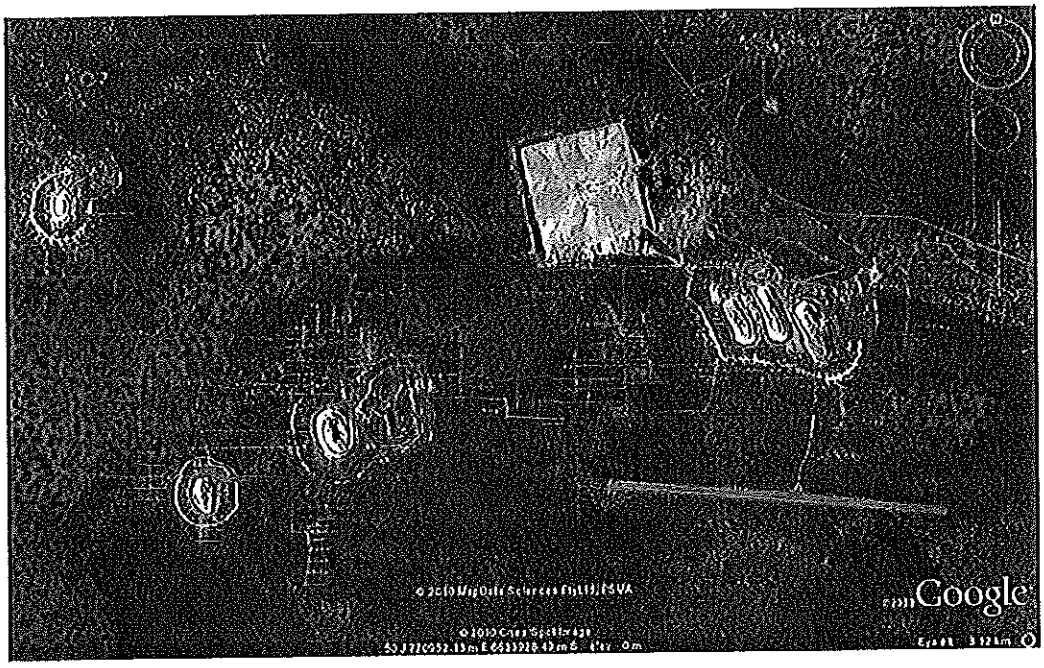


Figure 2: Mt Dimer mine



2.5.3 Pit void lake

The void pit will also act as a store of drinkable water for prolonged time periods after rains for feral goats. Even if the mine void water is saline, rainwater will sit on top of the saline water protected from severe evaporation by the void, and could support feral animals for sometime after rain.

Response

Submissions 2.5.2 and 2.2.5 also address this point.

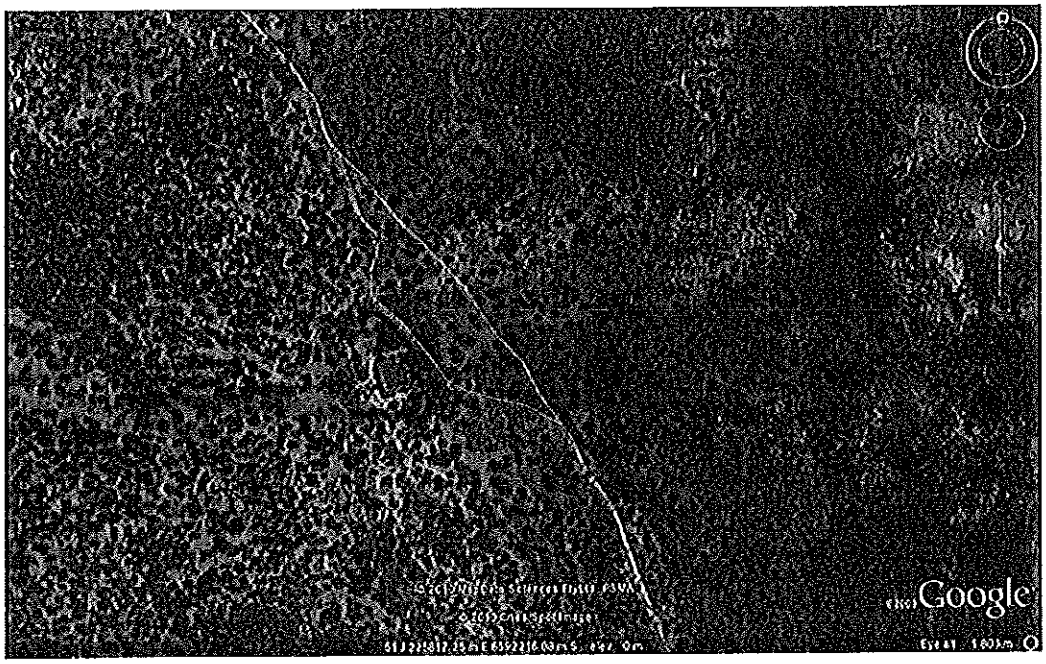
Polaris considers the submission to be a subjective statement that impacts may occur at some time in the future. This is not substantiated with any local evidence.

Permanent and near permanent water sources already exist in the locality. Figure 3 shows one of a number of pastoral dams, which have presumably existed since Jaurdi station was an active pastoral lease. They have not been decommissioned and rehabilitated for the 20 years since CALM/DEC ownership and management of the property.

There is no evidence of feral goats in the locality.

There is no evidence of localised heavy grazing around these long standing water sources.

Figure 3: Pastoral dam



2.5.4 Flora impacts

Flora would be impacted as outlined in the Polaris botanical surveys which identify two priority species in the Carina mine area, eleven in the haul road and rail siding area and six in the accommodation village and siding extension areas.

Response

This is acknowledged in the PER. Some individuals of these species will be impacted as detailed in PER Table 18. However, surveys have identified many more individuals in the surrounding area. Polaris concludes there will not be a significant impact to any of these species as a result of the project.

2.5.5 Locally restricted flora

As with many BIF mines, this site contains significant and locally restricted flora and ecological communities. Currently, none of these BIF species or communities are protected in secure conservation reserves.

The existence of significant endemic flora provides yet another urgent reason to refuse approval to the mine until some areas have been set aside to protect the values of the BIF

Response

The statement is incorrect. The surveys conducted have not identified any significant endemic flora or communities in the Carina project area or the immediate confines around the project area.

Statistical analysis of survey data comparing the small hill at Carina with the BIF ranges nearby (data supplied by DEC), which is a listed PEC, demonstrated that there was a lack of similarity, in terms of species presence-absence data. The species which are present on the Carina hill are common in the broader tenement.

The Hunt Range, which is the northern continuation of the major geological feature that includes Carina is in Crown reserve No 36208.

2.5.6 Subterranean fauna

Regularly, singleton samples are found in surveys, suggesting that sampling methodologies chosen are inadequate for identifying the species found within the BIF.

Response

It is generally accepted that no single sampling or survey methodology is capable of identifying every single individual in the entire region. This is true of vegetation, flora, fauna, invertebrate and subterranean fauna survey methodologies.

This is an inherent limitation which applies to all projects. A number of EPA Guidance Statements on assessment of environmental factors have been produced. All acknowledge that surveys have limitations. The guidance documents provide survey methods considered acceptable in environmental impact assessment of projects.

2.5.7 Troglofauna surveys

The mine should not be given environmental approval until:

- Surveys of Troglofauna are completed to a point that shows that loss of habitat will be within an acceptable limit – this needs to be quantified.
- Some BIF Troglofauna habitat has been protected by the Government

Response

Polaris considers both these points have been addressed.

PER section 9.6, Figure 17 and Table 18 discuss troglofauna habitat assessment and show similar subterranean fauna habitat occurring in a 12 kilometre range along the Mt Dimer Shear Zone between Carina and Chamaeleon. This habitat connectivity is supported by capture of the same species at both locations.

The Hunt Range, which is the northern continuation of the major geological feature that includes Carina is in Crown reserve No 36208.

2.5.8 Strategic Review

Whilst the Government no longer endorses the Strategic Review in practice, it remains cabinet endorsed policy until it has been officially rejected. Principles put forward in the Strategic Review, include:

(i) "No development activity to proceed in the Yilgarn Craton BIFs that would result in the IUCN Threat Category of any given plant or animal taxon increasing ie. initially not being listed as threatened under any category to being listed (the three IUCN categories for threatened species being Vulnerable, Endangered and Critically Endangered), or increasing from Vulnerable to Endangered, or from Endangered to Critically Endangered."

(ii) "No development activity to proceed in the Yilgarn Craton BIFs that would result in the IUCN Threat Category of any ecological community increasing from not being listed as threatened under any category to being listed, or where already listed (or qualifying for listing) as a TEC, having its actual or recommended Threat Category increased (from Vulnerable to Endangered or from Endangered to Critically Endangered)"

Response

Threat categories listed in EPA Guidance Statement 51 are:

1. Presumed Totally Destroyed;
2. Critically Endangered: <10% of pre-European extent remains in an intact condition in the bioregion;
3. Endangered: 10 to 30% of pre-European extent remains;
4. Vulnerable: declining and/or has declined in distribution and/or condition, and whose ultimate security is not yet assured (it could move into a category of higher threat in the near future if threatening processes continue) (English and Blyth 1997, 1999).

The report by D.P. Shepherd, et.al (2002) *Native Vegetation in WA- Extent, Type and Status* shows the Coolgardie bioregion to still contain 98.5 % of native vegetation since European settlement.

There is no Critically Endangered, Endangered or Vulnerable, species that will be impacted by the project. The project will not result in any species being given such listing.

2.6 WILDFLOWER SOCIETY OF WA (WSWA)

2.6.1 Project should not proceed

The Wildflower Society of Western Australia (Inc.) is of the belief that this project should not be allowed to proceed. This is principally because the location is in an area which has long been recognised as having high conservation values.

Response

Polaris acknowledges the opinion expressed by the WSWA. Polaris does not agree with this view and believes multiple land uses, including mining, can coexist in the region.

The Wildflower Society included this point in their appeal, lodged on the level of assessment set by the EPA for this project. The Office of the Appeals Convenor considered the appeal and reported to the Minister for the Environment (March 2009). The Minister for Environment and Youth dismissed the appeal.

2.6.2 Economic value

The project will have an unacceptable impact on the environment whilst being of minimal economic value.

Response

Polaris disagrees with this statement. Polaris considers the PER shows that project impacts will be localised and not significantly effect environmental values in the region.

Polaris disagrees that the economic value of the project is minimal. At current iron ore prices, the project has gross revenue of over $2 billion, with an estimated royalty to the State of $150 million.

2.6.3 EPA Bulletin 1256

Carina proposal falls within a region which has been the subject of advice of the EPA to the Minister for the Environment under Section 16(e) of the Environmental Protection Act 1986. The advice is contained in Bulletin 1256 dated May 2007. Recommendation 2 includes the point that proponents be advised that proposals for further mining in areas of the highest conservation value are unlikely to be found environmentally acceptable.

Response

The following extract from the Office of the Appeals Convenor report to the Minister for the Environment (March 2009) (pg 5) on appeal numbers 209-211 of 2008 is directly relevant.

> **EPA Advice**
>
> *Third party appeals*
>
> In response to appeals from third parties, the EPA reported that its Bulletin 1256 and the *Strategic Review of the Conservation and Resource Values of the Banded Iron*

> *Formation of the Yilgarn Craton* noted that proposals for further mining in areas of the highest conservation are unlikely to be found to be environmentally approved. The EPA considered that the areas of highest conservation include the areas recommended for the A Class Nature Reserve. The EPA advised that the proposal is within an area proposed as a conservation park and is not considered to be an area of the highest conservation; therefore it was of the view that setting a PUEA is not appropriate.

The above passage confirms the Carina project is not in an area of the 'highest conservation values'.

Polaris considers the term 'highest conservation value' is a general term which is poorly defined in the stated documents and specifically within the total of 1,300,000 hectare area of the proposed extended northern yilgarn conservation system. Many statements in Bulletin 1256 commence with "further investigation....", indicating not all values in this large area are adequately known. On further investigation, many areas may not contain highest conservation values.

2.6.4 Refuse proposal

The society is of the view that the EPA should have stopped the proposal at referral stage but as that did not happen now is the time for the EPA to recommend that the proposal not proceed.

Response

Submissions 2.6.1 and 2.6.3 also address this point.

Polaris considers due process has occurred on this matter and the Minister has made a decision.

2.6.5 Government Policy

We note that the Premier is on record as saying the Strategic Review of the Conservation and Resource Values of the Banded iron Formation of the Yilgarn Craton, DEC & DOIR October 2007 is dated and he has also advised the Wildflower Society in the same manner, however the recommendations were adopted by the Cabinet of the day and have not yet been replaced by any later cabinet policy.

Response

Polaris submits the following points in response to this comment.

1. Defining government policy and implementing actions arising from that policy is a matter for government.
2. The submission correctly points out that the 2007 government policy referred to was adopted "by the Cabinet of the day", which was also a Cabinet from a previous government. That is; the policy was not adopted by a previous Cabinet of the existing Government.
3. The comment does not provide any specific detail what affect this government policy (adopted or otherwise) has on the Carina project.

2.6.6 Draft Regional Management Plan

The Northern Yilgarn Conservation Reserves Draft Management Plan is currently with the Minister for the Environment and also the Department of Treasury and Finance Regulatory Gatekeepers Unit. It would be premature for the EPA to make a decision on the Carina Mine until the draft plan was released for public comment.

Response

Polaris disagrees with this comment. Polaris believes any statutory assessment process must assess and determine projects based on the current laws and standards at the time. Potential or proposed events, that may or may not come into effect at some future (indeterminate) time, should not be considered in the environmental assessment process of a project under review.

If such a process were adopted, projects would need to consider all sorts of possible future considerations, that include;

- Possible future declared rare flora or fauna (species unknown at this stage).
- Possible future significant flora or fauna (species unknown at this stage).
- Possible future changes in government policy (government unknown at this stage).

This draft plan has not been released for public comment and is it uncertain whether the draft plan has even received internal comment from other Government agencies. The timing of release of the draft plan and its eventual finalisation would appear to be a number of years away.

2.6.7 Principle of Intergenerational Equity.

We fail to see how a *Conceptual Mine Closure Plan* adequately addresses this principle. It is apparent the company has not seriously addressed this issue.

Response

The Conceptual Mine Closure Plan is consistent with terminology and content of the ANZMECC/MCA (2000) *Strategic framework for mine closure* document. See extracts **below.**

> **2.3 Closure Plans**
>
> *Closure plans should be developed to reflect the status of the project or operation.*
>
> At least two types of closure plan will be required through the life of a mine; a Conceptual Closure Plan (project phase) and the main Closure Plan (operations phase) [*see Box 2 – Closure Plans*]:
>
> - a Conceptual Closure Plan for use during feasibility, development and detailed design; and
> - a Closure Plan for use during construction, operation and post-operation [*see Box 3 – Typical Contents of a Closure Plan*].

Box 2 Closure Plans

Conceptual Closure Plan

A Conceptual Closure Plan identifies the key objectives for mine closure to guide project development and design. It should include broad land use objectives and indicative closure costs. (This does not preclude land use objectives being varied during the mine life to reflect changes in both knowledge and technology.)

Closure Plan

Closure planning includes a commitment to progressive rehabilitation and detailed plan development and implementation. A number of subsidiary plans need to be developed as the Closure Plan evolves. These typically include: a rehabilitation plan, a decommissioning plan and a maintenance and monitoring plan.

- *Rehabilitation plan:* A key component of the Closure Plan is a commitment to progressive rehabilitation. In conjunction with an active research and trials programme, this may assist in minimising ongoing contamination and reduce final costs by confirming or modifying completion criteria and demonstrating that they can be met. Progressive rehabilitation allows best use of available personnel and equipment and should assist in minimising required security deposits.
- *Decommissioning plan:* As a detailed component of the Closure Plan, a decommissioning plan should be developed towards the final stages of an operation. (As the exact date for ceasing production is rarely known, it is suggested that the decommissioning plan be developed 2 to 4 years prior to estimated cessation.) Once established it should be updated annually. The decommissioning plan include such things as: details of the demolition and removal or burial of all structures not required for other uses; removal, remediation or encapsulation of contaminated materials; and the procedures for making safe and sealing, openings to underground workings.
- *Maintenance and monitoring plan:* The last aspect of the Closure Plan is performance monitoring, which should be designed to demonstrate that the completion criteria have been met. This period should also plan for remedial action where monitoring demonstrates completion criteria are unlikely to be met. If progressive rehabilitation has been successful, with stabilisation and revegetation meeting completion criteria this last phase of closure may be shortened. It is, however, unlikely to be less than 5 years in duration.

Source: The Australian and New Zealand Minerals and Energy Council (ANZMEC) and the Minerals Council of Australia (MCA) (2000) *Strategic Framework for Mine Closure*

2.6.8 Vegetation and flora reports

We note that nine flora survey reports are detailed in the PER however only four were included in the appendices to the PER. Two of these were done at the driest time of the year and it is not possible to tell with the others as the dates given with all reports are the publishing dates not the time of the field work. The timing of the work does not fit the EPA guidance Statement No 51 and thus their value and completeness is open to question.

Response

The nine surveys listed on PER pg 48 were included to show that botanical surveys on various aspects of the project had been occurring since 2007. Survey numbers 1-4 were not included in the PER appendices as these were targeted surveys for specific and localised aspects of the project (drill lines, access roads and gravel pits), as shown in bold in the report title in Table 5. Survey number 5 was a survey for an alternative haul road alignment to Darrine siding (See PER Figure 1). This route was not selected as the preferred haul road route, so was not part of the final project description. Surveys 6-9 were included as appendices to the PER.

Polaris considers all but one of the surveys were conducted within parameters described in EPA guidance statement No 51 (GS51). The Coolgardie bioregion is shown as being included in the Eremaean botanical province, characterised by 'main rain sporadic'. GS51 acknowledge that for a range of reasons not every botanical survey in the State can occur in exactly optimal conditions. Survey limitations are discussed in GS51 and possible implications this may have to the project.

Survey number 9 is acknowledged as occurring at a sub optimal time. PER Commitment 4 is included to address this issue. As discussed in PER section 9.4.4.4, proposed impact areas examined in this survey are small (accommodation camp, 2.25ha and an access track, 2.5ha) in the same soil and vegetation type previously surveyed in August (report No. 8).

Data from all surveys, not just those included as appendices in the PER were used for vegetation mapping of the area.

Polaris considers the risk of any significant impact to significant species from the proposed small and localised disturbances to be low.

Table 5: Flora surveys

No.	Report	Date surveyed
1	Mattiske Consulting Pty Ltd. Oct 2007. Flora and vegetation **survey of drill hole sites** in exploration tenement E77/1115 Carina Prospect.	August 2007
2	Mattiske Consulting Pty Ltd. Mar 2008. Flora and vegetation **survey of proposed access route** exploration tenement E77/1115 Carina Prospect.	February 2008
3	Mattiske Consulting Pty Ltd. Mar 2008a Flora and vegetation **survey of infill drill sites** in exploration tenement E77/1115 Carina Prospect.	January 2008
4	Mattiske Consulting Pty Ltd. July 2008. Flora **survey of the proposed gravel pit** within exploration tenement E77/1115.	May 2008
5	Mattiske Consulting Pty Ltd. Aug 2008. Flora and vegetation survey of the **proposed Carina transport route: Darrine siding.**	July 2008
6	Mattiske Consulting Pty Ltd. Sep 2008. Flora and vegetation survey of the Carina exploration lease area (Appendix 4).	May-July 2008
7	Mattiske Consulting Pty Ltd. April 2009. Declared rare and priority flora survey: Carina mine tenement M77/1244A (Appendix 4).	March-April 2009
8	Mattiske Consulting Pty Ltd. Oct 2009. Flora and vegetation survey of the proposed Carina transport route: Carina mine to Mt Walton road siding (Appendix 4).	August 2009
9	Recon Environmental (Feb 2010) Carina iron ore project: Mt Walton siding vegetation. Report for Polaris Metals NL. (Appendix 4).	January 2010

2.6.9 Peer Review

It is stated on page 2 of the PER a Charles Newland from Pilbara Resources was part of a study team and is listed as Peer review. We can find no evidence of any peer review although

a Charles Newland is listed in the Recon Environmental Report (Feb 2010). The Society is of the view a peer review of the flora and vegetation work would be appropriate particularly in view of the location of the proposed mine.

