



**Environmental  
Protection  
Authority**

## Kalgoorlie Rare Earths Processing Facility

Lynas Kalgoorlie Pty Ltd

Report 1712  
October 2021

This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986* (WA). It describes the outcomes of the EPA's assessment of the Kalgoorlie Rare Earths Processing Facility proposal by Lynas Kalgoorlie Pty Ltd.

This assessment report is for the Western Australian Minister for Environment and sets out:

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

A handwritten signature in black ink, appearing to be 'MT' followed by a stylized flourish.

**Prof. Matthew Tonts**

Chair

Environmental Protection Authority

14 October 2021

# Summary

## Proposal

The proposal is to construct and operate the Kalgoorlie Rare Earths Processing Facility at Lot 500, Great Eastern Highway, Yilkari, near the City of Kalgoorlie-Boulder. The proposal includes all activities associated with the processing of rare earth concentrate to produce rare earth carbonate. The anticipated life of the proposal is 25 years.

The proponent for the proposal is Lynas Kalgoorlie Pty Ltd.

The proposal will process rare earth concentrate sourced from the proponent's Mt Weld mine, to produce a rare earth carbonate for export and return by-product back to the mine site. The proposal is located in proximity to the City of Kalgoorlie-Boulder, approximately 7 kilometres (km) from the city centre, in the Goldfields Region of Western Australia.

## Consultation

The EPA published the proponent's referral information for the proposal on its website for 7 days public comment. The EPA also published the proponent's environmental review document on its website for public review for 4 weeks (from 9 June 2021 to 7 July 2021). The EPA considered the comments received during these public consultation periods in its assessment.

## Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts and emissions. The sequence commences with avoidance, then moves to minimisation/reduction/rehabilitation, and offsets are considered as the last step in the sequence.

The proponent considered the mitigation hierarchy in the development and assessment of its proposal, and as a result has:

- Removed the Yarri Road By-product Storage Facility to avoid impacts to air quality and social surroundings.
- Determined to return processing by-products to the Mt Weld mine where facilities are currently designed for management of such by-products.
- Proposed a vegetated buffer between the Great Eastern Highway and the proposal.
- Proposed construction of noise bunding and shielding of equipment.
- Proposed dust control measures including routine dust suppression during construction sealing of hard stand areas dust extraction system for concentrate delivery and sealed storage with dust extraction for raw materials.
- Proposed implementation of a waste gas and air quality treatment system.

## Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of the assessment. For each factor, the EPA has assessed the residual impacts of the proposal on the environmental values and considered whether the environmental outcomes are likely to be consistent with the EPA's environmental factor objectives.

### Air quality

The proposal is not likely to have a residual impact on air quality and it is recognised that the background levels for key air quality parameters are currently over the National Environmental Protection (Ambient Air Quality) Measures 2021.

- Not likely to be material impacts to air quality provided minimisation measures for waste gas and dust are complied with.

### Human health

- Not likely to be material impacts to human health, provided minimisation measures for dust and transport are complied with.

### Social surroundings

- Not likely to be material impacts to social surroundings provided minimisation measures for noise dust and visual amenity are complied with.

## Holistic assessment

The EPA considered the connections and interactions between relevant environmental factors and values to inform a holistic view of impacts to the whole environment. The EPA formed the view that the holistic impacts would not alter the EPA's conclusions about consistency with the EPA's factor objectives.

## Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- residual impacts, emissions and effects in relation to the key environmental factors, separately and holistically (this has included considering cumulative impacts to air quality in the Kalgoorlie Air Shed)
- likely environmental outcomes (and taking into account the EPA's recommended conditions), and the consistency of these outcomes with the EPA's objectives for the key environmental factors
- the EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

The EPA has recommended that the proposal may be implemented subject to conditions recommended in Appendix A.

# Contents

Summary ..... i

1    Proposal..... 1

2    Assessment of key environmental factors ..... 6

     2.1   Air quality..... 6

     2.2   Human health ..... 10

     2.3   Social surroundings ..... 14

3    Holistic assessment..... 18

4    Recommendations ..... 19

5    Other advice ..... 20

**Tables**

Table 1: Location and proposed extent of proposal elements ..... 2

Table 2: Summary of assessment for air quality ..... 9

Table 3: Summary of assessment for human health ..... 13

Table 4: Summary of assessment for social surroundings..... 17

**Figures**

Figure 1: Project location.....4

Figure 2: Development envelope and disturbance footprint.....5

Figure 3: Intrinsic interactions between environmental factors..... 18

**Appendices**

Appendix A: Recommended conditions.....21

Appendix B: Decision-making authorities.....29

Appendix C: Consideration of Environmental Protection Act principles.....30

Appendix D: Evaluation of other environmental factors.....33

Appendix E: Relevant policy, guidance and procedures.....43

Appendix F: List of submitters .....44

Appendix G: Assessment timeline.....45

References ..... 46

# 1 Proposal

The Kalgoorlie Rare Earths Processing Facility is a proposal to construct and operate a Rare Earths Processing Facility (REPF) at Lot 500, Great Eastern Highway, Yilkari. The proposal is located 7 km from Kalgoorlie, in the Goldfield region of Western Australia (see Figure 1).

The REPF site will comprise an acid cracking kiln and leaching plant which will process material from the Mt Weld mine site. Associated infrastructure includes small temporary by-product (gypsum and iron phosphate) storage areas. The by-product storage areas at the REPF are not intended to provide long-term storage. A long-term By-product Storage Facility (BSF) was proposed at Yarri Road. During the assessment the proponent amended the proposal to withdraw the Yarri Road BSF. By-products will now be returned to the proponent's mine at Mt Weld.

The rare earth carbonate product from the REPF will be packaged in closed containers and transported by rail to the port of Fremantle for export. The rare earth carbonate will not require regulation under the *Radiation Safety Act 1978* as it does not exceed the radiation threshold for regulation.

The proponent for the proposal is Lynas Kalgoorlie Pty Ltd. The proponent referred the proposal to the Environmental Protection Authority (EPA) on 11 September 2020. The referral information was published on the EPA website for 7 days public comment. On 24 November 2020, the EPA decided to assess the proposal at the level Referral Information with additional information required. The EPA also published the environmental review document (Lynas 2021a) incorporating the additional information on its website for public review for 4 weeks (from 9 June 2021 to 7 July 2021).

The proposal was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) who determined under the *Environment Protection and Biodiversity Conservation Act 1999* that the proposal was not a controlled action and did not trigger a nuclear action.

The proposal is set out in section 2 of the proponent's environmental review document (Lynas 2021a), which is available on the EPA website.

The elements of the proposal which have been subject to the EPA's assessment are included in Table 1.

**Table 1: Location and proposed extent of proposal elements**

Proposal element	Location	Maximum extent or range
<i>Physical elements</i>		
Development envelope	Figure 2	135 ha
Disturbance footprint	Figure 2	120 ha
<i>Operational elements</i>		
Rare earth concentrate feed		Up to 162,000 dry tonnes per annum
Rare earth carbonate product		Up to 68,000 dry tonnes per annum
Processing facility derived waste/by-product		Up to 132,000 dry tonnes per annum of iron phosphate Up to 330,000 dry tonnes per annum of gypsum
<i>Timing elements</i>		
Project life		25 Years

**Units and abbreviations**

ha – hectare

**Proposal amendments**

The original proposal is set out in section 2 of the proponent's environmental review document (Lynas 2021a), which is available on the EPA website.

During the assessment process the EPA encouraged the proponent to identify avoidance and mitigation measures for by-product storage in addition to those included in the original proposal.

A long-term by-product storage facility (BSF) was originally proposed at Yarri Road, in an area east of Kalgoorlie near other waste facilities. During the assessment, the proponent requested changes to the proposal to remove the Yarri Road BSF from the proposal. The iron phosphate and gypsum by-products will now be returned for disposal at suitably constructed facilities at the proponent's Mt Weld mine. Both the Department of Mines, Industry Regulation and Safety (DMIRS) and the Radiological Council of Western Australia have provided advice that this is a suitable disposal location and can be managed under existing approved management plans. The changes were unlikely to significantly increase any impacts of the proposal and will result in some reduced potential impacts on the environment. The EPA Chair's notice, of 9 September 2021, consenting to the change is available on the EPA website.

The consolidated and updated elements of the proposal which has been subject to the EPA's assessment is included in Table 1.

## Proposal alternatives

The City of Kalgoorlie-Boulder approached the proponent in May 2019 offering three potential locations for the REPF in Kalgoorlie. These were:

- Strategic Industrial Area 1 (SIA1) located near the BHP Nickel West operations
- Lot 350 Great Eastern Highway (Lot 350)
- Lot 500 Great Eastern Highway (Lot 500), Yilkari.

Lot 500 Great Eastern Highway was selected as the most suitable location after reviewing selection criteria which included environmental, social and heritage considerations. The key benefits of constructing the REPF at Lot 500 Great Eastern Highway included access to existing infrastructure such as road and rail, proximity to existing gas and power supplies, availability of recycled water for processing requirements, no ecologically sensitive areas and it is close to an existing skilled workforce. Land tenure was also already established as the City of Kalgoorlie-Boulder holds a lease over the land, which it has sub-leased to the proponent.

The proponent initially proposed to store by-products produced by the process at the REPF site considering that markets for these products would be found and no long-term storage would be required. However, this was not considered a suitable long-term option and the EPA requested the proponent develop an alternative for the long-term disposal of by-products produced at the REPF.

