

**Proposed heavy industrial park at Mungari,  
26km south-west of Kalgoorlie**

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Landcorp

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

Environmental Protection Authority  
Perth, Western Australia  
Bulletin 675  
March 1993

## THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

## APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

## ADDRESS

Hon Minister for the Environment  
12th Floor, Dumas House  
2 Havelock Street  
WEST PERTH WA 6005

## CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 19 March, 1993.

ISBN 0 7309 4774 2

ISSN 1030 - 0120

Assessment No.750

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## Summary and recommendations

The proponent, Landcorp, proposes to establish an industrial park at Mungari, 26 km south-west of Kalgoorlie and 13km north-east of Coolgardie. The park is to cater for the development of heavy industry in the Kalgoorlie/Boulder region.

A review by the proponent of potential sites in the goldfields identified Mungari as a preferred site because of its apparently low mineral potential, proximity to infrastructure, distance from residences and drainage considerations.

The proposal to establish a heavy industry park at Mungari was referred to the Environmental Protection Authority by Landcorp on 20 August 1992. The level of assessment was set at Consultative Environmental Review. The Consultative Environmental Review was released for public review on 16 November 1992, with close of submissions on 14 December 1992. There were eight government and seven public submissions.

The Environmental Protection Authority has assessed the potential environmental impacts of the proposal, as described in the Consultative Environmental Review, and utilised additional information supplied by other government agencies, the public and the proponent. Additionally, officers of the Environmental Protection Authority carried out several site inspections and discussed environmental issues with members of the public and relevant government authorities.

The Environmental Protection Authority believes that the proposal should be considered as an exercise in changing the land use of the site from rural to one for heavy industry and the extension of existing services (infrastructure) onto the site.

Based on the information supplied in the Consultative Environmental Review and additional information supplied by the proponent during the assessment, the Environmental Protection Authority has concluded that the proposal to establish a heavy industrial park at Mungari is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental issues as provision of a buffer zone around the core industrial area of the park, air quality (sulphur dioxide from regional sources), the need to collect background environmental data and the protection of flora and fauna from unnecessary clearing. The Environmental Protection Authority believes that the commitments and assurances given by the proponent regarding its control on new industries wishing to set up in the park, by the future Mungari Industrial Park Advisory Board, are acceptable.

The Environmental Protection Authority notes that a reasonable buffer zone is proposed around the industrial park to ensure that people cannot live any closer to the park than the current Mungari homestead.

All industries proposed for the park would need to meet normal guidelines, standards and criteria for environmental protection at the boundary of the park and at the nearest residence. Proposals for industries to be located in the park would be required to demonstrate to the Environmental Protection Authority that they are able to meet operating standards at the park boundary both individually and cumulatively. The proponent may need to ensure that cumulative impacts are considered prior to new developments within the park being proposed.

The Environmental Protection Authority has concluded that subject to the type and extent of industries to be located there, the Mungari Industrial Park is likely to have little or no impact on the operations of existing emitters of sulphur dioxide in the Kalgoorlie/Boulder region.

The Environmental Protection Authority considers that the emission and monitoring of noise, atmospheric contaminants and solid and liquid waste disposal associated with the construction and operations of industries proposed for the Mungari Industrial Park should be controlled through conditions imposed by Works Approvals and subsequently, Licences, under the Environmental Protection Act.

Accordingly, the Environmental Protection Authority recommends that the proposal is environmentally acceptable and could proceed subject to the information given in the Consultative Environmental Review, in responses to issues raised during the assessment and commitments made by the proponent.

### **Recommendation 1**

The Environmental Protection Authority has concluded that the proposal to establish a heavy industrial park at Mungari is environmentally acceptable and could proceed as described in the Consultative Environmental Review and in responses to issues raised during the assessment, and subject to commitments given by the proponent.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring consideration to be:

- the provision of an adequate buffer zone around the core industrial area of the park;
- management and protection of air quality (sulphur dioxide);
- the need to collect background environmental data; and
- the protection of flora and fauna from unnecessary clearing.

The Authority believes that these issues are adequately addressed by the commitments made by the proponent (Appendix 1), the proponent's responses to issues raised in public submissions (Appendix 3), and the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's commitments to environmental management (Appendix 1) and the Environmental Protection Authority's recommendations in this report.

### **Recommendation 2**

The Environmental Protection Authority recommends that the proponent should ensure that leases or transfers of land to occupiers/purchasers within the industrial park are only made if the development proposed on that land can meet the Environmental Criteria for Establishment of Industries at Industrial Park, Mungari as amended from time to time by the Environmental Protection Authority (A copy is attached as Appendix 5).

### **Recommendation 3**

The Environmental Protection Authority recommends that the proponent should prepare and implement an Environmental Management Programme to meet the requirements of the Minister for the Environment, describing plans for, but not necessarily be limited to:

- collection of background environmental data including sulphur dioxide levels, noise levels and ground and surface water quality;
- conservation of native flora and fauna at Mungari (in the form of a Landscape Master Plan);
- cumulative environmental impact studies where appropriate; and
- periodic reporting of monitoring results and consequential changes to environmental management.

The timing of the preparation and review of the implementation of these plans should meet the requirements of the Environmental Protection Authority.

The Environmental Protection Authority concludes that the emission and monitoring of noise, atmospheric contaminants and solid and liquid waste disposal associated with the construction and operations of industries proposed for the Mungari Industrial Park will be controlled through conditions imposed by Works Approvals and subsequently, Licences, under the Environmental Protection Act.

# **1. Introduction**

The proponent, Landcorp, proposes to establish an industrial park at Mungari, 26km south-west of Kalgoorlie and 13km north-east of Coolgardie (Figure 1). The park is to cater for heavy industrial development in the Kalgoorlie/Boulder region. Provision of a suitable industrial area in the Goldfields region is expected to encourage the processing of a range of raw materials there, resulting in further employment opportunities.

A review by the proponent of potential sites in the goldfields identified Mungari as a preferred site because of its apparently low mineral potential, proximity to infrastructure, distance from residences and drainage considerations.

The proposal to establish a heavy industry park at Mungari was referred to the Environmental Protection Authority by Landcorp on 20 August 1992. The level of assessment was set at Consultative Environmental Review. The Consultative Environmental Review was released for public review on 16 November 1992, with close of submissions on 14 December 1992.

During the environmental assessment of the proposal the Environmental Protection Authority utilised information supplied by other Government agencies, the public and the proponent. Additionally, officers of the Environmental Protection Authority carried out site inspections and discussed environmental issues with interested members of the local community.

## **2. Alternative sites**

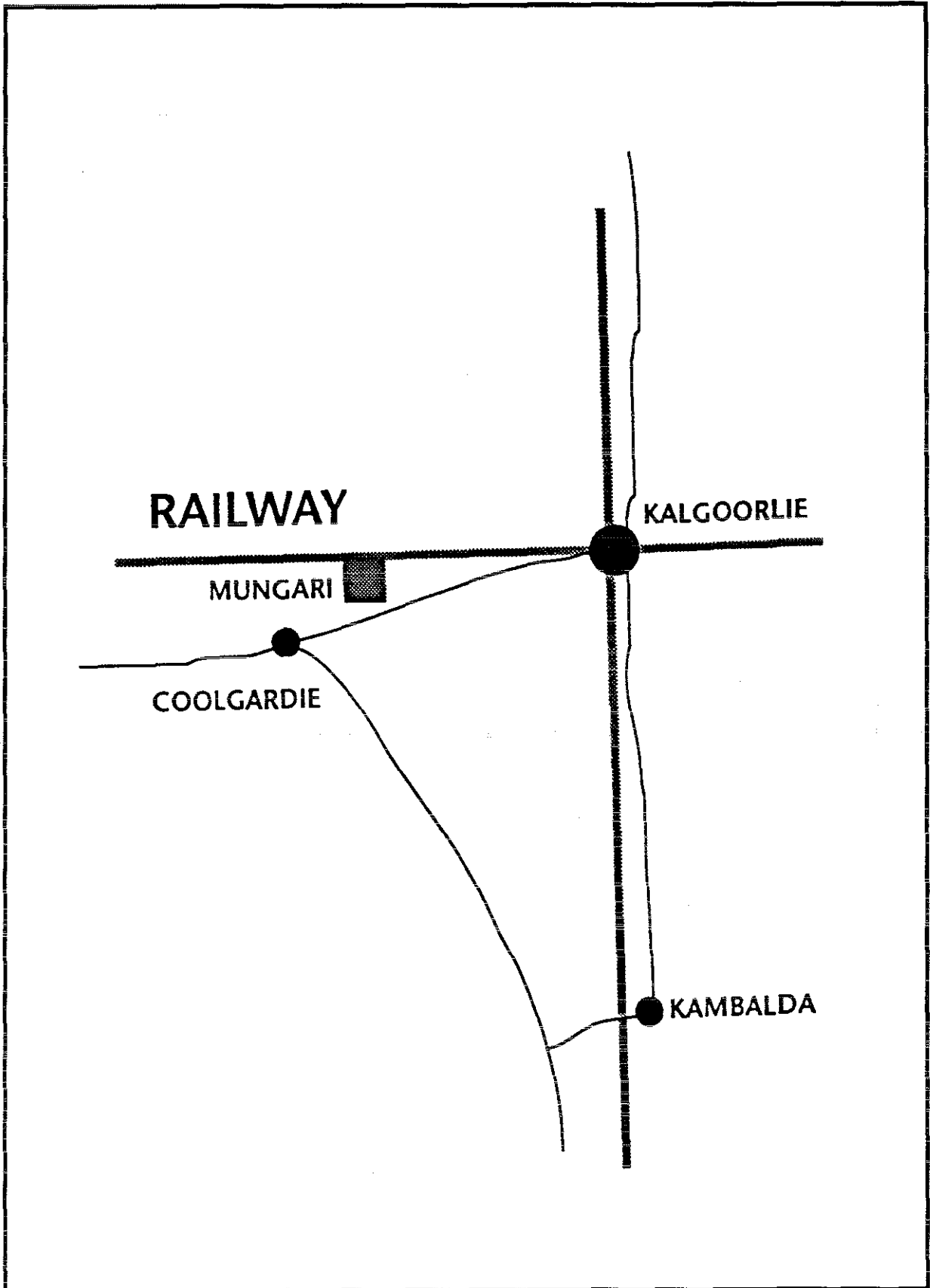
The proposed site at Mungari has evolved from earlier studies to determine a suitable site for heavy industry in the goldfields region. Studies on two of the sites previously considered, Hampton (20km south of Kalgoorlie) and Gidgi (6km north), were put out for public comment by the proponent (then called ILDA). As the study did not constitute a proposal, the Environmental Protection Authority decided not to formally assess it, but rather to offer advice during the public comment stage as set out in Bulletin 607.