Response

Charles Newland is an independent consultant who provided peer review to the draft PER.

2.6.10 PEC

However we note from the discussion on pages 50 and 51 there is a difference of opinion on some issues culminating in bullet point three on page 51 setting out the view of Polaris. From this it is apparent independent review of the flora and vegetation work is warranted.

Response

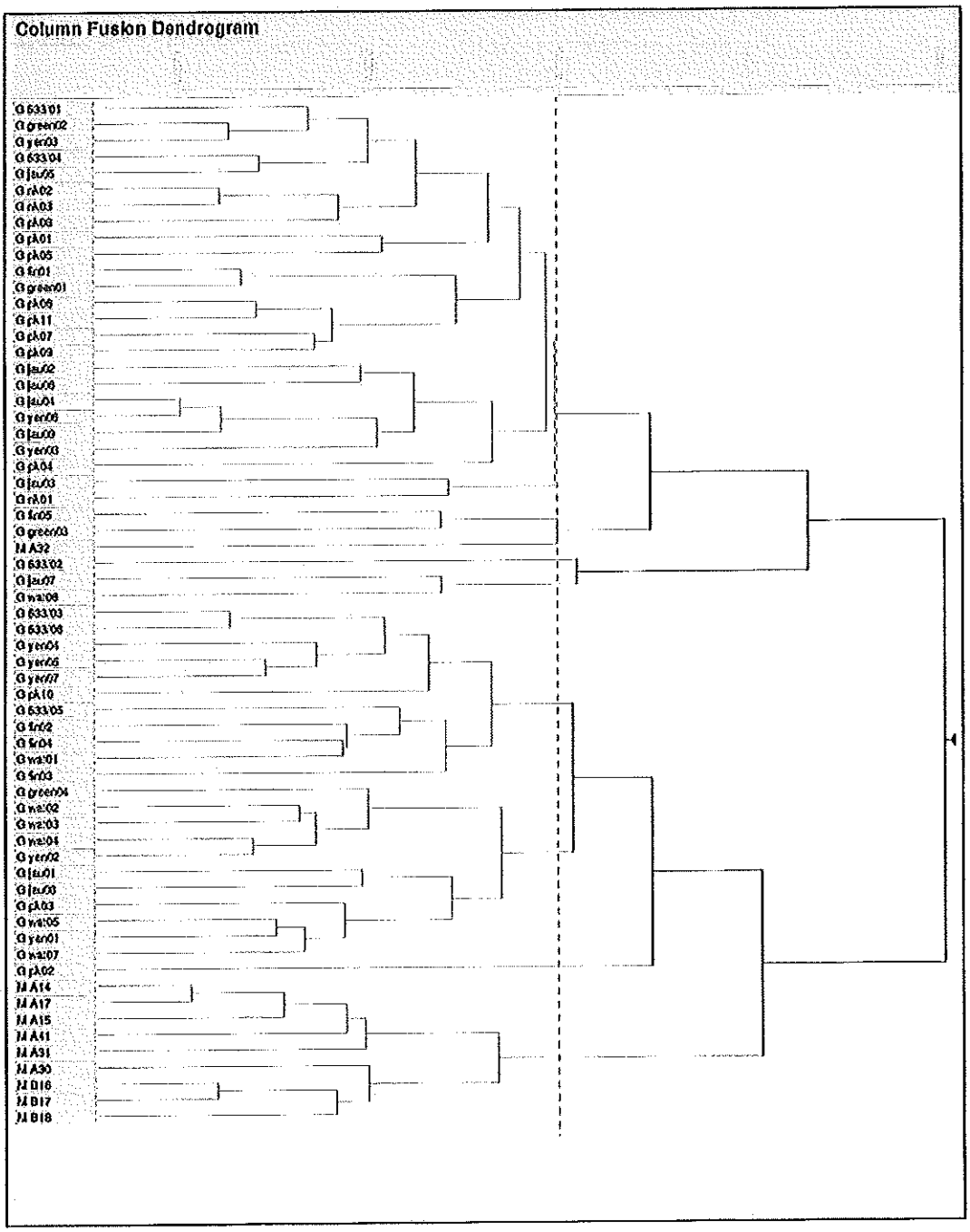
The bullet points referred to discuss comments made by DEC to the draft PER, on vegetation mapping undertaken for the project. The comments referred to similarity between the mapped S2 vegetation community with the Mt Finnerty Range Priority Ecological Community (PEC).

Data from both the S2 and PEC were analysed and presented in a dendogram and two way table, which were submitted back to the EPA in response to DEC comments. This response was included in bullet points in the final PER.

The 2 way table is included in the back of the exploration tenement vegetation mapping report in PER Appendix 4. However, due to the large amount of data in one table, it needs to be printed at A1 scale to be legible. The dendogram is shown in Figure 4. Gibson's sites in the Finnerty Range survey are prefixed by "G", and Mattiske sites prefixed by "M". With the exception of site MA32, all the S2 sites are grouped together, and have a low association with the Gibson sites. This analysis shows the S2 community type has a low similarity to the Gibson data for the Finnerty Range PEC.

Polaris considers a detailed review has been undertaken on the degree of similarity between the ridgeline community at Carina (S2) and the Mt Finnerty Range Priority Ecological Community (PEC). The conclusion is the two vegetation types are not similar.

Figure 4: Dendogram of vegetation sites



2.6.11 Lepidosperma species

Later problems to arise with the Lepidosperma species mentioned on page 52 bullet point seven. Therefore all efforts should be made now to address the issues prior to the EPA making a recommendation on the project.

Response

Polaris considers it has adequately addressed impacts to this species from the project. Some individuals of this, as yet unnamed species, will be impacted by the haul road. However, surveys of an alternative alignment in the immediate area identified many more individuals. The preferred haul road alignment contains the least number of individuals of the two routes. The survey of the accommodation village, between 1 to 2 kilometres from the haul road survey sites also recorded this species.

Polaris considers the surveys currently undertaken show this species to be distributed through the local area (approximately 8 km long x 2 km wide = 1,600 hectares). Localised, small scale disturbances (haul road of 30 metres wide and 2.25 ha accommodation camp) is not anticipated to have a significant effect on this species.

Flora monitoring proposed during the life of the mine will include the sandplain community. This will add to the regional botanical knowledge base and distribution of specific species (eg: *Lepidosperma* species).

2.6.12 Weeds

We note the predicted out-come for weeds is only No introduction or spread of significant weeds. This is unacceptable. The proponent should be committing to not introducing any weeds and also doing their best to control the two currently recorded.

We note a target of <5% cover in Table 1 Completion Criteria and Initial Targets in the Rehabilitation Plan. As mentioned above the target should be no weeds in areas being revegetated.

Response

The rehabilitation plan (table 1) includes the objective that major weeds capable of becoming dominant at the expense of native plants are absent (ie target 0%) but that minor infestations of low significant weeds (<5%) is acceptable.

2.6.13 Topsoil and waste rock

We note in the rehabilitation plan the totally inadequate attention to the management of top soil and characterisation of mine rock waste in the initial mine planning stages.

Response

Polaris disagrees with this statement.

Characterisation of waste rock is presented in PER section 9.1.

Topsoil is adequately addressed in a number of project documents. These include:

i. Vegetation Management Procedure (pg 1). Manage topsoil removal, stockpiling and return operations. Topsoil is a critical factor in achieving successful rehabilitation of disturbed areas, as it contains the majority of seeds, soil micro-organisms, organic matter and nutrients. It is a limited resource and especially important at Carina as rocky areas on exposed ridgelines contain little if no recoverable topsoil

ii. Vegetation Management Procedure (pg 2).Polaris is committed to minimising areas of vegetation disturbance through: Staged approach to activities, therefore only clearing areas as necessary

iii. Vegetation Management Procedure (Table 2).Conserve available topsoil for use in rehabilitation. Topsoil salvaged and stored for use in rehabilitation. All stored topsoil reused in rehabilitation

iv. Vegetation Clearing Procedure. •Topsoil removal (where required), will be removed to a depth of approximately 50 mm to 100 mm and stored immediately adjacent to the area where it was cleared and separate to any subsoil or vegetation stockpiles.

v. Internal Clearing Permit – Conditions. Topsoil stockpiling conditions:

- Remove topsoil (top 100 mm where available) and stockpile in designated area.
- Topsoil stockpiles maximum 2 m high.

vi. Rehabilitation plan (pg3). Topsoil and vegetation return.

vii. Once primary earthworks on the waste landform are completed, available topsoil is respread over the waste landform to a depth of approximately 100 millimetres. Available stockpiles of vegetation are then pushed over batters of the waste landform to provide seed, mulch and fauna habitat. In some locations, collections of timber, vegetation and large rocks may be pushed together in piles, to provide a diversity of habitat types.

Other submission points where topsoil is addressed is 2.1.8 and 2.9.13.

2.6.14 Bond

We also note the proponent, as expected is only proposing that a minimum bond rate be set.

Response

The data presented in tables 2 and 3 of the rehabilitation plan are taken from the Department of Mines and Petroleum bond policy (DMP 2009).

2.6.15 Fire

One issue that does not seem to be addressed is that of fire particularly from humans and equipment but also of wildfires and we see this as a major shortcoming in the content of the PER.

Response

Submission 2.2.1 addresses this point.

2.7 SHIRE OF ESPERANCE

2.7.1 Upgrades of Esperance Port capacity

Further upgrades to the capacity of Esperance Port would be required to accommodate the anticipated iron ore output (4 Mtpa)

Response

Polaris consulted with both the Port of Esperance and the Shire of Esperance during 2009, on the option to export ore from Esperance, as is currently done by Cliffs Natural Resources. Polaris is fully aware of the upgrades to rail and port infrastructure required for this option to proceed. At the present time, export through the port of Fremantle (Kwinana) is the preferred option.

2.7.2 Infrastructure upgrades

Increasing rail traffic may require upgrades to the rail infrastructure and/or road infrastructure impacted by increased rail traffic. Please note that Main Roads, on behalf of the Department of Transport are currently undertaking a planning study known as an 'Alignment Definition Study (ADS)', to develop a long term solution for the existing Esperance Port Access Corridor, that will support the port and general development of the town and region.

Response

This comment is noted. At the present time, export through the port of Fremantle (Kwinana) is the preferred option.

2.8 WESTERN 4WD MAGAZINE

2.8.1 Submission

I make this submission on behalf of my reader base and the wider travelling 4WD community.

Response

Polaris does not accept this as a valid submission. Requirements for group submissions are clearly identified in the section titled Why not join a group? in the "invitation to make a submission" at the front of the PER. This submission does not provide a list of individuals in this group submission, nor is it considered likely the author has a mandate from the "magazine's reader base" or the "wider travelling 4WD community" to speak on their behalf.

Polaris considers this submission should be regarded as an individual submission.

2.8.2 Visitors

The Yilgarn Craton and the Goldfields woodland north and east of Southern Cross is an area of significant visitation by 4WD travellers.

Response

This statement is noted.

2.8.3 Helena and Aurora Range

The Helena and Aurora range is special for its views from the car parking area at the top.

Response

The Carina project is approximately 30 km from the Helena and Aurora range.

It may be worth noting that the access roads to the top of the Helena and Aurora range were constructed by BHP in the 1960's when undertaking exploration drilling of the range. The 'parking area' referred to are old drill pads.

2.8.4 Granites

Granites in this area are around 2.7 billion years old. The public should be able to visit these places without anymore mining activity threatening access.

Response

The Carina project will not prevent or inhibit public access to granite areas in the region.

2.8.5 Historical sites

The H&A Range and points east have significant heritage value where wood-line tracks and camps point to historical activity. Camps dating back to the early 1900s near Mt Finnerty have already been compromised by mining exploration.

Polaris has no knowledge of impacts on historical sites by other mining exploration.

2.8.6 Endangered flora

Endangered flora occurs in the proposed area.

Response

This is incorrect. Botanical surveys have of the project area have not identified any declared rare flora that will be impacted.

2.8.7 DEC management

The DEC should be able to continue its management plan for the area and open it up for more visitor activity in Mt Manning Nature Reserve, the H&A Range and on Jaurdi Station.

Response

This is a matter for the DEC to address.

2.8.8 Banded Ironstone Formations

Banded Ironstone Formations are a unique part of WA's geology and the Yilgarn is unique on a global scale. It is a far too important landscape to be dug up and sent overseas.

Response

Polaris acknowledges the opinion expressed in the submission. Polaris considers that mining and other land uses can co-exist in the region.

2.9 ANONYMOUS

This submission raised many individual points dealing with a number of issues. Many of the individual points raised are repeated or can be grouped into common issues. The issues have been listed below, with individual submission points allocated to each issue.

2.9.1 Botanical survey methodology

No.	Comment	Response
1	The finding of new species of Lepidosperma is a common occurrence in light of the renewed taxonomic focus on this diverse group. The report does not give any details of the likelihood as to whether the species found represents a new taxon or not.	This is incorrect. Text from the PER is provided below. Two *Lepidosperma* species were also recorded that are not currently listed on the Western Australian Herbarium database. These are currently named *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) and *Lepidosperma* sp. Mt. Finnerty (S. McNee LCS 9486). Verbal advice indicates that both these species will be eventually listed as Priority species. [PER pg 52, dot point 6]. Four species were also recorded that are not currently listed on the Western Australian Herbarium database. These are *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B), *Lepidosperma* sp. Lake King (RL Barrett 3442), *Lepidosperma* sp. (MWP12) and Leucopogon sp. Mt Walton. *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) has been previously recorded in the immediate area. Verbal advice from Russell Barrett to Tara Read (Recon Environmental) is that *Lepidosperma* sp. Lake King (RL Barrett 3442) appears to be quite widespread, but is not well collected. The two other species are possibly new species and are not presently recorded on Florabase. [PER pg 53, dot points 3 and 4].
2	There is no discussion in the document of the population statistics, significance or impacts on the four undescribed taxa not yet listed on the Western Australian Herbarium database.	See points 2.6.11 and 2.9.1(1) above. Polaris considers it is not necessary to attempt to count the total number of plants in a large area. The survey work confirms the plants identified are not restricted to project disturbance areas and are also present in adjacent vegetation. Regionally, the soil / landform type in which they are recorded covers a large area. Polaris acknowledges that a minor percentage of the total area occupied by the sandplain will be impacted by the project. Population counts of *Lepidosperma* within the haul road corridors were made. Population estimates across the entire sandplain were not made as it was not deemed necessary, given that the estimated impact of both the haul road and accommodation camp within the sandplain community would affect

No.	Comment	Response
		0.14% of the total area. The information obtained to date shows the small area of disturbance proposed by the project in the locality is unlikely to have a significant effect on any species.
3	It is indicated that *Lepidosperma* sp. Mt Finnerty has been recorded widely on the Finnerty Range. This species is restricted in distribution, and it is incorrect to state that it is widely distributed.	The sentence in the PER (pg 52, dot point 6) states "The second species has been widely recorded in the Mt Finnerty area by Western Botanical". The sentence is referring to the fact that many more individuals of this species have been recorded in the immediate area (Mt Finnerty). The statement does not say the species is widely distributed, in a regional sense. *Lepidosperma* sp. Mt. Finnerty has been recorded widely on the Mt Finnerty Range, particularly in surveys undertaken by Western Botanical on behalf of Reed Resources. The survey by Mattiske Consulting has also now recorded this species on the flats located to the east of Mt Finnerty, on the proposed haul road route. This suggests that this species may not be entirely restricted to the BIF hill. Additional surveys are required to further quantify this wider local distribution.
4	It is suggested that populations of *Lepidosperma* sp. Aurora Sandplain (RL Barrett RL2809B) may be widespread in the vegetation communities where it has been recorded, however, no definitive or exhaustive survey for this species is provided.	This is correct. Surveys to date have identified individuals of this species dispersed in a survey area of approximately 8 km long x 2 km wide (total 1,600 hectares in area). This species is not currently listed on Florabase, but verbal advice from R. Barrett suggests that it is likely to be listed as a Priority species. No definitive count has been made of every single individual in this entire area, or a larger area beyond this. Polaris considers this is not necessary for project assessment. The information obtained to date shows the small area of disturbance proposed by the project in the locality is unlikely to have a significant effect to this species.
5	A species - impact table is not presented in the PER document. It is therefore not possible to assess the relative proportional impacts on individuals or populations of species with conservation or taxonomic	This is incorrect. PER Table 18 shows the proposed number of individuals of priority species anticipated to be impacted by the project and the proportion this represents – based of numbers currently counted.

No.	Comment	Response
	significance within the project.	
6	The descriptions of priority species were very general and regional context is very broad. This may not emphasise the geographic restriction of Priority species. No recognition of range extensions of some species found.	The description of priority species and their regional context is provided in Mattiske (2008) pg8. Recognition of the range extension of *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) is given in PER pg 52, dot point 6.
7	The document refers to the range extension of one undescribed Lepidosperma, however, this is not discussed.	See point 6 above.
8	Haul Road survey appears to have selected sites based on vegetation communities rather than intensive surveys of the whole alignment.	The survey was undertaken in accordance with EPA Guidance Statement 51. The entire haul road alignment was traversed, as well as 124 plots of 30 m radius surveyed. This represents one survey plot approximately every 450m. It is considered this represent a good survey coverage of the floristic values of the proposed haul road route. The submission implies that surveys must identify every plant in the entire project area, as well as every plant within an undetermined area around the project, (in order to place the project's 'take' in context). This is not practical. It is generally accepted that no single sampling or survey methodology is capable of identifying every single individual in the entire region. This is true of vegetation, flora, fauna, invertebrate and subterranean fauna survey methodologies. This is an inherent limitation which applies to all projects. A report on the Review of the Environmental Impact Assessment Process in WA by the EPA (March 2009) outlined the emphasis of the EP Act is to consider proposals on the basis of their potential for significant adverse effects on the environment and to determine whether the proposal may be implemented. In examining a project's consistency with the precautionary principle the report (pg 19) states: *The application of a risk-based approach infers that there is no*

No.	Comment	Response
		"zero" risk associated with proposals as this is not achievable". *The precautionary principle (one of the guiding principles in the Act) is sometimes used to justify that "zero" risk is an appropriate policy position. This is not the intent of the principle which reads:* *Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:* *i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and* *ii. an assessment of the risk-weighted consequences of various options.* Polaris submits the surveys undertaken and reported in the PER show there are no significant effects on significant species from the project. Some individuals of priority listed flora and plants of other significance, will be impacted, but many more are recorded locally. The overall effect on these species is concluded to not be significant.
9	The haul road route crosses large areas of yellow sandplain. The majority of surveys for this assessment were conducted in the summer months. Consequently it is likely that the majority of species encountered were not flowering and identification of many would be very difficult. Further, annual herbs would have been absent. Numerous winter growing annual herbs in the region have priority status.	This is incorrect. Mattiske (2009) (pg 7) states the haul road survey occurred in the period 8-12 June and 24-25 August. The first survey of the haul road alignment was not during a peak flowering period. However, the second survey of the haul road, undertaken in late August 2009, occurred during a flowering season after winter rainfall. The respondent states that the "haul road route crosses large areas of the yellow sandplain". As previously indicated, the impact of both the haul road and accommodation camp is 1.6 % of the immediate sandplain area. This cannot be construed as "a large area".

2.9.2 Scale of vegetation mapping

No.	Comment	Response
1	This coarse level of mapping can and has led to significant difficulties in assessing the local and regional vegetation communities and impacts on these. The relatively low complexity of patterning across the landscape causes us significant concern with regard to the veracity of the mapping undertaken and reported.	Polaris considers the 1:10,000 scale vegetation mapping over the exploration tenement is not a coarse level of mapping. In comparison to mapping undertaken by DEC on Priority Ecological Communities, where boundaries for the Finnerty Range PEC were mapped from a combination of broad scale 1:100,000 and 1:250,000 geology mapping, the 1:10,000 scale for the exploration tenement is regarded as very detailed. Whilst the overall area of the exploration tenement is large, the survey effort was more intense in and near the impact area of the mine.
2	The S2 vegetation description appears to have lumped various distinct shrublands into one. This suggests very broad scale mapping, plus walking at wide scale has potential to miss inconspicuous species such as Spartothamnella Helena & Aurora.	The survey was undertaken in accordance with EPA Guidance Statement 51. Polaris considers the level of survey and scale of vegetation mapping sufficient to provide adequate coverage to assess the floristic values of the vegetation. It is generally accepted that no single survey is capable of identifying every single individual plant. This is an inherent limitation which applies to all projects.
3	The proponent makes statements that "Vegetation communities impacted by the project are widely distributed in the region". To be able to adequately assess this issue, vegetation mapping of a high degree of accuracy, coupled with statistical assessment to confirm vegetation units, needs to be conducted. Sufficient information is not presented within the PER document or appendices to support this statement.	Polaris considers this has been done and reported in project documents. PATN statistical analysis and a two way table are presented in Mattiske 2008.