In response to this, the DMIRS identified three potential sites for the development of a long-term storage option with no mining tenement encumbrances in the Kalgoorlie region. All three sites were to the north of Kalgoorlie, with only two being suitable for use as a long-term BSF. A site at Common Reserve 8767, Yarri Road, Parkeston was one of the three locations identified and was assessed to be the most suitable of the three proposed sites.

Following further consultation, the proponent requested an amendment to the proposal to remove the Yarri Road BSF as described above. By-products would now be transported to the proponents Mt Weld mine for disposal.

The EPA notes that it has only considered the proposal as presented by the proponent and has not undertaken an assessment of any alternatives.



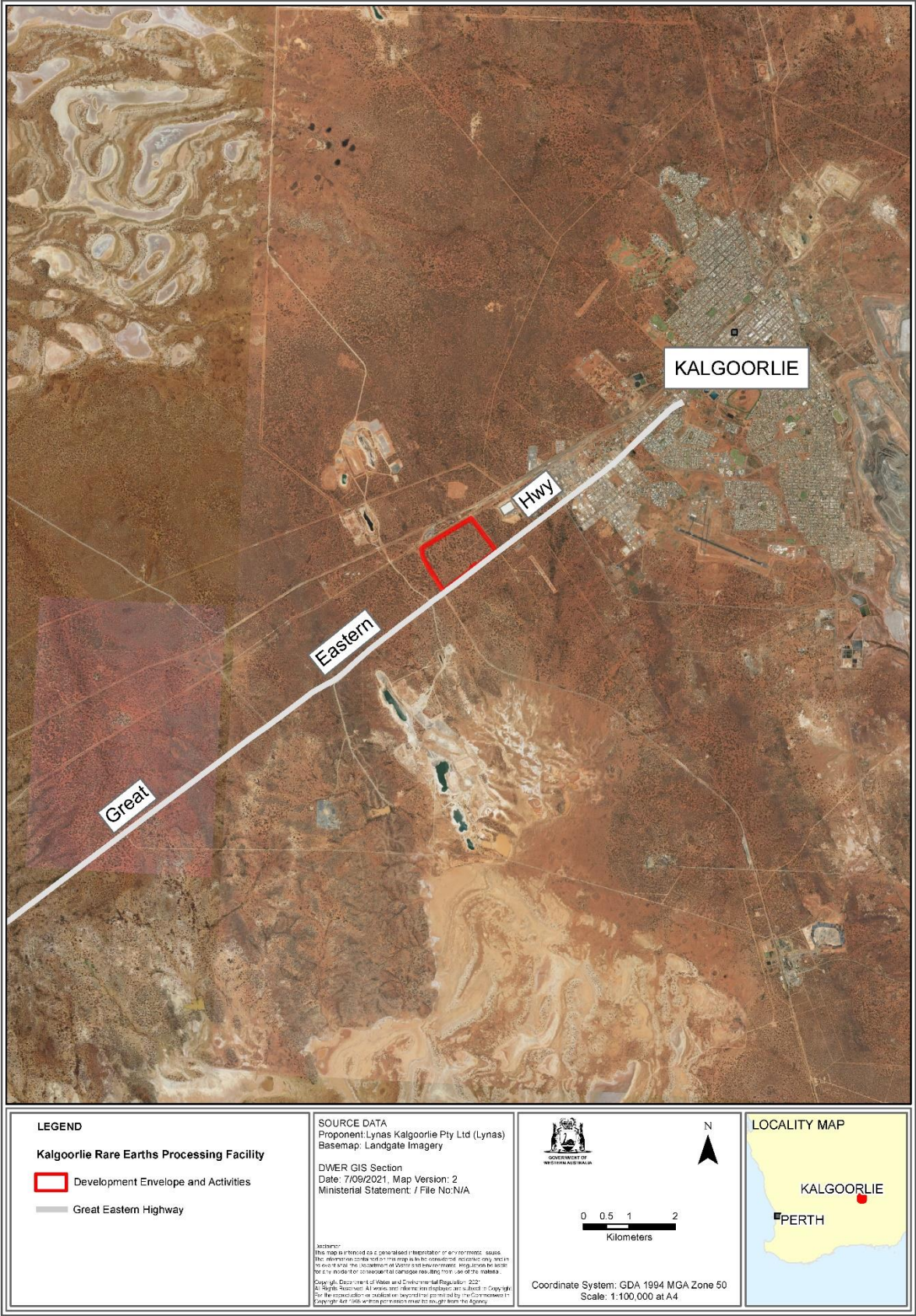


Figure 1: Project location



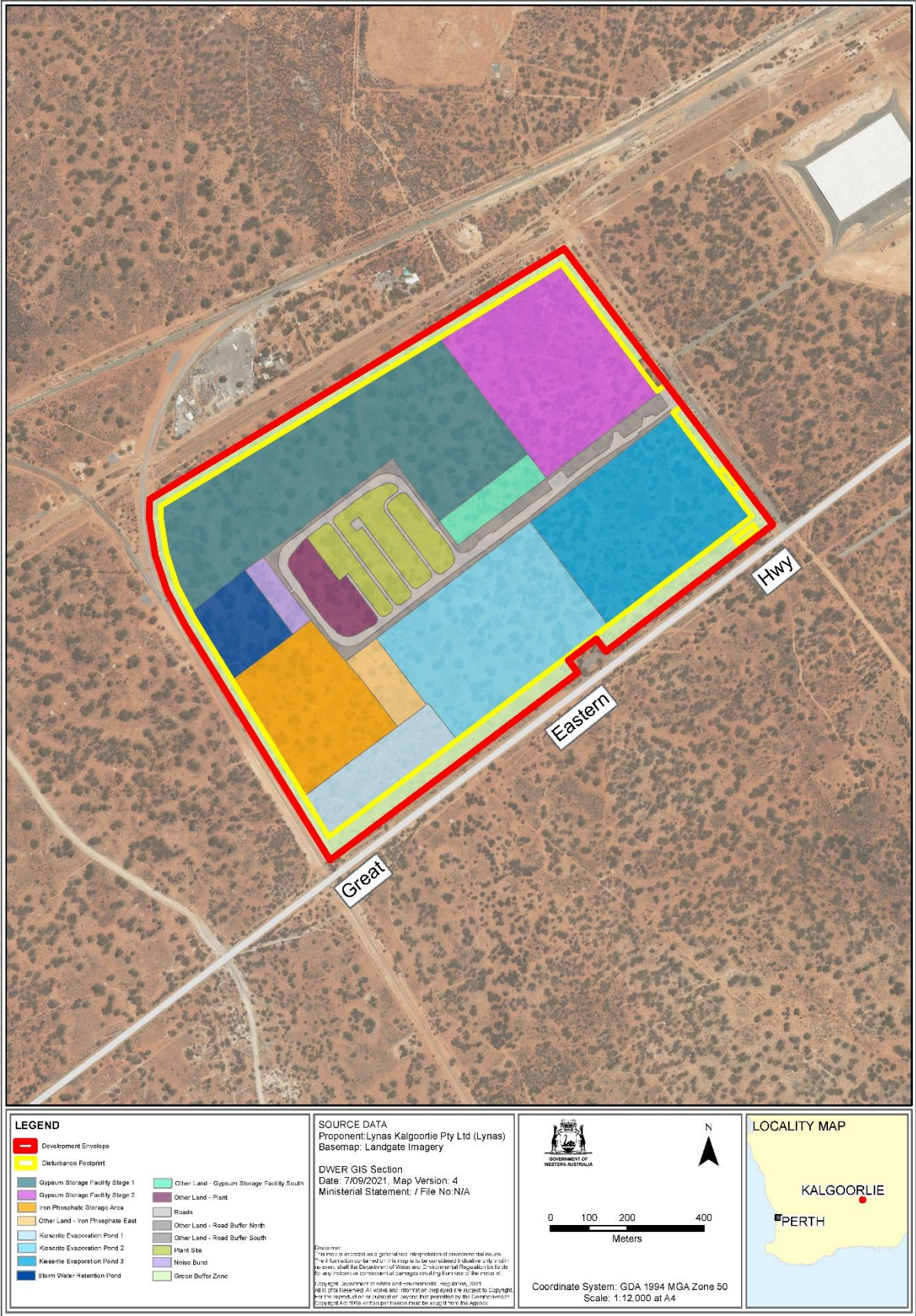


Figure 2: Development envelope and disturbance footprint

## 2 Assessment of key environmental factors

This section includes the EPA's assessment of the key environmental factors. In its determination to assess the proposal, the EPA originally included flora and vegetation, terrestrial environmental quality, terrestrial fauna and inland waters as key environmental factors. These factors were included due to the uncertainty concerning the by-product storage facility at Yarri Road. As this component of the proposal has now been removed, the EPA has concluded these are no longer key environmental factors for the assessment. This evaluation is included in Appendix D.

### 2.1 Air quality

#### 2.1.1 Environmental objective

The EPA's environmental objective for air quality is *to maintain air quality and minimise emissions so that environmental values are protected*.

#### 2.1.2 Investigations and surveys

Air dispersion modelling was conducted for the REPF of the significant sources under a number of scenarios to assess the potential impact to ambient air quality associated with these sources – both in isolation and cumulatively within the region.

