

KEYSBROOK MINERAL SAND PROJECT,
KEYSBROOK, WESTERN AUSTRALIA:
PUBLIC ENVIRONMENTAL REVIEW

JUNE 2006

PREPARED FOR

OLYMPIA RESOURCES LIMITED

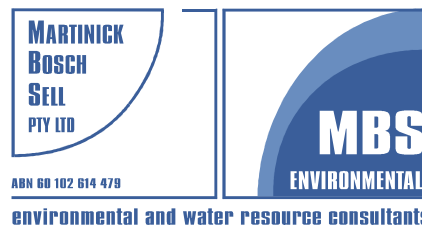


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INVITATION TO MAKE A SUBMISSION

The Environmental Protection Authority (EPA) invites people to make a submission on this proposal.

Olympia Resources Limited is proposing to develop a mineral sand mine and primary processing plant in a rural area near Keysbrook, 70kms south of Perth. Land within the mine area is predominately used for dairy cattle grazing

The proposal is to extract minerals progressively across the mine area, by developing shallow pits, average 2 metres depth and constructing a primary processing plant. Residual quartz sand and clay will be returned and the landform reinstated to approximately pre-mining contours. Heavy mineral concentrate will be transported off-site for secondary processing.

In accordance with the Environmental Protection Act, a Public Environmental Review (PER) has been prepared which describes this proposal and its likely effects on the environment. The PER is available for a public review period of 8 weeks from 26 June 2006, closing on 21 August 2006.

Comments from government agencies and from the public will assist the EPA to prepare an assessment report in which it will make recommendations to government. If you are able to, the EPA would welcome electronic submissions in particular, emailed to the project assessment officer or via the EPA's Website (see address below).

Where to get copies of this document

Printed copies of this document may be obtained from Sandra Jamieson at Olympia Resources, Level 4, 25 Walters Drive, Herdsman WA 6016. Phone 9244 1411 at a cost of \$10. Electronic copies on a CDROM are available at a cost of \$4.50.

Copies may also be downloaded from www.olympiaresources.com

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated as public documents unless provided and received in confidence subject to the requirements of the Freedom of Information Act, and may be quoted in full or in part in each report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining with a group or other groups interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people) please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the PER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal environmentally more acceptable.

When making comments on specific proposals in the PER:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable; and
- suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed.

- Attempt to list points so that issues raised are clear. A summary of your submission is helpful.
- Refer each point to the appropriate section, chapter or recommendation in the PER.
- If you discuss different sections of the PER, keep them distinct and separate, so there is no confusion as to which section you are considering.
- Attach any factual information you may wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name;
- address;
- date; and
- whether you want your submission to be confidential.

The closing date for submissions is: 21 August 2006

The EPA prefers submissions to be sent in electronically. You can either e-mail the submission to the project officer at the following address:

ruwani.ehelepola@environment.wa.gov.au

OR

use the submission form on the EPA's website:

www.epa.wa.gov.au/submissions.asp

OR

if you do not have access to e-mail then please post your submission to:

Chairman
Environmental Protection Authority
PO Box K822
PERTH WA 6842

Attention: Ms Ruwani Ehelepola

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

Olympia Resources Limited (Olympia) proposes to develop an open cut mineral sand mine and primary processing plant within an area of rural land near the small township of Keysbrook. Keysbrook is located approximately 70 kilometres south of Perth, on the eastern edge of the Swan Coastal Plain (Figures 1 and 2). Main access to the project site is from the South Western Highway and Elliot Road or Readheads Road.

1.2 SCOPE OF PROJECT

The mine area is 1,234 hectares. Of this, 930 hectares (75.4%) is open pasture, 244 hectares (19.8%) is parkland cleared remnant vegetation and 60 hectares (4.8%) is good quality remnant vegetation.

The land use within the mine area is agriculture, specifically grazing of dairy cattle, with a small area of intensive horticulture.

The methods used for mineral sand mining and processing operations have been in use in the Western Australian mineral sand mining industry for many decades and are well proven. Olympia intends to carry out its mineral sand mining and processing operations in a manner similar to current practices used by mining companies in the southwest of Western Australia.

The proposal is to extract minerals from a series of locations across the Keysbrook mine area. This will require development of shallow pits to access the ore body and construction of a screening, concentration and separation plant. Ore will be mined by a scraper and screened before being processed and the heavy mineral concentrate (HMC) component separated from the quartz sand and clay fractions.

The quartz sand and clay will be returned to mined areas and the landform reinstated to approximately pre-mining contours.

The HMC will be transported to an off-site processing plant for secondary separation using gravity, magnetic and electrostatic methods to produce individual mineral products for sale.

The conceptual layout of the proposed Keysbrook project is shown in Figure 3 and will comprise the following major components:

- Mining to an average depth of two metres, with a maximum of five metres.
- Mining of approximately 4.25 million tonnes of ore per year.
- Construction and operation of a HMC plant producing approximately 115,000 tonnes of HMC per year.
- Construction of a water supply borefield, water containment ponds, associated support facilities and access roads.

Project components are discussed below.

a) Mining

The proposed Keysbrook mine has an expected operational life of up to eight years. The mine will utilise a contract mining operator and proponent operation of the HMC plant.

The open mine pit will be approximately 30 hectares in area (Figure 4). The mining method entails excavation of the leading edge of the mine pit while backfilling of the retreating edge occurs with waste sand from the processing plant.

A general description of the mining sequence is described below:

1. *Land clearing:* The proponent will undertake periodic stripping of open pasture and clearing of trees, as required, in advance of the mine path.
2. *Topsoil stripping:* Approximately 200 millimetres of topsoil will be stripped progressively from the mine path using scrapers. During early stages of mining, topsoil will be stockpiled until sufficient area has been mined to allow respreading for subsequent rehabilitation. Seasonal weather conditions will also constrain the times topsoil can be directly returned to completed areas.
3. *Mining:* Dry mining methods will be utilised in the extraction of ore. Scrapers will dig the ore and deliver it to a screening and feed preparation plant located near the mining area. The plant will screen oversized material (root fragments and rocks) from the ore and pump the remaining material as raw feed to the processing plant.

b) Pit Dewatering

The individual requirements for pit dewatering will vary with season. The general principles for pit dewatering for the mine are:

- In summer, the groundwater level will usually be below the level of the pit floor. Little dewatering will be required.
- In winter, the higher groundwater level will generally necessitate dewatering of the pit.
- In autumn and spring, dewatering will be required of a lesser proportion commensurate with the water table at that time.