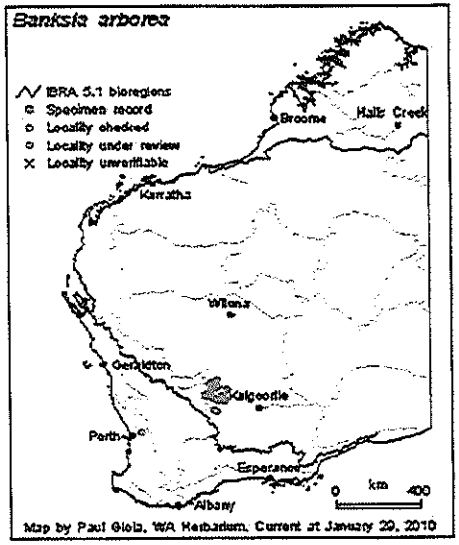
2.9.3 Interpretation of survey results

No.	Comment	Response
1	Species of conservation significance includes no discussion on the numbers of individuals in either a local or regional context and gives no analysis of the significance of proposed impacts on these species.	This is incorrect. PER Table 18 shows the proposed number of individuals of priority species anticipated to be impacted by the project and the proportion this represents – based on numbers currently counted. Discussion in PER sections 4.6.5 and 4.6.6 concludes the relatively small scale of project disturbance in this well vegetated area will not have a significant impact to any significant species.
2	Species for which records indicate significant range extensions have not been discussed or addressed.	See section 2.9.1(5). Polaris considers PER sections 4.6.5 and 4.6.6 discuss this issue and conclude the project will not have a significant impact to any of these species.
3	The discussion of impacts on significant flora (pg. 50) only discusses two of the 11 species with conservation significance found in the project area.	This is correct. PER pg 46 lists 2 Priority species were recorded in the mine tenement. 11 in the haul road and siding and 6 in the accommodation village, access roads and siding extension area. The two species discussed in PER pg 50 are in the subsection on the mine tenement. PER pgs 52 and 53 discuss the other two localities respectively.
4	The discussion on the analysis of vegetation types and similarities to regional data states the vegetation of the S2 community at Carina has a low similarity to the BIF description of the PEC but gives no analysis of this assessment. Further it states that this is well represented in the region and less than 2% of this community is being impacted by the project.	See section 2.6.10. PER table 17 shows the extent of S2 community currently mapped in the local area, with 1.7% proposed to be disturbed by the project.

No.	Comment	Response
5	The discussion of the vegetation of the tenements claims that the mosaic of vegetation associations are widespread within and beyond the tenement boundaries, however no analysis of this is presented	This is presented in PER Table 17. The vegetation map in Mattiske (2008) shows the vegetation communities in the mine tenement to also be represented in the exploration tenement.
6	*Banksia (Dryandra) arborea* not acknowledged as P4 species.	*Banksia arborea* was listed as a P4 species in June 2009, well after the vegetation survey and report was completed. Figure 5 shows Florabase records of *Banksia arborea* in the Eremaean, Coolgardie, Murchison, South west and Jarrah Forest bioregions. *Banksia arborea* is recorded as occurring in vegetation communities S2, W15 and W22 (Mattiske 2008 Appendix D). Mattiske 2008 Appendix C records survey plots where it was recorded as: • A17, A41, B16, B12 and B17. All these are on the Yendilberin hills and immediate surrounds, approximately 3 kilometres SSE from Carina. • CO41. Approximately 1.5 kilometres north of Carina. • Carina fauna CR3. This plot is within the carina open pit. Although no counts of this species have been recorded, its wider distribution outside project disturbance areas indicate the project is unlikely to have a significant impact on this species. P4 taxa are defined as: "Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 - 10 years."

No.	Comment	Response
7	There is reference to an undescribed Acacia species being found in the project, however, this species is not discussed in the text.	The undescribed Acacia species was a sterile specimen, identified as undescribed by Bruce Maslin of the WA Herbarium. Further surveys of the area in which this specimen was located are required during a flowering period to confirm conclusively if the taxon is new or a known species. The species is shown in Mattiske 2008 Figure 1 as occurring on the Yendillberin Hills, to the south of the project area. As the site is remote from the project area, no further comment was considered warranted.
8	No impact footprint available at time of survey therefore no proportional impacts able to be calculated.	The proposed mine area was being defined during the period of botanical assessment. Project disturbance areas were supplied to the consultants during the latter part of this period. Mattiske 2008 Table 2 and Figure 1 show the impact footprint on vegetation communities.
9	not much discussion on the flora of conservation significance and not much discussion on the vegetation communities.	Polaris disagrees with this comment. Polaris considers detailed discussion of these aspects are provided in the PER and botanical survey reports.

Figure 5: Distribution of Banksia arborea



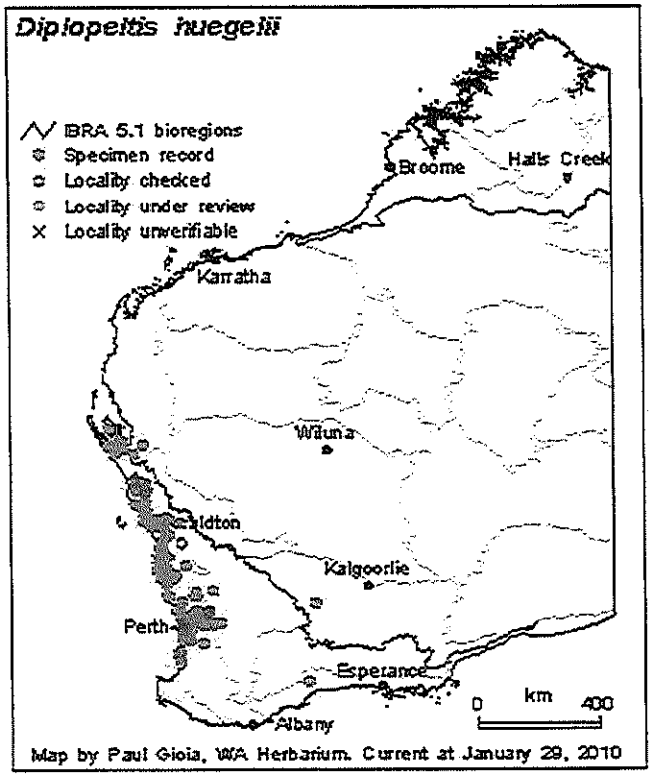
Source: http://florabase.dec.wa.gov.au/browse/map/4746

2.9.4 Botanical survey reports

No.	Comment	Response
	Exploration tenement	
1	*Casuarina obesa* is noted. It is highly unlikely to be present in the project area.	*Casuarina obesa* is likely to be an incorrect identification, and is more likely to be *Casuarina pauper*. *Casuarina obesa* and *Casuarina pauper* are very similar. The environment of the tenement in which the Carina mine is proposed does not contain the preferred habitat of *Casuarina obesa*. Neither of these species are listed as Priority species or species of significance.
2	Issues of significant range extensions, indicating incorrect or inadequate taxonomy are not addressed. e.g.: *Diplopeltis huegelii* is a near-coastal species but recorded in the species list.	Figure 6 below shows Florabase records of *Diplopeltis huegelii* from Shark Bay to Busselton, Southern Cross and Ravensthorpe. Mattiske 2008 records this species in vegetation type W5 (Mattiske 2008 Appendix D). PER Table 17 identifies only vegetation types S2, W2, W4 and W22 in the mine's disturbance footprint. It is concluded the project will have no effect on *Diplopeltis huegelii*.
3	Species in Appendix C are not listed in the species list in Appendix 2.	Polaris is unsure what context "Appendix 2" refers to. Without further information, no response can be made to this point
4	Appendix D. Plant Community S1 contains all species in first series – very unlikely.	There has been a printing error in Appendix D of Mattiske 2008. The correct Appendix D is provided in Appendix 2 of this document. Polaris considers this error has no material effect to the project.
5	Why does the species list in Appendix D restart at A half way through?	See point 2.9.4(4) above.
6	On page 12, 5th paragraph, Mattiske states that it is difficult at this juncture to discuss implications of the proposed Carina mine as no footprint was available. They specifically note the new Acacia species and communities that are restricted to the BIF. Is the	See 2.9.3(7) and 2.9.3(8) A mining footprint was not available during the period when vegetation mapping of the exploration tenement was being carried out. However, the location of the ore body was known, and was taken into

No.	Comment	Response
	Acacia a BIF endemic? And, at which point was the footprint made available and who conducted the assessment of risk to flora?	account during surveys. A mine footprint was provided by Polaris Metals subsequent to completion of the vegetation mapping of the tenement, and was subsequently surveyed again for rare and priority flora.
	Siding and village	
7	Four days for a field survey to ID all flora and map communities, with limited access and very hot, inappropriate weather (Jan 2010), is not an adequate assessment of vegetation and flora of the rail siding and village area.	This is acknowledged. PER Commitment 4(pg 102) addresses this point.
8	Recent fires in sandplain mean that species were missed due to early stage in post-fire regeneration.	This is accepted. See points 2.9.1(7) and 2.9.4(8)
9	Goodenia drummondii ssp. drummondii is a significant range extension in this area - perhaps not this species? Is not discussed.	Read (2010)(pg 13):In PER Appendix 4 states that collections of this species were made in the FASU (Fire impacted Allocasuarina shrubland on undulating sandplain) and ASUS (Allocasuarina spinosissima mixed shrubland on undulating sandplain) habitats. These units have been differentiated based on their recent fire history, rather than any landform characteristic. The sandplain landform covers a vast area in this locality. Further surveys proposed (PER commitment 4) may add to the knowledge base of this species.
10	Spring surveys needed, confirming veg mapping and flora assessments	This is acknowledged. PER Commitment 4(pg 102) addresses this point.
	Haul road and siding	
11	Recent fire history in parts of this area means that the flora and vegetation surveys were incomplete.	No single survey is capable of identifying every plant in the area. This is an inherent limitation which applies to all projects. PER Commitment 4(pg 102) addresses this point.

Figure 6: Distribution of Diplopeltis huegelii



Source: http://florabase.dec.wa.gov.au/browse/map/4746

2.9.5 Time of year

No.	Comment	Response
1	Minimal annuals and grass species were found. timing not realistic (too early in the growing season - May to July).	It is generally accepted that no single sampling or survey methodology is capable of identifying every single individual in the entire region. This is an inherent limitation which applies to all projects. It is correct that some surveys of the Carina tenement, including the proposed alternate haul road routes were carried out at a time of year during which annuals were least likely to be recorded. However, surveys of both the tenement and alternate haul road routes were carried out during the August/September periods, when annual and grasses were present. Polaris considers the surveys undertaken and reported in the PER show there are no significant effects on significant species from the project. Some individuals of priority listed flora and plants of other significance will be impacted, but many more are recorded locally. The overall effect on these species is concluded to not be significant.
2	Numerous species are not identified to species level and are noted with a question mark.	The tenement survey was undertaken between May-July 2008. Many plants were only in a vegetative state (no flowers) at this time. A number of species collected require flowers for complete identification. Where a taxon could not be identified to species level accurately, and it was considered there may be a possibility that it may represent a priority taxon, this would have been noted as such. The tenement survey covered a much larger area than the project disturbance footprint. While a number of species could not be identified to species level, there was no indication provided by the botanical consultants that this represented a significant limitation or concern to the project. This was due to the following factors: i. They were recorded outside the project disturbance area. ii. The level of identification available indicated they were not, or unlikely, to be any of the significant species known to occur in the region. iii. They were recorded in a number of plots or over a number of vegetation types, indicating they were not locally restricted.

2.9.6 Insufficient time available

No.	Comment	Response
1	While nine previous survey have been referenced, no details have been given on the intensity, effort or coverage of flora and vegetation surveys conducted. It is not possible to gauge whether sufficient time has been spent on the project area to accurately identify all significant flora and adequately map vegetation.	See point 2.6.8. Table 5 shows that Mattiske consulting has conducted various surveys over the project area over a 2 year period, from August 2007 to August 2009. Polaris considers this is sufficient time to provide adequate coverage over the project area

2.9.7 Transect spacing

No.	Comment	Response
1	Polaris states that there is a low likelihood of species with conservation significance remain unidentified in the project area and that targeted surveys for species with known conservation significance were conducted in transects at 100 metre spacing. In our experience, a 100m spacing for such targeted surveys is inadequate to be able to fully assess significant flora species. The inconspicuous nature of Spartothamnella Helena & Aurora realistically requires intensive surveys of 5-10m spacing between botanists in dense scrub to ensure that individuals are located. Annual priority flora species known to occur in the area may also have been missed given the timing of surveys (earlier than Spring).	The survey was undertaken in accordance with EPA Guidance Statement 51. Polaris considers the level of survey and scale of vegetation mapping sufficient to provide adequate coverage to assess the floristic values of the vegetation. There is no single standard defining spacing for transect surveys. The submission notes that very narrow spacing is required to identify inconspicuous plants in dense scrub. The Carina project area is open woodland. The transect spacing conducted is considered adequate for the site specific characteristics.

2.9.8 Incomplete taxonomy

No.	Comment	Response
1	Number of taxa not fully identified (listed as Genus as sp. or with ?) recorded and listed in the species list of Mattiske's reports may be due to lack of flowering material.	Acknowledged. See point 2.9.5(2).
2	Annual species located on priority DEC desktop search were not located during the field surveys e.g. Gnephosis intonsa P1 and Phlegmatospermum eremaeum P2, Lepidium genistoides P3. suggesting that surveys were not at flowering times.	Acknowledged. See points 2.9.5(1) and 2.9.5(2). It is generally accepted that no single sampling or survey methodology is capable of identifying every single individual in the entire region. This is an inherent limitation which applies to all projects.

2.9.9 Vegetation map in the PER

No.	Comment	Response
1	No vegetation map clearly showing communities and significant flora is presented in the Flora and Vegetation section of the PER.	This is incorrect. Figure 12 in the Flora and Vegetation section of the PER shows the vegetation communities within the mine disturbance areas.

2.9.10 Priority Ecological Community

No.	Comment	Response
1	While listed PECs are noted, there has been no discussion as to whether the vegetation of the project area is allied in any way to known PECs	This is incorrect. See point 2.6.10. The conclusion from this discussion in the PER is that the S2 community has a low similarity to the Mt Finnerty PEC.
2	Comparing Carina hilltop communities to Mt Finnerty and Helena and Aurora Range PECs are also inadequate. It is understood that the DEC is re-determining PECs on certain BIF ranges in the Yilgarn region. It is not good enough to expect that the PEC's currently in place in the region are a thorough representation of what needs conserving on the outcropping BIFs.	Polaris considers environmental assessment of a project must be assessed on the current classifications of relevant factors. Future possible classification, reclassification or renaming of species etc can not be relevant considerations in EIA.

2.9.11 Clearing principles

No.	Comment	Response
1	Principle 1. Table 30 shows the Management action to address loss of vegetation due to clearing is to collect seeds prior to clearing. While this is commended and an entirely appropriate action, the value of topsoil in returning vegetation post mining should not be overlooked. However, given the lack of addressing this aspect in any differential clearing, topsoil and subsoil stripping and stockpiling programs, the proponent runs the risk of having a relatively low rate of return via topsoil return in rehabilitation.	Polaris does not agree with this view and considers topsoil is adequately addressed in project documentation. Other submission points, such as 2.6.13, also address topsoil. The submission fails to recognise that topsoil will be stored for an extended period (likely to be 3 years) before the waste landform is sufficiently developed for progressive rehabilitation to commence. There is significant literature evidence to indicate prolonged storage has a negative effect on seed viability and biological activity in topsoil. Supplementary seeding and fertilising are proposed in the rehabilitation plan to offset this effect. Polaris considers the above information demonstrates that topsoil has been adequately addressed in project design. However, it is acknowledged that this information is dispersed in a number of documents, procedures and forms. To clarify this, Polaris will implement the following outcome: **Outcome 8:** Amend the rehabilitation plan to provide further information on topsoil removal, storage and return and cross reference other documents relevant to topsoil.

No.	Comment	Response
2	Principle 2. Management Action 2 of Table 30. states that "Rehabilitation will return habitat to the majority of the project area". Coupled with the lack of waste characterisation and linking of vegetation types to soil profiles. there is no evidence that the proponent understands the linkages between vegetation - soils – and underlying surface materials.	Polaris does not agree with this view and considers waste characterisation is adequately addressed in project documentation. This includes: i. PER section 9.1 ii. Rehabilitation plan section 2.1.1: Water management design. final surface armouring. sheeting. and topsoiling are prescribed. Polaris considers waste landform design and rehabilitation has been adequately addressed. However. it is acknowledged that this information is dispersed in a number of documents. procedures and forms. To clarify this. Polaris will implement the following outcome: **Outcome 9:** Amend the rehabilitation plan to provide further information on waste characterisation and waste landform rehabilitation.
3	Principle 4. While no listed Threatened Ecological Communities (TECs) or PECs are noted at the site. the vegetation of the project area may yet. upon consideration. be regarded as a PEC.	Polaris considers environmental assessment of project must be assessed on the current classifications of relevant factors. Future possible classifications. reclassifications or renaming of species etc can not be relevant considerations in EIA.
4	Principle 8. The impacts through clearing and building of the waste rock landform on visual amenity and therefore environmental values of the proposed Jaurdi Conservation Park is not acknowledged. The project lies within the proposed Jaurdi Conservation Park and as such will have a major localised impact on the visual amenity of this proposed reserve.	This is incorrect. PER section 5.3 addresses visual amenity. Given the low relief of the project site and significant buffer distances to any external activity, Polaris considers there will be a negligible impact on environmental factors and visual amenity from the project.

2.9.12 Clearing

No.	Comment	Response
1	Individuals of two undescribed Lepidosperma species will be impacted by the proposed alignment for the haul road. The paragraph goes on to state that further numbers of these and other significant flora are present in an alternative route adjacent that was considered and assessed. Further that "the survey indicated it is likely more of these species will occur in the S12 vegetation community... ". However, there is no presentation of data to enable analysis of these impacts on these species in either a local or regional level. Either these species are or are not more widespread and common - (DEC) can not make an assessment of the impacts on these species based on a statement of likelihood.	Response to comments on the Lepidosperma species is also provided in 2.6.11 and 2.9.1(1). Surveys have confirmed these species are not confined to project disturbance areas and are more widely dispersed in the immediate area. Given this information and that the extent of disturbance proposed is small and localised, Polaris considers it likely there will not be a significant impact to these species from the project.
2	The PER document makes statements on the regional distribution of flora with conservation significance with little evidence to back this up.	This is incorrect. PER section 4.6.6 and Table 18 discuss regional flora surveys. Table 18 lists 12 separate surveys undertaken within 30-40 kilometres of Carina.
3	A commitment by the proponent to undertake further surveys is not adequate for the purposes of a PER where approval to clear vegetation with conservation significance may be granted.	Polaris does not agree with this comment. Surveys undertaken to date show all significant species also occur beyond the boundaries of proposed disturbance. Polaris considers the survey information shows there will not be a significant impact to significant species from the project. The number of individuals of significant species proposed to be disturbed is low (PER Table 18). Further surveys and additional studies are undertaken on a range of factors during the life of mine. The outcome of these studies add to the regional knowledge base.