The modelling assessment considered the potential air quality impacts on sensitive (human) receptors, including locations where people are residing either on a temporary or permanent basis, noting that the current Department of Water and Environmental Regulation (DWER) guidelines exclude the consideration of on-site project-related receptors as sensitive receptors.

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to air quality:

- *Kalgoorlie Rare Earths Processing Plant – Air Quality Impact Assessment* (appendix G of the referral document) (Environmental Technologies and Analytics (ETA 2020)
- *Peer Review of Kalgoorlie Rare Earths Processing Facility – Air Quality Impact Assessment, prepared by Environmental Technologies and Analytics dated July 2020* (appendix H of the referral document) (Rambol 2020)
- *Expert Opinion on: Kalgoorlie Rare Earths Processing Facility Air Quality Impact Assessment*, Matisons Toxicology Solutions (MTS 2021).

DWER has advised that the modelling methodology has been conducted in accordance with the Air Quality Guidance Notes (DoE 2006).

#### 2.1.3 Assessment context: existing environment

The existing air quality in the region is influenced by natural sources such as wind erosion and bushfires. In addition, the Kalgoorlie region contains other significant mineral processing plants, principally associated with the production of gold. Dust



may also occur due to anthropogenic activities in the study area, such as other mining operations.

To account for background or existing air quality in the region, the proponent used ambient monitoring data made available by DWER. DWER currently measures carbon monoxide, sulphur dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> in the Kalgoorlie region. The proponent based existing ambient conditions for the model on the 2018 DWER monitoring results. Levels of PM<sub>10</sub> and PM<sub>2.5</sub> can be highly variable in the region and are regularly affected by exceptional events such as fires or windblown dust events.

The nearest residences to Lot 500 Great Eastern Highway, are in the area zoned Freight/Transport to the north and are approximately less than 100 m from the REPF boundary or 500 m from the centre of the site. The nearest sensitive population group (residential) within the Kalgoorlie town site, is approximately 3 km to the northeast.

#### 2.1.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Lynas 2021b).

Public comments were received concerning the potential dust emissions particularly associated with the Yarri Road site. The proponent has addressed these concerns and has removed the BSF at Yarri Road from the proposal. Waste will now be transported back to the Mt Weld mine.

The impact from potential radionuclides in dust are discussed under the key environmental factor of human health (section 2.2).

#### 2.1.5 Potential impacts from the proposal

The proposal comprises both point and fugitive sources of emissions with potential to impact the receiving environment, and nearby sensitive receptors. The EPA identified the following proposal activities which could impact on its environmental objective for air quality:

- construction activities resulting in fugitive dust emissions
- consumption of natural gas in the kiln
- addition of chemicals to the process resulting in point source emissions
- atmospheric emissions.

The air quality modelling conducted on behalf of the proponent (ETA 2020) compared worst case scenario emissions against ambient air criteria specified in the National Environmental Protection (Ambient Air Quality) Measures 2015 (NEPMs 2015) which indicated that the predicted maximum ground level concentrations from the REPF for all modelled pollutants were below the relevant air quality assessment criteria and generally present a low risk of potential impact to the sensitive receptors identified. The proponent undertook a peer review of the parameters used in the model (Ramboll 2020).

Findings from the model show that under worst case conditions (plant start up and shut down) the plant emissions present a relatively low to moderate change in predicted air quality ground level concentrations. The maximum concentration at any identified receptor for key parameters were:

- PM<sub>10</sub> (24-hour) - 31.8% of the assessment criteria
- SO<sub>2</sub> (1-hour) - 4.5% of the assessment criteria
- SO<sub>2</sub> (24-hour) - 6.9% of the assessment criteria
- NO<sub>2</sub> (1-hour) - 50.7% of the assessment criteria
- H<sub>2</sub>SO<sub>4</sub> (1-hour) - 30.9% of the assessment criteria
- H<sub>2</sub>SO<sub>4</sub> (24-hour) - 32.3% of the assessment criteria.

During the assessment of the proposal the ambient air quality NEPM was revised and updated in 2021 (NEPM 2021). The modelling undertaken by the proponent to determine impacts on air quality from the REPF was compared to the 2015 NEPM. NEPM 2021 has more stringent assessment criteria and whilst the emissions from the REPF remain well below criteria specified in the revised NEPM 2021, the existing background levels for the Kalgoorlie-Boulder region are above the revised NEPM levels. This in turn results in the cumulative emissions from the REPF and background being above the NEPM 2021.

The proponent has sought expert toxicological advice on the potential impacts of the change in the NEPM during assessment. The independent review advised that it was unlikely that the changes to the levels from NEPM 2015 to NEPM 2021 will have a significant impact on sensitive receptors (MTS 2021).

### 2.1.6 Avoidance measures

During assessment of the proposal, in response to public comment and potential impacts, the proponent requested a change to the proposal during assessment under s. 43A of the *Environmental Protection Act 1986* (EP Act) to remove the Yarri Road BSF from the proposal. By removing this aspect, the proponent has avoided air quality impacts associated with this component of the original proposal.

### 2.1.7 Minimisation measures (including regulation by other DMAs)

The proposal includes the following measures to minimise impacts to air quality:

- routine dust suppression during construction
- sealing of hard stand areas to prevent dust generation during operations
- dust extraction system for concentrate delivery
- sealed storage with dust extraction for raw materials
- waste gas from the kiln will be cleaned using a Waste Gas Treatment (WGT) system, using a combination of venturi scrubbers, packed tower and wet electrostatic precipitators
- an emergency waste gas scrubbing system will be installed as a backup in the event of any failure of the primary WGT system.

The emissions to air can be appropriately regulated to meet the EPA's objective for air quality through the implementation of an Environmental Protection Licence issued under Part V of the EP Act.

### 2.1.8 Assessment of impacts to environmental values

The EPA has considered the emissions from the proposal in relation to their contribution to the cumulative emissions of the airshed, the recent changes to the NEPM which occurred during the assessment and the *Environmental Protection (Goldfields Residential Areas) (Sulfur Dioxide) Policy 2003* (Goldfields EPP). It is noted that the current background concentration of key air quality parameters are above the current NEPM 2021 but below the Goldfields EPP.

The EPA considers that the proponent's emissions will not significantly alter the cumulative concentration of key air quality parameters. It is also noted that in regard to sulfur dioxide emissions, both the proponents' emissions and the cumulative emissions are below the concentrations specified in the Goldfields EPP.

In addition, the proponent has provided further assessment that the levels are not likely to cause significant impacts to sensitive receptors (MTS 2021).

The EPA does not consider that there is a significant residual impact to the key environmental factor of air quality and considers that impacts to air quality are able to be managed through the implementation of an Environmental Protection Licence issued under Part V of the EP Act.

### 2.1.9 Summary of key factor assessment and recommended conditions

The EPA has considered the likely environmental outcomes of the proposal on air quality environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 2.

**Table 2: Summary of assessment for air quality**

Residual impact or risk to environmental value		Assessment finding	Recommended conditions and DMA regulation
1	Potential impact to air quality through emissions associated with the consumption of gas and chemical treatment of concentrate	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Direct regulation through: <ul style="list-style-type: none"> <li>• Environmental Protection Licence issued under Part V of the EP Act.</li> <li>• Application of the <i>Environmental Protection (Goldfields Residential Areas) (Sulfur Dioxide) Policy 2003</i> (Goldfields EPP).</li> </ul>

## 2.2 Human health

### 2.2.1 Environmental objective

The EPA's environmental objective for human health is *to protect human health from significant harm*.

### 2.2.2 Investigations and surveys

The proponent undertook a Radiation Impact Assessment (RIA) to assess the radiological impact from the Kalgoorlie REPF to workers, members of the public and the environment. The RIA includes a description of the regulatory framework at a national and state level within Australia; a description of the likely sources of radiation; exposure pathways; and an assessment of the potential of the proposal to impact on human health and the environment.

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to human health:

- *Kalgoorlie Rare Earths Processing Plant – Air Quality Impact Assessment* (appendix G of the referral document) (Environmental Technologies and Analytics (ETA 2020)
- *Lynas Kalgoorlie Rare Earths Processing Facility – Radiation Impact Assessment*, Revision 7 (1 April 2021) (appendix T of the environmental review document) (Lynas 2021a)
- *Lynas Kalgoorlie Rare Earths Processing Facility – Radiation Management Plan* (appendix U of the environmental review document) (Lynas 2021a)
- *Rare Earths Processing Facility, Kalgoorlie WA – Independent Peer Review of the Radiation Impact Assessment (RIA)* (appendix V of the environmental review document) (Lynas 2021a).

### 2.2.3 Assessment context: existing environment

The proponent undertook a pre-operational environmental radiation monitoring program at Lot 500 Great Eastern Highway, to determine the characteristics of the receiving environment.

On 11 and 12 November 2019, a gamma radiation survey of Lot 500 Great Eastern Highway was conducted to obtain baseline data prior to work commencing on the site. A total of 625 readings were taken at 50x50 grid intervals, in accordance with guideline *NORM-3.1 pre-operational monitoring requirements* (DMIRS 2010). A mean background Gamma radiation level of 0.14 microsieverts per hour (µSv/hr) was recorded.

The rare earth concentrate produced at the Mt Weld mine contains a low level of Naturally Occurring Radioactive Material (NORM). During the processing of this concentrate the radionuclides are separated and bond with iron phosphate (IP), which is the solid material produced after filtering of the primary leach solution.