The Environmental Protection Authority concluded that both the Gidgi and the Hampton sites would be manageable for heavy industry, but would be significantly affected by sulphur dioxide emissions. A workforce at an industrial park at the Hampton site could be subjected to excessive levels of sulphur dioxide from the nickel smelter during northerly winds. Similarly, any industry at the Gidgi site emitting sulphur dioxide could have problems during a northerly wind as its contribution of sulphur dioxide to the Kalgoorlie airshed would be in addition to that from the Gidgi roaster. Additionally, the workforce at the Gidgi site could be affected by sulphur dioxide from the Gidgi roaster unless further restrictions were placed on emissions from the roaster. Major objections were also raised to the Gidgi site because of its untested mineral potential.

## **3. Description of the proposal**

### **3.1 Need for the proposal**

The proponent's objective in developing the Mungari Industrial Park is to ensure that the Kalgoorlie/Boulder region has a heavy industrial site that is environmentally and socially acceptable and offers industry a viable and approved location on which to develop. Provision of a suitable industrial area in the Goldfields region is expected to encourage the processing of a range of raw materials there, resulting in further employment opportunities.



*Figure 1: Regional location for proposed Mungari Heavy Industrial Park (from proponent's Consultative Environmental Review)*



### **3.2 Potential industries for the park**

The types of industry likely to establish in the park would be those based on the mining industry, either in adding value to resources already produced in the area, or those that would manufacture products for consumption by the industry.

The types of industries identified by the proponent as having potential to locate in the industrial park could include producers of flotation reagent, surfactants, hydrated lime, sodium cyanide, calcined gypsum, titanium dioxide, acids, agricultural fertilisers, general chemicals, explosives and rare earths.

### **3.3 Site description, infrastructure and access**

The site covers 785ha and the area proposed for development by industry is 550ha (Figure 2). It is located on the boundaries of two pastoral leases, Mt Burgess to the west and Mungari to the east.

The site access would be from the Great Eastern Highway, 1.6km to the south-east. In response to submissions, the proponent has decided to change the site access road location from that shown in the Consultative Environmental Review to a more suitable alignment further to the south-west, subject to approval by the Main Roads Department.

The site is bounded to the north by the main standard gauge Kalgoorlie-Perth railway line and to the south-east by the Goldfields water pipeline. A rail spur parallel to the main line as well as within the site, has been allowed for in the conceptual planning. The 220kV powerline from Muja passes through the north-west corner of the site and a 33kV line from the Boulder substation passes along the southern boundary.

### **3.4 Buffer zones**

The present zoning of the land is rural. As part of the rezoning for the industrial park, a 1km wide buffer zone is proposed (Figure 2), within which no residential development would be allowed.

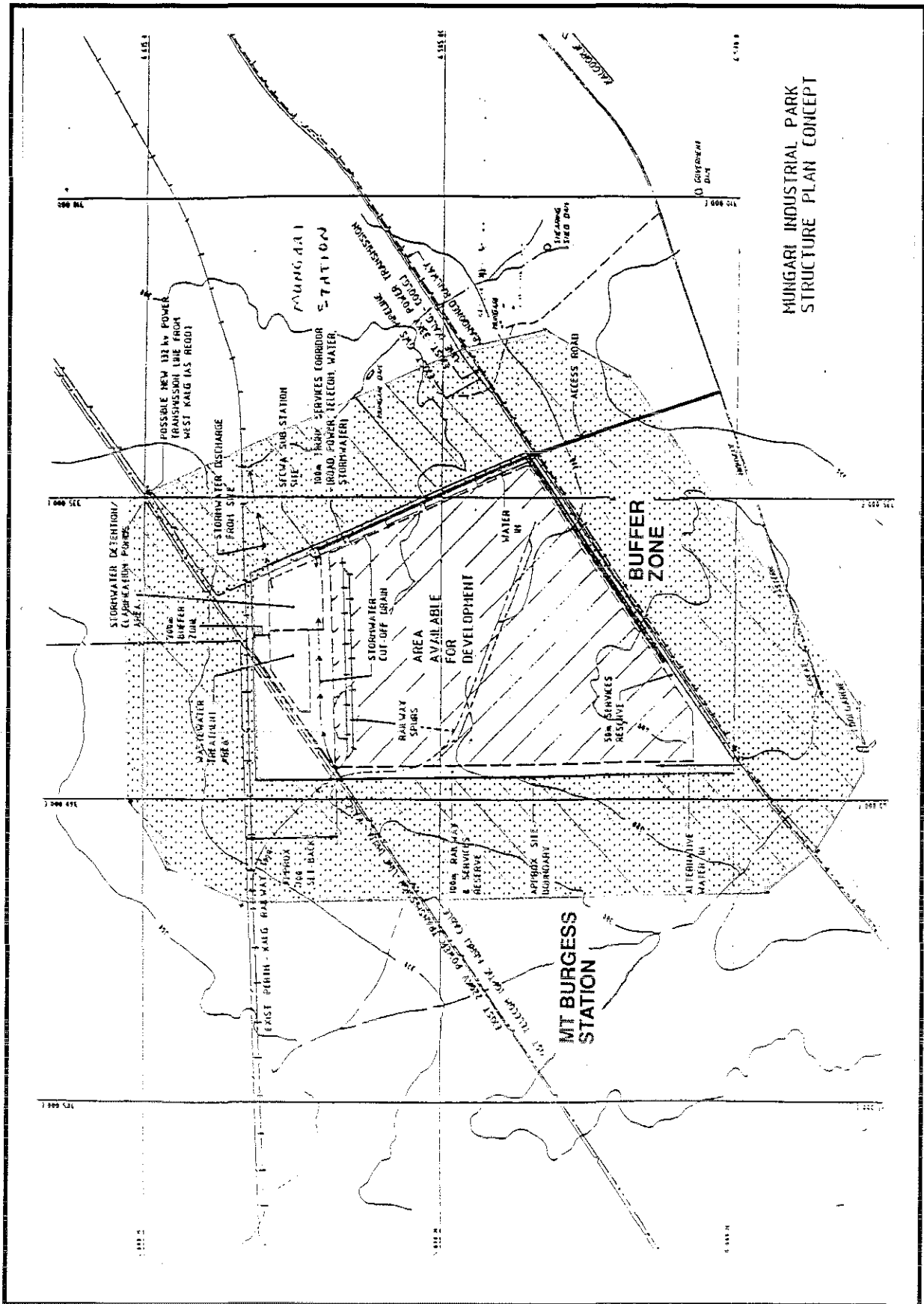
Internal buffers between industries would be developed as part of the site landscaping. Establishment of the buffers would form part of agreements with industries wishing to locate in the park.

### **3.5 Waste management**

Waste water would be processed and recirculated for use by industry wherever economically viable. Liquid waste disposal on the Mungari site would be based on the use of evaporation ponds or possibly, where nutrients are available in the waste, used for irrigation. An area has been set aside at the northern end of the site to provide for a waste water treatment plant if required.

Where solid wastes could not be recycled or disposed of on-site they would be removed to a yet to be identified and approved industrial waste landfill. Landcorp and the Department of State Development would work with the Mungari Park Management Committee, the Goldfields Esperance Development Authority and local councils to locate and develop an appropriate site.

If solid waste was to be produced that would not be suitable for disposal in a standard industrial waste disposal site, then the proponent has identified the Mt Walton hazardous disposal site as a possible location for disposal of this type of waste.