2.9.13 Soil assessment, topsoil and rehabilitation plan

No.	Comment	Response
1	The PER document includes minimal information on topsoil striping and management. Topsoils and subsoils should be carefully stripped and stockpiled so that they can be married together in rehabilitation works and dissimilar materials segregated and used appropriately.	These points are addressed in other submissions and responses as follows: 2.1.5, 2.1.8, 2.6.13, 2.9.11(1), 2.9.11(2)
2	While topsoil is referred to, the commitment to salvage 50 to 100 millimetres of topsoil is an inadequate amount to be salvaged for future rehabilitation.	
3	Accurate description of soils is essential for development of topsoil and rehabilitation plans. A lack of attention to this aspect will result in poor topsoil and subsoil segregation and lead to substandard rehabilitation outcomes.	
4	There is insufficient focus within the waste characterisation section (pg. 88, 89) to give any meaningful information on textures of waste material to be taken from the various areas to be cleared. There is no information in the PER or the PEMP on the potential suitability of materials at greater depth in the soil profile for final landform formation and subsequent use as surface materials for rehabilitation. Given the lack of a detailed soils assessment and detailed rehabilitation, it is apparent the proponent has little idea of the material that will form the waste rock landform and what challenges they will face in rehabilitation.	

5	There is a contradiction in the information on the height of the waste rock landform. Page 113, dot point 2 states the WRL will be 35m in height, in two 15m high lifts. 2 x 15 = 30.	PER pg 112 states "A waste landform with a total approximate area of 120 ha will be located adjacent to the open pit. It will be 30-35 m high, which is the height of the Yendilberin Hills, immediately to the south." PER pg 113 states "The maximum height will be 35 metres, constructed in two 15 metre high lifts." The text is intended to convey that there will be two lifts of approximately 15 m each, for a total approximate height of 30 m, but a maximum height of 35m.

2.9.14 Other comments

No.	Comment	Response
1	Some species listed within the species list from vegetation mapping surveys are obsolete on FloraBase.	Florabase is constantly being updated. Species identified were correct at the time the report was prepared. The submission does not indicate if this may have a material effect to the project.
2	Government Policy. We find the paragraphs within the document addressing government policy (pg. 77, 78) totally unacceptable and a slur against the professionalism and ethics of the officers of the DEC. In particular, we find the discussion using quotations from Hansard and passages from the Industry Working Group (IWG) report as polarising and entirely inappropriate for inclusion within the PER document. We protest very strongly at the use of these passages within the proponents PER document and find them totally unacceptable and disgraceful.	Polaris does not agree with this opinion. This section of the PER was intended to précis a number of documents related to the proposed northern yilgarn conservation reserve system. Irrespective of individual opinion on these documents and their content, the fact remains they exist. It is acknowledged there is a spectrum of personal opinion on this issue (as exemplified by this submission point and points made by submitters in sections 2.5, 2.6 and 2.8). Polaris' view is summarised in the 5 dot points on PER page 79.

3	Indirect impacts. Indirect impacts due to dust, changed environmental microclimate conditions and potential drying of the soil profile due to excavation of the mine void and exposure of the soil profile to increased evaporation or loss of infiltration capacity due to interruption of surface flow are possible and are not acknowledged.	Indirect impacts area addressed in the PER and PEMP. They are also addressed in point 2.2.4 above.
4	Use of saline water. The proponent discusses dust impacts on vegetation under this heading (pg. 102 and 103) and states in dot point 2 that indirect impacts on vegetation from use of saline water or dust are difficult to predict and that they are not anticipated to occur. The proponent gives an inappropriate quotation from EPA Report 1303 and inaccurately assumes that saline water and dust have no impact on vegetation, including Ricinocarpos brevis at Windarling. The proponent has not acknowledged plants are potentially susceptible to dust deposition on leaves, and potential unintended secondary impacts.	Saline water is addressed in point 2.1.3 above and also is included in indirect impacts above. The example of Ricinocarpos brevis quoted on PER pg 103 is intended to show that distance alone cannot be used to define indirect impact in all situations. Polaris considers indirect impacts are difficult to predict and their effect (where present) are heavily influenced by site specific factors. Polaris fully acknowledges that indirect impacts may occur and has committed to implementing a monitoring program to quantify these impacts.
5	The PER document does not acknowledge the proposed extensions to the Mt Manning Nature Reserve.	This is incorrect. The PER contains many references to the proposed northern yilgarn conservation reserve system.
6	The proponent's commitment to monitor effects of dust on vegetation (pg. 123) are applauded. There is insufficient detailed information on this factor on the vegetation of the Yilgarn region and any results from the project should be made publicly available.	Comment noted.

3. OUTCOME OF PUBLIC SUBMISSIONS

Many of the submissions raised issues that were already addressed in the PER and supporting document, so do not require amendment to the project's scope or management documentation. A summary of the key outcomes from submissions received is provided below.

Outcome 1 Determine available quantity of overburden from the waste landform footprint when sterilisation drilling is undertaken.

Outcome 2 Detailed mine planning and scheduling is continuing and will be presented in the mining proposal. It is considered the management measures in the PER and supporting documents provide sufficient information on surplus water to show that the issue has been identified, quantified and measures / procedures documented to manage this factor.

Outcome 3 It is considered drilling log data, mine design and pit optimisation already undertaken provides sufficient information on total waste quantities to show that the issue has been identified, quantified and measures / procedures documented to manage this factor. Detailed mine planning and scheduling is continuing and will be presented in the mining proposal to provide more detail on this issue.

Outcome 4 Wording of EPA recommended conditions should reflect practical outcomes at appropriate times of the life of mine. Polaris would welcome the opportunity to discuss and review draft conditions with the EPA.

Outcome 5 Detailed mine scheduling and waste landform design will be included in the mining proposal. Mine waste within the root zone of existing woodland (20-30mbgl) will be placed on the outer layer of the waste landform.

Outcome 6 Drilling is continuing to obtain samples for further metallurgical and geotechnical analysis. If the results show current separation distance between the pit and waste landform is insufficient, the waste landform will be relocated outside the zone of pit instability.

Outcome 7 Polaris would welcome input from DEC on any specific amendments to existing components or prepare additional management measures for inclusion into the PEMP, The revised PEMP will implement DEC Recommendation1.

Outcome 8 Amend the rehabilitation plan to provide further information on topsoil removal, storage and return and cross reference other documents relevant to topsoil.

Outcome 9 Amend the rehabilitation plan to provide further information on waste characterisation and waste landform rehabilitation.

Other submissions raised issues that do require additional actions and minor amendments to project documentation. These are detailed in the following sections.

3.1 AMENDMENT TO THE PEMP

The PEMP is an adaptive document that is intended to be revised and updated during the life of mine.

The inclusion of additional procedures, as detailed in a DEC submission is supported by Polaris. This will implement Outcome 7 and provide an operational level document to manage environmental issues from the project.

To date, no specific details have been provided from DEC. Polaris will liaise with DEC in the coming weeks on specific additions to the PEMP. A revised PEMP will be provided to the OEPA during the project assessment period.

3.2 AMENDMENT TO THE REHABILITATION PLAN

The rehabilitation plan is an adaptive document that is intended to be revised and updated during the life of mine. Outcome 8 and Outcome 9 require revision of the rehabilitation plan to include the following.

i. Collate information already contained in the PER and supporting documents on topsoil management.

ii. Collate information already contained in the PER and supporting documents on mine waste characterisation, waste landform design and rehabilitation methods.

iii. Provide additional information on mine waste.

The inclusion of additional information as a result of public submissions will provide greater clarity on the proposed rehabilitation method and process. The revised rehabilitation plan will be provided to the OEPA during the project assessment period.

3.3 DETAILED DESIGN IN THE MINING PROPOSAL

In addition to the PER assessment under the *Environmental Protection Act 1986*, the project also requires approval under the *Mining Act 1978*. The latter process requires additional mine planning, scheduling and safety aspects, not normally required in the EIA process.

Information on extraction sequence, such as shown in Table 3 and other pit design parameters are detailed in the mining proposal. Outcome 1, Outcome 2, Outcome 3, Outcome 5 and Outcome 6 are all components of detailed mine scheduling and design.

3.4 CORRECTION TO SUPPORTING DOCUMENTS

A number of updates and errors were identified in supporting documents. Polaris considers these have no material effect on the nature and scope of the project. Updates and errors identified in Mattiske (2008) are:

1. *Banksia arborea* was listed as a Priority species after the survey and report was completed. P4 taxa are defined as "taxa which are considered to have been adequately

surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 - 10 years."

Banksia arborea was recorded as occurring in vegetation communities S2, W15 and W22. Survey plots where it was recorded are located in areas that will not be disturbed by the project, as well as one site within the project disturbance footprint. (Carina fauna CR3). Undisturbed sites are on the Yendilberin hills and immediate surrounds, approximately 3 kilometres SSE from Carina and a site approximately 1.5 kilometres north of Carina.

2. Wrong data supplied in Appendix D. The correct information is supplied in Appendix 2 to this document.

3.5 ADDITIONAL SURVEYS AND INVESTIGATIONS

The PER and PEMP recognise that throughout the life of mine, additional surveys and monitoring is undertaken on a range of factors including, flora, subterranean fauna, rehabilitation and groundwater.

This information will be reported in project audit documents and incorporated into revisions of the PEMP and related documents. This information is used to verify current survey and modelling results and increase the knowledge base of environmental factors in the region.

APPENDICES

APPENDIX 1:
ADVERTISEMENT

Public Notices

APPENDIX 1
NOTICE OF APPLICATION for a FINANCE BROKER'S LICENCE
Individual (Natural Person)
[Sections 24 & 27]
FINANCE BROKERS CONTROL ACT 1975 (WA)
To the Commissioner for Consumer Protection

Polaris Metals NL

Carina Iron Ore Mine: Yilgarn Region of WA

(15 March to 12 April 2010)

Polaris Metals is proposing to develop the Carina iron ore deposit, located approximately 60 kilometres northeast of Koolyanobbing and 100 kilometres northeast of Southern Cross. Development and operation of the Carina deposit is scheduled to commence from the end of 2010. The project involves open cut mining from a single pit, ore haulage approximately 50 kilometres to a siding on the trans Australian railway, dry crushing and screening and train loading at the siding.

A Public Environmental Review (PER) has been prepared by the Company in accordance with Western Australian Government procedures and is released for public review. The PER describes the proposal, examines the likely environmental effects and the proposed environmental management procedures associated with the proposed development.

Hard copies of the PER may be purchased for $10 or a CD version is available at no cost from:

Alesha Waru
Level 2 1109 Hay Street WEST PERTH WA 6005
Phone: (08) 9215 1222

Copies of the PER may also be downloaded from www.polarismetals.com.au

Copies of the PER will be available for examination at:

- Department of Environment and Conservation, Library/Reading Room, 4th Floor, The Atrium 168 St Georges Tce, PERTH WA 6000
- Department of Environment and Conservation Kalgoorlie Office
  32 Brookman St, Kalgoorlie WA 6430
- Battye Library, 25 Francis Street, Alexander Library Building, Perth Cultural Centre, Perth WA 6000
- Shire of Yilgarn and Shire of Coolgardie Public Libraries

Public submissions close on 12 April 2010.

The EPA prefers submissions to be made electronically using one of the following:

- the submission form on the EPA's website: www.epa.wa.gov.au/submissions.asp;
- by email to submissions@epa.wa.gov.au;

Alternatively, submissions can be

- posted to: Chairman, Environmental Protection Authority, Locked Bag 33, CLOISTERS SQUARE WA 6850, Attention: (Digby Drake-Brockman); or
- delivered to the Environmental Protection Authority, Level 4, The Atrium, 168 St Georges Terrace, Perth, Attention: (Digby Drake-Brockman); or
- faxed to (08) 6467 5562.

If you have any questions on how to make a submission, please ring the EPA assessment officer, Digby Drake-Brockman on 6467 5435.

APPENDIX 2:
MATTISKE 2008 – APPENDIX D

APPENDIX D: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY PLANT COMMUNITY WITHIN EXPLORATION TENEMENT E77/1115

Note: * indicates introduced (weed) species; P1, P2, P3 and P4 denote - Priority Flora Species (DEC 2008b)

SPECIES	PLANT COMMUNITY																							
	S1	S2	S5	W1	W2	W4	W5	W7	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27
Acacia ?ancistrophylla var. *ancistrophylla*	x				x																				
Acacia andrewsii					x																				
Acacia aneura var. *aneura*	x				x																				
Acacia assimilis					x		x													x			x	x	
Acacia assimilis subsp. *assimilis*					x		x													x					
Acacia burkittii	x	x		x	x	x	x			x	x	x	x		x	x	x	x		x		x		x	x
Acacia colletioides	x			x	x	x	x	x		x	x		x	x				x	x	x		x			x
Acacia coolgardiensis	x																								
Acacia cremulata (P3)	x				x	x				x			x												x
Acacia eremophila var. *variabilis* (P3)	x																								x
Acacia erinacea	x		x		x	x	x			x	x		x	x			x	x		x		x		x	
Acacia ?graniticola					x																				
Acacia hemiteles	x				x			x		x		x										x			
Acacia inceana subsp. *conformis*					x																				
Acacia jennerae	x			x	x	x	x			x									x						
Acacia merrallii				x	x	x				x								x	x			x			
Acacia minyura					x																				
Acacia multispicata								x																	
Acacia prainii	x			x	x													x	x	x		x			
Acacia quadrimarginea		x			x	x												x							
Acacia ramulosa	x																x							x	
Acacia resinimarginea	x				x					x			x			x					x	x			
Acacia ?rigens		x																							
Acacia sibina	x	x			x					x		x	x							x	x				x
Acacia sp.													x												
Acacia tetragonophylla		x	x		x		x			x	x	x	x	x		x				x		x	x	x	
Acacia undescribed (B.Maslin)		x																							
Acacia yorrakinensis	x																								
Allocasuarina campestris	x	x	x		x							x	x							x		x	x		
Allocasuarina corniculata	x																					x			x
Allocasuarina helmsii													x												
Alyxia buxifolia	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x			x		x		x	
Amphipogon caricinus	x				x			x		x		x	x	x		x	x			x					
Amyema benthamii		x																							
Amyema miquelii	x				x	x	x						x						x	x	x	x			
Aristida holathera var. *holathera*		x					x																		
Asteraceae sp.	x				x																				
Atriplex nummularia	x			x	x	x	x			x	x			x				x	x	x		x		x	
Atriplex vesicaria	x			x	x	x	x		x	x	x		x					x	x	x		x			
Austrostipa elegantissima	x	x		x	x	x	x			x			x					x	x	x		x		x	

APPENDIX D: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY PLANT COMMUNITY WITHIN EXPLORATION TENEMENT E77/1115

Note: * indicates introduced (weed) species: P1, P2, P3 and P4 denote - Priority Flora Species (DEC 2008b)

SPECIES	PLANT COMMUNITY																								
	S1	S2	S5	W1	W2	W4	W5	W7	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27
?Austrostipa nitida										x															
Austrostipa platychaeta						x																			
Austrostipa sp.													x												
?Austrostipa sp.	x				x	x																			
Baeckea crispiflora	x				x			x		x						x						x			
Baeckea elderiana	x	x			x					x		x	x		x					x	x				
Baeckea muricata	x												x												
Banksia arborea		x											x												
Beyeria brevifolia	x																			x					
Beyeria brevifolia var. *robustior*																						x			
Beyeria calycina var. *minor*	x																						x		x
Borya constricta					x																	x			x
Bossiaea walkeri					x																				
Brachychiton gregorii		x																							
Callitris canescens	x																								
Callitris preissii	x							x																	
Calothamnus gilesii																						x			x
Calycopeplus paucifolius		x																				x			
Cassytha melantha													x												
Casuarina obesa																				x					
Casuarina pauper		x				x				x			x												
Chamaexeros macranthera	x				x			x								x						x			
Cheilanthes adiantoides					x																				
Cheilanthes brownii																				x					
Cheilanthes lasiophylla		x																							
Codonocarpus cotinifolius	x																								
Comesperma ?volubile																				x					
Cratystylis subspinescens					x				x									x							
Cryptandra aridicola	x																								
Dampiera eriocephala	x																								
Daviesia benthamii subsp. *Acanthoclona*	x																								
Daviesia purpurascens (P4)					x								x	x				x				x			
Dianella revoluta	x	x			x		x			x			x										x		
Diplopeltis huegelii						x																			
?Dissocarpus paradoxus					x																				
Dodonaea lobulata		x			x								x							x					
Dodonaea microzyga var. *acrolobata*	x				x							x								x					
Dodonaea stenozyga	x				x						x									x					
Dodonaea viscosa subsp. *angustissima*	x	x			x					x		x	x					x		x		x			
Dodonaea viscosa subsp. *mucronata*																									x

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	PLANT COMMUNITY																							
SPECIES	S1	S2	S5	W1	W2	W4	W5	W7	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27
Drosera sp.	x				x																				
Enchylaena lanata					x	x	x			x										x				x	
Eragrostis dielsii													x												
Eremophila alternifolia	x				x					x				x											
Eremophila caperata	x				x	x		x		x												x			
Eremophila decipiens	x				x				x						x										
Eremophila decipiens subsp. *decipiens*	x	x	x		x	x	x			x			x	x		x				x		x	x		
Eremophila georgei		x																							
Eremophila granitica	x			x	x		x			x			x		x			x	x	x		x			
Eremophila interstans				x	x				x																
Eremophila interstans subsp. *interstans*	x				x											x									x
Eremophila interstans subsp. *virgata*				x	x					x												x			
Eremophila ionantha	x			x	x	x	x		x	x			x	x				x	x	x		x		x	
Eremophila latrobei subsp. *latrobei*													x												
Eremophila maculata subsp. *brevifolia*					x				x																
Eremophila oldfieldii subsp. *angustifolia*	x	x			x		x			x	x	x	x	x						x		x			
Eremophila oppositifolia subsp. *angustifolia*	x				x	x				x	x	x	x		x			x		x				x	
Eremophila scoparia	x			x	x	x	x			x	x		x			x	x	x	x	x		x			x
**Erodium botrys*					x	x	x			x												x			
**Erodium cicutarium*					x																				
Eucalyptus capillosa subsp. *capillosa*																			x						
Eucalyptus celastroides subsp. *celastroides*					x					x															
Eucalyptus celastroides subsp. *virella*					x																	x			
Eucalyptus corrugata	x	x		x	x	x	x			x	x	x	x	x			x	x	x	x	x	x		x	
Eucalyptus delicata					x														x	x					
Eucalyptus ebbanoensis	x																								
Eucalyptus ewartiana	x	x			x								x												
Eucalyptus gracilis	x												x												
Eucalyptus griffithsii																			x						
Eucalyptus horistes	x	x			x			x																	x
Eucalyptus leptopoda subsp. *subluta*	x																								
Eucalyptus longicornis				x	x	x	x						x	x				x	x	x		x			
Eucalyptus loxophleba subsp. *lissophloia*	x				x			x		x			x	x	x	x	x	x		x	x	x	x	x	
Eucalyptus loxophleba subsp. *supralaevis*																						x			
Eucalyptus moderata						x	x																		
Eucalyptus oleosa subsp. *oleosa*	x	x			x	x	x	x		x		x	x			x		x							
Eucalyptus pileata	x																					x			
Eucalyptus platycorys	x																								
Eucalyptus ravida	x			x	x	x	x			x	x		x							x					
Eucalyptus salmonophloia	x			x	x	x			x	x								x				x			

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Eucalyptus salubris				x	x	x	x			x									x			x			
Eucalyptus sheathiana	x			x	x					x	x		x				-	x							x
Eucalyptus sp.													x												
Eucalyptus stricklandii																				x		x			
Eucalyptus transcontinentalis	x			x	x			x		x	x														
Eucalyptus trichopoda				x	x	x												x		x					
Eucalyptus yilgarnensis	x			x	x	x		x		x								x				x			x
Euphorbia drummondii					x	x														x		x			
Euryomyrtus maidenii	x							x																	
Exocarpos aphyllus	x		x	x	x	x	x		x	x	x		x	x	x	x	x	x	x	x		x		x	x
Glischrocaryon aureum	x																								
Glycyrrhiza acanthocarpa	x																								
Gonocarpus confertifolius var. confertifolius	x																								
Goodenia elderi	x																								
Grevillea acuaria	x			x	x	x	x			x	x		x							x		x		x	x
Grevillea georgeana (P3)		x											x							x	x		x		
Grevillea huegelii	x																					x			
Grevillea juncifolia	x				x		x			x			x					x				x			
Grevillea nematophylla subsp. *nematophylla*											x														
Grevillea obliquistigma subsp. *obliquistigma*	x									x		x								x					
Grevillea zygoloba	x				x					x										x					
Hakea francisiana	x				x					x			x							x		x			x
Hakea ?recurva			x																						
Hakea scoparia	x																								
Halgania andromedifolia	x				x			x		x	x	x	x									x			x
Haloragis gossei				x	x		x															x			
Hemigenia sp. Sticky Terete (B. H. Smith 449)	x									x															
Hemiphora elderi	x																								
Hibbertia eatoniae	x	x			x							x	x							x					
Hibiscus sturtii	x																								
Hybanthus floribundus subsp. *curvifolius*											x					x									
Isopogon gardneri	x	x			x					x		x	x			x				x		x	x		
Keraudrenia velutina subsp. *elliptica*	x																								
Lachnostachys coolgardiensis	x																								
Lepidosperma ?brungalbin	x																								
Leptospermum ?fastigiatum	x																								x
Leucopogon sp. Clyde Hill (M.A. Burgman 1207)	x	x	x		x					x		x	x			x				x					x
Leucopogon ?sp. Coolgardie (M. Hislop & F. Hort MH 3197)																x				x	x		x		
Lomandra effusa	x				x	x							x									x			x
Lysiana casuarinae	x		x		x	x				x		x	x							x				x	