Transport of rare earth concentrate and IP between the Mt Weld mine and the Kalgoorlie REPF, and the disposal at the Mt Weld mine, will be covered under the existing *Mt Weld Mining Radiation Management Plan* and associated *Transport Management Plan* regulated by DMIRS and the Radiological Council of Western Australia.

Transport of the concentrate to be exported through Fremantle port does not require regulation, as the radionuclides are separated from this material during the processing of the rare earth concentrate ore.

#### 2.2.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Lynas 2021b).

Public comments were received concerning the potential impacts to human health through exposure to radiation associated with dust emissions - particularly from the Yarri Road site. The proponent has addressed these concerns and has removed the storage facility at Yarri Road from the proposal. Waste will now be transported back to the Mt Weld mine.

#### 2.2.5 Potential emissions from the proposal

The proposal has the potential to impact on human health through radiation exposure. The processing of rare earths has intrinsic issues associated with radiation due to the nature of the material being processed and NORM present in the ore. The proposal will produce approximately 132,000 dry tonnes per annum of IP as a by-product. The IP will require temporary storage on site at the REPF to allow it to dry prior to transport for disposal at Mt Weld.

During storage there is the potential for dust lift off which may result in exposure to radiation from the IP.

There is a risk of dust from the transport of by-products to the Mt Weld mine, however transport would occur in covered trucks and closely regulated through a *Transport Management Plan*.

#### 2.2.6 Avoidance measures

During assessment of the proposal, in response to public comment and potential impacts, the proponent requested a change to the proposal during assessment under s. 43A to remove the Yarri Road by-product storage facility from the proposal. By doing so the proponent has avoided all impacts to human health associated with this component of the original proposal. Facilities for storage of low-level radioactive waste already exist at the Mt Weld mine and the mine is located in an isolated area away from any residential populations. The by-products will return from where the ore was mined.

The issue raised during the public consultation regarding potential impacts to air quality (dust) from the Yarri Road by-product storage facility has been addressed



through the s. 43A which has resulted in no material being stored at Yarri Road and hence no potential impact to air quality from that facility.

### 2.2.7 Minimisation measures (including regulation by other DMAs)

Mitigation measures to minimise the impact on human health from radiation are similar to those outlined under air quality. The primary exposure to the public will be through radiation associated with potential sources of dust.

The proponent has identified the following measures to minimise impacts to human health:

- Maintenance of the IP in a damp state to reduce dust lift off.
- Return of the Iron Phosphate to the Mt Weld mine for permanent disposal in suitably constructed engineered structures.
- Implementing the Radiation Management Plan. The proponent submitted the Radiation Management Plan which has been approved by the DMIRS.

### 2.2.8 Assessment of impacts to environmental values

The RIA (appendix T of environmental review document) (Lynas 2021a) demonstrated that the radiological impacts of this proposal would be low. Doses to occupational workers are conservatively estimated to be less than 2 milli Sieverts per year (mSv/y), which is well below the 20 mSv/y limit for workers. Public doses are also expected to be low, with the closest residence estimated at approximately 0.3 mSv/y, well below the 1 mSv/y limit for the public.

The radiological impact on non-human biota was assessed using the 'Environmental Risk from Ionising Contaminants Assessment' (ERICA) software tool as detailed in *Environmental Protection: Development of an Australian Approach for Assessing Effects of Ionising Radiation on Non-Human Species – Technical Report 154*. Edited by Australian Radiation Protection and Nuclear Safety Agency (ARPANSA 2010). The proponent adopted a conservative ERICA assessment which demonstrates that the assessed total dose rate per organism is well below the stringent 1.0 micro Greys per hour ( $\mu\text{Gy/hr}$ ) screening rate. The results of the REPF ERICA assessment, confirmed that there is a low radiological risk to non-human biota from the REPF operations. The proponent commissioned a peer review of this work (appendix V of the environmental review document) (Lynas 2021a) which confirmed these findings.

Transport of IP between Lot 500 Great Eastern Highway and the Mt Weld mine will be regulated by the Radiological Council of Western Australia and the DMIRS (due to the radiation associated with this material) under the existing *Mt Weld Mining Radiation Management Plan* and associated *Transport Management Plan*.

### 2.2.9 Summary of key factor assessment and recommended conditions

The EPA does not consider that there is a significant residual impact to the key environmental factor of human health. The EPA recognises that impacts associated with radiation can be effectively managed through other agencies and that no condition regarding human health is warranted. However, in order to ensure the

impacts to human health are minimised, the EPA recommends a condition be imposed to ensure the proponent removes the process by-products from the REPF site and returns them to the Mt Weld mine.

The EPA summary findings are in Table 3.

**Table 3: Summary of assessment for human health**

Residual emissions		Assessment finding	Recommended conditions and DMA regulation
1.	Potential impact to human health through exposure to low level radioactive material	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Direct regulation through: <ul style="list-style-type: none"> <li>• approved Radiation Management Plan and Transport Management Plan by DMIRS and the Radiological Council of Western Australia.</li> <li>• condition 3 (Waste Management).</li> </ul>

## 2.3 Social surroundings

### 2.3.1 Environmental objective

The EPA's environmental objective for social surroundings is *to protect social surroundings from significant harm*.

### 2.3.2 Investigations and surveys

An environmental noise impact assessment was undertaken by the proponent for the REPF site.

Air dispersion modelling was conducted for the REPF of the significant sources under a number of scenarios to assess the potential impact to ambient air quality associated with these sources - both in isolation and cumulatively within the region.

An Indigenous Heritage Archaeological and Ethnographic survey was carried out in 2003 over a broad area encompassing the REPF location.

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to social surroundings:

- *Kalgoorlie Rare Earths Processing Plant – Air Quality Impact Assessment* (appendix G of the referral document) (Environmental Technologies and Analytics (Lynas 2021a))
- *Proposed Kalgoorlie Rare Earths Processing Plant – Deposition [dust]* (appendix O of the environmental review document) (Environmental Technologies and Analytics (Lynas 2021a))
- *Rare Earths Processing Facility Yilkari, Western Australia - Environmental Noise Impact Assessment* (appendix P of the environmental review document) (Lynas 2021a)

### 2.3.3 Assessment context: existing environment

The proposal site is located approximately 7 km west of the Kalgoorlie central business district. It is situated within a developing industrial area, where other industrial uses currently exist. Other activities in the area include a power station, covered water storage facility, broadcast tower and several open pit mines.

The nearest residences occur on large land holdings located approximately 500 m from the centre of the site in an area zoned Freight / Transport and 100 m from the site boundary. The nearest sensitive population group (residential) to Lot 500 Great Eastern Highway lies within the Kalgoorlie town site, 3 km to the northeast.

There are no Registered Aboriginal Sites or Other Heritage Places recorded at the Premises. The closest Registered Aboriginal Site is the 'Binduli Rock Hole' situated approximately 830 m to the north.

### 2.3.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Lynas 2021b).

Public comments were received concerning the proximity of the REPF to the city of Kalgoorlie and the visibility from Great Eastern Highway entrance to the town.

Additional comments were received concerning the proximity of the Yarri Road BSF to the Ninga Mia Aboriginal community. The proponent has addressed these concerns through the amendment to the proposal and has removed the storage facility at Yarri Road from the proposal.

### 2.3.5 Potential impacts from the proposal

The proposal has the potential to impact on the receiving environment, and nearby sensitive receptors. The EPA identified the following proposal activities which could impact on its environmental objective for social surroundings:

- construction activities resulting in fugitive dust emissions
- material handling during operation resulting in fugitive dust emissions
- equipment operation resulting in noise emissions
- impact to visual amenity.

A noise impact assessment of the proposal was conducted (appendix J of referral information) to assess the potential impact on 16 sensitive receptors. After application of influencing factors and with no mitigation measures in place (unlikely worst case scenario), the model determined slight exceedances of the assigned noise levels at 6 of the sensitive receptors. Following this, the proposed noise controls were included (see mitigation below) in the model and the resulting modelled noise levels at all 16 sensitive receptors, including those, were found to be below the assigned levels.

During the public review of the proposal, a number of submitters raised concerns over the visual amenity impacts from the proposal. This was particularly in regard to the construction of the REPF and its location on the entrance to the city of Kalgoorlie Boulder. The main residential area is approximately 3 km from the site and the RPF is not likely to be visible from this area. Certain structures such as the stack may be visible from the Great Eastern Highway to traffic passing by.

Potential impacts from dust are discussed in section 2.1 air quality.

### 2.3.6 Avoidance measures

During assessment the proponent requested a change to the proposal under s. 43A of the EP Act. This change (as described above) was to remove the Yarri Road BSF from the proposal.

The Yarri Road BSF has raised concerns with the public due to the potential impacts to air quality from dust and also as the area was still under Native Title determination.

As a result of these concerns the proponent has amended the proposal to remove the BSF and hence avoid the impacts to social surroundings associated with it.

### 2.3.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed the following mitigation measures to minimise the impact on social surroundings:

- maintenance of a vegetation strip and vegetated bund to screen the REPF from residents and the Great Eastern Highway
- construction of noise bunding to reduce impacts from noise on sensitive receptors
- relocation of pumps and motors where practicable to the south eastern side of the plant to increase the separation distance between the plant and sensitive receptors
- shielding and cowling over motors and pumps to minimise noise emissions at the source.