MUNGARI INDUSTRIAL PARK  
STRUCTURE PLAN CONCEPT

Figure 2: Structure plan concept for proposed Mungari Heavy Industrial Park (modified from proponent's Consultative Environmental Review)

### **3.6 Land transfer and park management**

It is proposed to set up the Mungari Advisory Board which would be responsible for management of the Mungari Heavy Industry Park. The Board would be made up of representatives from the State government, community representatives and other appropriate agencies.

Land would be sold by the proponent to companies intending to locate within the park. Industries purchasing land in the park would need to obtain all necessary environmental and other approvals before commencing operations. They would also be required to adhere to rules and regulations set down by the park's Advisory Board.

## **4. Existing environment**

The nearest population centre is the Kurrawang Aboriginal Community, 6.5km to the north-east, with a population of 80 to 100 people. Mungari Homestead is located 1km north-east of the park boundary.

An anthropological survey of the site was carried out by the Aboriginal group Wati Yinangu Tjutgurpa Mirl Mirl Association Incorporated, with the conclusion that the site did not have any traditional or historical significance for the aboriginal groups in the area.

The area has a low annual rainfall, although high intensity storms over a short duration can cause sheet flow. The site for the industrial park is relatively flat, with surface runoff draining to the east and west into streams which eventually dissipate into salt lakes. The majority of the groundwater in the area is hypersaline (up to 250,000 mg/L).

A study of the flora and fauna on the site was commissioned by the proponent in September 1992 and the results detailed in the Consultative Environmental Review. Recommendations to the proponent by the consultant pertaining to development of the site at Mungari are given in Appendix 4 of this report. The proposed industrial park contains mainly uncleared scrubland which has been used for many years for sheep grazing. The proponent indicates that no declared rare flora are present in the area, although the priority species *Eremophila parvifolia* (priority 4) was identified. A prostrate herb, *Ptilotus holosericeus*, was identified as having a restricted distribution in the area. Although not currently subject to any prioritisation, it is likely that the conservation status will be reviewed and a priority of 2 or 3 will be assigned to the species by the Department of Conservation and Land Management.

The field survey recorded 41 bird specimens, six native and five introduced mammals, 11 reptiles and one amphibian. The Scarlet-chested Parrot *Neophema splendida* (Schedule 1 on the 1990 CALM Rare and Endangered Fauna Schedule) was last recorded in the study area during the period 1950-1976. The Scarlet-chested Parrot is reported to be common in the southern part of the Great Victorian Desert. Two other species gazetted in Schedule 2, the Peregrine Falcon *Falco peregrinus* and Major Mitchell's Cockatoo *Cacatua leadbeateri*, may be present in the study area.

There appear to be no gold prospects in the area of the proposed industrial park, although a number of parties have mining tenements for granite for dimension stone.

## **5. Summary of public and government agencies' submissions**

### **5.1 Introduction**

Prior to public review of the Consultative Environmental Review, the proponent conducted an effective public consultation programme in conjunction with other agencies.

The programme included the release of information explaining the proposal, contact with local community groups including the Kurrawang Aboriginal community and the local environmental group, pastoral lease holders and government agencies. In addition, a Community Liaison Committee was established to provide input to the planning of the proposed park and to ensure that the interests of the range of groups and individuals were taken into account. A public open day was held on the site on Saturday 3 October 1992 and was attended by five members of the public.

## **5.2 Issues raised in submissions and the proponent's responses.**

It is evident that the amount of consultation undertaken as part of the preparation of the Consultative Environmental Review has ensured that issues of concern to the community were specifically examined by the proponent. This was reflected in the relatively small number of submissions received during the formal review period.

There were eight government and seven public submissions. A list of those who made submissions is given in Appendix 2.

Relevant comments from submissions fall into the following broad categories: sulphur dioxide/air quality; risk/toxicity; solid waste disposal; flora and fauna protection; drainage and liquid waste disposal; site layout and access; buffer zones; Aboriginal sites; and social impacts.

The proponent has addressed the issues relating to the potential environmental impacts with commitments, which are listed in Appendix 1 and in responses to issues raised in submissions (Appendix 3).

# **6. Potential environmental impacts and management**

## **6.1 Introduction**

The assessment of this proposal is unusual in the sense that the Environmental Protection Authority is not assessing a specific industry. Rather, the proposal is one which if approved, would enable industry to locate into a properly planned industrial park. The proposal at this time is essentially conceptual and, apart from restrictions on land use imposed on the buffer zone, does not in itself create any significant impact.

The Environmental Protection Authority considers that the establishment of the industrial park is primarily a planning exercise, involving the development and provision of infrastructure over time, the capacity for synergies between industries which choose to locate together and the opportunity to manage potential environmental impacts in a coherent, integrated manner.

In assessing the potential impact of the proposal the Environmental Protection Authority considers the main issues to be what are the likely impacts and would they be manageable if the park realises its full potential. The proponent has identified the major potential environmental impacts of industries in the proposed industrial park as air quality impacts, noise, risks and hazards, ground and surface water protection and the protection of flora and fauna.

The Environmental Protection Authority has assessed the potential environmental impacts of the proposal, as described in the Consultative Environmental Review, and utilised additional information supplied by other government agencies, the public and the proponent in response to issues raised in submissions. Additionally, officers of the Environmental Protection Authority carried out site inspections and discussed environmental issues with members of the public and relevant government authorities.

## 6.2 Flora and fauna

The biological survey initiated by the proponent has shown that the project area is diverse in both flora and fauna and encompasses landform and vegetation associations which are widespread through the Goldfields region. The landform associations are generally represented within conservation reserves in the region.

The proponent has identified the principal impacts from the construction of the proposed development to be the local loss of vegetated areas and reduction in area of some poorly represented habitats, such as dense heath shrub lands. The area loss arising from the developments is considered insignificant in comparison to the ecological landform/vegetation units represented in the region. The severe local environmental impacts in the project area are deemed not significant for these widely distributed vegetation associations.

The proponent recognises that the flora, *Eremophila parvifolia* and *Ptilotus holosericeus*, may require special protection at specific localities within the area. Further consultation and field survey to ascertain the exact distribution of this species would be carried out to determine areas which may be retained undisturbed, thereby conserving the species in the area. The proponent has indicated that appropriate planning would be applied so that the proposed industrial park would not adversely impact significant species.

The proponent considers that the impact on the fauna would be generally secondary. There would be major local impacts initially with destruction of habitat and relocation of mobile species into adjacent habitats. Impacts would be minimised by staging clearing, limiting clearing to development sites, fencing off dangerous areas and limiting road and track development.

The proponent indicates that no significant faunal habitat or community exists within the project area. The three species to be found on the site and gazetted as "rare, or otherwise in need of special protection", including the Scarlet-chested Parrot *Neopheme splendida*, Carnaby's Cockatoo *Calyptorhynchus latirostris* and the Peregrine Falcon *Falco peregrinus*, are either nomadic or wide-ranging and as such are not dependent upon any specific habitats within the project area. The proponent considers that the project presents no significant reduction in habitat or impact on resident populations of these species.

The proponent considers that nearby wetlands and the Kurrawang Nature Reserve would be protected by treating stormwater from the site to a standard suitable for discharge to the creek system and by designing and monitoring evaporation ponds to ensure that they operate correctly. Licence conditions imposed on industry should ensure that impacts were contained within the buffer zone of the park.

The Environmental Protection Authority notes that the biological survey report carried out by Ecologia on behalf of the proponent has made a number of recommendations (Appendix 4) which if implemented, could significantly reduce impacts to the biota in the project area. In response to issues raised in submissions the proponent has indicated that a landscape master plan encapsulating these recommendations would be prepared and relevant sections incorporated within the District Planning Scheme amendment required to rezone the area for industry. Individual industries locating in the park would be required to comply with the master plan.

The Environmental Protection Authority considers that although the Mungari Industrial Park is unlikely to have a major impact on the flora and fauna of the region, local impacts could be severe enough that the proponent should prepare and implement a Landscape Master Plan as part of an overall Environmental Management Programme prior to the start of clearing of vegetation (see Recommendation 3). The Landscape Master Plan should incorporate as many of the recommendations made by Ecologia in their report as practicable.

## 6.3 Buffer zones

The Environmental Protection Authority considers that all proposed industrial parks which have the potential for pollution beyond their boundaries should make provision for a buffer

zone. With an appropriate buffer zone issues such as noise, air emissions, odour, leachates, risks and hazards and ground and surface water impacts are more easily able to be managed properly. The size of any buffer zone between industrial and surrounding residential areas is dependent on the type and number of hazardous industries, the properties of the materials involved, the quantity and physical conditions of the materials stored and meteorological and topographical conditions.

The proponent proposes to restrict land use within the buffer zone area of the pastoral leases by excluding future residential development. Such a restriction is best achieved through the planning system.

In response to submissions, the proponent has indicated that the development plan (yet to be prepared) would ensure that the Mungari Homestead located about 1km from the boundary of the park, would be outside the buffer zone.

A submission to the Environmental Protection Authority indicated that a significant part of the area nominated for the buffer zone is cleared. The proponent has responded by agreeing to tree planting within the buffer zone adjacent to the Homestead and along the abandoned railway line and within the area of the old Mungari Townsite.

The Environmental Protection Authority considers that the issue of compensation for the imposition of restrictions on the use of the land comprising the proposed industrial park and buffer zone could be addressed through legislation specific to the administration of pastoral leases. A negotiated settlement should be reached between the affected lease holders and the proponent.