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Maireana tomentosa	x				x	x				x															
Maireana trichoptera	x				x	x	x			x															
Maireana triptera	x			x	x	x	x			x	x		x			x	x		x	x		x		x	
Malleostemon roseus	x				x					x			x			x					x	x			
Melaleuca eleuterostachya	x							x																	
Melaleuca hamata	x	x			x					x		x	x							x					
Melaleuca leiocarpa			x		x												x			x					
Melaleuca nematophylla	x	x											x							x					
Melaleuca uncinata (complex)													x									x			
Melaleuca vinnula	x																								
Mirbelia microphylla					x																	x			
Monotaxis luteiflora	x																								
Olearia exiguifolia	x				x			x		x		x				x						x			x
Olearia muelleri	x	x		x	x	x	x			x	x	x	x	x		x	x	x	x	x		x		x	x
Olearia pimeleoides	x			x	x		x			x			x	x	x	x		x		x		x			
Persoonia coriacea	x	x																							
Phebalium canaliculatum	x				x					x		x	x		x	x					x				x
Phebalium filifolium	x	x			x			x			x		x												
Phebalium lepidotum	x										x		x			x						x			
Phebalium megaphyllum	x		x																						
Phebalium tuberculosum	x				x			x		x			x			x	x			x		x			
Philotheca brucei subsp. *brucei*	x	x	x		x								x		x					x			x		
Philotheca rhomboidea	x																								
Philotheca tomentella	x				x								x												
Physopsis viscida																						x			
Pimelea microcephala subsp. *microcephala*																					x				
Pittosporum angustifolium					x	x				x															
Poaceae sp.																						x			
Podolepis capillaris	x				x					x															
Prostanthera campbellii	x	x			x								x							x	x	x			
Prostanthera grylloana	x	x	x		x					x			x		x	x				x		x	x		
Proteaceae sp.																									x
Pseudactinia sp. Bungalbin Hill (F. H. & M. P. Molemans 3069)	x																								
Ptilotus carlsonii					x																				
Ptilotus drummondii					x																				
Ptilotus exaltatus var. *exaltatus*					x	x				x									x						
Ptilotus helipteroides var. *helipteroides*													x											x	
Ptilotus holosericeus									x													x			
Ptilotus obovatus var. *obovatus*					x		x			x	x		x	x			x			x				x	
Radyera farragei	x																								

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	S1	S2	S5	W1	W2	W4	W5	W7	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27
Rhagodia drummondii				x	x					x				x						x				x	
Rhagodia spinescens	x				x	x				x										x					
Rinzia carnosa																				x					
Santalum acuminatum	x	x		x	x	x	x		x	x			x	x				x		x		x			
Santalum spicatum	x	x			x		x			x	x	x	x	x				x		x		x		x	
Scaevola spinescens	x	x	x		x	x	x			x	x	x	x	x	x	x	x	x		x		x		x	
Schoenia sp.										x															
Sclerolaena diacantha					x				x																
?Sclerolaena diacantha	x				x	x	x			x			x												
Sclerolaena fusiformis	x				x		x			x	x		x	x						x				x	
Senna artemisioides subsp. *filifolia*	x	x		x	x	x	x			x	x		x	x	x	x	x	x	x	x		x		x	x
Sida intricata		x																							
Sida spodochroma					x	x												x	x						
Solanum hoplopetalum	x				x	x	x			x			x					x							
Solanum lasiophyllum																				x					
Solanum nummularium	x				x	x	x		x	x			x				x		x						
Solanum orbiculatum subsp. *orbiculatum*										x															
Solanum plicatile	x																								
Spartothamnella sp. Helena and Aurora range (P3)							x						x												
Stenanthemum stipulosum											x		x							x		x			
Streptoglossa liatroides					x				x																
Stylidium dielsianum								x																	
Swainsona colutoides	x																								
Templetonia sulcata					x	x	x		x	x	x		x		x			x				x			
Thryptomene kochii	x				x										x										
Thysanotus patersonii		x			x					x			x					x		x		x		x	
Triodia ?desertorum	x																								
Triodia irritans	x				x			x		x		x	x			x		x				x			x
Velleia connata	x																					x			
Verticordia ?helmsii																									
Westringia cephalantha	x				x		x	x		x			x			x									x
Westringia rigida	x	x			x	x					x		x	x								x			
Wurmbea tenella	x																								
Zygophyllum apiculatum	x				x					x			x						x	x				x	
Zygophyllum ?compressum										x										x					
Zygophyllum iodocarpum					x	x								x				x							

OEPA 2010/176
A308554
Nyomi Bowers
EPA

POLARIS
METALS NL

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2/6/2010

Office of the Environmental Protection Authority
Locked Bag 33
Cloisters Square
Perth WA 6850

Attention: Nyomi Bowers

Dear Nyomi

Carina Iron Ore Mine – Assessment No. 1756

I provide the following additional information in response to points raised at our meeting of 26 May 2010.

I have contacted Daniel Coffey from DEC to address additions and amendments to the PEMP on bushfire, weed and feral animal management. A revised PEMP will be submitted to you in due course.

The revised PEMP will also include revision of the fauna management procedure that clarifies the item on subterranean fauna survey raised at the meeting on 26th.

I trust this information answers all queries raised and the OEPA is now in a position to assess the proposal and submit to the EPA for a determination.

Yours truly

Paul Rokich
Environmental Manager

1. Vegetation mapping.

I have arranged for Libby Mattiske or Dave Angus to phone you direct. Hopefully, this will enable you to clarify the outstanding items and obtain the information you require.

2. Fragmentation

During the comparison of haul road alignments1 (Darrine) and 2 (Mt Walton), consultation with DEC occurred and is recorded in PER Table 23.

DEC did not support the Darrine option as it passed through the centre of the proposed Jaurdi park. Although it mostly followed existing tracks, it was considered the road widening required and traffic volume would have a significant fragmentation effect, mainly for less mobile fauna. The existing tracks were also some of the main access routes used by visitors, so a parallel light vehicle road (to keep this traffic off the haul road) would also need to be constructed. This would increase the total trafficable corridor, further increasing the fragmentation effect.

In comparison, DEC preferred the Mt Walton road alternative. It was considered this route down the eastern periphery of the proposed park had a far less intrusive and fragmenting effect. It is also located on the eastern side of a ridgeline (limiting visual impact from the main part of the proposed park) and removed from the main track system used by visitors.

The haul road runs parallel to a range of low hills comprising the Yendilberin hills, Mount Walton, Watt hills and Mount Finnerty. The road does not impede north-south movement along this range, so there is no fragmentation effect from the haul road along the range. There are no permanent water sources or major identifiable corridor / linkage features in the vicinity of the haul road, such that construction of the road may fragment these features from surrounding areas.

Another significant factor is that the Mount Walton route exits the proposed park at its southern end. The rail siding and ancillary infrastructure would be located entirely out of the proposed park. The Darrine option placed this infrastructure in the proposed park, significantly adding to the total disturbance footprint and also including high activity components (power generation, fuel storage, vehicle servicing) within the proposed park.

The outcome from this consultation was that the alignment of the Mount Walton route was not considered to have a significant fragmentation effect to the proposed park.

The table below provides documented information on the proposed Jaurdi park conservation values or 'highest conservation'(highlighted), with comments from Polaris on the effect haul road option 2 (Mt Walton) has on these values.

No.	Reference	Polaris Comment
1	1. CALM (1994-2004) Goldfields Region: Regional Management Plan No.27 includes the following: The following criteria apply to categories of CALM land: (pg8) **Conservation Park** Purpose identical to national park. Areas generally are not nationally or internationally unique, in terms of landscape and/or biota. These are generally smaller areas or where nature conservation values have been affected by past land use.	The proposed category of conservation park, as opposed to national park or nature reserve, reflects that the values in these areas are not as high as the latter categories. Specific values are not identified.
2	Jaurdi Pastoral Lease (pg 43-44) **Justifications and Implications** The lease was purchased by CALM in 1989 using Sandalwood Conservation and Regeneration Project funding and is not now used for grazing. The lease has high conservation values for arid-zone woodland vegetation because it was never extensively stocked. State forest is an appropriate form of tenure to achieve the multiple objectives of sandalwood, arid-zone woodland and flora and fauna conservation without unduly restricting other land uses, particularly mining. See Section 2.1.5 for implications. The former facilities including homestead, quarters and shearing shed have potential for development as a Field Studies Centre.	Arid zone woodland identified as a conservation value. (then) category of State forest seen as an appropriate management category to achieve conservation objectives without unduly restricting other land uses, particularly mining. Considered to confirm that managed activities can occur which have localised / restricted impact, provided that significant affect to identified conservation values do not occur. As documented in previous responses to OEPA, the proportional disturbance footprint of Carina mine components in a proposed park area of 289, 776 ha is not considered significant. EPA Bulletin 1256 (pg20), Map 3 shows the vast majority of the proposed park consists of Beard's vegetation type 141- York gum, Salmon gum and Gimlet. Polar considers haul road option 2 will have a negligible impact on the arid zone woodland conservation value of the proposed park.
3	2. EPA Bulletin 1256 (May 2007) Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve (Table 1)Yendilberin and Watt Hills / Proposed Jaurdi Conservation Park: Further investigation of the current Conservation Park recommendations to ensure adequate conservation of rare and endemic flora and other significant factors.	Specific values not identified but recognise further investigation is required to quantify factors and ensure their conservation.

4	3. Office of the Appeals Convenor (March 2009). Report to the Minister for the Environment Appeal Numbers 209-211 of 2008 **EPA advice** (pg 5) Third party appeals In response to appeals from third parties, the EPA reported that its Bulletin 1256 and the Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton noted that proposals for further mining in areas of highest conservation are unlikely to be found environmentally approved. The EPA considered that the areas of highest conservation include the areas recommended for the A Class Nature Reserve. The EPA advised that the proposal is within an area proposed as a conservation park and is not considered to be an area of highest conservation; therefore it was of the view that setting a PUEA is not appropriate.	Consistent with point 1 above. Proposed park is not considered to be an area that contains the highest conservation values.
5	(Pg8). This proposal is located within the area identified in EPA Bulletin 1256 as No. 5, that is, further investigation of the current Conservation Park recommendations should be undertaken to ensure adequate conservation of rare and endemic flora and other significant factors. The key factors identified within this area in Bulletin 1256 are: i. Rare flora endemic to BIF range; ii. Endemic rare flora in sandplains, woodlands or other habitats; iii. Important habitat for specially protected fauna; iv. Excellent representation of woodland, sandplain and other inadequately reserved vegetation and animal habitats; v. Aboriginal Heritage sites; vi. Substantial landforms with significant visual amenity; vii. Historical significance; and viii. Geoheritage significance.	Specific conservation values identified. Haul road option 2 impact on these identified values as follows: i. HR option 2 does not impact a BIF range or any endemic rare flora. *No impact on this conservation value.* ii. Botanical surveys on HR option 2 have not identified any endemic rare flora in the road corridor. Priority species and undescribed species have been identified, but more of these plants have also been recorded outside the road corridor. *No impact on this conservation value and low impact to priority and undescribed species.* iii. The habitat types in HR option 2 are not unique in a local or regional context. Arid zone woodland is widely represented in the region. No specially protected fauna (eg malleefowl) were recorded in the road corridor. *No impact on this conservation value.* iv. The vegetation of HR option 2 does contain both woodland and sandplain vegetation. Botanical survey (PER Appendix 4) maps the vegetation communities within the haul road corridor. Woodland communities are prefixed by W, sandplain prefixed by S. Proportional areas are W- 111ha and S - 33ha EPA Bulletin 1256 (pg20), Map 3 shows the same regional

			vegetation types: 141- York gum, Salmon gum and Gimlet and 435- Acacia neurophylla and spp to be widely represented in both Crown reserve 48470 Helena and Aurora Range Conservation Park (124,345ha) and Crown reserve 36208 Mt Manning Range Nature Reserve (203,068ha). While Map 3 shows these reserves also contain other regional vegetation types, significant proportions of vegetation types 141 and 435 are evident in these reserves. *Low impact on this conservation value.*
		v.	Aboriginal heritage surveys have been undertaken for the HR option 2 alignment. No sites of significance were recorded. *No impact on this conservation value.*
		vi.	HR option 2 does not traverse any substantial landform with significant visual amenity. *No impact on this conservation value.*
		vii.	HR option 2 does not impact any location of (presumed European) historical significance. *No impact on this conservation value.*
		viii.	HR option 2 does not impact any location of geoheritage significance. *No impact on this conservation value.*

3. Subterranean fauna procedure.

PER commitment 5 states "to undertake further troglofauna surveys in the region, to improve knowledge of troglofauna populations in the region and those found at Carina. Results of surveys conducted will be included in the Annual Environmental Report."

This commitment is intended to provide a management measure for subterranean fauna, to increase knowledge on this factor, in a region where limited information is currently available.

It was not intended that further surveys be undertaken immediately, as part of the Carina environmental impact assessment process. Subterranean fauna surveys require holes to be drilled to allow surveys to be undertaken. As further exploration drilling is undertaken in the local area, establishing drill holes, further subterranean surveys will be conducted. These surveys will add to the regional knowledge base for this factor.

The paragraph preceding Commitment 5 [PER pg 108] states:

> Further sampling will add to knowledge of troglofauna populations in the region, given the existing database is extremely limited. Exploration drill holes are required to conduct subterranean fauna surveys. To date, Polaris has only undertaken drilling at the Carina and Chamaeleon project areas. Other exploration targets, between these two sites have been identified, and will be drilled over the next 12 months. This will enable additional sampling to be undertaken, along the strike length, in similar geology to the Carina and Chamaeleon deposits.

This was intended to clarify that (i) further sampling was not intended to occur immediately and (ii) was intended to form part of the management measure for this factor. The fauna management procedure in the Project Environmental Management Plan (PEMP) will be revised to clarify this position.

4. Contour numbers on plans

The CD of digital information for the Carina project will include numbers on the contour intervals. Revised maps will be produced and submitted with contour levels.

The alignment of HR option 2 has been selected, in part, to maximise in–situ cut and fill, and be located on soil types such that suitable borrow material is sourced within the road corridor. Polaris will not establish any external borrow pits inside the proposed park.

Polaris will not establish any additional borefields in the proposed park. Additional bores are required at the siding end to provide water for the accommodation village and dust suppression at the siding. These tenements have not yet been granted so exploration drilling for water has not yet occurred. It is unknown at this point where the bores will be located.

Your question on "confirming the southern option for placement of mine infrastructure" needs some clarification. Mine infrastructure will still be required at the mine and will be located in the infrastructure area nominated on the plan. The following points are provided for clarification:

i. The accommodation village was relocated from the mine end to the siding end – now outside the park.
ii. The permanent crushing and screening plant was relocated from the mine infrastructure area to the siding – now outside the park.
iii. The airstrip has been separately discussed and is detailed in point 7 below.

iv. The main power generation capacity (required to service the crushing plant) will be located at the rail siding.
v. Ancillary infrastructure comprising site office, fuel storage, workshop (for front end loaders needed to load trains), laboratory, supply yard will be located at the rail siding.
vi. At the mine, the following infrastructure is required:
    a. ROM pad. Ore from the open pit is stockpiled and then re-loaded into road train trucks for transport on the haul road to the siding.
    b. Parking area for mine equipment fleet consisting of dump trucks, excavators, bulldozers, front end loaders, grader, water trucks.
    c. Workshop to service above equipment.
    d. Site office, lunch room and ablutions
    e. Power generators

The result of these changes is that the mine infrastructure area (inside the proposed park) can be reduced, from 39 hectares as shown in the PER Figure 12 to 20 hectares.

5. Offsets

The mitigation sequence is:

1. Avoid – avoid the impact altogether.
2. Minimise – limit the severity of the impact.
3. Rectify – rehabilitate affected site as soon as possible.
4. Reduce – eliminate impact over time.
5. Offset – if significant residual impacts remain to critical value assets.

Outcomes and management measures contained in the PER and supporting documents that specifically address components of the mitigation sequence are as follows:

Avoid.

i. [PER pg 101] Relocate the waste landform from the east side of the open pit to the west side to;

    avoid the population of *Grevillea georgeana* ,
    avoid the minor drainage lines.

ii. [PER pg iv] Considered alternative locations for mine components that resulted in consolidating infrastructure. This **avoids** the need for additional clearing to duplicate functions and reduced the overall project disturbance footprint.
iii. [PER pg viii] Infrastructure sharing also has significant benefits, in eliminating the need to duplicate facilities. The Mt Walton haul road option enables multi-user access to resources being examined in the Mt Finnerty area by other companies. If these deposits are developed, this alignment enables access to these areas and **avoids** the need for other companies to duplicate a haul road.
iv. [PER pg 101] **Avoid** the *Spartothamnella sp.* Helena &Aurora Range (P.G. Armstrong 155-109) located in the haul road alignment.
v. [PER pg 82] Polaris has developed a Project Environmental Management Plan (PEMP) for the Carina project. The PEMP includes plans and procedures to mitigate risks to as low as practically possible. Polaris will implement the following commitment 3: to implement the Project Environmental Management Plan.

    The PEMP is designed to use the **first four steps in the mitigation sequence.**

Minimise

i. [PER pg iii] The preferred haul road alignment has been sited to the east of the conservation park area, to **minimise** penetration (fragmentation) and has been sited off the sand plain country where significant road work construction is required to sustain heavy haulage.

ii. [PER pg iv] Alternative infrastructure location options have been examined, to maximise operational efficiencies and **minimise** disturbance within the proposed Jaurdi conservation park. Disturbance inside the proposed Jaurdi conservation park boundary can be reduced by 60 hectares (ha), and overall disturbance by 56 hectares, by locating ancillary infrastructure close to the rail siding.

iii. [PER pg xii] Clearing procedure implemented to **minimise** disturbance area to that required for the project.

iv. [PER pg vii] Polaris will implement progressive rehabilitation during the life of mine. Local provenance seed, collected from the mine area and immediate surrounds, will be used in rehabilitation. These actions are consistent with the mitigation sequence steps; to rectify, **minimise** and reduce.

v. [PER pg 34] A high proportion of the Priority species identified in the survey over the chosen haul road route were in the yellow sandplain country. The chosen haul road route **minimises** disturbance in this floristically diverse landform type.

vi. [PER pg 35] Consolidating mine infrastructure to **minimise** overall disturbance from duplication of infrastructure and additional length of interconnecting access roads has been addressed in both the ESD and PER – and is considered a significant environmental benefit.

vii. [PER pg 52] The botanical survey covered a haul road corridor of 60 metres, however the road itself will be approximately 30 metres wide. At construction, flexibility exists to move the road alignment within the corridor, to avoid or **minimise** impact to Priority species at particular locations.

viii. [PER pg 53] Based on results of these surveys the original alignment was chosen, as it impacted the smallest number of plants. This implements the second step in the mitigation hierarchy (**minimise**).

ix. [PER pg 105-106] In order to **minimise** terrestrial fauna impacts, a number of measures, as listed below, will be implemented. Further details on these measures are provided in the Fauna Management Procedure, which is included in the PEMP.