Pit dewatering water will be pumped from in pit sumps into the mining and processing operations and replace bore water, thus lowering bore water usage, especially in winter.

c) Processing

Processing of the ore occurs in two stages.

1. *Screening and feed preparation:* The dry screening and wet feed preparation plant removes material greater than two millimetres. The oversize is returned to the pit floor and buried as part of the backfilling process. The remaining sand is mixed with water and pumped as a slurry to the wet concentration plant.
2. *Wet concentration:* The processing capacity of the wet concentration plant is approximately 600 tonnes per hour. At the wet concentrator the clay is removed from the slurry using hydrocyclones and is fed into the clay fines thickener. The valuable heavy mineral fraction is separated from quartz sand using wet gravity spirals. The

residue quartz sand is mixed with thickened clay from the thickener and is pumped from the wet concentrator plant back into the mined area of the open pit to backfill the retreating edge of the pit to approximately pre-mining levels. A proportion of the thickened clay may be placed on top of the backfilled sand to add extra clay at the surface of the re-contoured area. This aids moisture and nutrient retention in the rehabilitated land. The HMC is pumped onto a stockpile to drain off water prior to being transported off-site to a dry mineral separation plant.

d) Water Supply

An estimated process water requirement of 1.5 to two gigalitres per annum will be met by two bores to be constructed on Lot 59 on the mine area (Figure 5). Groundwater will be pumped from the Leederville aquifer with the bores being 80-100 metres deep. An extraction licence will be obtained before operations start.

During winter, a large proportion of process water will be sourced from pit dewatering. In summer, this will dramatically reduce, if not cease. A greater proportion of process water will then need to be sourced from the bores.

The water requirement for mining and processing is estimated at 1,820 kilolitres per hour. Of this volume, about 1,600 kilolitres per hour is recycled within the process and 220 kilolitres per hour is added via pit inflow water or bore water, i.e. 88% of water usage is recycled.

The site water storage dam will have the capacity to store 74,000 kilolitres and will be constructed near the thickener and wet concentrator.

e) Waste Materials

The waste products from the ore fall into one of three categories:

1. Organic material and coarse fragments (about 2%).
2. Fine clay and silt (about 8%).
3. Quartz sand (about 90%).

Organic material (mostly tree roots) and coarse fragments comprise greater than two millimetre particles. This fraction is rejected by the screening process at the feed preparation plant. The material will be placed directly back into mine void areas under reclamation.

Fine clay and silt particles less than 20 micrometres are separated at the wet concentration plant. The material exits the plant as a slurry and is pumped along with quartz sand to mine void areas under reclamation.

The quartz sand is a free draining material ranging from 20 micrometres to two millimetres, which is separated from the heavy mineral at the wet concentrator. Waste sand exits the wet concentrator plant as a slurry and is pumped back to mine void areas under reclamation.

f) Support Infrastructure

The mining contractors will provide a workshop to maintain their vehicles. Included in the workshop facilities will be a bunded washdown pad with an attached oil/water separation system.

g) Power Supply

The main electrical power for the wet concentrator, screening plant, transfer pumps and bores will be provided from the mains power supply. Usage is estimated at about 2.5 megawatts. With total load running at 70-80% of connected load, the connected total power supply for the mine is anticipated to be 3.15 megawatts.

Small stand-alone diesel generators may be required to supply power to moveable pumps used for in-pit dewatering.

h) Fuels and Oils

A licence will be obtained from Department of Consumer and Employment Protection (DOCEP) for the storage of all dangerous goods on-site.

Fuel storage facilities will be provided by the mining contractor for use by the mining equipment. Fuel will be stored on-site in on ground self-bunded bulk storage tanks. Bulk fuel storage facilities will comply with AS 1940:2004 and Department of Environment (DoE) requirements. The bulk fuel storage capacity will be a 55,000 litre tank.

Any lubricants stored in 1,000 bulk pods or 200 litre drums will be held in bunded areas. Fuel and lubricant dispensing will occur on a bunded hardstand area, to contain accidental spillage.

Other than diesel fuel and oil, no bulk volumes of dangerous goods or hazardous substances will be stored on-site.

i) Workforce

The mine will require a workforce of about 30-35, which will be sourced locally where possible.

The site will operate on a commute basis with a continuous roster of 12-hour shifts.

j) Waste Disposal

There will be no on-site disposal of waste. A commercial waste disposal company will be contracted to supply bulk bins for removal of all rubbish from site. A licenced commercial waste disposal company will also be contracted to supply appropriate contains to store waste oil, grease and fuel/oil filters and remove these items on a regular basis.

k) Roads and Transport

The transport route selected by Olympia is Atkins Road, Readheads Road, South Western Highway.

Approximately 115,000 tonnes per annum of HMC will be produced at Keysbrook and trucked to Picton. This represents about 2,200 tonnes per week of HMC cartage or six to seven 50-tonne truckloads per day. Truck movements to and from the Keysbrook mine site will therefore be between 12 and 14 per day. All loads will be covered prior to leaving the site.

1.3 EXISTING ENVIRONMENT

l) Regional Setting

The mine is situated along the eastern edge of the Swan Coastal Plain, about 70 kilometres south of Perth and four kilometres west of the small township of Keysbrook. The area for mining is 1,234 hectares, located on privately-owned land. Figure 3 shows the mine site layout.

Ninety five percent of the mine area has been completely cleared or parkland cleared for grazing activities. The remaining 5% of remnant vegetation consists of trees with a partially intact understorey.

The topography of the mine area is flat to very gently undulating plain. The lowest elevations are in the south-west of the mine area at approximately 22 metres Australian Height Datum (AHD), gradually sloping to approximately 48 metres AHD in the north-east.

m) Surface Hydrology

At a regional level, all the surface drainage ultimately flows to Peel-Harvey estuary. Streams from the Darling Scarp and foothills flow through the mine area.

The mine area and surrounds are characterised by low relief topography that results in a landscape that becomes flatter and increasingly poorly draining westward from the scarp. In the pastured areas, most of the low-lying areas, creeks and wetlands have been cleared and drained. Downstream of the mine area west of Hopelands Road the low relief is even more pronounced, resulting in a wetland chain all the way to Peel Harvey estuary.

The mine area can be subdivided into three major drainage areas; each with a number of minor subcatchments. The major drainage areas are:

- Balgobin/Nambeelup Brook (90.5 percent of project area).
- North Dandalup Tributary (4.5 percent of project area).
- Dirk Brook Tributary (5.0 percent of project area).