The Environmental Protection Authority considers that environmental issues associated with ongoing management of the buffer zone should be managed by the implementation and preparation of an Environmental Management Programme (see Recommendation 3)

## **6.4 Environmental criteria for industry**

### **6.4.1 Transfer of commitments**

In the Consultative Environmental Review the proponent made a number of environmental management commitments in order to protect the environment. The proponent has since modified these commitments as some would be the responsibility of the proponent and others the responsibility of future occupiers of the separate industrial sites. The commitments are presented in Appendix 1 as the proponent's consolidated commitments (Appendix 1) and as Environmental Criteria for Establishment of Industries in the Mungari Industrial Park (Appendix 5).

The Environmental Protection Authority considers that the proponent in implementing the proposal, should fulfil its commitments. The Criteria for Establishment of Industries in the Mungari Industrial Park may not be the only requirements for industry to be located within the park, however they should be used as a minimum standard.

The Environmental Protection Authority considers that the proponent should ensure that leases or transfers of land to occupiers/purchasers within the industrial park are only made if the development proposed on that land can be shown to meet the Environmental Criteria for Establishment of Industries at the Mungari Industrial Park as amended from time to time by the Environmental Protection Authority (see Recommendation 2).

### **6.4.2 Waste management**

Evaporation is considered by the proponent to be the preferred option for liquid waste disposal at Mungari. Potential environmental impacts that could arise from a large area of evaporation ponds are leakage and odour.

Ponds would be designed to reduce seepage rates to a level between  $10^{-8}$  and  $10^{-9}$  m/s. At this rate the ponds would have negligible effect on a groundwater that is already hypersaline. The proponent has indicated that a monitoring programme would be established in conjunction with the Environmental Protection Authority, the Water Authority of Western Australia, industry and Mungari Park Management to check for any leakage into the groundwater. Should any impact occur on the groundwater, the specific industry responsible would be required to rectify pond performance.

The normal source of smell is from anaerobic digestion ponds associated with agricultural processing where the liquid has a high biological oxygen demand level. Odour is largely related to overloading the pond's ability to support the BOD causing a release of hydrogen sulphide. In order to ensure that this type of smell is not generated within the park, the proponent has indicated that the park management would ensure that all waste water treatment systems with the potential to smell are managed in a manner which makes the generation of smell unlikely. If problems with odour do arise, park management would ensure that remedial action was undertaken to eliminate the problem.

The disposal of suitable waste water by irrigation would have to clearly show that no build-up of potential pollutants was occurring due to irrigation and that there was no effect on surrounding groundwater or soil salinity. This would be managed by monitoring of specified elements in crops and soil, cropping and ultimate export from the area, and rotation of area under irrigation.

Liquid wastes that are not suitable for disposal to on-site evaporation ponds or could not be treated on site to produce such a waste, could be transported off-site for disposal at a facility such as the Perth Industrial Waste Treatment Facility at Forrestdale or other appropriate facilities.

Any hazardous waste generated on the sites would be transported to Mount Walton for disposal at the government's secure storage site or to alternative sites acceptable to the Environmental Protection Authority.

The various options for the disposal of solid waste from the Mungari Industrial Park include recycling and approved local land fill sites and lined land fill sites. Odour associated with putrescible wastes would be controlled by removing such wastes on a regular basis for disposal to landfill.

The Environmental Protection Authority notes that the intentions of the proponent in relation to the design and construction of waste water treatment and disposal systems, action in the event of leakage from evaporation ponds, and the manner of solid waste disposal. The proponent has also committed (Appendix 1) to work in conjunction with the Mungari Park Advisory Board, Goldfields Esperance Development Authority and the local shires to locate a site suitable for disposal of solid industrial waste, in accordance with the requirements of the relevant government agencies. The Environmental Criteria for Industries to Establish in the Mungari Industrial Park (Appendix 5) specify requirements for industry in regard to waste disposal.

The Health Department has submitted that it has a primary role in all waste disposal systems for solid and liquid waste. The suitability of using leach drains for on-site disposal of liquid effluent in heavy clay soils was also questioned. The proponent has responded that should the soils be unsuitable for this method of disposal, alternative disposal methods would be assessed, such as anaerobic digestion, evaporation and irrigation.

Some concern was raised in public submissions that evaporation ponds with toxic substances could represent a significant hazard to nomadic water fowl. The proponent has indicated that a range of landing deterrents may be necessary including the use of mesh, compressed air scarers and flapping devices.

Proponents of industries intending to locate within the proposed Mungari Industrial Park which have the potential for ground or surface water pollution would be required to apply for a Works Approval and Licence in accordance with Part V of the Environmental Protection Act.

### 6.4.3 Sulphur dioxide

For many years the Kalgoorlie/Boulder region has experienced high concentrations of sulphur dioxide in the air, mainly as a result of the operations of three small gold roasters at Boulder and the Kambalda Nickel Smelter. With the development of the satellite Gidji Gold Roaster these smaller roasters have been closed and as a consequence the air quality in the residential areas of Kalgoorlie/Boulder has improved considerably. However, short term events with high sulphur dioxide concentrations still occur under some circumstances.

In order to control sulphur dioxide for residential areas of the Kalgoorlie/Boulder region, the Environmental Protection Authority implemented an Environmental Protection Policy in 1988. The purpose of this policy was to achieve and maintain a level of air quality appropriate to the residential areas of a mining town. The Environmental Protection Policy specified acceptable levels of sulphur dioxide over various averaging periods and the objectives are achieved by applying conditions on the operating licences of existing industries which emit sulphur dioxide.

A new Environmental Protection Policy was released for comment by the Environmental Protection Authority in February 1992 and after appropriate modifications, gazetted as the Environmental Protection (Goldfields Residential Areas) (Sulphur dioxide) Policy and Regulations 1992 in January 1993. The new Environmental Protection Policy is different to the previous Environmental Protection Policy in that it extends the area to be protected to include Kambalda, Coolgardie and Kurrawang, and more stringent air quality objectives have been introduced. The new Environmental Protection Policy, which is summarised below, specifies a four year phasing in period to introduce an air quality limit of 1400 ug/m<sup>3</sup> (not to be exceeded at any time) and an air quality standard of 700 ug/m<sup>3</sup> (desirable not to exceed). Compliance by industry with the standard is expected for 99.9% of the time. A tightening of these standards in the future is not precluded.

**Table 1. Air quality objectives**

Limit	Standard	Averaging period
1400 ug/m <sup>3</sup>	700 ug/m <sup>3</sup>	1 hour

**Table 2. Ambient air quality limits for sulphur dioxide**

Commencing date	Limit	Averaging period
29 January 1993	1300 ug/m <sup>3</sup>	3 hours
1 January 1994	2000 ug/m <sup>3</sup>	1 hour
1 January 1995	1800 ug/m <sup>3</sup>	1 hour
1 January 1996	1600 ug/m <sup>3</sup>	1 hour
1 January 1997 and 1 January in each succeeding year.	1400 ug/m <sup>3</sup>	1 hour

**Table 3. Minimum levels of compliance with standards**

Commencing Year	Number of hours over standard
1993	131
1994	131
1995	87
1996	43
1997	8



The objectives of the new policy will be achieved by applying conditions to the operating licences of industries which emit sulphur dioxide. The licence conditions, ambient air quality limits and ambient air quality standards are legally established by being prescribed in the regulations. The air quality limit will be enforced as a condition of licences to industries which emit sulphur dioxide. A breach of that licence condition is an offence under the Environmental Protection Act and may result in prosecution. The regulations specify the level of compliance with the standard. A single exceedance of the limit, or a greater number of exceedances of the standard than may be specified in licences of industries emitting sulphur dioxide, would be considered a breach of licence.

A number of submitters to the Environmental Protection Authority were concerned that if the industrial park at Mungari was established, the new Environmental Protection Policy would be extended to cover this area which could result in further shutdowns to industry. At this stage the Environmental Protection Authority does not intend to include any new industrial areas such as Mungari in the new Environmental Protection Policy. However the Environmental Protection Authority would review this position if and when a substantial workforce was located in the Mungari Industrial Park and monitoring showed that the area was affected by significant levels of sulphur dioxide. The Mungari Industrial Park would be considered in the same light as other developments outside the Environmental Protection Policy area such as operating minesites and pastoral communities.

Some submissions indicated that any increase in sulphur dioxide emissions (as a result of industries establishing at Mungari) would make it more difficult for existing companies to comply with the Environmental Protection Policy. The Environmental Protection Authority considers that operators and proponents of projects should take all reasonable and practicable measures to prevent or minimise the discharge of waste. The unnecessary utilisation of the environment's capacity to accept discharges of waste may preclude future developments which may be considered desirable by the community. A proponent would be expected to assess cumulative effects of its proposal together with existing emitters such as Kambalda Nickel Smelter and Gidgi Gold Roaster and show how the cumulative impact meets the Environmental Protection Policy criteria prevalent at that time.

The Environmental Protection Authority concludes that subject to the type and extent of industries to be located there, the Mungari Industrial Park is likely to have little or no impact on the operations of existing emitters of sulphur dioxide in the Kalgoorlie/Boulder region.