- Avoid unnecessary clearing beyond that strictly required.
- Retain cleared vegetation and topsoil for use in rehabilitation.
- Progressively rehabilitate areas when they are completed.
- Induct all personnel on important fauna constraints and factors at the site.
- Exclude firearms and pets from the project area.
- Manage rubbish disposal to discourage scavenging by native and feral animals.
- Routine site inspections so problems can be identified and remedied at an early stage.
- Create fauna egress points in water storage dams by constructing shallow sloped sides or install mats.

x. [PER pg 108] Further sampling will add to knowledge of troglofauna populations in the region, given the existing database is extremely limited. Exploration drill holes are required to conduct subterranean fauna surveys. Other exploration targets, between these two sites have been identified, and will be drilled over the next 12 months. This

will enable additional sampling to be undertaken, along the strike length, in similar geology to the Carina and Chamaeleon deposits.

Polaris will implement the following commitment 5: to undertake further troglofauna surveys in the region, to improve knowledge of troglofauna populations in the region and those found at Carina. Results of surveys conducted will be included in the Annual Environmental Report.

This commitment implements the second step in the mitigation hierarchy (**minimise**).

xi. [PER pg 115] Polaris will implement the following commitment 6: to undertake progressive rehabilitation during the life of mine.

The use of local provenance seed, collected from the mine area and immediate surrounds, will implement the second step in the mitigation hierarchy (**minimise**) and also the fourth step (reduce).

xii. [PER pg 123] Commitment 9: to implement a vegetation health monitoring program to quantify indirect effects to adjacent vegetation from dust and the use of saline water.

This commitment implements the second step in the mitigation hierarchy (**minimise**), to limit the severity of impact.

Rectify

i. [PER pg 115] Polaris will implement the following commitment 6: to undertake progressive rehabilitation during the life of mine.

This commitment implements the third step in the mitigation sequence (**rectify**).

ii. [PER pg vii] Polaris will implement progressive rehabilitation during the life of mine. Local provenance seed, collected from the mine area and immediate surrounds, will be used in rehabilitation. These actions are consistent with the mitigation sequence steps; to **rectify,** minimise and reduce.

Reduce

i. [PER pg 115] Polaris will implement the following commitment 6: to undertake progressive rehabilitation during the life of mine.

The use of local provenance seed, collected from the mine area and immediate surrounds, will implement the second step in the mitigation hierarchy (minimise) and also the fourth step (**reduce**).

ii. EPA objective: Ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape where practicable.

Predicted outcome: The second lift of the waste landform will be visible from vantage points where the Yendilberin hills are now visible. As rehabilitation establishes over the waste landform, it will **reduce** visual impact on the landscape.

iii. [PER pg vii] Polaris will implement progressive rehabilitation during the life of mine. Local provenance seed, collected from the mine area and immediate surrounds, will be used in rehabilitation. These actions are consistent with the mitigation sequence steps; to rectify, minimise and **reduce**.

The measures detailed above implement the first four steps in the mitigation sequence, so the residual impact on all environmental factors considered in the PER was low. Polaris considers the Carina project does not have such a significant residual impact to either a critical or high value asset that warrants consideration of an offset (step 5).

6. **Haul Road**

Based on discussion at the meeting, the following information is supplied to clarify this matter.

i. The ore haulage road train trucks are not road licensable. They are 200 tonne payload triple trailer trucks, with a gross vehicle mass approaching 240 tonnes (See PER Table 1).
ii. These trucks will operate day and night.
iii. Truck movements (full and empty) equate to approximately 1 truck every 10-15 minutes on the road.

Polaris has considered a number of factors (including safety) in its assessment of haul road alternatives. This analysis included consultation with both DTF and DEC. In summary, these factors are;

a. Overall distance. The shortest route is usually considered to have inherent benefits. This includes;
    - less direct costs to build and maintain,
    - less fuel consumed in haulage,
    - less emissions produced,
    - less indirect impacts - based on the principal that the shorter the road, the less probability (risk) of indirect impacts (shadow effect on vegetation, fauna deaths).
b. Road safety. Having ore haulage trucks on a dedicated mine road not trafficked by the public.
c. Route selection. Select a route on optimum soil types and contours to maximise local cut:fill, maximise use of soil types capable of supporting heavy vehicle traffic and minimise travel across contour (up and down hills).
d. Botanical surveys indicate this route impacts the least number of priority and significant species.
e. Infrastructure sharing. Selecting a route that enabled use by other mining companies in the local area, avoiding the need to duplicate haul road construction if other resources are developed in proximity to the haul road.
f. Locates a main activity centre (rail siding) and ancillary infrastructure outside the proposed conservation park.

This resulted in option 2 (Mt Walton) being selected by Polaris as its preferred haul road route.

Reed Resources Ltd ACN 099 116 631 (Reed Resources) is the parent company of Mount Finnerty Pty Ltd ACN 093 675 471(Mt Finnerty). Polaris Metals NL ACN 085 223 570 (Polaris) signed the Mt Walton Haul Road Access Deed (dated 14 January 2010) with Reed Resources and Mt Finnerty. The Deed is regarded as a commercially confidential agreement between the parties.

The Deed allowed Polaris to lodge miscellaneous license application L15/305 over exploration licences held by Mt Finnerty without objection from Mt Finnerty. L15/305 was subsequently granted on 14 May 2010. The Deed provides for ongoing use of respective tenements by the tenement holders until they expire, are surrendered or terminated.

Based on discussion at the meeting, the following information is supplied to clarify the matter of continued use of the haul road after mine closure.

Supporting documents to the PER includes a Conceptual Mine Closure Plan (Appendix 8), consistent with the Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia (ANZMEC/MCA) (2000) *Strategic Framework for Mine Closure*. Section 6 of this document includes the following text:

> For purposes of this plan, the assumption has been made that all site facilities and infrastructure will be dismantled and the area rehabilitated at mine closure. However, during the mine's life, Polaris will consult with key stakeholders to ensure infrastructure that could be used after completion of operations is identified.
>
> The development of mines in remote locations in Western Australia often necessitates construction of significant infrastructure, with a number of possible options for sequential use. Mine infrastructure usually includes:
>
> - An independent power supply, often with many kilometres of transmission line.
> - Haul road and access network
> - Borefield and pipeline network.
> - Potable water treatment plant.
> - Communication link.
> - Airstrip.
> - Accommodation and messing facility.
>
> Sequential land use planning with stakeholders often has conflicting principles for the mining industry. Desire from some stakeholders to provide for sequential activities such as tourism and eco-tourism mean that requests for mining companies to retain some infrastructure for sequential uses continues to gain momentum.
>
> Often, safety and public liability considerations conflict with stakeholder desire of having the public in close proximity to disused mines. Other issues include ongoing ownership and maintenance of retained infrastructure. Continued consultation is required to resolve these issues

The process adopted by Polaris is to continue consultation with stakeholders during the life of mine on possible sequential use of infrastructure by others after mine closure. The outcome of these consultations are to be documented in subsequent (interim) versions of the mine closure plan, culminating in final (approved) outcomes in the final mine closure plan.

There is a logical association for some infrastructure, such as retention and sequential use of the rail loop by Westnet Rail. Sequential use of other infrastructure by other parties, specifically the haul road, is not currently defined. In the absence of a clearly defined alternative outcome post closure, the 'default' assumption in the conceptual mine closure plan, *that all infrastructure is dismantled and the area rehabilitated at mine closure*, will be implemented.

7. Airstrip

Based on discussion at the meeting, the following information is supplied to clarify this matter.

During the preparation of the PER, Polaris had a number of consultation meetings with DEC on a range of issues, which included the airstrip.

As the location of the airstrip is closely linked to the location of the accommodation village, Polaris examined a number of alternatives, as the accommodation village was firstly located near the mine and later moved near the siding.

The outcome of the consultation and assessment of alternatives has been presented in previous documents. In summary, Polaris preferred position is:

1. Share the extended Jaurdi airstrip with Reed Resources.

   Mount Finnerty Pty Ltd (C/o Reed Resources) applied for miscellaneous licence L15/309 on 3/3/2010. The tenement covers the Jaurdi airstrip and sufficient area for airstrip extension. On grant, Mt Finnerty Pty Ltd will be the tenement holder and owner of any expanded infrastructure. Polaris would be agreeable to entering into an access agreement with Mount Finnerty Pty Ltd to be able to utilise this infrastructure. In such an outcome, extension and use of the Jaurdi airstrip is therefore an action by another company and is not included in Polaris Metals Carina project. Accordingly, 'airstrip' has been removed from the scope of the Polaris Metals project.

Should the above outcome not occur, Polaris will commute FIFO workers to the existing airstrip at Southern Cross, located 140 kilometres (by road) from the accommodation village.

Independent of the above, Polaris's position is that for emergency use, the Jaurdi airstrip be extended to Royal Flying Doctor Service (RFDS) minimum requirements, as agreed by DEC in their letter to Reed Resources dated 6 December 2005. Irrespective of whether the airstrip is or is not used for FIFO operations, in an emergency, a local airstrip capable of landing RFDS aircraft, rather than a 140 kilometre road journey can be the difference between life and death. As this correspondence is between Reed Resources and DEC, Polaris will liaise with Reed Resources to implement the agreed outcome on grant of tenement. Implementing this action would require clearing approximately 7ha.

Mt Finnerty Pty Ltd applied for miscellaneous licence L15/309 on 3/3/2010. The application was advertised, with the objection period closing on 16/4/2010. No objections were received.

It should be noted that this is not an action within the scope of the Carina iron ore project or an action by Polaris Metals.

Possible impact on conservation values of the proposed park associated with expansion of the airstrip to accommodate aircraft routinely used in FIFO operations is similar to the information supplied in the table in point 2 above. The most relevant information is presented in the table below.

No.	Reference	Polaris Comment
1	Office of the Appeals Convenor (March 2009). Report to the Minister for the Environment Appeal Numbers 209-211 of 2008 (Pg8). This proposal is located within the area identified in EPA Bulletin 1256 as No. 5, that is, further investigation of the current Conservation Park recommendations should be undertaken to ensure adequate conservation of rare and endemic flora and other significant factors. The key factors identified within this area in Bulletin 1256 are: i. Rare flora endemic to BIF range; ii. Endemic rare flora in sandplains, woodlands or other habitats; iii. Important habitat for specially protected fauna; iv. Excellent representation of woodland, sandplain and other inadequately reserved vegetation and animal habitats; v. Aboriginal Heritage sites; vi. Substantial landforms with significant visual amenity; vii. Historical significance; and viii. Geoheritage significance.	Specific conservation values identified. Jaurdi airstrip extension impacts on these identified values as follows: i. The airstrip is not on a BIF range and no DRF has been recorded in the extension area. *No impact on this conservation value.* ii. No DRF or endemic flora recorded. One Priority 3 species and one range extension of a species has been recorded and previously reported in correspondence to the OEPA. *No impact on this conservation value and low impact to priority and undescribed species.* iii. The habitat types in the airstrip are not unique in a local or regional context. The site is already disturbed with an existing airstrip and access tracks. Arid zone woodland is widely represented in the region. No targeted fauna survey has been conducted, however given the extent of past disturbance and the small area required for airstrip extension, it is considered unlikely the site provides an important local fauna habitat. *No impact on this conservation value is anticipated.* iv. The airstrip vegetation type is woodland. The proposed additional clearing beyond the 1,200 metre minimum required for RFDS landing is 2 ha for a 1,500m airstrip and 5 ha for a 2,000m airstrip. EPA Bulletin 1256 (pg20), Map 3 shows the same regional vegetation type: 141- York gum, Salmon gum and Gimlet to be widely represented in Crown reserve 48470 Helena and Aurora Range Conservation Park (124,345ha) and also, to a lesser proportion, in Crown reserve 36208 Mt Manning Range Nature Reserve (203,068ha). *Low impact on this conservation value.* v. The airstrip is located on tenements not held by Polaris. Polaris is unaware if aboriginal heritage surveys have

			already been undertaken over this site. Historic disturbance is likely to have already impacted any sites, if present. The small area required for airstrip extension is considered unlikely to have a significant affect on an aboriginal heritage site. Heritage surveys are routinely implemented as part of tenement grant requirements or prior to Programme of Work (POW) disturbance. As Mt Finnerty Pty Ltd is the tenement applicant, this action would not be undertaken by Polaris. *No significant impact on this conservation value is anticipated.*
		vi.	The airstrip does not traverse any substantial landform with significant visual amenity. *No impact on this conservation value.*
		vii.	The airstrip extension area does not impact any location of (presumed European) historical significance. The Ryan's Find historic gold shaft is located in the vicinity but will not be impacted by the airstrip extension. *No impact on this conservation value.*
		viii.	The airstrip does not impact any location of geoheritage significance. *No impact on this conservation value.*

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22/6/2010

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Locked Bag 33
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Attention: Mark Jefferies

Dear Mark

Carina Iron Ore Mine – Assessment No. 1756

Thank you for speaking to Marcelle Anderson of WorleyParsons about the progress of the assessment for the Carina Iron Ore project.

In order to ensure that you have all the information you require on the remaining two issues discussed in that conversation which required further clarification I am please to provide the following information.

Haul Road

An analysis of potential haul road routes was undertaken as part of the studies for the environmental assessment.

On the basis of this analysis the Haul road on the eastern side of the proposed Jaurdi conservation park to a rail siding located outside the proposed park provided the best outcomes in terms of impact on the conservation park and construction methodology.

Polaris Metals has been advised in writing by the Department of Treasury and Finance (DTF) concerning the use of the Mt Walton Access Road for mine haulage. I attach this letter and an email from Main Roads WA for completeness of information.

Airstrip

An airstrip is required for workforce FIFO commuting and emergency events. The optimum location of the site's airstrip is within a short distance from the main work centre and associated infrastructure, with all weather vehicle access to the airstrip.

The requirement for an airstrip near the mine site has been avoided by Polaris' intention to use the extended Jaurdi Station airstrip.

While this airstrip is presently sufficient for small planes, it will need to be lengthened to accommodate larger aircraft routinely used on mines for FIFO rosters and the Royal Flying Doctor Service (RFDS). The present airstrip is 841m long. The minimum runway length for RFDS use is 1,200m. I attach the current RFDS standards for your information. It is proposed to extend the airstrip to meet minimum RDFS requirements for legal landing and safety.

On a site visit with Department and Conservation officer (Ian Kealley) this week (21/6/2010) it appeared that an extension to 1,200 m could be achieved by removing some regrowth vegetation at the southern end of the runway. DEC indicated they would have no objection to this extension and a further extension to 1,500m to allow larger aircraft would not be opposed.

This work would be undertaken by Reed Resources and is therefore not part of the Carina referral.

Further information and documents are attached.

I trust this information clarifies all remaining items and the OEPA is now in a position to assess the proposal and submit to the EPA for a determination.

Yours sincerely

Paul Rokich

Environmental Manager

1. Haul Road

Based on discussion at the meeting of 26/5/2010, the following information was supplied to clarify this matter.

i. The ore haulage road train trucks are not road licensable. They are 200 tonne payload triple trailer trucks, with a gross vehicle mass approaching 240 tonnes (See PER Table 1).
ii. These trucks will operate day and night.
iii. Truck movements (full and empty) equate to approximately 1 truck every 10-15 minutes on the road.

Polaris has considered a number of factors (including safety) in its assessment of haul road alternatives. This analysis included consultation with both DTF and DEC. In summary, these factors are;

a. Overall distance. The shortest route is usually considered to have inherent benefits. This includes;
    - less direct costs to build and maintain,
    - less fuel consumed in haulage,
    - less emissions produced,
    - less indirect impacts - based on the principal that the shorter the road, the less probability (risk) of indirect impacts (shadow effect on vegetation, fauna deaths).
b. Road safety. Having ore haulage trucks on a dedicated mine road not trafficked by the public.
c. Route selection. Select a route on optimum soil types and contours to maximise local cut:fill, maximise use of soil types capable of supporting heavy vehicle traffic and minimise travel across contour (up and down hills).
d. Botanical surveys indicate this route impacts the least number of priority and significant species.
e. Infrastructure sharing. Selecting a route that enabled use by other mining companies in the local area, avoiding the need to duplicate haul road construction if other resources are developed in proximity to the haul road.
f. Locates a main activity centre (rail siding) and ancillary infrastructure outside the proposed conservation park.

This resulted in **option 2 (Mt Walton) being selected by Polaris as its preferred haul road route.**

The DTF has provided correspondence REF: 2008/27834, dated 18 May 2010, confirming the department's position that the Mt Walton road is not to be used for ore haulage **(Attachment 1).**

Based on discussion at the meeting of 26/5/2010, the following information is supplied to clarify the matter of continued use of the haul road after mine closure.

Reed Resources Ltd ACN 099 116 631 (Reed Resources) is the parent company of Mount Finnerty Pty Ltd ACN 093 675 471(Mt Finnerty). Polaris Metals NL ACN 085 223 570

(Polaris) signed the Mt Walton Haul Road Access Deed (dated 14 January 2010) with Reed Resources and Mt Finnerty. The Deed is regarded as a commercially confidential agreement between the parties.

The Deed allowed Polaris to lodge miscellaneous license application L15/305 over exploration licences held by Mt Finnerty without objection from Mt Finnerty. L15/305 was subsequently granted on 14 May 2010. The Deed provides for ongoing use of respective tenements by the tenement holders until they expire, are surrendered or terminated.

Supporting documents to the PER includes a Conceptual Mine Closure Plan (Appendix 8), consistent with the Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia (ANZMEC/MCA) (2000) *Strategic Framework for Mine Closure.* Section 6 of this document includes the following text:

> For purposes of this plan, the assumption has been made that all site facilities and infrastructure will be dismantled and the area rehabilitated at mine closure. However, during the mine's life, Polaris will consult with key stakeholders to ensure infrastructure that could be used after completion of operations is identified.
>
> The development of mines in remote locations in Western Australia often necessitates construction of significant infrastructure, with a number of possible options for sequential use. Mine infrastructure usually includes:
>
> - An independent power supply, often with many kilometres of transmission line.
> - Haul road and access network
> - Borefield and pipeline network.
> - Potable water treatment plant.
> - Communication link.
> - Airstrip.
> - Accommodation and messing facility.
>
> Sequential land use planning with stakeholders often has conflicting principles for the mining industry. Desire from some stakeholders to provide for sequential activities such as tourism and eco-tourism mean that requests for mining companies to retain some infrastructure for sequential uses continues to gain momentum.
>
> Often, safety and public liability considerations conflict with stakeholder desire of having the public in close proximity to disused mines. Other issues include ongoing ownership and maintenance of retained infrastructure. Continued consultation is required to resolve these issues

The process adopted by Polaris is to continue consultation with stakeholders during the life of mine on possible sequential use of infrastructure by others after mine closure. The outcome of these consultations are to be documented in subsequent (interim) versions of the mine closure plan, culminating in final (approved) outcomes in the final mine closure plan.

There is a logical association for some infrastructure, such as retention and sequential use of the rail loop by Westnet Rail. Sequential use of other infrastructure by other parties, specifically the haul road, is not currently defined. In the absence of a clearly defined alternative outcome post closure, the 'default' assumption in the conceptual mine closure plan, *that all infrastructure is dismantled and the area rehabilitated at mine closure*, will be implemented.

2. Airstrip

Location of the airstrip is closely linked to the location of the accommodation village, to provide a short commute distance between the main accommodation centre and the airstrip.

During the preparation of the PER, Polaris had a number of consultation meetings with DEC on a range of issues, which included the airstrip. Polaris examined a number of alternatives, as the accommodation village was firstly located near the mine and later moved near the siding.

The outcome of the consultation and assessment of alternatives has been presented in previous documents. In summary, **Polaris preferred position is to share the extended Jaurdi airstrip with Reed Resources.**

Previous consultation between DEC and another company with tenements in the area (Reed Resources Ltd) provided an agreed outcome to extend the existing airstrip to minimum requirements for Royal Flying Doctor Service (RFDS) use. This was confirmed in a letter Ref 25.4.5m, dated 6 December 2005 (**Attachment 2**). RFDS minimum standard is a 1,200m long airstrip (**Attachment 3**).

As this correspondence is between Reed Resources and DEC, Polaris is not directly involved.

For information:

> A 1,200 m airstrip restricts the type of aircraft capable of landing. An airstrip of 1,500 m would enable more types of aircraft to use the facility and a 1,800 m airstrip would enable all aircraft types routinely used in FIFO operations in the region to use the airstrip.

It is Polaris's view that if DEC and Reed Resources reassess the agreed position, to allow a 1,500 m airstrip, this would enable landing of 9, 19 and 37 seat aircraft. This would provide sufficient flexibility to cater for crew changes.