The watercourses can be split into three categories:

1. **Major Water Courses - Peak flows of two to five cubic metres per second.**

These are Balgobin Brook and North Dandalup River Tributary. These watercourses have substantial bridges (up to 15 metres wide) at the downstream road crossing. Both watercourses also contain Draft EPP-listed wetlands that are outside the mine area.

2. **Medium Watercourses - Peak flows of one to two cubic metres per second.**

These are Dirk Brook Tributary, Nambeelup Brook North Tributary, Balgobin Brook South Tributary and Nambeelup Brook South Tributary. Culvert sizes on adjacent roads are in the range of dual 1,050 millimetre circular pipes and they are still well defined watercourses. Dirk Brook Tributary and Nambeelup Brook South Tributary also contain Draft EPP-listed wetlands that are outside the mine area.

3. **Minor Watercourses - Peak flows of less than one cubic metre per second.**

The minor watercourses are generally shallow and poorly defined. Diversion of these watercourses will be manageable with earthworks such as bunds and drains around mine pits.

n) **Groundwater**

The mine area is located within the Proposed Karnup – Dandalup Underground Water Pollution Control Area. The area has been allocated a policy use of Priority 2 (P2). The groundwater area has not been formally gazetted as a public water source protection area.

Priority 2 source protection areas are defined to ensure there is no increase in risk of pollution to the water source. This is declared over land where low intensity development already exists. Priority 2 areas are managed in accordance with the principle of risk minimisation and so some development is allowed under specific guidelines (DoE, 2005).

Two aquifers of the Perth Basin are relevant to the project. Firstly, the shallow superficial formation containing both the Bassendean Dunes and Guildford Formation. This aquifer will be affected by the mining operations as it contains the mineral deposit.

Mining operations during the winter will result in the groundwater levels in the Bassendean Sand being temporarily lowered to the base of the unit, in and around individual mining cells. Water levels will start recovering as mining moves to new cells, excavated cells are backfilled, and rainfall recharges the reconstituted aquifer.

The second relevant aquifer is the Leederville Formation, extending to about 100 metres depth. It will be utilised as a water source for the mining operation.

Water salinities in the Superficial aquifer range from 200 to 1,000 milligrams per litre total dissolved solids (TDS), while in the Leederville Formation they are generally less than 1,000 milligrams per litre TDS.

o) **Vegetation and Flora**

The mine area is 1,234 hectares. Of this, 930 hectares (75.4%) is open pasture, 244 hectares (19.8%) is parkland cleared remnant vegetation and 60 hectares (4.8%) is remnant vegetation in good condition.

The mine area is located on the Pinjarra Plain sub unit of the Swan Coastal Plain (Beard, 1981). The vegetation of the mine area is described as being Marri (*Corymbia calophylla*) woodland. Heddle *et al.* (1980) undertook vegetation mapping of the Darling System on a finer scale than Beard (1981). They identified four distinct vegetation complexes that occur on the project area. These were the Forrestfield Complex, the Guildford Complex, the Bassendean Complex (South and Central) and the Southern River Complex.

Three vegetation and flora surveys of the project area have been undertaken; in May 2004, October 2004 and October 2005.

No declared rare or priority flora were located during the surveys.

A total of 40 vascular plant families, 119 genera and 169 taxa were recorded in the survey. The dominant plant families were Poaceae (21 taxa), Myrtaceae (13 taxa), Asteraceae (12 taxa), Cyperaceae and Papilionaceae (11 taxa). These five families represent 43% of the total number of taxa surveyed.

Three of the vegetation units located during the Bennett (2004) survey were inferred to be potential Threatened Ecological Communities (TECs). Bennett (2004) concluded the vegetation condition of FCT 3a and 3c were recorded as mainly degraded to completely degraded and are not considered worthy of conservation.

Statistical analysis of the main potential TEC concluded that the sites are more likely to belong to FCT 21a or 21c than to FCT 20b. Other quadrats in the survey were also inferred as FCT type 21c.

p) Fauna

The majority of the area to be mined (95%) has been either totally or parkland cleared for agricultural purposes, with the remaining native vegetation areas highly fragmented. As such, the amount of habitat available has been severely reduced. The primary issue for fauna in fragmented agricultural landscapes is connectivity of remnant vegetation. Relatively few species use cleared areas, and those that do usually require areas of native vegetation to supply at least some of their needs.

A fauna habitat assessment was conducted in May 2004. A total of three amphibian species, one reptile species, 41 bird species and two mammal species were identified in the survey. This included one Priority 3 species (Red-tailed Black Cockatoo), one Priority 4 species (Quenda) and one introduced species (Kookaburra).

Of particular interest is the potential presence of the Short-billed (Carnaby's) Black Cockatoo (*Calyptorhynchus latirostris*) and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). A survey was undertaken to identify cockatoo species and potential breeding sites in October 2005.

The only species of cockatoo observed directly during the survey was the Forest Red-tailed Black-Cockatoo. The presence of the Baudin's Black-Cockatoo was inferred through the presence of Marri nuts that were marked distinctively by feeding birds. Only a few potential

nesting hollows were identified in the survey. None of the potential hollows identified showed evidence of current occupation.

Overall, the potential of the vegetation remnants to provide breeding habitat for cockatoos is low, with Lot 56 showing the highest potential.

q) Aboriginal Heritage

Olympia commissioned Australian Interaction Consultants to carry out a preliminary study relating to the proposed Keysbrook project.

Before any disturbance of the site occurs, in consultation with the appropriate Aboriginal people, Olympia will undertake an archaeological survey of the proposed project area to determine the location and nature of any unrecorded sites and ensure that all requirements of the *Aboriginal Heritage Act 1972* (Western Australia) are met. The survey will be undertaken and the results provided to the EPA prior to the release of the EPA report and recommendations bulletin.

1.4 STAKEHOLDER CONSULTATION

A public consultation programme has been undertaken to consult with:

- State Government departments, agencies and organisations.
- Local Government authorities.
- Landholders in and around the project site.
- Community groups.
- Special interest groups.

Objectives of the community consultation programme for the Keysbrook project are to:

- Identify key stakeholders.
- Ensure that appropriate information regarding the proposed project is communicated to all stakeholders.
- Determine the key concerns of stakeholders regarding the proposed project.
- Involve interested stakeholders in project planning.

Communication methods include a public information session, one-on-one discussions and small group discussions. A monthly newsletter is distributed to a mailing list, with recipient numbers increasing. Newsletters are posted on the company's website, with provision for interactive feedback from interested parties. Individual information sheets have been prepared in response to specific questions or concerns. Olympia will continue to liaise closely and regularly with interested and affected stakeholders throughout the planning, development and operational stages of the project.