#### **6.4.4 Noise**

Heavy industry produces noise and usually operates 24 hours per day. The Environmental Protection Authority considers that noise emissions from any project should not exceed:

- 40 dB LA10, 1 hour slow between 2200 hours and 0700 hours on any day when measured on any noise-sensitive premises;
- 45 dB LA10, 1 hour slow between 1900 hours and 2200 hours on any day, and between 0700 hours and 1900 hours on Sundays and gazetted public holidays, when measured on any noise-sensitive premises;
- 50 dB LA10, 1 hour slow between 0700 hours and 1900 hours on Monday to Saturday inclusive, when measured on any noise-sensitive premises; and
- 65 dB LA slow when measured at or near the boundary of premises that are not noise-sensitive premises (other industries).

where such emissions would result in the noise level present at the affected premises exceeding the ambient noise level present at any time by more than 5 dB LA slow. Noise emissions from those activities which are of concern to occupiers of noise-sensitive premises should not exhibit tones, amplitude and frequency modulation and impulsiveness of a nature which increases the intrusiveness of the noise. Noise surveys and assessments should be conducted in consultation with the Environmental Protection Authority. More detail on noise requirements are provided in Appendix 5.

#### **6.4.5 Dust**

The concentration of airborne dust contributed by any premises licensed under the Environmental Protection Act should not exceed the acute impact level of 1000 micrograms per cubic metre, averaged over 15 minutes, at the boundary of the premises. For the longer term, at residences the NH&MRC guideline of an annual mean of 90 micrograms per cubic metre, measured over 24 hour periods should not be exceeded.

#### **6.4.6 Risks and hazards**

The Environmental Protection Authority has established risk assessment criteria and processes that account for both the technical and the locational safety aspects of hazardous industry. Present criteria for individual fatality risk levels are given in the Environmental Protection Authority Bulletin 611 as follows:

- a. a risk level in residential zones of one in a million per year or less, is so small as to be acceptable to the Environmental Protection Authority;
- b. a risk level in "sensitive developments", such as hospitals, schools, childcare facilities and aged care having developments of between one half and one in a million per year is so small as to be acceptable to the Environmental Protection Authority;
- c. risk levels from industrial facilities should not exceed a target of fifty in a million per year at the site boundary for each individual industry and the cumulative risk level imposed upon an industry should not exceed a target of one hundred in a million per year;
- d. a risk level for any non-industrial activity located in buffer zones between industrial facilities and residential zones of ten in a million per year or lower is so small as to be acceptable to the Environmental Protection Authority.

The term "individual risk level" refers to the frequency per year (the measure of likelihood) of death of an individual due to an accident. Individual risk levels are typically represented by a series of contours showing the risk of fatality to an individual at a certain place over a year of exposure to a particular hazard.

Landcorp has indicated that as a gas pipeline to Mungari does not exist, industry requiring gas would have to be supplied with LPG by rail and/or road. Individual industries would receive gas delivery by truck to dedicated storage facilities. The acceptability of such storage facilities would be determined by the Environmental Protection Authority during the environmental assessment of each project.

Should an explosives manufacturing plant or area be proposed for the Mungari area, a separate industrial area would probably be required, as Department of Minerals and Energy Regulations require a 1km safety separation distance between the explosives facility and other industry.

The Environmental Protection Authority points out that any industry wishing to locate in the Mungari Industrial Park that has a potential to cause risk impacts on the surrounding communities will be required to carry out a risk analysis to show that it can meet the Environmental Protection Authority criteria. The proponent has given a commitment (Appendix 1) that a model of the cumulative risk levels associated with the Mungari Industrial Park will be generated to ensure that the individual risk levels are maintained within the guidelines established by the Environmental Protection Authority in Bulletin 611. The Environmental Criteria (Appendix 5) state that each intending occupier who would be engaged in hazardous activities in the Mungari Industrial Park shall participate in the preparation of a model of cumulative risk levels which should be generated to ensure that the above criteria are met.

### **6.5 Social impacts**

The proponent has undertaken a social impact study which examined the potential impact on the area around Coolgardie and Kalgoorlie. The study examined the broad issues of population trends, employment characteristics, infrastructure, transport and tourism, and concluded that the impacts of the park, when fully developed, could be accommodated and managed properly.

The Environmental Protection Authority concludes that these impacts can be readily managed and would not adversely affect the communities at Coolgardie and Kalgoorlie.

Potential impacts on nearest neighbours, especially the Mungari Homestead and the Kurrawang Aboriginal community, were examined by the proponent and direct discussions held with appropriate representatives. It is the Environmental Protection Authority's view that all issues of concern can be managed and accommodated by the proponent. In this regard the Environmental Protection Authority supports the proposed Mungari Advisory Board which should ensure ongoing community involvement as the park develops.

The proponent has committed to continued consultation and liaison with the local communities (Appendix 1). The Environmental Protection Authority is satisfied that the recommendations of this report and the commitments by the proponent will ensure that social impacts associated with the establishment of industries at Mungari are adequately managed.

## **6.6 Aboriginal sites**

In response to issues raised during submissions concerning consultation with Aboriginal groups in the area, the proponent has indicated that the party utilised for the ethnographic component of the study had held discussions with other local Aboriginal groups and communities. A report had been prepared for submission to the Department of Aboriginal Sites which indicates that there are no sites of significance within the boundary of the core industrial site.

The Environmental Protection Authority suggests that the proponent discuss with the Department of Aboriginal Sites of the West Australian Museum appropriate ways of complying with the provisions of the Aboriginal Heritage Act 1972-80.

## **6.7 Monitoring and cumulative impacts**

The proponent has indicated that in order to assess changes at the site due to industry development, background data would be developed on groundwater (salinity and nutrients), air quality and noise levels. In response to submissions, the proponent has proposed that should the park receive environmental approval, a sulphur dioxide monitor would be established on site.

Monitoring bores may be required around the evaporation ponds to monitor any seepage that could occur and facilitate recovery if necessary. Monitoring programmes would also be established by individual industries as agreed with the responsible authorities (Environmental Protection Authority, Water Authority of WA). Results of these monitoring programmes would be reported to the relevant authorities with copies to the Park Advisory Board.

The proponent has indicated that should an unplanned environmental impact occur, the incident would be reported to the Environmental Protection Authority and other responsible authorities and remedial action taken by the responsible industry to rectify the impact. Remedial action would be overseen by the Advisory Board. Should levels of air emissions exceed the parameters specified in the Consultative Environmental Review then the industry responsible for the emission will be required to cease operations until the emission can be brought within acceptable levels.

The Environmental Protection Authority considers that the proponent should collect sufficient background data on environmental parameters such as ground and surface water quality, air quality and noise at Mungari and other environments likely to be impacted by industries to be located there, prior to the establishment of those industries within the park. To ensure that any cumulative impacts of industry on adjoining lands are managed, the Environmental Protection Authority considers that the proponent may need to undertake cumulative environmental impact studies during the life of the project (see Recommendation 3). Proponents for industries to be located in the park would be required to demonstrate to the Environmental Protection Authority that they are able to meet operating standards at the park boundary both individually and cumulatively.

## **7. Conclusions and recommendations**

Based on the information supplied in the Consultative Environmental Review and additional information supplied by the proponent during the assessment, the Environmental Protection Authority concludes that the proposal to establish a heavy industrial park at Mungari is environmentally acceptable. In reaching this conclusion, the Environmental Protection Authority identified the main environmental issues as provision of a buffer zone around the core industrial area of the Park, management and protection of air quality (sulphur dioxide), the need to collect background environmental data, and the protection of flora and fauna from unnecessary clearing.

The Environmental Protection Authority concludes that the proposal should be considered as an exercise in changing the landuse of the site from rural to one for heavy industry and the extension of existing services (infrastructure) onto the site.

The Environmental Protection Authority notes that a reasonable buffer zone is proposed around the industrial park to ensure that people cannot live any closer to the park than the current Mungari homestead.

The Environmental Protection Authority concludes that, subject to the type and extent of industries to be located there, the Mungari Industrial Park is likely to have little or no impact on the operations of existing emitters of sulphur dioxide in the Kalgoorlie/Boulder region.