Mount Finnerty Pty Ltd (C/o Reed Resources) applied for miscellaneous licence L15/309 on 3/3/2010. The tenement covers the Jaurdi airstrip and sufficient area for airstrip extension. On grant, Mt Finnerty Pty Ltd will be the tenement holder and owner of any infrastructure. Polaris would be agreeable to entering into an access agreement with Mount Finnerty Pty Ltd to be able to utilise this infrastructure.

In such an outcome, extension and use of the Jaurdi airstrip is an action by another company and is therefore not included in Polaris Metals Carina project. Accordingly, 'airstrip' has been removed from the scope of the Polaris Metals project.

Government of Western Australia
Department of Treasury and Finance
Building Management and Works

Attachment 1

Enquiries: Randall Haigh
Direct Line: 9222 4719
Our ref: 2008/27834
Your ref:

Mr Paul Rokich
Environmental Manager
Polaris Metals
PO Box 670
WEST PERTH WA 6872

Dear Paul

MT WALTON ACCESS ROAD – ROAD SHARING AGREEMENT WITH POLARIS METALS

Further to our letter of 'in principle agreement' to the proposed road sharing arrangements, I confirm the position of The Department of Treasury and Finance, Building Management and Works (BMW) is that the Mt Walton access road is not to be used for mine haulage traffic.

BMW main considerations in reaching this position were:

- to ensure access to the Mt Walton Facility is not compromised or restricted through conflict with mining operations, particularly during disposal campaigns;
- to avoid the risk to existing road users arising from sharing the road with high volumes of heavy haulage vehicles. A risk for which BMW may be responsible; and
- to ensure that any agreement with Polaris does not compromise the future ability of BMW to enter into similar arrangements with others or to make the road available for use by government departments and the broader community.

Comparisons of construction costs and clearing requirements of upgrading the existing access road verses construction of a dedicated haul road were discussed. These comparisons however, were not considered by BMW in reaching its position with respect to excluding haul traffic from the existing access road.

Please contact Randall Haigh on 9222 4719 should you require any further information.

Yours sincerely,

Stewart Barrett
Acting Assistant Director - Works Planning and Coordination
Regional Programs
18 May 2010

169 Hay Street East Perth Western Australia 6004
Locked Bag 44, Cloisters Square, Perth WA 6850
Telephone (08) 9440 2211 Facsimile (08) 9440 2222
www.bmw.wa.gov.au
wa.gov.au

Attachment 2

Your Ref:
Our Ref: 25.4.5m
Enquires: Julie Patten
Phone: (08) 9021 2677
Fax (08) 9021 7831
Email: juliepa@calm.wa.gov.au

DEPARTMENT OF
Conservation
AND LAND MANAGEMENT
Conserving the nature of WA

Mr C Reed
97 Outram Street
WEST PERTH WA 6005

Dear Chris

JAURDI AIRSTRIP UPGRADE

In follow up to the phone conversation between yourself and Julie Patten, Reserves Officer relating to the upgrade of the Jaurdi Airstrip for use in an emergency situation. The Department of Conservation and Land Management (CALM) has no objections to Reed Resources carrying out this work in January as part of their operations in the area.

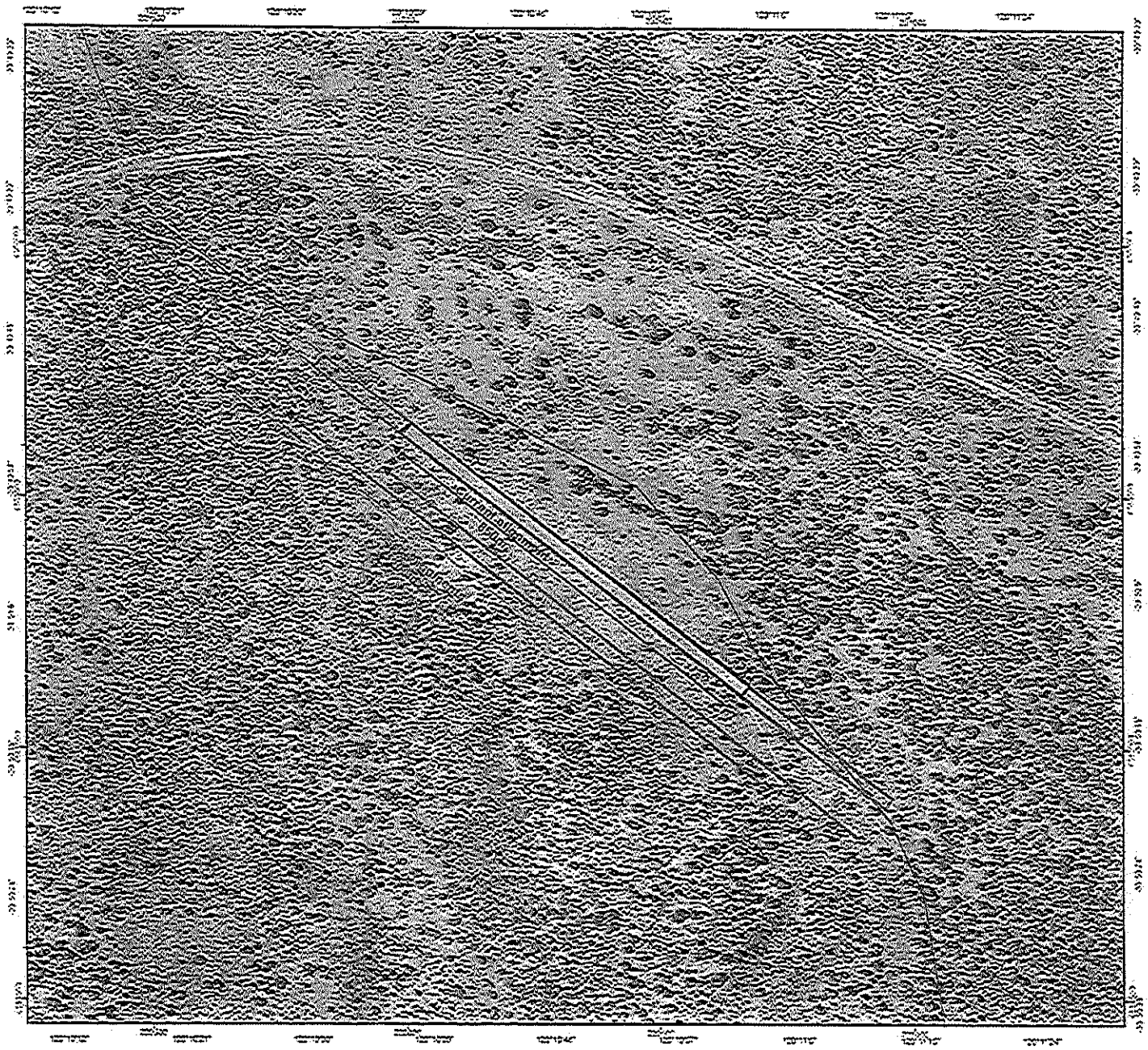
The current length of the airstrip is 841m. The Royal Flying Doctor Service (RFDS) requires air strips to be 1090m x 40m for legal landing and safety. It would be possible to remove some regrowth vegetation at the southern end of the runway to extend the length of the runway to RFDS standards. The length could be extended approximately 300m before large Salmon gums are encountered. The existing Ryans Find road may need to be realigned back to its original alignment as indicated by the black line on the attached map rather than its current course (indicated by the red line) which goes across the runway. This original alignment requires a machine to remove some overgrown vegetation. CALM requests that Reed Resources undertake this work as part of the airstrip extension work.

Please call Julie Patten or Ryan Butler at the Kalgoorlie Office, when you have confirmed dates of machines working in the area.

Yours sincerely

Ian Kealley
Regional Manager

6 December 2005



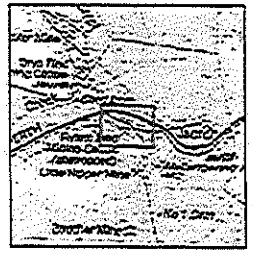
Jaurdi Airstrip

1:7,500 (A3)

0 85 170 340 510 680

Meters

Projection: Universal Transverse Mercator
MGA Zone 51, Datum: GDA94



Department of Environment and Conservation

Produced by R.Sutter
Under the Direction of
Kelton McNamara
Director General, Department of
Environment and Conservation

Contours shown at 10 seconds intervals
Grid shown at 500 metre intervals

Produced at 8:06am, on June 26, 2008

Flora and vegetation

The detailed analysis of the vegetation survey data is required in order to determine the correlation between the analysis, and the vegetation mapping undertaken. This information is vital for the assessment of the likely impacts on vegetation communities in the proposal area in a local and regional context. It is noted that this information has been previously requested and that you have provided a response, however the same questions surrounding how the vegetation mapping was derived still remain.

The following response on how the vegetation mapping was derived is provided by Mattiske Consulting Pty Ltd (Attachment 2).

- Good quality aerial photographic maps were prepared and used for a desktop preliminary delineation of potentially different vegetation communities, and site selection. The density of sites was higher in the region of the likely mine impact and the surrounding landscape. A large proportion of the Carina exploration tenement, on the western side of the tenement, was not planned for any impact, and consequently the intensity of surveys in this area of the tenement was lower;
- In the field, vegetation surveys in accordance with Guidance Statement 51 were carried out. The data collected included: flora and vegetation described and sampled systematically at each survey site, and additional opportunistic collecting was undertaken wherever previously unrecorded plants were observed, whilst moving from one location to the next. At each site the following floristic and environmental parameters were noted; GPS location, topography, percentage litter cover, soil type and colour, percentage of bare ground, outcropping rocks and their type, pebble type and size, time since fire and the percentage cover and average height of each vegetation stratum. For each vascular plant species, the average height and percent cover of both live and dead material were recorded and if needed numbers of Rare or Priority or potentially significant species;
- Additional survey sites were added in the field where vegetation communities were deemed to change or vary whilst walking from one planned survey site to the next and also in replicated/similar sites of the vegetation communities;
- In addition to survey sites selected specifically for vegetation mapping, additional vegetation site data was incorporated from the drill hole clearance vegetation surveys, vegetation surveys of potential haul road routes, and sundry surveys requested by Polaris Metals within the tenement. This provided a higher intensity of coverage in the high impact area of the tenement;
- After plant identification, the field data was used to derive presence-absence, and percentage cover matrices. These were used as source input data in PATN Version 3.11 (Blatant Fabrications, 2006) statistical analysis software, which was used to analyse the field data and derive relationships between survey sites based on the percentage cover and presence or absence of species between survey sites. The resulting information provided data, which grouped sites based on species composition. This data was used to inform and support interpretation of aerial photographic maps, together with field data on soils and topography, to delineate individual plant communities, and the production of vegetation maps. The descriptions of plant communities were based on the structural forms of Australian vegetation developed by Beard (1990).

Need this info?

Outcome

The above information provides a response to comments raised, adds further information than that included in the PER and further clarifies this issue. However, this has no direct or material change to the proposal. No changes are required to the proposal.

– Polaris response (21/05/10) to OEPA letter sent 06/05/10

POLARIS
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27th July 2010

Dr Paul Vogel
Chairman, Environmental Protection Agency
Locked Bag 33, Cloisters Square
WA 6850

Polaris Metals Pty Ltd – Carina Iron Ore Project

Dear Paul.

Thank you for the opportunity to meet and discuss the Carina project last week. With much of the substantial discussion relating to the Haulage Road alignment I have written to clarify the Polaris position.

We believe the Mt Walton option is superior to the DTF alignment.

1. For Polaris the Mt Walton option is a lower cost construction, operating and maintenance package. A total of $17.1 Million dollars is expected to be saved (includes 3.3 Million litres of diesel fuel) over the first 5 years of the Haulage Road life. Please note this is a conservative estimate based on the costs associated with the additional length of the DTF alignment (+18.7%). No subjective elements relative to topography, ground conditions or water availability have been included.
2. Polaris also deems the dedicated Mt Walton road as an acceptable safety risk. This compares with mixing 250 Tonne off- Road Haul Trucks with even a limited amount of general traffic on the DTF alignment.
3. DTF have a preferred stance to maintain their road as a closed facility to large haulage trucks.
4. A summary of environmental factors concludes that,
   - Land clearing requirements are less than 1% different for the competing alignments.
   - The environmental "values" of the alignments do not favour a particular option.
5. Neither of the alignments is totally outside the proposed Jaudi Conservation Park. Clearly the DTF alignment has less intrusion into the Proposed Park. However it is difficult for Polaris to see the issue of "Fragmentation" as substantial. The boundary of the Proposed Park has been assumed to be determined by its former designation as a pastoral lease. There has been a line drawn in the sand but is there significant environmental impact relative to the alignment position?

   Given that the Mt Walton road will be rehabilitated on completion of mining we see no long term fragmentation issue.

These arguments underpin our belief that the Mt Walton alignment offers a lower cost, safer haulage option to the DTF road with no higher environmental impact.

It is also of concern to Polaris that the DTF option has been introduced late in the PER process. While we respect the right of DEC to include this issue in their public submission response, we believe there was ample opportunity to settle on an outcome in the consultation stage. A change at this stage of the project will incur a significant time penalty to the Proponents.

For detail relative to the above please see the attached Annexure 1

Thanks for your consideration and we look forward to our meeting on the 5th August.

Yours faithfully,

Leigh Taylor
General Manager,
Polaris Metals Pty Ltd

Annexure

1. Road comparison – construction and operating costs.

Basis: All Mt Walton costs are as per the lowest tender document. Operating and Maintenance costs are based on the first five years of haulage road life. The DTF road costs have been factored on road length only and do not include provisions for different topography or ground conditions. This is expected to generate conservatively low increments.

	Mt Walton	DTF	Increment
Road length Km	48	57	18.7%
Construction cost	$6.5 M	$7.7 M	$1.2 M
Operating cost	$75.6 M	$89.8 M	$14.2 M
Maintenance cost	$9.6 M	$11.4 M	$1.8 M
Total cost	**$91.7 M**	**$108.9 M**	**$17.2 M**

Diesel fuel use in the Mt Walton operating base cost was 295,000 litres/month. Projected monthly increment is 55,000 litres.

Assessment Process

2. Environmental Scoping Document (ESD)
   a. Version 1 of the ESD was submitted to the OEPA in April 2009. Version 4 (July 2009) was approved at the EPA meeting 6 August 2009, subject to some additional modifications and clarifications. All drafts (versions 1 to 4) were referred to other DMA's (including DEC) for comment.
   b. All versions of the ESD clearly described and showed two alternative haul road routes under consideration (called the 'Darrine' and 'Mt Walton' roads). Neither of these routes coincided with the Mt Walton waste facility access road (called the 'DTF road')
   c. No feedback was provided to Polaris at this point in the process that the two proposed haul roads or the nominal 150 hectares of clearing required would be considered unacceptable by the EPA. Also, no feedback was provided that other alignment(s) should also be considered.
3. PER
   a. Some minor changes in project components were proposed by Polaris late in the preparation of the PER. This was due to reconfiguration of the project to relocate the crushing plant from the mine to the rail siding. This also enabled relocation of the accommodation village and deletion of the need for a separate site airstrip.
   b. At this time, DEC and OEPA requested Polaris to reconsider the DTF road as a possible haul road option.
   c. These changes were included in the final PER, released for public comment.
   d. 9 submissions were received in the 4 week submission period. Only one comment on the haul road alignment was received – by DEC. The submission and Polaris' response is reproduced below.

Submission

Issue: The proposed alignment of the haul route will duplicate an existing road and therefore increase impacts on the proposed Jaurdi Conservation Park.

Discussion: The proposed haul road will result in the clearing of 150 ha of native vegetation. The alternative of upgrading the existing Mt Walton Intractable Waste Facility (IWF) access road will result in a significantly smaller area of clearing within the proposed Jaurdi Conservation Park and associated sandplain and woodland vegetation communities.

The Department of Treasury and Finance - Building Management and Works (DTF) manages the IWF and access road. The road is not a public road. DTF has objected to the IWF access road being used as the haul road due primarily to safety concerns for the potential for accidents between mining vehicles and other vehicles. An agreement with DTF for the use of this road would be required.

Recommendation 2: That the proponent utilises the existing Mt Walton IWF access road as the haul route to minimise impacts on the proposed Jaurdi Conservation Park.

Recommendation 3: That in the event the haul route as proposed in the PER is approved, detailed planning of the final alignment, and borrow pits, should be undertaken.

Response

Polaris disagrees with this comment. The PER details Polaris's preferred haul road route.

The EPA approved Scoping Document clearly shows proposed haul roads to the two rail sidings under consideration, with the disturbance area required for this infrastructure also clearly identified in Table 1. No comment was provided to Polaris at this early stage in the process that the proposed haul road, clearly shown as not coinciding with the Mt Walton access road, or the 150 hectares proposed, would be considered unacceptable. It is understood government agency stakeholder was also sought by the EPA on the draft Scoping Document.

PER Section 6 details consultation held with key stakeholders, and specifically DEC (being one of the principle government agency stakeholders for this project). PER Table 22 lists meetings held over an 18 month period (4/2/2008 – 8/9/2009).

This comment was previously raised to PER draft 1. A detailed response was provided and incorporated into the final PER, in section 3.8.13, Figure 1 and Table 3. The response analysed alternative haul road options with pros and cons of each option.

The submission comment is based on the premise that the total area of clearing for the haul road can be significantly reduced by going out to an existing track (which extends the total kilometres travelled in the process). This premise is flawed. The response on this issue includes the following key factors:

- The existing road is not a public road. It is a private access road to the Mt Walton Intractable Waste Facility, administered by the Department of Treasury and Finance - Building Management and Works (DTF). The DTF does not support the use of this road for ore haulage. Polaris concurs with this view.
- A new road is still required to link the Carina mine with the Mt Walton access road (at any point).

- The existing Mt Walton road is only half the width required for the haul road, so significant clearing to widen the existing road is still required.
- The existing road traverses undulating sandplains. This sand is totally unsuitable for sustained heavy haulage trucks of 240 tonne gross vehicle mass. A large quantity of gravel is required, to construct a road base of sufficient strength to take these loads. Additional clearing to obtain this material would offset any clearing saved by using the existing road.
- Calculation of areas involved in points 2, 3 and 4 above show the total disturbance area for haul road option 3 (the DTF road) is 142.74ha and option 2 (the Mt Walton road) is 144ha. This represents an initial reduction of only 1.26ha or 0.9% for the DTF road.
- The calculations above are just for initial haul road construction. More gravel will be required during the life of mine to maintain the DTF road. Ongoing maintenance and repair of the road surface during the life of mine will be significantly higher over the sand profile. The relative length of haul road over deep sand on the DTF road (47 km) compared to the Mt Walton road (8km) is a ratio of approximately 6:1. The minor reduction in initial clearing for the DTF road will be further reduced over the life of mine, as more gravel will be needed to maintain this option. With an initial clearing difference of less than 2ha between, the two options, Polaris concludes it is highly likely there will be more clearing required for the DTF road over the life of mine.
- Botanical surveys of these sandplains have found them to be highly floristically diverse and contain a significant number of priority species, range extensions of known species and undescribed species. Polaris's preferred haul road route minimises the distance traversed through these sandplains and has surveyed alternative alignments to identify the route with the least impact to these species.

Polaris reiterates its position that the view raised in the submission that the DTF road will significantly reduce total clearing is an oversimplification. It does not account for all the criteria required to construct and maintain a heavy haulage road for 5 years. When all these factors are considered, the shortest route traversing the best landform (ie Mt Walton road) will result in the least total clearing required. For this, and other, reasons provided in the PER, Polaris fully supports the DTF position that the Mt Walton road is not suitable for ore haulage.

Polaris does not support Recommendation 2.

Polaris considers Recommendation 3 has already been implemented and is described in the PER.

4. Consultation
    a. Extensive consultation occurred through the preparation of the PER with the two key government agency stakeholders – DTF and DEC.
    b. DTF clearly communicated that they did not support ore haulage on the DTF road.
    c. DEC clearly communicated that they did not support the Darrine road as it traversed through the middle of the proposed Jaurdi conservation park. Their preferred option was the Mt Walton road, as it traversed the eastern periphery of the proposed park.

d. Polaris clearly communicated to DEC the DTF position and for a range of other reasons, Polaris also agreed with that position that the DTF road was not suited to ore haulage.