1.5 SUMMARY OF ENVIRONMENTAL FACTORS

The main environmental factors and impacts associated with the Keysbrook project were identified by Olympia in consultation with DoE and Department of Conservation and Land Management (CALM) and through discussions with relevant stakeholders. They are summarised in Table 1.

Table 1: Environmental Factors Relevant to the Keysbrook Mineral Sand Project

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Biophysical					
Vegetation Communities	To maintain the abundance, diversity, geographic distribution and productivity of vegetation communities through the avoidance or management of adverse impacts and improvement of knowledge.	Over 95% of the mine area is either cleared pasture or fragmented remnant vegetation with a condition score of completely degraded. The major consolidated area of remnant vegetation in generally good condition is most likely FCT 21a or 21c. Small areas of TEC types 3a and 3c were recorded. These had a condition score of degraded to completely degraded.	About 60ha of remnant vegetation and 244ha of parkland cleared vegetation is present within the proposed mine area and will need to be progressively cleared during the life of the project.	The amount of vegetation to be cleared will be minimised as far as practicable. The principle of avoidance has been used to excise significant vegetation areas and wetlands from the mine area. Mining areas will be rehabilitated upon completion using retained topsoil and seed collected from local species. The principle of no net loss of native vegetation will be implemented over the mine site. A vegetation management plan will be developed, including monitoring of areas cleared, to ensure no unnecessary clearing is undertaken.	There will be a temporary loss of vegetation by implementing the proposal. Local seed will be used in the rehabilitation to return the same tree species. Rehabilitation will also return low-lying vegetation species currently absent or existing as isolated trees in consolidated corridor planting, providing a net increase of this vegetation than currently exists. The rehabilitation plan will replace the same vegetation at the site than cleared.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Flora	To maintain the abundance, diversity, geographic distribution and productivity of flora at species ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge.	No declared rare flora or priority species were identified. The remnant vegetation areas in the mine area are fragmented. There are no established corridor linkages within the mine area and from the mine area to other vegetated areas.	There is potential for flora of conservation significance to occur in the mine area. Mining activities may result in the removal of these species.	A vegetation management plan will be developed with an objective to minimise impact to significant flora species and communities and include trials on relocation of selected species (such as <i>Xanthorrhoea preissii</i>) in advance of mining, seed collection for rehabilitation programmes using tubestock planting and direct seeding. The management plan will stipulate consultation with CALM and DoE on aspects of vegetation management and rehabilitation strategies.	Avoidance of significant vegetation areas has been accommodated by not mining 48.7ha from Lot 56 and Lot 3 to conserve important attributes. The rehabilitation plan will return an equal area of vegetation that is cleared and also locate it to function as corridor linkages, therefore providing an improvement over the current fragmented remnants.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Fauna	To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	<p>The remnant vegetation areas in the mine area are fragmented. There are no established corridor linkages within the mine area and from the mine area to other vegetated areas.</p> <p>The majority of the mine area is cleared farm paddocks. The remaining native vegetation areas are actively grazed, with most now containing tree overstorey over pasture grass.</p> <p>The more significant fauna habitat locations, containing dense understorey and wetland habitats, are located outside the mining area and will not be disturbed.</p> <p>A cockatoo survey identified birds feeding in the area. No active nest sites were identified although possible nest sites were located.</p>	<p>Progressive clearing of up to 304ha has the potential to reduce the available habitat of fauna species.</p> <p>Reduction in habitat may reduce the local populations of fauna species of conservation significance.</p>	<p>The amount of vegetation to be cleared will be minimised as far as practicable.</p> <p>Clearing will be progressive, so not all the vegetation will be cleared at once. Rehabilitation will follow after mining.</p>	<p>The principle of avoidance has been used for significant fauna habitats identified in the flora survey, such as wetlands and stands of mature trees with nest hollows, by excising them from the mine plan to conserve these habitats.</p> <p>The rehabilitation plan will establish corridor linkages to increase the mobility of fauna.</p> <p>Although there will be temporary loss of fauna habitat and food resources during the project, implementation of progressive rehabilitation will re-establish fauna habitat, food source and the provision of vegetation corridors for native fauna species.</p>

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Wetlands	To maintain the integrity, ecological functions and environmental values of wetlands.	<p>There are listed EPP wetlands on the periphery of the mine area.</p> <p>Another wetland, not listed in the EPP, was identified on Lot 64.</p> <p>The wetlands are subject to grazing by stock.</p>	In the progressive mining of the area, groundwater may be temporarily impacted.	<p>All EPP wetlands are located on the edge of resource areas and will be avoided and retained. No disturbance to listed EPP wetlands will occur.</p> <p>Modelling of pit dewatering has shown that effects of water table drawdown are confined to levels less than the seasonal water table fluctuation beyond the immediate extent of the mine pit.</p>	<p>The principle of avoidance has been used to ensure all wetlands will not be directly disturbed by mining activity and the maximum possible indirect effects from pit dewatering are consistent with natural seasonal fluctuations.</p> <p>The rehabilitation plan will enhance riparian vegetation corridors to ensure wetland biodiversity values are maintained, or improved, at a regional scale.</p>

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Surface Water	To maintain the quantity of surface water so that existing and potential environmental values, including ecosystem maintenance, are protected.	<p>The surface hydrology is characterised by a number of major drainage lines, running through the mine area from upstream catchments and minor channels with localised catchments.</p> <p>Many of the existing drainage lines, major and minor, have been modified into agricultural drains.</p> <p>The vast majority of all riparian vegetation along the drainage lines has been cleared.</p> <p>Stock has unimpeded access to almost all the drainage lines through the mine area.</p>	Changes in the local surface runoff regime resulting in contamination of surface water runoff with sediment.	<p>Waters from potentially contaminated catchments will be captured and treated prior to release to natural catchments where necessary.</p> <p>The principle of avoidance has been used to ensure no disturbance to the major drainage lines, avoiding any impact to these waterways.</p> <p>Mitigation and management strategies will be implemented for the minor drainage lines impacted by the proposal to ensure water quality meets discharge criteria.</p>	<p>Impact to the major drainage lines will be avoided. There will be negligible effect on surface water by the project.</p> <p>Progressive rehabilitation with pasture will stabilise mined areas quickly, minimising the risk to surface water quality, in order to maintain discharge water quality to within acceptable standards.</p>