### **Recommendation 1**

**The Environmental Protection Authority has concluded that the proposal to establish a heavy industrial park at Mungari is environmentally acceptable and could proceed as described in the Consultative Environmental Review and in responses to issues raised during the assessment, and subject to commitments given by the proponent.**

**In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring consideration to be:**

- the provision of an adequate buffer zone around the core industrial area of the park;**
- management and protection of air quality (sulphur dioxide);**
- the need to collect background environmental data; and**
- the protection of flora and fauna from unnecessary clearing.**

**The Environmental Protection Authority believes that these issues are adequately addressed by the commitments made by the proponent (Appendix 1), the proponent's responses to issues raised in public submissions (Appendix 3), and the Environmental Protection Authority's recommendations in this report.**

**Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's commitments to environmental management (Appendix 1) and the Environmental Protection Authority's recommendations in this report.**

The Environmental Protection Authority considers that it could be necessary or desirable to make minor and non-substantial changes to the designs and specifications of the proposal which were examined as part of the Environmental Protection Authority's assessment. Accordingly, the Environmental Protection Authority considers that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

The Environmental Protection Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

The Environmental Protection Authority notes that during the detailed implementation of proposals, it is often necessary to make minor and non-substantial changes to the designs and specification which have been examined as part of the Environmental Protection Authority's assessment. The Environmental Protection Authority considers that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

### **Recommendation 2**

**The Environmental Protection Authority recommends that the proponent should ensure that leases or transfers of land to occupiers/purchasers within the industrial park are only made if the development proposed on that land can meet the Environmental Criteria for Establishment of Industries at Industrial Park, Mungari as amended from time to time by the Environmental Protection Authority (A copy is attached as Appendix 5).**

### **Recommendation 3**

**The Environmental Protection Authority recommends that the proponent should prepare and implement an Environmental Management Programme to meet the requirements of the Minister for the Environment, describing plans for, but not necessarily be limited to:**

- **collection of background environmental data including sulphur dioxide levels, noise levels and ground and surface water quality;**
- **conservation of native flora and fauna at Mungari (in the form of a Landscape Master Plan);**
- **cumulative environmental impact studies where appropriate; and**
- **periodic reporting of monitoring results and consequential changes to environmental management.**

**The timing of the preparation and review of the implementation of these plans should meet the requirements of the Environmental Protection Authority.**

The Environmental Protection Authority concludes that the emission and monitoring of noise, atmospheric contaminants and solid and liquid waste disposal associated with the construction and operations of industries proposed for the Mungari Industrial Park will be controlled through conditions imposed by Works Approvals and subsequently, Licences, under the Environmental Protection Act.

The Environmental Protection Authority points out that the proponent's compliance with Environmental Conditions and the conditions of Works Approvals and Licences will be periodically audited. Pollution control limits and other conditions will be periodically reviewed and may be modified by the Environmental Protection Authority in the light of operating experience.

# **Appendix 1**

**Landcorp**

**Consolidated list of environmental management commitments**

## PROPONENT'S COMMITMENTS

### PROPOSED HEAVY INDUSTRY SITE AT MUNGARI, 26KM SOUTH-WEST OF KALGOORLIE (750)

#### LANDCORP

The proponent has made the following environmental commitments:

**1. General**

The park will be developed according to all relevant government statutes and agency requirements.

**2. Waste disposal**

The proponent will initiate a study incorporating the Goldfields Esperance Development Authority and local shires to locate a suitable industrial waste site as soon as environmental approval for the Mungari site has been received from the Minister for the Environment.

**3. Risks and hazards**

A model of the cumulative risk levels associated with the Mungari Industrial Park will be generated to ensure that the individual risk levels are maintained within the guidelines established by the Environmental Protection Authority in Bulletin 611.

**4. Social commitments**

1. The proponent will establish an advisory board for the Mungari Industrial Park made up of representatives from government agencies, community representatives and other appropriate agencies (i.e. workers, industry).
2. Ongoing community consultation will be one of the tasks of the advisory board.
3. Encouragement of the development of local employment strategies will be one of the tasks of the advisory board.
4. The advisory board will ensure the Environmental Protection Authority is notified of firm proposals by industries offering to locate in the park.

## **Appendix 2**

**List of government agencies and members of the public  
who made a submission**



Health Department of Western Australia  
Water Authority of Western Australia  
Department of Conservation and Land Management  
Department of Planning and Urban Development  
Main Roads Department  
Department of Aboriginal Sites, WA Museum  
WA Government Railways Commission  
City of Kalgoorlie-Boulder  
Dodsley Pty Ltd (for quarrying of granite)  
Western Mining Corporation Ltd  
Kalgoorlie Consolidated Gold Mines Pty Ltd  
B M, N F and H C Scanlon (Mungari Station)  
Kurrawang Aboriginal Christian Community Inc  
Gubrun Aboriginal Corporation  
D Sheehan

## **Appendix 3**

**Proponent's responses to public submissions**

## MUNGARI ENVIRONMENTAL ISSUES

### 1. Sulphur Dioxide/Air Quality

- 1.1 What assurance is there that the proposed industrial park will not impact on the operations of the Kambalda Nickel Smelter and the Gidgi Gold Roaster in the future?
- 1.1 The impact of both KNS and GGR will be determined by the EPA. The proposed site is not currently protected by an EPP and as an industrial site it is not expected that domestic standards will be applied to the area.
- 1.2 Is there more information on proposed monitoring of air quality around the park?
- 1.2 It is proposed that should the park receive environmental approval to proceed, an SO<sub>2</sub> monitor would be established on site to log concentration within the park and thus determine accurate air quality and impact.
- 1.3 How would air pollution standards be enforced within the park?
- 1.3 The industry locating in the park will be subject to approval by the EPA who will set and enforce licence conditions.
- 1.4 How would cumulative impacts of emissions on vegetation and air quality be monitored?
- 1.4 Each individual industry would be required to monitor its own emissions in accordance with its licence conditions. An SO<sub>2</sub> monitor would be established on site (see 1.2). The decision in regard to further cumulative monitoring will be determined by the EPA.

### 2. Risk/Toxicity

- 2.1 What type of toxic substances would be utilised and transported, and what management procedures would be used to protect the nearby communities?
- 2.1 It is not known what industries will be locating at Mungari, therefore knowledge of substances to be used in the Park is not available. Any industry transporting toxic substances would require licensing and approvals through the Department of Minerals & Energy and the EPA. Management procedures will be imposed on individual industries by the relevant authorities.
- 2.2 Is it proposed that an explosives manufacturing facility could be located within the estate? If so, what precautions could be taken to ensure the safety of people working and living in the vicinity?
- 2.2 No proposals have been received to locate an explosives manufacturing facility within the estate. Any industry locating within the estate would need to meet environmental and safety requirements stipulated by the EPA. Any explosive facility would also have to meet Mines Department regulations.

### 3. Solid Waste Disposal

- 3.1 What consideration would be given to utilisation of open cut mine pits for the purpose of solid waste disposal?
- 3.1 Should disused open cut mine pits be environmentally acceptable for acceptance of solid waste and the pits were of no further economic value, consideration would be given to their use.

- 3.2 The heavy clay soils may not be suitable for on-site disposal of liquid effluent by leach drains. What other alternatives would be available for future industries to dispose of this material?
- 3.2 Further detailed engineering studies will be carried out on site development once approvals have been received for the industrial park. This will include assessment of suitability of soils for leach drains. Should the soils prove incompatible with leach drain systems, the alternative disposal methods such as anaerobic digestion, evaporation and irrigation will be assessed.

#### 4. Flora and Fauna

- 4.1 Evaporation ponds with toxic substances represent a significant hazard to nomadic waterfowl. What type of landing deterrent would be considered?
- 4.1 A range of preventative measures are possible depending on the scale of the evaporation pond. It is possible that a combination of methods will be necessary at Mungari Industrial Estate:

- . Small ponds can be covered with mesh. However, it is probable that total coverage is not feasible given the size of ponds envisaged.
- . For large ponds compressed air "scarers" which produce an intermittent loud noise can be used. It has been found at other sites within the Goldfields that such devices are most effective when used in the evening when birds are roosting for the night.
- . Another method feasible for large ponds is the use of wire strainers, to which flapping devices such as tape are attached, strung across the pond.

It is considered that a part of the environmental approval process individual industries locating in the Park will be required to address this issue if relevant to their operations.

- 4.2 How would the proponent ensure that the conservation and recreational value of wetlands west of the site would not be jeopardised by the discharge of insufficiently treated wastewater?
- 4.2 Stormwater run off from the site will be treated to such an extent as to render it safe and suitable for discharge into the creek system. Evaporation ponds will be designed to standards suitable to the EPA and Water Authority and monitoring bores established by industry to ensure these ponds operate within design parameters.
- 4.3 The Kurrawang Nature Reserve (12 km east) has high conservation value for small mammals. How would this area be considered in the monitoring of direct and indirect impacts of developments in the park?
- 4.3 Licence conditions imposed on industry will ensure that impacts of the park will be contained within the designated buffer zone. SO<sub>2</sub> monitoring has been discussed in 1.4 and stormwater and seepage in 4.2.

- 4.4 How would future projects for the park be assessed and monitored for their cumulative rather than individual environmental impacts?
- 4.4 It is proposed that cumulative hazard and risk modelling will be carried out to ensure that individual industries do not impact adversely on each other or that cumulative impact will not breach the integrity of the buffer zone.
- 4.5 The 5 Year Landcare Plan for Mungari Station will need to be revised to accommodate impacts of the industrial park. How will the proponent be assisting with this revised plan?
- 4.5 Discussions have been held with the Mungari Station Pastoralist and the land care plan will be addressed during the course of negotiations to secure the relevant areas of pastoral lease, in order to ensure that the current land care plan is not adversely affected by the proposal.
- 4.6 The EPA notes that the biological survey report carried out by Ecologia on behalf of the proponent has made a number of recommendations which, if implemented, could significantly reduce impacts to the biota in the project area. What additional commitments is the proponent prepared to make in the light of these recommendations?
- 4.6 As discussed in Section 7.9 of the report, appropriate planning will be applied so that the proposed industrial park will not adversely impact significant species. These steps will include staging clearing, limiting clearing to development sites, fencing off dangerous areas and limiting road and track development.