Measures to control dust are discussed in section 2.1.7.

The EPA notes that the proponent will be required to comply with the Environmental Protection (Noise) Regulations 1997.

### 2.3.8 Assessment of impacts to environmental values

The EPA has considered the potential impacts to social surroundings particularly in regard to noise, dust and visual amenity.

The EPA considers that proponents fugitive dust emissions are manageable and will not significantly alter the cumulative concentrations of dust in the Kalgoorlie-Boulder area.

The proponent has demonstrated that the REPF is not likely to have a significant impact on noise at sensitive receptors and the proposal as described in the Environmental Review Document and is capable of operating within the Environmental Protection (Noise) Regulations 1997.

The location of the REPF is on the entrance to the city of Kalgoorlie-Boulder. Concerns were raised through the public comment period on the visual impact this will have on the area and particularly the entrance statement to the city. The proponent has proposed to maintain a vegetated buffer between the Great Eastern Highway and the facility which will provide a visual screen.

The EPA does not consider that there is a significant residual impact to the key environmental factor of social surroundings and considers that fugitive dust emissions and the impact to sensitive receptors will be regulated through the

implementation of an Environmental Protection Licence issued under Part V of the EP Act.

### 2.3.9 Summary of key factor assessment and recommended conditions

The EPA has considered the likely environmental outcomes of the proposal on social surroundings environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 4.

**Table 4: Summary of assessment for social surroundings**

Residual emissions		Assessment finding	Recommended conditions and DMA regulation
1.	Noise emissions from plant operation	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Direct regulation through through Environmental Protection (Noise) Regulations 1997.
2	Fugitive dust emissions from material stockpiles and operation of the plant	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Regulation through Environmental Protection Licence issued under Part V of the EP Act.
3	Visual amenity	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Direct regulation through: <ul style="list-style-type: none"> <li>condition 2 (Visual Amenity).</li> </ul>

### 3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key environmental factors and environmental values individually in the key factor assessments above, given the link between air quality, human health and social surroundings, the EPA also considered connections and interactions between them to inform a holistic view of impacts to the whole environment.

Figure 3 illustrates the connections and interactions between the key environmental factors to inform the EPA's holistic assessment.



**Figure 3: Intrinsic interactions between environmental factors**

The EPA has considered the connectivity between the key environmental factors and considers that all three key environmental factors are intrinsically linked and that the impacts from one are not isolated from the others. By the same token, the mitigation measures employed to avoid or minimise the impacts from one factor are also linked.

The potential impacts to human health arise due to potential exposure to radiation from the concentrate and the by-products (namely the IP) however for this to have a potential impact it must also impact on air quality as the method of exposure for the environment is through air borne dust - this in turn impacts on amenity values and hence social surroundings.

Similarly, by implementing measures to avoid or minimise the potential for dust from the proposal, the proponent reduces the potential impact to human health and social surroundings.

The EPA considers that the proposed mitigation and management for impacts to air quality will also mean the inter-related impacts to other environmental factors (including the values associated with human health and social surroundings) are likely to be consistent with the EPA's environmental factor objectives.

#### Summary of holistic assessment

When the separate environmental factors and values affected by the proposal were considered together in a holistic assessment, the EPA formed the view that the impacts from the proposal would not alter the EPA's views about consistency with the EPA's factor objectives, as assessed in section 2.

## 4 Recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values likely to be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- EPA's confidence in the proponent's proposed mitigation measures
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment and
- principles of the EP Act.

The EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.



## 5 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

The EPA provides the following information for consideration by the Minister.

- Regulation of radiation matters will be undertaken by DMIRS and the Radiological Council of Western Australia. This will include the approval and review of compliance with Radiation Management Plans and Transport Management Plans to allow for the transport of rare earth concentrate and IP between the Mt Weld mine and the Rare Earths Processing Facility.
- Regulation of air emissions including sulphur dioxide through Part V of the EP Act.
- Regulation of noise emissions through the Environmental Protection (Noise) Regulations 1997.

## Appendix A: Recommended conditions

Section 44(2) of *Environmental Protection Act 1986* specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This appendix contains the EPA's recommended conditions and procedures.

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

#### KALGOORLIE RARE EARTHS PROCESSING FACILITY

**Proposal:** Construct and operate a rare earths processing facility at Lot 500 Great Eastern Highway, Yilkari, Kalgoorlie.

**Proponent:** Lynas Kalgoorlie Pty Ltd  
Australian Company Number 053 160 302

**Proponent Address:** Suite 1, 45 Royal Street, East Perth 6004 WA

**Assessment Number:** 2269

**Report of the Environmental Protection Authority:** 1712

Pursuant to section 45 of the *Environmental Protection Act 1986*, it has been agreed that the proposal described in section 2 of the proponent's referral (September 2020), as amended by the change to proposal approved under section 43A on (9 September 2021) may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

### 1 Limitations and extent of proposal

When implementing the proposal, the proponent shall ensure the proposal does not exceed the following extents:

Proposal element	Location	Limitation or maximum extent
<i>Physical elements</i>		
Development envelope	Figure 2	135 hectares
Disturbance footprint	Figure 2	120 hectares
<i>Operational elements</i>		
Processing of rare earth concentrate		Up to 162,000 dry tonnes per annum
Rare earth carbonate production		Up to 68,000 dry tonnes per annum
Processing facility derived waste/by-products		Up to 132,000 dry tonnes per annum of iron phosphate

		Up to 330,000 dry tonnes per annum of gypsum
<i>Timing elements</i>		
Proposal life		25 years

## 2 Visual Amenity

2-1 The proponent shall implement the proposal to meet the following environmental outcomes:

- (1) maintain a vegetation buffer of no less than 30 metres between the Great Eastern Highway and the boundary of the facility;
- (2) revegetate all bunding constructed on the boundary of the facility with native species; and
- (3) undertake operations in a manner that minimises visual impacts from implementation of the proposal as far as practicable.

## 3 Waste Management

3-1 During operation of the Kalgoorlie Rare Earths Processing Facility, the proponent shall ensure that **processing facility derived waste** is removed to a waste facility approved by the Department of Mines, Industry Regulation and Safety located at the Mt Weld mine by the later of:

- (1) twelve (12) months of its production; or
- (2) the capacity of any dedicated storage infrastructure at the site being exceeded.

3-2 Where the proponent has identified the **processing facility derived waste** is no longer considered a waste and becomes considered a **processing facility derived by-product**, it may be removed to an alternative location for storage or reuse, as approved by the CEO in writing.

## 4 Contact Details

4-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

## 5 Time Limit for Proposal Implementation

- 5-1 The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any commencement, prior to this date, must be substantial.
- 5-2 Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

## **6 Compliance Reporting**

- 6-1 The proponent shall prepare, and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 6-6, or prior to implementation of the proposal, whichever is sooner.
- 6-2 The Compliance Assessment Plan shall indicate:
- (1) the frequency of compliance reporting;
  - (2) the approach and timing of compliance assessments;
  - (3) the retention of compliance assessments;
  - (4) the method of reporting of potential non-compliances and corrective actions taken;
  - (5) the table of contents of Compliance Assessment Reports; and
  - (6) public availability of Compliance Assessment Reports.
- 6-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 6-2, the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 6-1.
- 6-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 6-1 and shall make those reports available when requested by the CEO.
- 6-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.
- 6-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

- (1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;
- (2) include a statement as to whether the proponent has complied with the conditions;
- (3) identify all potential non-compliances and describe corrective and preventative actions taken;
- (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and
- (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 6-1.

## 7 Public Availability of Data

7-1 Subject to condition 7-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

7-2 If any data referred to in condition 7-1 contains particulars of:

- (1) a secret formula or process; or
- (2) confidential commercially sensitive information,