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Groundwater	The project is located within the proposed Karnup Dandalup Underground Water Pollution Control Area (UWPCA). The project is to be implemented to maintain the quality and quantity of groundwater so that existing and potential environmental values, including ecosystem maintenance, are protected.	The two major aquifers affected by the proposal are the superficial aquifer and the deeper Leederville aquifer. The superficial aquifer will be affected by dewatering of the mine pit. The Leederville aquifer will be affected by abstraction of the required 2GL of water for mineral processing and dust suppression.	Temporary groundwater depression in the superficial aquifer as a result of pit dewatering extending to adjacent users or natural systems. Abstraction of groundwater from the Leederville aquifer having an effect on adjacent users.	Groundwater modelling has shown superficial groundwater dewatering for pit operation to have only a temporary and geographically narrow effect. Groundwater abstraction for the processing operation will be licensed and monitoring conducted to ensure there is no adverse effect to other licensed users. Abstraction volumes and water quality monitoring will occur and be reported to regulatory authorities. Water will be recycled to minimise abstraction volumes.	Dewatering of the mine pit will only have a temporary and localised drawdown of the superficial aquifer that will not extend beyond the boundary of the resource area. Adjacent undisturbed natural systems are predicted to experience fluctuations in ground water levels no greater than normal seasonal water table movement (see charts 4 and 5), resulting in negligible anticipated impact. Water extraction from the Leederville aquifer is not anticipated to impact on other licensed users.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Soil	To maintain the integrity, ecological functions and environmental values of the soil.	<p>The majority of the mine area is cleared pasture.</p> <p>The mine area is hosted in the Bassendean sand unit that does not have a distinct soil horizon profile.</p> <p>Dieback disease has been identified in selected upland native vegetated areas on the site. Indications are that the disease has been present on the site for many years.</p> <p>A baseline investigation for Potential Acid Sulfate Soils (PASS) was conducted. The results confirmed low acid risk over the mine area.</p>	<p>Alteration of the soil profile in mined areas.</p> <p>Spread of <i>Phytophthora cinnamomi</i> (dieback) in native vegetation areas.</p> <p>Disturbance of PASS and possible increase in soil acidity.</p>	<p>Topsoil will be stripped, re-used or stockpiled for later re-use in rehabilitation.</p> <p>Waste sand material from the plant will be returned to areas where mining has been completed.</p> <p>Develop dieback management procedures for mining and rehabilitation, including monitoring of susceptible species' survival in rehabilitated areas.</p> <p>If required, an acid soils management plan will be prepared including the monitoring of discharge water and the implementation of management methods to ensure the project does not result in the generation of acid soils.</p>	<p>Topsoil will be either directly returned to completed areas undergoing rehabilitation or stockpiled for later use.</p> <p>Management measures will be implemented to minimise the risk of dieback impact on existing and rehabilitated vegetation in the mine area.</p> <p>Management measures will be implemented if monitoring of discharge water confirms acid generation is occurring.</p> <p>The mitigation measures identified will ensure the environmental values of the soil are maintained.</p>

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Landform	To maintain the integrity, ecological functions and environmental values of landforms.	The heavy minerals are hosted in the Bassendean sand unit. This unit will be most impacted by the mine. Southern River and Guildford units occur in the edges of the mining area. Minor impacts to these units also occur. The Forrestfield unit is outside the mine area and will not be disturbed.	Alteration of the local topography and landforms due to mining activities.	The post-mining landform shall be returned as close as possible to the pre-mining state. Pre-existing drainage patterns will be maintained. Rehabilitation and landform design plans will be developed. Erosion control measures will be implemented during mining and maintained until rehabilitation has fully established.	The post-mining landform will be returned to a similar state as existed pre-mining. Original drainage patterns will be reinstated. All landforms will be stabilised with either pasture or native vegetation. The landform values will not be adversely affected by the mining activities.
Rehabilitation	To ensure that rehabilitation of completed mine areas achieves a stable landform that is consistent with the surrounding landscape and is compatible with the pre-mining land use.	The existing land use over the mine area is agriculture, predominantly cattle grazing. The primary rehabilitation objective is to return the land to its pre-mining use. Also refer to the above sections on vegetation, flora, soils and landforms.	Up to 304ha of remnant native vegetation is expected to be cleared for the project. Rehabilitation will occur using the 'no net loss' principle to progressively replant this area.	Prepare a Rehabilitation Management Plan to address planting locations, species selection, rehabilitation monitoring and annual planting programme. The management plan will stipulate consultation with landowners, CALM and DoE on rehabilitation strategies, implementation and monitoring.	Rehabilitation will replace at least as much native vegetation as removed for mining. Rehabilitation will focus on corridor linkages with increased community diversity by both upland and lowland planting, to provide an improved environmental outcome over the current fragmented upland landscape and totally cleared lowland landscape.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Weeds	<p>To ensure weeds are controlled in native revegetation areas to allow establishment of planted trees.</p> <p>The majority of the mine area is to be returned to its pre-mining land use of pasture. In these areas, weed management is to be restricted to the control of declared pest plant species.</p>	<p>The majority of the mine area is open pasture. Most of the native vegetation remnants consist of trees over pasture grass.</p>	<p>Weed infestation can inhibit establishment and survival of planted trees, decreasing the effectiveness of the rehabilitation programme.</p>	<p>Selective application of herbicides, if required, to allow establishment of planted trees.</p> <p>Areas rehabilitated with pasture species will only receive management of declared pest species.</p>	<p>Weeds will be controlled in native vegetation areas to allow establishment of native species.</p>
Conservation Areas	<p>To protect the environmental values of areas identified as having significant environmental attributes.</p>	<p>These are no conservation or nature reserves in the mine area.</p> <p>Significant vegetation areas on-site comprise remnant areas in good condition, wetlands and mature trees suitable for bird nesting sites.</p>	<p>A portion of the remnant vegetation areas with high environmental attributes may need to be cleared during the life of the mine.</p>	<p>Avoid impact to good quality remnant vegetation areas if possible.</p> <p>Implement strategies to rehabilitate remnant vegetation areas that are to be impacted by the project.</p>	<p>Olympia has used the principle of avoidance to excise 48.7 from Lot 56 and Lot 3 as a concession to conservation area planning.</p> <p>The mitigation measures identified will ensure the environmental values of local conservation areas are maintained.</p>
Pollution Management					