The proponent will prepare a landscape master plan encapsulating the recommendations of the Flora and Fauna Study will be prepared and relevant sections incorporated within the District Planning Scheme amendment required to rezone the area for industry. Individual industries locating in the park will be required to comply with this master plan.

## 5. Drainage

- 5.1 How would stormwater be discharged to the east of the site (uphill) when natural stormwater discharge is to the north?
- 5.1 The confusion over direction of flow has arisen because there is an error in the co-ordinates on the Structure Plan. This will be rectified when a detailed structure plan is prepared for the site.
- 5.2 Would drainage from the industrial area drain into the creek system which flows through the Kurrawang property? If so, what impact is this likely to have on the community and emu farm located there?
- 5.2 The stormwater run-off from the site will be treated to such an extent to render it safe and suitable for discharge into the creek system and any discharge from the site will be monitored to ensure its quality.

- 5.3 The waste water treatment and stormwater detention ponds appear to be situated in an unsuitable area where there is much rock outcrop. Is this the case, and what alternative areas are available?
- 5.3 The suitability of otherwise of the area designated for stormwater and wastewater treatment will be dependent on detailed site investigations and the method of treatment to be adopted. Given the general landform over the site, i.e. sandy clay in varying depths of approximately 1-6 m, overlaying rock. It is expected that a site will be available within the general area designated for treatment.

## 6. Site Layout and Access

- 6.1 What are the relative merits of locating service corridors in the centre of the park, compared with on the perimeter, as proposed?
- 6.1 The final layout of the park will be determined via a detailed engineering assessment and planning exercise. The location of service corridors along boundaries gives the park core flexibility for development. The final layout could see the location of a service corridor in a central location.
- 6.2 Have discussions been held with Westrail regarding the rail layout for the park?
- 6.2 Preliminary discussions have been held with Westrail, however detailed design will not be undertaken until environmental approval is given.
- 6.3 It has been submitted that road access to the site should be further to the south-west, because of less potential impacts (noise, dust, lights) on Mungari Homestead, the road would be on high ground (reducing need for culverts and probability of flooding), and the route is shorter (less cost and environmental impacts). What consideration has the proponent given to these factors in the designation of the road access?
- 6.3. The proponent agrees with the submission and agrees to relocate the access to the south-west, providing MRD approval is forthcoming.
- 6.4 Would the proponent take action to ensure that the existing access to Mungari Homestead should be degazetted and included in the Pastoral Lease, when access to the industrial park is established?
- 6.4 This is not considered an issue relevant to the impact of the park. However, the proponent will have no objection to the degazetment of the road.
- 6.5 What consideration would be given to access for the nearby granite quarry in the detailed planning of roads for the park?
- 6.5 The proponent has had discussions with the mining company concerned. The proposed route is in accordance with 6.3.

## 7. Buffer Zone

- 7.1 Mungari Homestead is situated within the eastern extremity of the proposed buffer zone. Given that heavy industry could be located in the park within 1 km of this residence, how would the proponent ensure that the people living there would not be affected? Should impacts occur, what action could the proponent carry out to rectify the situation?
- 7.1 The exact distance of the Mungari Homestead from the park is yet to be determined. It is indicated that the residence is outside the 1 km buffer zone, and the development plan will ensure that a 1 km buffer is maintained.

The EPA will be responsible for the imposition of licence conditions on industry to ensure impacts are contained within the buffer zone.

- 7.2 It has been submitted that much of the area nominated for the 1 km buffer around park is cleared. To reduce the impact of industries in the park on the Mungari Homestead, it has been suggested that a buffer of trees should be planted on the southern and eastern boundaries, and along the old railway alignment. What consideration has the proponent given to this aspect?
- 7.2 The proponent has met with the pastoral lease holders at Mungari and has agreed to tree planting within the buffer zone adjacent to the homestead and along the abandoned rail line. Additional planting within the area of the old Mungari Townsite has also been agreed.
- 7.3 Would there be a buffer zone established between the nearby quarry in the north-west of the site and industry so as not to restrict optimum economic realisation of granite resource?
- 7.3 The Granite Mine is considered to be a compatible industry and will be considered in the location of any future industries.

## 8. Aboriginal Sites

- 8.1 What progress has been made in assessing the views of other Aboriginal groups in the area in regard to sites of traditional or historic significance?
- 8.1 The Aboriginal Group utilised for the ethnographic component of the study has held discussion with other local aboriginal groups and communities. The report prepared for submission to the Department of Aboriginal Sites indicates that there are no sites of significance within the boundary of the core industrial site, and recommends that the project can proceed.
- 8.2 What archaeological work has been or will be carried out?
- 8.2 The proponent is liaising with the Department of Aboriginal Sites and will be appointing a suitable qualified consultant to undertake this work.

## 9. Social Impacts

- 9.1 What assurances can be given to the local communities over the types of industries to be located in the park?
- 9.1 The types of industry are unknown at this stage. Any proposal to locate in the park will be subject to environmental impact assessment by the EPA.
- 9.2 What sort of approval process would industries wishing to locate within the park go through?
- 9.2 It is envisaged that application to locate in the park will be channelled through the Mungari Advisory Board. All industries will require EPA and local authority approval plus any other approvals as would be required by relevant statutory bodies.
- 9.3 Would the Mungari pastoralists and the Kurrawang community be represented on the Community Liaison Committee?
- 9.3 (a) The communities liaison committee has representatives from both the Pastoralists and Graziers Association and the Aboriginal Torres Strait Island Commission.

- 9.3 Have the financial impacts (loss of income, devaluation of property, replanning) of the industrial park on Mungari pastoralists been addressed to their satisfaction?
- 9.3 (b) When environmental approval for the park is given, negotiation that will address these issues will be undertaken when the land is secured.
- 9.4 Would an affirmative action policy for Aboriginal employment be developed for the park, and whose responsibility would this be?
- 9.4 Employment policy will be determined by the individual industries, however the proponent has encouraged the involvement of aboriginal people in site studies carried out to date and would encourage industry locating within the park to apply a similar policy.
- 9.5 How would the security and privacy of Mungari pastoralists and the Kurrawang community be safeguarded by the proponent?
- 9.5 Mungari: It is not envisaged that the security or privacy of Mungari Station will be breached. It is proposed that the park will be fenced off from the remaining pastoral lease. Separate road access to the park will be provided.
- Kurrawang: There is no anticipated impact on either the privacy or security of the Kurrawang community.
- 9.6 Would the proponent relocate the Mungari Homestead if emissions cannot be managed properly?
- 9.6 Conditions imposed on industry by the EPA will ensure no adverse impact will occur that would necessitate the relocation of the Mungari homestead.
- 9.7 Would the proponent relocate the Kurrawang community if their health situation becomes untenable, or if emu meat produced there becomes unfit for human consumption?
- 9.7 Conditions imposed on industry by the EPA will ensure no adverse impacts will occur that would necessitate the relocation of the Kurrawang Community or impact upon emu meat production. Should such adverse impacts occur then the EPA has the power to shut down the offending industry until modifications have been made to the process to ensure compliance with EPA conditions.



## **Appendix 4**

**Recommendations by *Ecologia* Environmental Consultants to  
Landcorp for the proposed Mungari Industrial Park.**

# Recommendations by *Ecologia* Environmental Consultants to Landcorp for the proposed Mungari Industrial Park.

Detailed recommendations are listed in two categories where appropriate; assessment level, design level and management level. Recommendations at the design level present strategies which will mitigate impacts to the environment inherent in the design of the proposed project. The second level of recommendation is aimed at management strategies constructed to ameliorate possible impacts to the functioning and quality of the biological environment by the proposed project and to preserve existing conservation values. In order to reduce impact to the biota of the project area the proponent should undertake the following;

## Design Level Recommendations

### RECOMMENDATION 1

Where possible the specific siting of proposed industries or developments be located to avoid impacting significant flora populations in the project area. Specifically developments should be sited to avoid impact to *Ptilotus holosericeus* populations. This species will require special consideration in relation to the location of developments within the project area.

### RECOMMENDATION 2

Retain maximum areas of undisturbed vegetation within the project area where possible. The distribution of vegetation remnants should encompass the range of habitats present and offer some continuity across the site. A mosaic of vegetation remnants across the project area should be encouraged to maximise and preserve the biological diversity and to allow fauna movement within and through the area.

### RECOMMENDATION 3

The position of secondary works associated with the project construction phase should be located within the constraints of minimal impact upon surrounding habitats which are to be retained. All secondary works features in the area should be developed to minimise encroachment upon surrounding habitat thereby maximising the area to be retained undisturbed.

## Management Level Recommendations

### RECOMMENDATION 4

Clearing for all operations in the vicinity of significant flora locations should be kept to a minimum to reduce impact to surrounding habitats which may be utilised by significant flora. Minimal disturbance should be practised within 50 m of significant locations.

### RECOMMENDATION 5

All clearing operations should be kept to a minimum to reduce impact on surrounding ecosystems and to maximise the retention of undisturbed sectors in the project area.

## **Recommendations by *Ecologia* Environmental Consultants to Landcorp for the proposed Mungari Industrial Park.**

### **RECOMMENDATION 6**

Dust suppression techniques should be applied to reduce impact to adjacent vegetation from excess dust during construction activities.