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

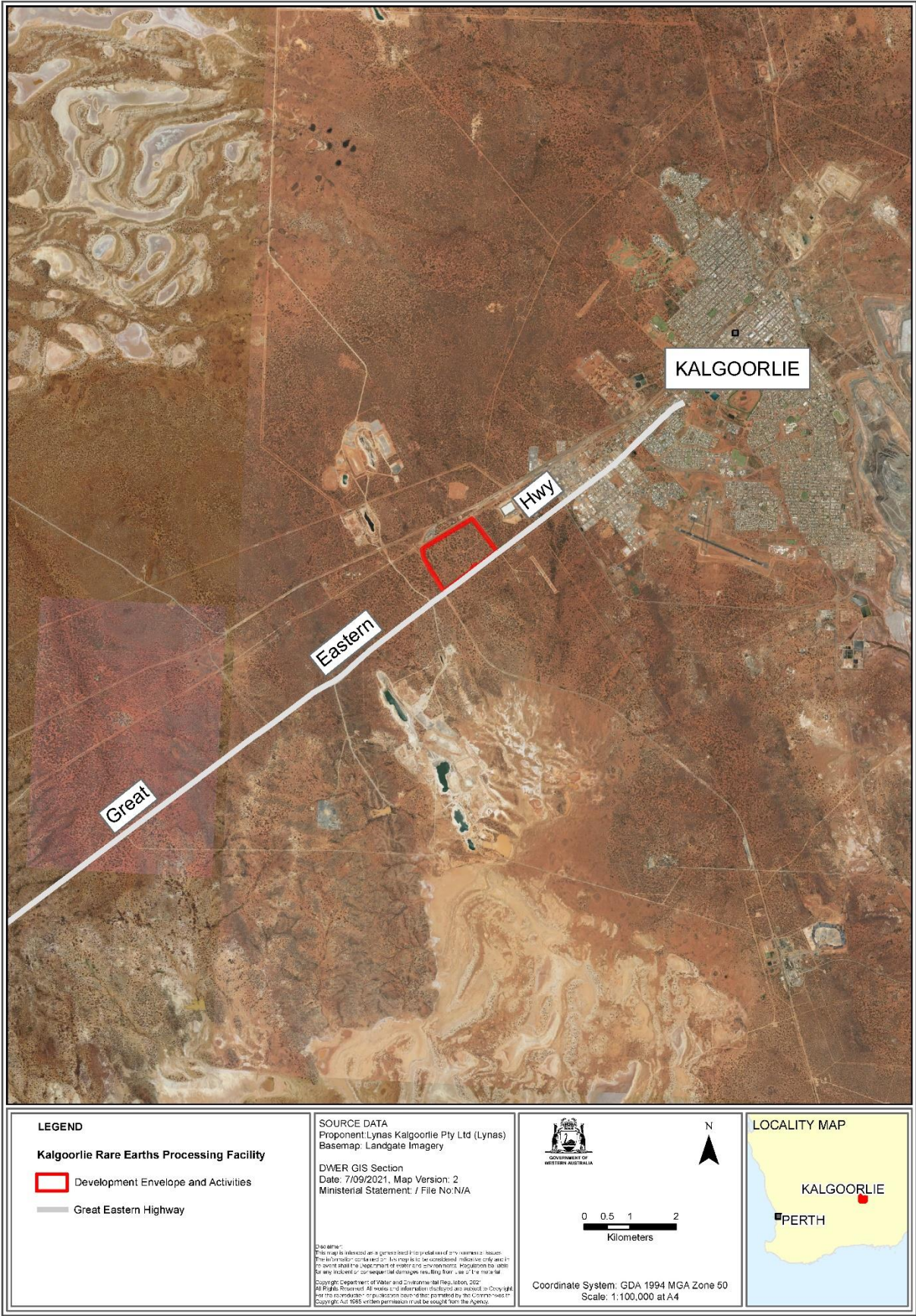
**Table 1: Abbreviations and definitions**

Acronym or abbreviation	Definition or term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or his delegate.
Processing facility derived waste	Waste material produced as a result of the operation of the facility which does not have a recognised viable alternative use.

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Processing derived by- product	Waste material produced as a result of the operation of the facility for which a viable alternative use has been found.
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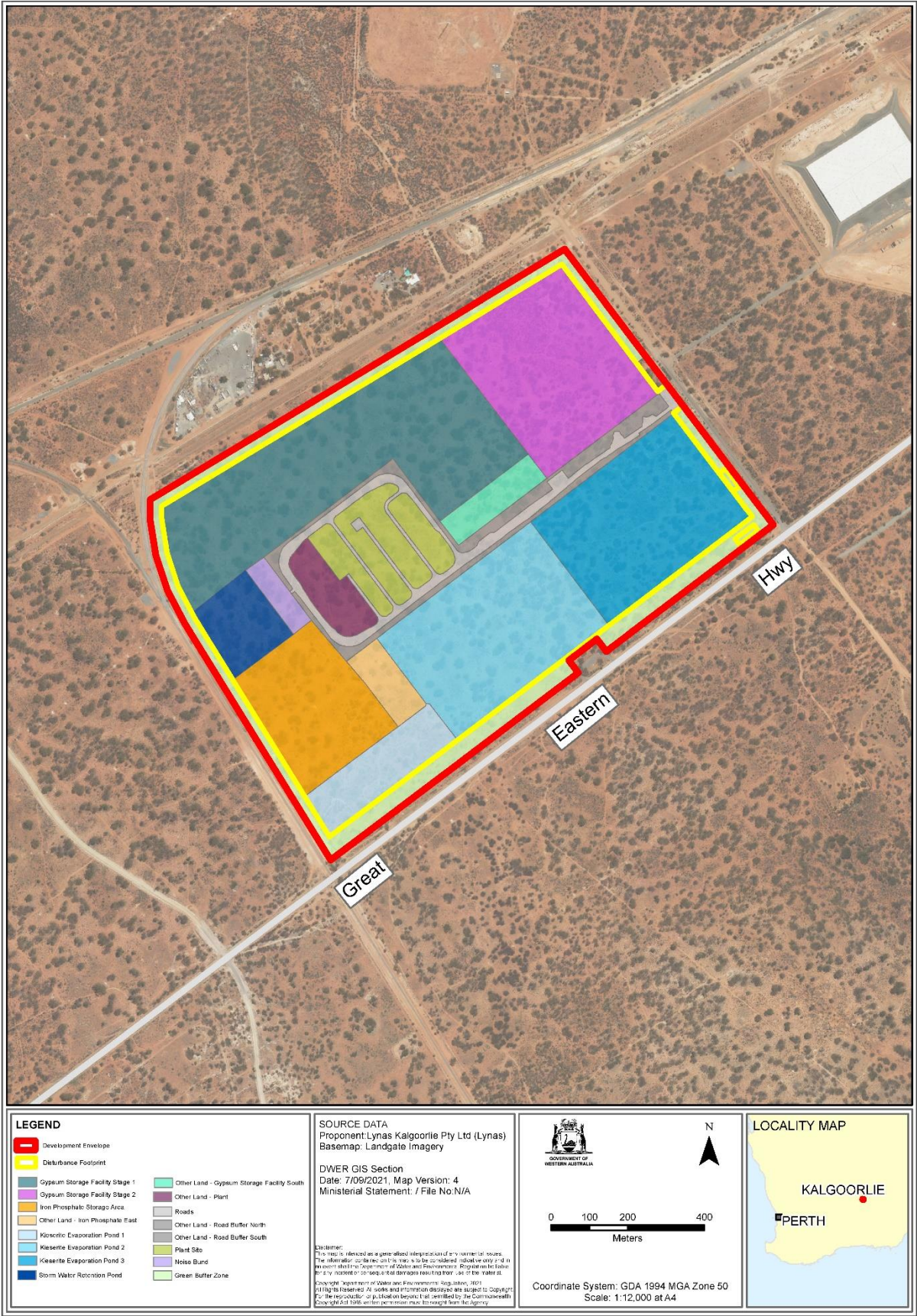




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Figure 1: Project location





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Figure 2: Development envelope and disturbance footprint



## Schedule 1

All coordinates are in metres, listed in Map Grid of Australia Zone 51 (MGA Zone 51), datum of Geocentric Datum of Australia 1994 (GDA94).

Coordinates defining the development envelope are held by the Department of Water and Environmental Regulation, Document Reference Number DWERDT499720.

## Notes

The following notes are provided for information and do not form part of the implementation conditions of the Statement:

- The EPA notes that many of the potential emissions and discharges associated with the proposal will be regulated under Part V of the Environmental Protection Act 1986. This includes the storage of by-products on site. The Department of Water and Environmental Regulation will assess the emissions and discharges in detail, and mitigation and monitoring conditions are expected to be applied to the proposal.
- The EPA notes that management of impacts associated with low level radioactive material and Naturally Occurring Radioactive Material will be regulated through the *Mines Safety and Inspection Act 1994* and the *Radiation Safety Act 1975* via the implementation of a Radiation Management Plan and a Transport Management Plan.

## Appendix B: Decision-making authorities

Section 45(1) of the *Environmental Protection Act 1986* requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following DMAs have been identified:

Decision-Making Authority	Legislation (and approval)
1. Minister for Environment	<i>Environmental Protection Act 1986</i> - Part IV
2. Minister for Mines and Petroleum	<i>Mining Act 1978</i> - granting of a General Purpose Lease
3. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i> – Section 18 clearances
4. Chief Executive Officer, Department of Water and Environmental Regulation	<i>Environmental Protection Act 1986</i> - works approval and licence - approval for noise management plans for construction outside of prescribed hours
5. Chief Dangerous Goods Officer, Department of Mines, Industry Regulation and Safety	<i>Dangerous Goods Safety Act 2004</i> - storage and handling of dangerous goods
6. Executive Director Resource and Environmental Compliance, Department of Mines, Industry Regulation and Safety	<i>Mining Act 1978</i> - mining proposal
7. State Mining Engineer, Department of Mines, Industry Regulation and Safety	<i>Mines Safety and Inspection Act 1994</i> - mining proposal - approval to commence mining operations
8. Secretary, Radiological Council	<i>Radiation Safety Act 1975</i> - Approval of Radiation Safety Management Plan
9. Chief Executive Officer, City of Kalgoorlie-Boulder	<i>Planning and Development Act 2005</i> – - Planning Approval <i>Local Government Act 1995</i> - development approval and scheme amendment <i>Health Act 1911</i> and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974 - permit for treatment of sewage

Note: In this instance, agreement is only required with DMAs 1, 2 and 3 these DMAs are Ministers.