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Air Quality	To ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements.	The mine area is in a rural environment. There are no existing issues of deterioration in air quality from a major contributor. Localised emissions of dust and smoke would be related to specific activities.	Mining activities will result in airborne dust particles. Minor release of greenhouse gases from mining equipment.	Dust suppression procedures applied in line with industry best practice. All practicable measures will be taken to reduce energy consumption. Completed areas will be rehabilitated and revegetated as soon as practicable.	Management of dust emissions are to be controlled by a number of measures. Monitoring will be implemented to confirm the success of the management programme. The mitigation measures identified will ensure the environmental values of air quality are maintained.
Surface Water Quality	To ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements.	The mine area is in a rural environment. There are no existing issues of deterioration in surface water quality from a major contributor. Localised discharge of turbid water would be related to existing activities such as access to waterways by stock and runoff from newly ploughed paddocks.	Degradation of quality of surface runoff by sediments and hydrocarbon spillages.	A hydrocarbon management procedure will be prepared in consultation with DoW and implemented. Waters from potentially contaminated catchments will be captured and treated prior to release to natural catchments where necessary.	Hydrocarbon storage and handling will be managed to minimise the risk of contamination of surface waters. There will be negligible effect on surface water quality by mine activities.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Groundwater Quality	The mine is located within the proposed Karnup Dandalup UWPCA. The project is to be implemented to ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements.	The mine area is in a rural environment. There are a number of licensed users for both the superficial and Leederville aquifers.	Contamination of groundwater by chemicals and hazardous substances.	The project is to be implemented in accordance with the proposed Priority 2 (P2) land use management guidelines to ensure activities do not adversely affect groundwater quality. A hydrocarbon management procedure will be prepared in consultation with DoW and implemented, including a monitoring regime, to ensure contamination of groundwater does not occur.	Hydrocarbon storage and handling will be managed to minimise the risk of contamination of groundwaters. Groundwater quality will not be adversely affected by mine activities.
Soil Quality	To ensure that rehabilitation achieves an acceptable standard compatible with the intended land use, and consistent with appropriate criteria.	The existing land use over the mine area is agriculture, predominantly cattle grazing. The primary rehabilitation objective is to return the land to this purpose.	Deterioration in topsoil quality with stockpiling. Deterioration in nutrient and water holding capacity after mining.	Topsoil will be directly returned to completed areas when possible. Storage in stockpiles will be to industry best practice. Development of a rehabilitation management plan.	Rehabilitation to pasture will involve two seeding years to establish good quality pasture and include application of lime and fertilizer as needed to generate good pasture growth. No deterioration in soil quality from the project.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Noise	To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet Noise Regulations.	The mine area is in a rural environment. There are no existing issues of noise generation from a major contributor. Localised noise generation would be related to specific activities.	Noticeable increase in noise levels for nearby residents.	Implement a work plan to operate in different locations, times and wind directions in order to comply with statutory requirements. Location of noise-generating equipment within enclosed structures. Placement of topsoil stockpiles to buffer emissions.	Operations on-site will be scheduled to minimise noise to adjacent residents. Compliance with statutory noise requirements.
Road Transport	Ensure that noise and dust levels meet acceptable standards and that an adequate level of service, safety and public amenity is maintained.	The mine area is in a rural environment. There are no existing issues of road transport disturbance from a major contributor. Localised traffic impacts would be related to specific activities.	Increases in noise and dust along the haulage route. Increase in traffic volume on local roads and highways.	Only 12-14 truck movements per day are proposed. All trucks will be well maintained and be operated by appropriately licensed operators. Local public roads will be maintained to a suitable standard as agreed with local councils. Appropriate permits will be obtained from relevant agencies for the truck configuration.	There will be minimal impact on the local road system and the level of public safety from the low number of trucks used for the project.
Light	To avoid or manage potential impacts from light overspill and comply with acceptable standards.	The mine area is in a rural environment. There are no existing issues of light overspill from a major contributor.	24-hour processing will require lighting to enable a safe working environment. Light overspill may be visible from nearby residences.	Orientate lights to minimise impacts on residences.	The large lot sizes generally through the mine area minimise the impact of light overspill. No significant adverse impacts are anticipated.

Environmental Factor	Environmental Objective	Existing Environment	Potential Impacts	Environmental Management	Predicted Outcome
Social Surrounds					
Heritage	To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.	The mine area is in a rural environment that is mostly cleared.	There are no known heritage sites located on the Keysbrook site.	A heritage survey will be conducted prior to commencement of site works to ensure no sites of significance are disturbed by the project. Olympia will ensure that all of its staff and contractors engaged on the project are aware of their obligations and responsibilities under the legislation.	No impact to any sites of significance.
Visual Amenity	To ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape.	The mine area is located in a gently undulating to flat landscape. Some residents will have views of the mine area.	Mining areas may be visible from secondary roads at the edges of the mine area and nearby residences.	The active mine envelope rapidly moves through the landscape. Progressive rehabilitation will reinstate the visual amenity soon after mining is complete.	Visual impact will be reduced to as low as reasonably practical. The mining is a temporary land use, with rehabilitation re-establishing a rural visual aspect.

1.6 SUMMARY OF ENVIRONMENTAL MANAGEMENT ACTIONS

Environmental management actions proposed by Olympia are listed in Table 2. For each action, reference is made to the section in which it occurs within this report. It is anticipated these will form part of the conditions of approval from DoE.

Table 2: Summary of Environmental Management Actions

No.	Management Action
Vegetation and Flora	
9.1.4a	<p>A range of development options has been considered and reasonable steps taken to avoid native vegetation as required by element one of the EPA Position Statement 2:</p> <ol style="list-style-type: none"> 1. The wet concentrator plant, process water dam, supporting infrastructure and stockpiles have been located to minimise impacts on native vegetation by preferentially locating them in existing cleared areas. 2. Listed EPP wetlands will not be disturbed by mining activities. All EPP wetlands are located on the periphery of the mine area. Mine planning will ensure the wetlands, plus an identified buffer zone, will be retained (Figures 11, 12 and 13). 3. A remnant vegetation area of 33.7 hectares on Lot 56 that contains approximately half the mature trees with suitable hollows for cockatoo nesting, vegetation in good-very good condition has been excised from the mine area. With the addition of the vegetated non-mineralised exclusion areas and the EPP wetland exclusion area, a total of 48.7 hectares of the 108.1 hectares (45 per cent) of the vegetation on Lots 56 and 3 will not be disturbed. The 48.7 hectare exclusion area includes; <ul style="list-style-type: none"> • 2.45 hectares of the 3.20 hectares (76 %) of the CcXp community (Table 33) inferred as FCT 3c. Only 0.75 hectares of this FCT will be impacted by the mining operation. Bennett (2004); pg 7, records the condition of both the 3c and 3a community types as degraded to completely degraded. The community type 3c was of a larger area than FCT3a but it also adjoined paddocks with most of the understorey replaced by pasture (weed) species. • 25.71 hectares of the 61.3 hectares (42%) of the BaBm community in Lots 56 and 3, attributed by Griffin (2005) as 21a/c. This also includes mature trees, potentially suitable as cockatoo nest sites (Figure 14). Only 40.2 hectares will be impacted by the mining operation.
9.1.4b	Areas to be cleared will be delineated in the field with survey pegs and flagging tape before clearing commences. Company supervisors will oversee the clearing works.
9.1.4c	<p>Olympia has prepared a Vegetation Management Plan. The plan establishes a recording, monitoring and reporting framework for site activities that may impact on vegetation. The plan includes:</p> <ul style="list-style-type: none"> • Recording areas of vegetation cleared. • A schedule of any surveys and monitoring required to be undertaken. This will include monitoring the health of riparian vegetation in the EPP wetlands surrounding the mine area as mining passes these locations. Monitoring will continue until groundwater levels return to pre mining levels.