### **RECOMMENDATION 7**

Develop landscape guidelines for the Industrial Park to ensure integrated native plantings occur both within industrial lots and common areas. The primary goal of the landscape plan must be the reestablishment of suitable local biological habitats which may be utilised by indigenous species.

### **RECOMMENDATION 8**

Where appropriate and in accordance with the plan carry out progressive rehabilitation of relevant areas to the level of existing land use in accordance with a rehabilitation programme devised in consultation with CALM and other relevant authorities.

### **RECOMMENDATION 9**

The top soil, vegetation and litter layer of all areas to be disturbed should be stockpiled for later rehabilitation programmes. Vegetation debris, logs, topsoil and rocks should be returned to areas which have been disturbed and in need of rehabilitation. These substrates should be utilised to assist with rehabilitation by providing seed stores, moisture traps and fauna micro-habitats.

### **RECOMMENDATION 10**

Areas to be rehabilitated should be ripped, reseeded and replanted using local species. Micro-relief should be provided in all rehabilitated areas to maximise water permeability, maintain soil friability and maximise seed lodgement.

### **RECOMMENDATION 11**

Keep abreast of developments in impact management techniques in the Goldfields. Ongoing liaison should be maintained with CALM regarding management of the resident significant flora populations.

### **RECOMMENDATION 12**

Ensure that employees, contractors and sub contractors are made aware of the legislated conservation status of rare flora and any environmental restrictions placed on the Mungari Industrial Estate project during the development phase.

### **RECOMMENDATION 13**

Restrict non avian faunal access to potentially hazardous areas, by fencing if required.

### **RECOMMENDATION 14**

Prohibit off road driving and shooting in the project area, particularly during the construction phase while fauna relocations are occurring.

## **Appendix 5**

**Environmental criteria for establishment of industries in the  
Industrial Park at Mungari, 26km south-west of Kalgoorlie  
(February 1993)**

## **ENVIRONMENTAL CRITERIA FOR ESTABLISHMENT OF INDUSTRIES IN THE INDUSTRIAL PARK AT MUNGARI, 26KM SOUTH WEST OF KALGOORLIE (FEBRUARY 1993)**

NOTE: These environmental criteria are to be met to the requirements of the Environmental Protection Authority, and are subject to modification. Additional matters such as odour and oxides of nitrogen (NO<sub>x</sub>) may need to be addressed in later versions.

### **1. General**

Any development in the Mungari Industrial Park shall be carried out according to all relevant government statutes and agency requirements, and shall be referred to the Environmental Protection Authority at the earliest opportunity.

### **2. Solid and liquid waste management**

- 2-1 Wastewater treatment and disposal systems within the industrial park shall be appropriately designed and installed.
- 2-2 Prior to construction of such wastewater treatment facilities, each industry shall supply details of location and design to the Mungari Industrial Park Advisory Board and obtain necessary statutory approvals for these prior to commencing construction.
- 2-3 In the event of leakage from any wastewater treatment ponds causing an unacceptable environmental impact, immediate action shall be taken to stop the leakage so that the environmental impact is rectified.
- 2-4 Solid waste shall be disposed of in a satisfactory manner.
- 2-5 Solids remaining in evaporation ponds shall only be disposed of by approved methods.

### **3. Noise limits**

All operations should be conducted so that noise emissions do not unreasonably impact on the surroundings.

#### **3-1 Noise emissions from any project shall not exceed:**

- 40 dB L<sub>A10</sub>, 1 hour slow and 50 dB L<sub>A max</sub> slow between 2200 hours and 0700 hours on any day when measured on any noise-sensitive premises;
- 45 dB L<sub>A10</sub>, 1 hour slow and 55 dB L<sub>A max</sub> slow between 1900 hours and 2200 hours on any day, and between 0700 hours and 1900 hours on Sundays and gazetted public holidays, when measured on any noise-sensitive premises;
- 50 dB L<sub>A10</sub>, 1 hour slow and 70 dB L<sub>A max</sub> slow between 0700 hours and 1900 hours on Monday to Saturday inclusive, when measured on any noise-sensitive premises; and
- 65 dB L<sub>A</sub> slow when measured at or near the boundary of premises that are not noise-sensitive premises (other industries);

where such emissions would result in the noise level present at the affected premises exceeding the ambient noise level present at any time by more than 5 dB L<sub>A</sub> slow.

- 3-2 Noise emissions from those activities which are of concern to occupiers of noise-sensitive premises shall not exhibit tones, amplitude and frequency modulation and impulsiveness of a nature which increases the intrusiveness of the noise.
- 3-3 Noise surveys and assessments shall be conducted in consultation with the Environmental Protection Authority.

The following definitions apply to these criteria.

"ambient noise" means the generally non-intrusive noise which is always present due to such sources as motor vehicles operating on roads (other than those adjacent to the premises where the noise environment is being assessed), general industrial, commercial and other activities where individual noise sources such as fans, machinery, refrigeration and air-conditioning plant and vehicles cannot be identified and natural noise sources such as wind-induced vegetation noise but not the noise caused by the allegedly offending source or sources;

"dB LA10, 1 hour slow " means the A weighted noise level exceeded for 10% of the time, determined over a time period of one hour with a sound level meter set to measure in slow dynamic response mode, and

"noise-sensitive premises" means any land or building that is used as a residence, guest house, hotel, motel, caravan park, school, church, hospital, or as an office or consulting rooms, where such office or consulting rooms are not located in an industrial area.

#### 4. Atmospheric Emissions

##### 4-1 Sulphur dioxide

Industries wishing to establish in the Mungari Industrial Park should comply with the requirements of the Environmental Protection (Goldfields Residential Areas) (Sulphur dioxide) Policy and Regulations 1992, of which the ambient air quality limits and standards are set out below:

**Table 1. Air quality objectives**

Limit	Standard	Averaging period
1400 ug/m <sup>3</sup>	700 ug/m <sup>3</sup>	1 hour

**Table 2. Ambient air quality limits for sulphur dioxide**

Commencing date	Limit	Averaging period
29 January 1993	1300 ug/m <sup>3</sup>	3 hours
1 January 1994	2000 ug/m <sup>3</sup>	1 hour
1 January 1995	1800 ug/m <sup>3</sup>	1 hour
1 January 1996	1600 ug/m <sup>3</sup>	1 hour
1 January 1997 and 1 January in each succeeding year.	1400 ug/m <sup>3</sup>	1 hour

**Table 3. Minimum levels of compliance with standards**

Commencing Year	Number of hours over standard
1993	131
1994	131
1995	87
1996	43
1997	8

The objectives of the new policy will be achieved by applying conditions to the operating licences of industries which emit sulphur dioxide. The licence conditions, ambient air quality limits and ambient air quality standards are legally established by being prescribed in the regulations. The air quality limit will be enforced as a condition of licences to industries which emit sulphur dioxide. A breach of that licence condition is an offence under the Environmental Protection Act and may result in prosecution. The regulations specify the level of compliance with the standard. A single exceedance of the limit, or a greater number of exceedances of the standard than may be specified in licences of industries emitting sulphur dioxide, would be considered a breach of licence.

#### 4-2 Dust

Concentration of airborne dust contributed by any premises within the industrial park shall not exceed the acute impact level of 1,000 micrograms per cubic metre (ug/m<sup>3</sup>) averaged over 15 minutes at the boundary of the premises. For the longer term, at residences an annual mean of 90 micrograms per cubic metre, measured over 24 hour periods, shall not be exceeded.

#### 4-3 Other, e.g. odour and oxides of nitrogen (NO<sub>x</sub>)

To be determined as required.

### 5. Risks and hazards

5-1 The Mungari Industrial Park should comply with the requirements and approach to be adopted for evaluation of risks and hazards as detailed in Environmental Protection Authority Bulletin 611 (Criteria for the Assessment of Risk from Industry, Environmental Protection Authority Guidelines, 1992). These requirements include the principle of "avoiding avoidable risk" and include the following criteria for individual fatality risk levels:

- (1) A risk level in residential zones of one in a million per year or less, is so small as to be acceptable to the Environmental Protection Authority.
- (2) A risk level in "sensitive developments", such as hospitals, schools, child care facilities and aged care housing developments of between one half and one in a million per year is so small as to be acceptable to the Environmental Protection Authority.
- (3) Risk levels from industrial facilities should not exceed a target of fifty in a million per year at the site boundary for each individual industry and the cumulative risk level imposed upon an industry should not exceed a target of one hundred in a million per year; and
- (4) A risk level for any non-industrial activity located in buffer zones between industrial facilities and residential zones of ten in a million per year or lower, is so small as to be acceptable to the Environmental Protection Authority.

5-2 Each intending occupier who would be engaged in hazardous activities in the Mungari Industrial Park shall participate in the preparation of a model of cumulative risk levels which should be generated to ensure that the above criteria are met.

### 6. Decommissioning

The satisfactory decommissioning of any project, removal of plant and installations and rehabilitation of the site and its environs is the responsibility of each future proponent.

6-1 At least six months prior to decommissioning of any project, a decommissioning and rehabilitation plan shall be prepared and subsequently implemented.