Environmental factors

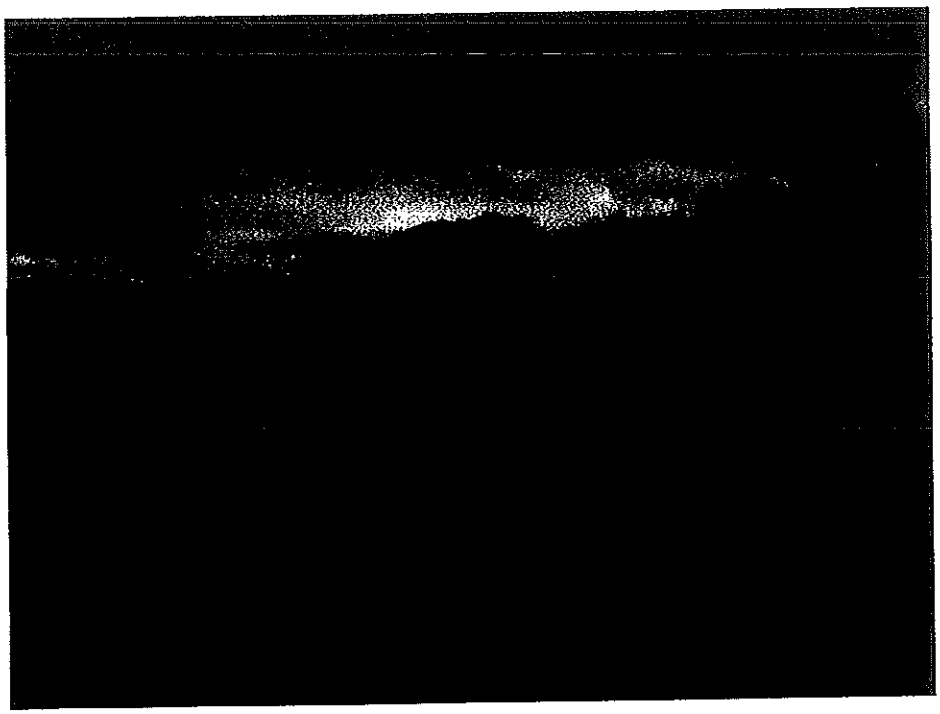
5. Extent of clearing
    a. The view that the total area of clearing for the haul road can be significantly reduced by going out to an existing road is an oversimplification. It does not account for all the criteria required to construct and maintain a heavy haulage road for the life of mine.
    b. Calculated area of initial clearing to construct the DTF road is 142.74ha and the Mt Walton road is 144ha. The difference is only 1.26ha or 0.9% between the two options.
    c. These figures are just for initial construction. More gravel will be required during the life of mine to maintain the DTF road as, proportionally this road traverses 6 times more underlying sand that the Mt Walton road.
    d. Polaris concludes it is highly likely more total clearing will be required for the DTF road over the life of mine.
6. Criteria assessed
    a. The table below summarises the criteria examined in selection of the preferred haul road alignment

Factors	Darrine	Mt Walton	DTF road
Length inside the proposed park (km)	51	38	28.5
Length outside the proposed park (km)	0	10	28.5
Total HR length (km)	51	48	57
Total HR clearing area (ha)	N/A	144	142.74
Rail siding relative to proposed park	In	Out	Out
Traverse sand topography (additional earthwork)	No	No	Yes
Multi-user potential	No	Yes	No
Visual impact / public contact	Yes	No	Yes
Overall rating	√√	√√√	√

7. Length of haul road in the proposed park
    a. The table above clearly shows there is **no option that removes ore haulage from the proposed park** (see also point 10).
    b. Consideration of alternative routes and their respective merits is therefore based on the perceived benefit of an incremental reduction in haul road length in the proposed park against total impacts and costs.
8. Botanical surveys
    a. A key finding from the botanical survey conducted over the chosen route (Mattiske October 2009)(pg 13) is that *"The scrub community which was present on the yellow sandy soils towards the southern end of the proposed transport route was populated by a more diverse range of species..."* This is not surprising considering other sandplain regions in WA are regarded for their high floristic diversity. A high proportion of the Priority species identified in the survey over the chosen route were in the yellow sandplain country.

b. In addition to Priority species, significant range extension of a *Lepidosperma* species not currently listed on the Western Australian Herbarium database was recorded in the sandplain community. *Lepidosperma* sp. Aurora Sandplain (R.L. Barrett 2809B) has only previously been recorded on sandplain country north of the Helena and Aurora Ranges (R. Barrett, personal communication to Mattiske Consulting), so the record from this survey represents a significant range extension for this species.
c. In the survey over the accommodation village area, also in the sandplain community, species not currently listed on the Western Australian Herbarium database were also recorded. These are Lepidosperma sp. Aurora Sandplain (R.L. Barrett 2809B) (previously recorded in the immediate area), Lepidosperma sp. Lake King (RL Barrett 3442), Lepidosperma sp. (MWP12) and Leucopogon sp. Mt Walton. Verbal advice from Russell Barrett to Tara Read (Recon Environmental) is that Lepidosperma sp. Lake King (RL Barrett 3442) appears to be quite widespread, but is not well collected. The two other species are possibly new species and are not presently recorded on Florabase.

9. Malleefowl
   a. The acacia scrubland dominant in the sandplain community is a preferred habitat for malleefowl. The photo below is a recorded sighting of birds. Increasing heavy haulage on a 24/7 cycle in this landform type increases risk of fauna death.



10. Fragmentation
   a. The issue of fragmentation of the proposed conservation park has been raised by DEC and OEPA as a key reason in their preference of the DTF road over the Mt Walton road.
   b. Polaris' response is that the proposed park is not yet gazetted, nor is its final boundary defined. The boundary of the former Jaurdi pastoral station has been used or assumed to be the boundary of the finally gazetted park. This is a

subjective position. In any future proposal to establish the conservation park, the finally gazetted boundary of the park may well not be the straight lines of the former pastoral station. The actual extent and nature of the 'fragmentation' of the haul road is therefore not presently identifiable.

11. Environmental values

a. EPA Bulletin 1256 identified action for area No. 5 as *"further investigation of the current Conservation Park recommendations should be undertaken to ensure adequate conservation of rare and endemic flora and other significant factors"*. The key factors identified within this area in Bulletin 1256 are:

Bulletin 1256	Polaris response
	Mt Walton road option impact on these identified values as follows:
i. Rare flora endemic to BIF range;	i. Mt Walton road option does not impact a BIF range or any endemic rare flora. *No impact on this conservation value.*
ii. Endemic rare flora in sandplains, woodlands or other habitats;	ii. Botanical surveys on Mt Walton road option have not identified any endemic rare flora in the road corridor. Priority species and undescribed species have been identified, but more of these plants have also been recorded outside the road corridor. *No impact on this conservation value and low impact to priority and undescribed species.* In comparison, surveys over the sandplain community, (traversed more by the DTF road) contains range extension of undescribed species and potentially newly discovered species.
iii. Important habitat for specially protected fauna;	iii. The habitat types in Mt Walton road option are not unique in a local or regional context. Arid zone woodland is widely represented in the region. No specially protected fauna (eg malleefowl) were recorded in the road corridor. *No impact on this conservation value.* In comparison, the thick Acacia scrub over the sandplain community, (traversed more by the DTF road) contains preferred habitat for Malleefowl and birds have been sighted in this landform.
iv. Excellent representation of woodland, sandplain and other inadequately reserved vegetation and animal habitats;	iv. The vegetation of Mt Walton road option does contain both woodland and sandplain vegetation. Botanical survey (PER Appendix 4) maps the vegetation communities within the haul road corridor. Woodland communities are prefixed by W, sandplain prefixed by S. Proportional areas are W- 111ha and S - 33ha. EPA Bulletin 1256 (pg20), Map 3 shows the same regional vegetation types: 141- York gum, Salmon gum and Gimlet and 435- Acacia neurophylla and spp to be widely represented in both Crown reserve 48470 Helena and Aurora Range Conservation Park (124,345ha) and Crown reserve 36208 Mt Manning Range Nature Reserve (203,068ha). While Map 3 shows these reserves also contain other regional vegetation types, significant proportions of vegetation types 141 and 435 are evident in these reserves. *Low impact on this conservation value.*
v. Aboriginal Heritage sites;	v. Aboriginal heritage surveys have been undertaken for the Mt Walton road option alignment. No sites of significance were recorded. *No impact on this conservation value.*

vi.	Substantial landforms with significant visual amenity;	vi.	Mt Walton road option does not traverse any substantial landform with significant visual amenity. *No impact on this conservation value.*
vii.	Historical significance; and	vii.	Mt Walton road option does not impact any location of (presumed European) historical significance. *No impact on this conservation value.*
viii.	Geoheritage significance.	viii.	Mt Walton road option does not impact any location of geoheritage significance. *No impact on this conservation value.*

Conclusion

It is Polaris' view that when **all** factors are considered, the Mt Walton road has the least overall environmental impact.

POLARIS
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6 August 2010

Xuan Nguyen
General Manager - Minerals Environment
Department of Mines and Petroleum
Mineral House, 100 Plain Street
East Perth WA 6004

Dear Xuan,

Multi use potential of Polaris Metals proposed Carina haul road.

I write to request assistance from DMP in providing information and/or maps on the mineral prospectivity in the region surrounding Polaris' proposed Carina haul road.

As you are aware, the Carina project is undergoing environmental assessment. A key item is the decision on choice of haul road route between Polaris' proposed route (Option 2 on the attached plan) and going out to the existing Department of Treasury and Finance (DTF) access road to the Mt Walton Intractable Waste Facility (red road on the attached plan).

In consultation with other tenement holders over which Polaris' proposed road traversed, Polaris supported co-use of the proposed haul road by other tenement holders, in the event minable resources were identified in proximity to the road. This would dramatically reduce duplication of haul roads in the locality.

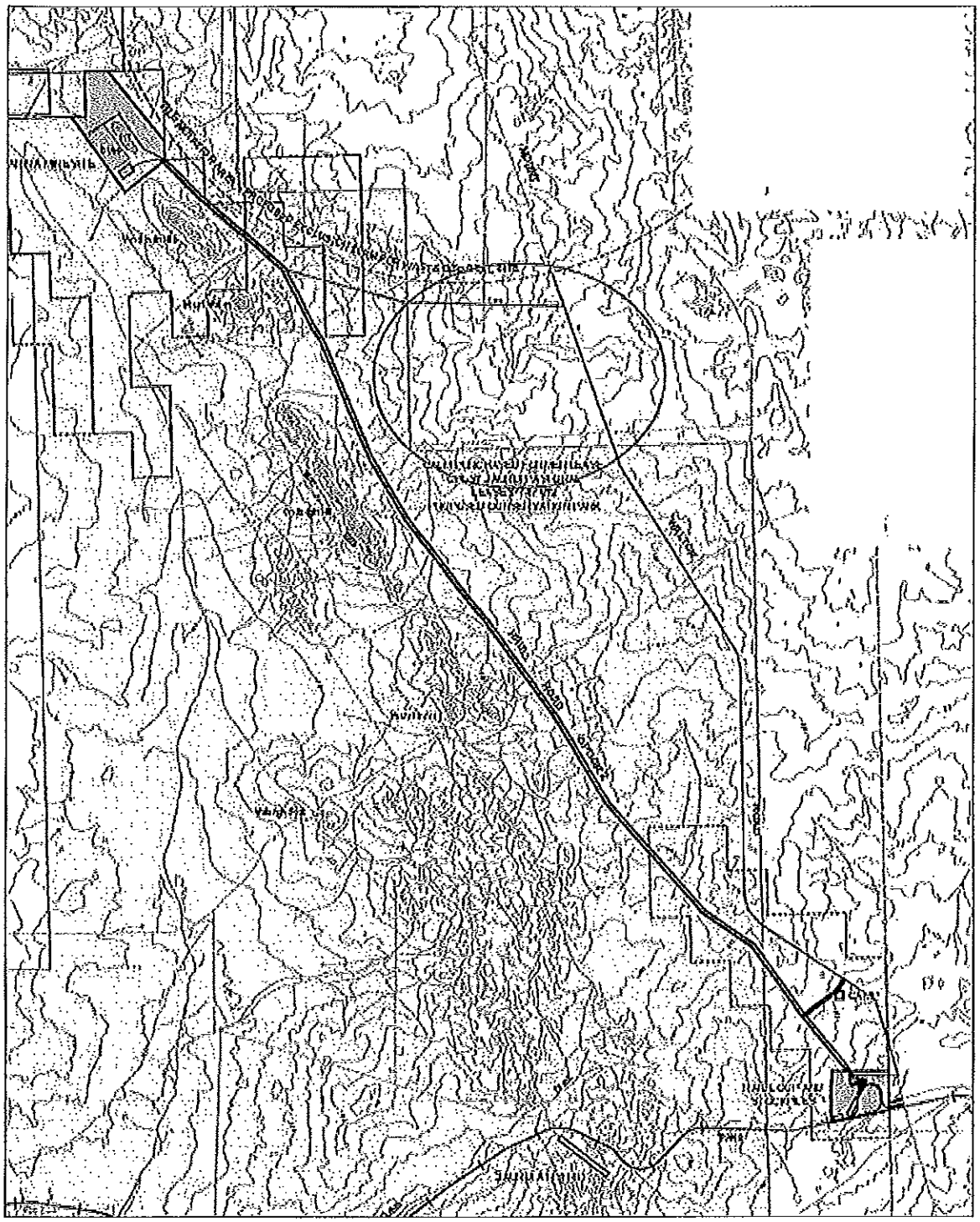
Polaris wishes to obtain information from DMP on the mineral prospectivity in the locality. This information would show mineral prospectivity in the general area along the Mt Finnerty-Yendilliberin Hills range (adjacent to the proposed Polaris haul road) relative to prospectivity in the vicinity of the DTF road.

Polaris considers the location of its proposed haul road would have a significant benefit as a multi-user haul road if additional mineral resources were to be developed in close proximity. If the haul road was moved to the DTF alignment, other tenement holders would need to construct longer lengths of connecting haul road, dramatically increasing impacts and fragmentation in the region.

Your assistance in this regard would be appreciated.

Yours truly,

Leigh Taylor
General Manager



20/08

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19th August 2010

Mr Colin Murray
Director Assessment and Compliance Services
Office of the Environmental Protection Agency
Locked Bag 33, Cloisters Square
WA 6850

Re. Multi use potential of Polaris Metals proposed Carina Haul Road (Assessment no. 1756)

Dear Colin,

We are open to the use of the Carina Haul Road as a multi user facility for other local mining developments.

We would not consider ad-hoc usage of the road but would use best endeavours to accommodate other miners whose best interests (and those of the local environment) would be served by using the road. Formal Road Access Agreements would be required to manage road user safety and to recognise reasonable compensation for road maintenance and upkeep.

With respect to your second point, our Road Access Agreement with DTF is for access from the Great Eastern Highway to the Mt Walton siding. All traffic from the Mt Walton siding and Accommodation Centre, to the mining area, will use the proposed haul road. We do not intend for any ore haulage units to be on any part of the DTF road and we do not intend routine use of the DTF road, north of the Accommodation Centre access road.

Please contact me if you need further clarification.

Yours faithfully,

Leigh Taylor
General Manager,
Polaris Metals Pty Ltd

17168

Government of Western Australia
Department of Mines and Petroleum

Your ref:
Our ref: A1128/200405
Enquiries: Lee Hassan - Ph 92223501 Fax 92223633
Email: lee.hassan@dmp.wa.gov.au

Leigh Taylor
General Manager
Polaris Metals Pty Ltd
Level 2,
1109 Hay Street
WEST PERTH WA 6005

Dear Leigh

MULTI USE POTENTIAL OF POLARIS METALS PROPOSED CARINA HAUL ROAD

Thank you for your letter of 6 August 2010 addressed to Xuan Nguyen requesting information and/or maps on the mineral prospectivity in the region surrounding Polaris' proposed haul road.

Attached is a map showing assessed prospectivity of the area in relation to your proposed haul road and the Mount Walton Road. Also shown are known mineral deposits/prospects in the area. As you indicate in your letter there is significant mineralisation in the vicinity of your proposed haul road and it would make sense for this to be a multi-user haul road.

Yours sincerely

L. Y. Hassan

Rick Rogerson
A/Excecutive Director
GEOLOGICAL SURVEY

10 August 2010

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Release Classification: - Addressee and Within Government Only

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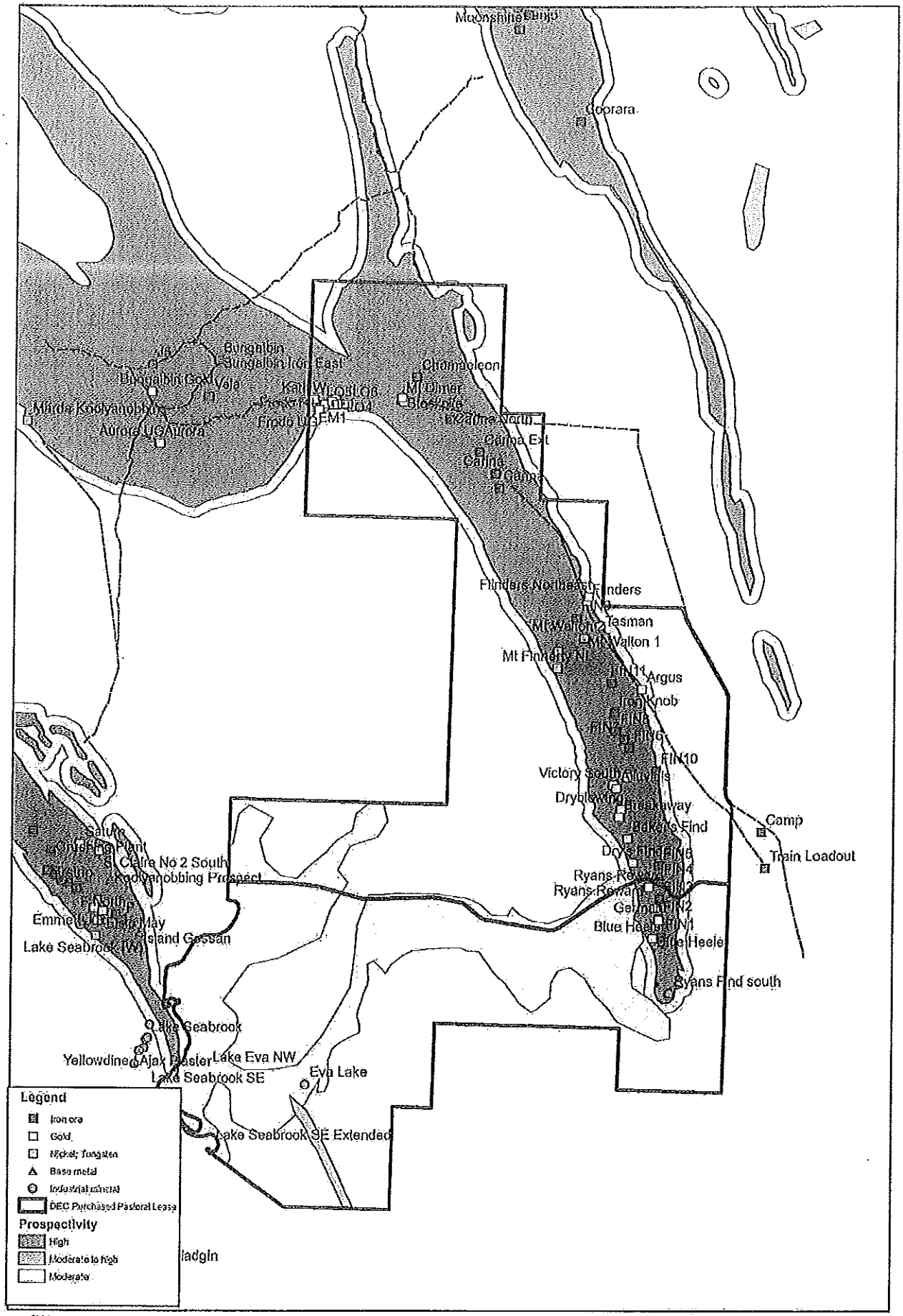
Prospectivity and access routes: ex Jaurdi pastoral lease



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Department of Mines and Petroleum