No.	Management Action
	<ul style="list-style-type: none"> • Preparing a rehabilitation plan that includes recording local seed collection, species used in rehabilitation, trials undertaken, plant relocation, fencing and weed control. • A reporting and review schedule for the plan.
Fauna	
9.2.4a	<p>Olympia has prepared a Fauna Management Plan which identifies:</p> <ul style="list-style-type: none"> • Target areas for further surveys and possible fauna relocation programmes. • A schedule of any monitoring that is required. • A reporting and review schedule for the plan.
9.2.4b	<p>Clearing of mature trees will only occur outside the known breeding season for cockatoos, to avoid any risk to hatchling birds.</p>
Rehabilitation and Closure	
9.3.4a	<p>Olympia has prepared a Rehabilitation Management Plan which includes the following:</p> <ul style="list-style-type: none"> • Progressive rehabilitation. • Seed collection. • Species selection for rehabilitation. • Detailed rehabilitation plans for each property. • Recording and monitoring of any trials undertaken. • Fencing. • Weed control. • A monitoring schedule for works completed. • A reporting and review schedule for the plan.
9.3.4b	<p>Selective application of herbicides will occur in the spring of the first year of planting to improve establishment of planted trees. Further application of herbicide in the second year will be undertaken if required.</p>
9.3.4c	<p>Olympia has prepared a Decommissioning and Closure Plan which includes the following provisions:</p> <ul style="list-style-type: none"> • Prior to shutdown, clean-up the process facilities and process any materials, including the run-of-mine ore storage pad. • Ensure that, once infrastructure is no longer required, it is removed. • The final open pit is to be backfilled to approximately pre-mining landform levels • Salvage pumps and other equipment. • Remove all hazardous materials, machinery and equipment. • Remove remaining buildings and infrastructure, and dispose of any demolition waste off-site. • Decommission bores, seal and plug below ground. • Decommission non-essential roads including re-establishment of natural drainage lines. • Rehabilitate all disturbed areas as specified in the RMP.

No.	Management Action
Acid Soils	
9.4.4a	During operations Olympia will implement a monitoring programme to detect any changes in pH, electrical conductivity (EC) and TAA as a result of generation of acid soil effects.
9.4.4b	<p>A number of management measures are to be implemented that will serve to buffer against acid formation. These include:</p> <ul style="list-style-type: none"> • Add a limestone bed in the water dam, to serve as a buffer to acidification of the water. • Add a limestone rubble-lined spillway for any surplus water requiring to be discharged during peak flow periods. • Add agricultural lime during the reseeding and fertilising programme, as part of the rehabilitation to pasture.
9.4.4c	Trigger levels of key parameters will be defined. Olympia will prepare and implement an ASSMP if these are exceeded. Initial trigger levels are TAA > 60 milligrams per litre (as CaCO ₃) and a pH variance >10% acid trend (reducing pH level) of background levels. These trigger levels will be reviewed annually against monitoring data to ensure their relevance and accuracy during the life of mine.
Dieback Disease	
9.5.5	Implementing the management measures in Table 42 will minimise the risk of introduction and spread of the fungus in upland rehabilitation sites.
Groundwater	
9.6.4a	Olympia will prepare and implement a hydrocarbon management procedure in consultation with DoW.
9.6.4b	Olympia will prepare and implement a water operating strategy. The DOE site licence will also stipulate a monitoring and reporting requirement.
9.6.4c	Olympia will implement measures to recycle as much water as possible.
9.6.4d	Monitoring groundwater quality will continue until such time that groundwater levels have recovered following cessation of operations, to provide post-closure data.
9.6.4e	Fuel storage and workshop facilities will be located on elevated ground to ensure a two metre separation distance to the highest water table level, thus complying with the Waters and Rivers Commission (WRC) guidelines.
9.6.4f	There will be no storage of hydrocarbons on the floor of the mine pit.
9.6.4g	The wet concentrator plant will be located on elevated ground and have hardstand areas draining to sediment sumps to prevent uncontrolled drainage from the plant site.
Surface Water	
9.7.4a	Olympia will obtain the required permit to implement any diversions of minor watercourses around active mine areas.
9.7.4b	<p>Olympia will manage impacts on surface water quality by implementing the following:</p> <ul style="list-style-type: none"> • Isolating infrastructure areas that have the potential to contaminate surface water. • Constructing sediment sumps, silt and oil traps where necessary to remove sediments or pollutants from runoff before water enters local drainage. • Any spills of contaminants such as oil or fuel will be cleaned up immediately. • Monitor surface water quality around the active mine area.

No.	Management Action
9.7.4c	Surface water management structures will be designed and constructed to ensure minimum erosion potential. Diversion drains will be constructed so that water re-enters natural drainage lines at a velocity and depth that can be accommodated by the natural stream line without increased scouring.
9.7.4d	As a result of heavy rainfall events, there is the potential for increased turbidity off recently-rehabilitated areas that are not yet fully stabilised. Sedimentation basins will be constructed where required to reduce turbidity before release to the environment.
Air Emission	
9.8.4a	If diesel emissions prove to be an issue, Olympia will employ selective mining near the property to mine only when prevailing wind blows away from the property.
9.8.4b	<p>The following management and mitigation measures will be implemented to minimise and control air emissions.</p> <ul style="list-style-type: none"> • Vehicles and power generating equipment will be regularly maintained and serviced to manufacturer’s specifications to ensure efficient running of equipment and optimum fuel consumption, thereby minimising exhaust emissions. • Emissions will be reported as part of the National Pollutant Inventory.
9.8.4c	Any required permits will be obtained for burning conducted on-site. Burning will be scheduled to occur during periods when local wind forecasts show prevailing winds blowing away from adjacent residents.
Dust Management	
9.9.4	<p>Olympia has developed a Dust Management Plan (DMP) to manage particulate emissions so they do not cause environmental or human health problems. Dust control measures will include:</p> <ul style="list-style-type: none"> • Minimising clearing and open area. • Not stripping topsoil during periods of high winds. • Watering of internal traffic areas as required. • Growing of temporary ‘stubble’ crops to bind soil and decrease wind velocity at ground level. • Re-establishment of pasture as soon as possible after mining has been completed. • Using sprinkler systems around high activity infrastructure areas. • Installing a high wind warning system to enable the site to initiate dust control mechanisms in a timely manner. • Utilising clay and mulch to stabilise stockpile and non-vegetated backfill areas. <p>The DMP includes:</p> <ul style="list-style-type: none"> • Continuous wind monitoring on site linked to a warning system when threshold values are exceeded, to provide a proactive and real time management system. • The establishment of dust monitoring sites at strategic locations around the operation. • Regularly review monitoring data and investigate high results. Implement corrective actions to eliminate the causal factors.

No.	Management Action
	<ul style="list-style-type: none"> • Reporting of monitoring results will occur as required in the DoE operating licence, expected to be on an annual basis. • Regular communications will be held with adjacent landowners and a complaints management system, including investigation, action and feedback, implemented.
Noise	
9.10.5	<p>Olympia will implement the following noise management measures to ensure that:</p> <ul style="list-style-type: none"> • Noise control equipment on stationary and mobile equipment is operating correctly. • Mine planning will take into consideration the noise model results, prevailing wind direction and time (day or night operation) to schedule the location of operating plant to comply with noise standards at adjacent noise sensitive premises. • Noise emissions comply with the requirements of the <i>Environmental Protection (Noise) Regulations 1997</i> and the <i>Mining Act 1978</i>.
Waste Products	
9.11.4	<p>Olympia will implement management measures to minimise the potential for contamination of the surrounding environment due to general waste disposal as follows:</p> <ul style="list-style-type: none"> • There will be no on-site disposal of wastes. • Wastes will be stored in appropriate containers and locations including bunded areas (for hazardous materials) and bulk bins or rubbish bins (for general domestic and office refuse) • Wastes will be recycled where practicable. • General domestic and office waste will be disposed to an approved off-site landfill. • Effluent disposal systems will comply with local government health department requirements.
Dangerous and Hazardous Substances	
9.12.4	<p>Olympia will implement management measures to minimise the risk of contamination of soil, surface water and groundwater at the site:</p> <ul style="list-style-type: none"> • Develop and maintain a register of all hazardous materials imported to the site or generated as a result of activities undertaken at the site. This will document the hazardous material name, location, approximate volume, storage method and where applicable, disposal method for the substance and containers. • Locate fuel storage areas and workshops to comply with the two metre minimum separation distance to groundwater as described in WRC Policy No 1. • Fuel storage areas and workshops will be bunded in accordance with DoIR and DoE requirements. • Treat runoff contaminated with hydrocarbons prior to discharge. • Clean up hydrocarbon spills and remove contaminated soil from site. • Transport hazardous wastes generated by the operation off-site to licensed waste disposal facilities. This is likely to include waste oil, grease and mobile equipment filters. • Bring hazardous materials to the site in bulk packaging wherever possible. This will minimise the number of containers and reduce the risk of spillage.

No.	Management Action
	<ul style="list-style-type: none"> Complete major mechanical servicing and overhauling of mining equipment off-site. Conduct routine equipment and vehicle servicing activities including washdown on impermeable surfaces. Obtain a Licence to Store Dangerous Goods for the storage of diesel fuel on-site.
Heritage	
10.1.3	<p>Olympia will avoid any unnecessary disturbance to any identified Aboriginal heritage sites. Management and mitigation measures that will be implemented to achieve this will include:</p> <ul style="list-style-type: none"> Conduct an Aboriginal heritage survey of the mine area, in conjunction with Aboriginal representatives, prior to site works commencing. Comply with the requirements of the <i>Aboriginal Heritage Act 1972</i> and seek advice from the Department of Indigenous Affairs in the event that any Aboriginal heritage sites are identified during the life of the project. Olympia will ensure that all its staff and contractors on site receive an induction that includes their obligations and responsibilities under the <i>Aboriginal Heritage Act 1972</i>.
Transport	
10.2.3a	Olympia will obtain the necessary transport permits from the Shires of Murray and Serpentine Jarrahdale for transport on local roads, and Main Roads WA, for transport on the South Western Highway.
10.2.3b	Olympia will consult with the Shire of Murray on any required signage, upgrading of local intersections or road pavement that is needed for safe movement of all traffic on local roads.
10.2.3c	Olympia will consult with Main Roads WA on the intersection requirement of Readheads Road with the South Western Highway. Any required upgrade works will be undertaken to ensure safe traffic access and egress.

1.7 SUMMARY OF COMMITMENTS

Environmental commitments made by Olympia in regards to the Keysbrook project are outlined in Table 3.

Table 3: Summary of Commitments

No.	Topic	Objective	Action	Timing	Advice
1	Environmental Management	To avoid, minimise or mitigate impact to the environment	<p>Implement environmental procedures and management plans that address the management or avoidance of impacts to the environment such as impacts to:</p> <ul style="list-style-type: none"> Weeds. Groundwater quantity and quality. 	Prior to Construction	

No.	Topic	Objective	Action	Timing	Advice
			<ul style="list-style-type: none"> • Surface water. • Vegetation and flora. • Fauna. • Air, including dust impact. • Heritage. • Surrounding land use. • Noise. • Waste. • Dangerous and hazardous substances. 		
2	Environmental Management	To avoid, minimise or mitigate impact to the environment	Environmental performance achieved as a result of the environmental procedures and management plans will be audited, and procedures reviewed as necessary	During Construction	
3	Environmental Management	To avoid, minimise or mitigate impact to the environment	Implement environmental procedures and management plans that address the management or avoidance of impacts to the environment such as impacts to: <ul style="list-style-type: none"> • Weeds. • Groundwater quantity and quality. • Surface water. • Vegetation and flora. • Fauna. • Air, including dust impact. • Heritage. • Surrounding land use. • Noise. • Waste. • Dangerous and hazardous substances. 	During Operation	
4	Environmental Management	To avoid, minimise or mitigate impact to the environment	Environmental performance achieved as a result of the environmental procedures and management plans will be audited, and procedures reviewed as necessary	During Operation	