## Appendix C: Consideration of Environmental Protection Act principles

EP Act Principle	Consideration
<p><b>1. The precautionary principle</b></p> <p><i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</i></p> <p><i>In application of this precautionary principle, decisions should be guided by –</i></p> <ul style="list-style-type: none"> <li><i>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i></li> <li><i>(b) an assessment of the risk-weighted consequences of various options.</i></li> </ul>	<p>The EPA has considered the precautionary principle in its assessment, and has had particular regard to this principle in its assessment of air quality, human health and social surroundings.</p> <p>The EPA notes the high degree of interconnectedness between these three factors in this situation and recognises that the mitigation measures proposed by the proponent to avoid and minimise impacts to air quality will also affect the significance of impacts from human health and social surroundings.</p> <p>The EPA has recommended conditions to ensure that environmental protection outcomes are achieved through maintenance of visual amenity and appropriate disposal of by-products. The EPA notes that air quality, human health and social surroundings would also be regulated through Part V of the EP Act, the <i>Radiation Safety Act 1978</i> and the <i>Mines Safety and Inspection Act 1994</i>.</p> <p>From its assessment of this proposal the EPA has concluded there is no threat of serious or irreversible harm provided that the recommended conditions are implemented.</p>
<p><b>2. The principle of intergenerational equity</b></p> <p><i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	<p>The EPA has considered the principle of intergenerational equity in its assessment and has had particular regard to this principle in its assessment of air quality, human health and social surroundings.</p> <p>The EPA recognises the importance of rare earths in providing a more sustainable future through their use in the development of renewable energy technologies.</p> <p>In assessing this proposal, the EPA has recommended conditions to manage impacts to visual amenity and waste management. The EPA has also noted where complementary regulations will manage impacts to air quality.</p> <p>From its assessment of this proposal, the EPA has concluded that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the benefit of future generations.</p>

EP Act Principle	Consideration
<p><b>3. The principles of the conservation of biological diversity and ecological integrity</b></p> <p><i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	<p>The EPA has considered the principle of conservation of biological diversity and ecological integrity in its assessment, and has had particular regard to this principle in its assessment of flora and vegetation and terrestrial fauna.</p> <p>The EPA has considered to what extent the proposal will impact on flora and vegetation and terrestrial fauna and the extent to which these impacts can be ameliorated to ensure consistency with the principle of conservation of biological diversity and ecological integrity.</p> <p>The EPA has concluded that given the nature of the impacts being relatively minor as there are no threatened or priority flora or fauna species and the vegetation and habitat types are widespread in the region, that the proposed clearing is not likely significantly impact of biological diversity and ecological integrity of the area.</p> <p>From its assessment of this proposal, the EPA has concluded that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the benefit of future generations.</p>
<p><b>4. Principles relating to improved valuation, pricing and incentive mechanisms</b></p> <p><i>(2) Environmental factors should be included in the valuation of assets and services.</i></p> <p><i>(3) The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.</i></p> <p><i>(4) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.</i></p> <p><i>(5) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.</i></p>	<p>In considering this principle, the EPA notes that the proponent will bear the costs relating to implementing the proposal to achieve environmental outcomes, and management and monitoring of environmental impacts during construction, operation and decommissioning of the proposal. The EPA has had particular regard to this principle in considering social surroundings and human health.</p> <p>The EPA has had regard to this principle during the assessment of the proposal.</p>

EP Act Principle	Consideration
<p><b>5. The principle of waste minimisation</b></p> <p><i>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</i></p>	<p>The EPA has considered the principle of waste minimisation in its assessment and has had particular regard to this principle in its assessment of human health and social surroundings.</p> <p>The EPA notes the amendments to the proposal made by the proponent to remove the Yarri Road By-product Storage Facility from the proposal and minimise the discharge of waste into the environment by removing all By-product to the Mt Weld mine. It is also noted that the proponent will continue to seek alternative uses for its by-product and continue the work in this area commenced at its Malaysian operations.</p> <p>The EPA has had regard to this principle during the assessment of the proposal.</p>

## Appendix D: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
<b>Land</b>			
Flora and vegetation	<ul style="list-style-type: none"> <li>• Direct impacts to 120 hectares (ha) within a 135 ha development envelope at Lot 500.</li> <li>• Direct impacts to 97.3 ha within a 535 ha development envelope at By-product Storage Facility (BSF) on Yarri Road.</li> <li>• Potential material impacts to flora and vegetation from dust, weeds and pathogens</li> </ul>	<p><u>Public comments</u></p> <p>Two comments were received on this factor during public review period.</p> <p>One submitter noted the potential impacts of dumping the waste at the BSF on Yarri Road on surrounding flora and vegetation.</p> <p>The other submitter raised concerns of the possible occurrence of at least one priority flora species, <i>Eremophila praecox</i>, on Lot 500 Great Eastern Highway.</p>	<p>Flora and vegetation was identified as a key environmental factor when the EPA decided to assess the proposal.</p> <p>The level of assessment was set at Referral Information with additional information required under section 40(2)(a) of the EP Act (four-week public review). The EPA considered that the information provided was not adequate to assess the potential impact on flora and vegetation due to the absence of information regarding the type and extent of the proposed clearing at BSF on Yarri Road.</p> <p>Since setting the level of assessment, the proponent has changed the referral under s. 43A of the EP Act to remove the BSF on Yarri Road.</p> <p>Clearing of vegetation on Lot 500 Great Eastern Highway has previously been approved under Part V of the EP Act (CPS 8322/1) with an approved clearing covering the full extent of Lot 500 Great Eastern Highway (134.267 ha). This approval was issued to the City of Kalgoorlie-Boulder to allow clearing proposed for pending industrial land uses on Lot 500 Great Eastern Highway. Through the processing and assessment of this clearing permit the impacts have been considered against the clearing principles and found to be acceptable.</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>There were no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) recorded at the site and no threatened or priority species recorded. Surveys undertaken on Lot 500 Great Eastern Highway have shown that all flora and vegetation types are well represented outside of the development envelope.</p> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>• s. 43A change to remove the BSF on Yarri Road</li> <li>• an existing clearing permit</li> <li>• no TECs or PECs or vegetation communities being present</li> <li>• vegetation types affected being well represented in the region</li> <li>• relatively small scale of direct impacts</li> <li>• the <i>Environmental Factor Guideline – Flora and Vegetation</i> (EPA 2016a)</li> <li>• the significance of considerations in the <i>Statement of Environmental Principles, Factors and Objectives</i> (EPA 2020a)</li> </ul> <p>the EPA considers it is unlikely that the proposal would have a significant impact on flora and vegetation and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA no longer considered flora and vegetation to be a key environmental factor at the conclusion of its assessment.</p>
Terrestrial fauna	<ul style="list-style-type: none"> <li>• Direct impacts to 120 ha within a 135 ha development envelope at</li> </ul>	<p><u>Public comments</u></p> <p>Three comments were received on this factor during public review period:</p>	<p>Terrestrial fauna was identified as a preliminary key environmental factor when the EPA decided to assess the proposal.</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	<p>Lot 500 Great Eastern Highway.</p> <ul style="list-style-type: none"> <li>• Direct impacts to 97.3 ha within a 535 ha development envelope at BSF on Yarri Road.</li> <li>• Potential material impacts to local fauna populations arising from dust, light and noise generation during the construction phase.</li> </ul>	<p>Submitter 1 raised concerns that there was a lack of consideration for Short Range Endemics (SREs) besides the Arid Bronze Azure Butterfly. The proponent noted in their response to submission that the Arid Bronze Azure Butterfly was the only SRE invertebrate of conservation significance in the area according to the desktop assessment.</p> <p>Submitter 2 raised a number of concerns that terrestrial fauna surveys were inadequate. The proponent noted in its response that all surveys were aligned with the latest EPA Technical Guidance for terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020b). This was confirmed by technical experts within DWER.</p> <p>Submitter 3 raised concerns of the potential impacts of dumping the waste at the BSF on Yarri Road on surrounding terrestrial fauna.</p>	<p>The level of assessment was set at Referral Information with additional information required under section 40(2)(a) of the EP Act (four-week public review). The EPA considered that information provided was not adequate to assess the potential impact on terrestrial fauna due to the absence of information regarding the type and extent of the proposed clearing at BSF on Yarri Road.</p> <p>Since setting the level of assessment, the proponent has changed the referral under s. 43A of the EP Act to remove the BSF on Yarri Road.</p> <p>A Level 1 Fauna Risk Assessment has been conducted at Lot 500 Great Eastern Highway in 2018 along with a field survey to verify the desktop survey findings. This report was subsequently peer reviewed in June 2020 and confirmed the findings of the original report in regard to the likelihood of conservation significant species being present at the site.</p> <p>The habitat at Lot 500 Great Eastern Highway is unlikely to support any conservation significant fauna and the habitat type is well represented in the region. Fauna habitat is an open eucalypt woodland with a mixed understory of scattered shrubs and chenopods in good condition. A small area of denser shrubs exists at the site however it was not considered large enough or significantly different to represent a separate habitat type. As indicated in the flora and vegetation section above, this habitat type is locally and regionally well represented.</p> <p>Clearing of vegetation within Lot 500 Great Eastern Highway had been approved under a Part V Clearing</p>



Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>Permit (CPS 8322/1) of the EP Act for a total area of 134.9 ha. Through the processing and assessment of this clearing permit the impacts have been considered against the clearing principles and found to be acceptable.</p> <p>Implementation of the following recommendations will mitigate the impact outcomes for terrestrial vertebrate fauna during the vegetation clearing process:</p> <ul style="list-style-type: none"> <li>• Construction workforce will be trained in conforming to key mitigation measures defined in the Construction Environmental Management Plan, which includes a vertebrate fauna management plan for the construction phase (Appendix S of Environmental Review Document),</li> <li>• Clearing at Lot 500 Great Eastern Highway will be undertaken progressively as particular plant components are scheduled for construction to allow fauna to escape from the site;</li> </ul> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>• s. 43A change to remove BSF on Yarri Road</li> <li>• the approved clearing permit on Lot 500 Great Eastern Highway</li> <li>• no vertebrate fauna species listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) or Scheduled under the <i>Biodiversity Conservation Act 2016</i> (BC Act) were recorded within the Project area</li> <li>• the nature and scale of the terrestrial fauna impacts associated with activities</li> </ul>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<ul style="list-style-type: none"> <li>the mitigation measures identified within the Construction Environmental Management Plan for Terrestrial Fauna</li> <li>the <i>Environmental Factor Guideline – Terrestrial Fauna</i> (EPA 2016b)</li> <li>the significance of considerations in the <i>Statement of Environmental Principles, Factors and Objectives</i> (EPA 2020a)</li> </ul> <p>the EPA considers it is unlikely that the proposal would have a significant impact on Terrestrial Fauna and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA no longer considers terrestrial fauna to be a key environmental factor at the conclusion of its assessment.</p>
Terrestrial environmental quality	<ul style="list-style-type: none"> <li>Erosion or scouring from reduction in soil stability during civil works.</li> <li>Drainage and associated erosion of by-product facility surfaces and engineered hardstands.</li> <li>Potential seepage of leachates from chemical and by-product storage.</li> </ul>	<p><u>Public comments</u></p> <p>One comment was received on this factor during public review period. The submitter raised concerns about the potential impacts of soil contamination.</p>	<p>Terrestrial environmental quality was identified as a preliminary key environmental factor when the EPA decided to assess the proposal.</p> <p>The level of assessment was set at Referral Information with additional information required under section 40(2)(a) of the EP Act (four-week public review). The EPA considered that information provided was not adequate to assess the potential impact on terrestrial environmental quality in particular as it did not provide information on the Yarri Road site.</p> <p>Since setting the level of assessment, the proponent has changed the referral under s. 43A of the EP Act to remove the BSF on Yarri Road.</p> <p>Lot 500 Great Eastern Highway is characterised by low lying flat landforms with indistinct drainage lines. There</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>is little potential for erosion at site. Soil types are typically sandy clay near the surface overlaying clay and weathered bedrock. Soil investigations undertaken at Lot 500, determined that this site was unlikely to have acid sulphate soils present.</p> <p>The proponent has proposed the following mitigation measures:</p> <ul style="list-style-type: none"> <li>• bunding of chemical reagent and product storage</li> <li>• use of a Geosynthetic Clay Liner (GCL) and a High-Density Polyethylene (HDPE) lining of Lot 500 Great Eastern Highway storage facility base</li> <li>• ensuring storage facility design incorporates an adequate freeboard (nominally 300 mm) to prevent overtopping under significant rainfall events and</li> <li>• use of appropriate batter angles to minimise potential for erosion, and to ensure the structure is safe and geotechnically stable.</li> </ul> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>• s. 43A change to remove BSF on Yarri Road</li> <li>• the static nature of disturbance post construction</li> <li>• wide representation of soil types and landforms in the region</li> <li>• minimisation and environmental management proposed for Lot 500 Great Eastern Highway</li> <li>• the <i>Environmental Factor Guideline – Terrestrial Environmental Quality</i> (EPA 2016c)</li> <li>• the significance of considerations in the <i>Statement of Environmental Principles, Factors and Objectives</i> (EPA 2020a)</li> </ul>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>the EPA considers it is unlikely that the proposal would have a significant impact on Terrestrial Environmental Quality and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA no longer considers terrestrial environmental quality to be a key environmental factor at the conclusion of its assessment.</p>
<b>Water</b>			
Inland waters	<ul style="list-style-type: none"> <li>Contamination of surface water flows via leaks from chemical and by-product storage.</li> <li>Contamination of surface water from spills and leaks of chemicals, fuel or oil.</li> <li>Contamination of groundwater through failure of storage facility liners.</li> <li>Deposition of dust from stockpiles to ephemeral drainage lines.</li> </ul>	<p><u>Public comments</u></p> <p>Three submitters raised concerns regarding the contamination of groundwater at BSF at Yarri Road site</p> <p>One submitter raised concerns regarding water consumption in the context of existing water users and regional water management plans and the management of waste waters.</p> <p>One submitter raised concerns about radioactive substances generated by this proposal from water runoff that has encountered iron phosphate storage facility</p>	<p>Inland waters was identified as a preliminary key environmental factor when the EPA decided to assess the proposal.</p> <p>The level of assessment was set at Referral Information with additional information required under section 40(2)(a) of the EP Act (four-week public review). The EPA considered that information provided was not adequate to assess the potential impact on inland waters due to the absence of information regarding the type and extent of the potential impacts at Yarri Road site.</p> <p>Since setting the level of assessment, the proponent has changed the referral under s. 43A of the EP Act to remove the BSF on Yarri Road.</p> <p>There are no defined surface water features at the Lot 500 Great Eastern Highway, with surface water drainage occurring as shallow overland flows during periods of high rainfall.</p> <p>Potential impacts to surface water regimes at Lot 500 Great Eastern Highway is considered limited in nature,</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>due to the lack of significant surface water bodies and ephemeral creeks at, and downstream, of the site.</p> <p>The proponent undertook groundwater sampling from three groundwater monitoring wells located at Lot 500 Great Eastern Highway. Depth to groundwater at the site ranges between 32 to 36 metres below ground level. Groundwater quality is generally poor with pH ranging from 3.7 to 6.5 and electrical conductivity being high (50,000 to 84,000 <math>\mu\text{s}/\text{cm}</math>).</p> <p>The proposal will use retreated water from the City of Kalgoorlie-Boulder water treatment plant. The site will recycle water and would not discharge any wastewater.</p> <p>The proponent has proposed the following mitigation:</p> <ul style="list-style-type: none"> <li>• constructing lined waste facilities to prevent seepage</li> <li>• stormwater diverted away from operational areas and directed to natural flow paths downstream</li> <li>• plant facilities to be constructed on hardstand and stormwater collected from these areas to be retained on site.</li> </ul> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>• no defined surface water features at the Lot 500 Great Eastern Highway</li> <li>• the proponent not requiring water from ground or surface supplies</li> <li>• the depth to groundwater</li> <li>• the generally poor quality of the groundwater present at the sites</li> <li>• the proposed mitigation measures</li> </ul>



Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<ul style="list-style-type: none"> <li>the <i>Environmental Factor Guideline – Inland Waters</i> (EPA 2018)</li> <li>the significance considerations in the <i>Statement of Environmental Principles, Factors and Objectives</i> (EPA 2020a),</li> </ul> <p>the EPA considers it is unlikely that the proposal would have a significant impact on inland waters and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA no longer considers inland waters to be a key environmental factor at the conclusion of its assessment.</p>
<b>Air</b>			
Greenhouse gas emissions	Contribution of 56,082 tonnes carbon dioxide equivalence (CO <sub>2</sub> -e) per year scope 1 and 2 including site preparation and operation.	There were no public or comments regarding greenhouse gas.	<p>Greenhouse Gas (GHG) emission estimates for the proposal are based on methodologies and emission factors for determining Scope 1 and 2 emissions as defined in the <i>National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008</i> as amended (CER, 2019), with due reference to the most recent NGER Technical Guidelines (for 2018-19) (CER 2017).</p> <p>The majority of GHG emissions associated with the proposal would be from the consumption of electricity and natural gas.</p> <p>The tCO<sub>2</sub>-e/yr emitted represents approximately 0.056% of the 2018/19 GHG emissions for the national industry sector, or 1.1% of the Western Australian 2018 industrial sector emissions (DISER 2020).</p> <p>The annual scope 1 and 2 GHG emissions were predicted to be below the EPA's <i>Environmental Factor Guideline – Greenhouse Gas Emissions</i> (EPA 2020c)</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>limit of 100,000 tonnes per annum of CO<sub>2</sub>-e direct (scope 1) emissions.</p> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>• <i>the Environmental Factor Guideline – Greenhouse Gas Emissions (EPA 2020c)</i> which details that greenhouse gas from a proposal will be assessed where it exceeds 100,000 tonnes of scope 1 emissions each year, measured in CO<sub>2</sub>-e</li> <li>• the proposal contributing about 56,082 tonnes CO<sub>2</sub>-e per year scope 1 and 2 including site preparation and processing</li> <li>• the significance considerations in the <i>Statement of Environmental Principles, Factors and Objectives (EPA 2020a)</i></li> </ul> <p>the EPA considers it is unlikely that the proposal would have a significant impact on GHG emissions and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA did not consider the factor GHG emissions to be a key environmental factor at the conclusion of its assessment.</p>

## Appendix E: Relevant policy, guidance and procedures

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

- *Environmental Factor Guideline – Air Quality* (EPA 2020)
- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016)
- *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020)
- *Environmental Factor Guideline – Human Health* (EPA 2016)
- *Environmental Factor Guideline – Inland Waters* (EPA 2018)
- *Environmental Factor Guideline – Social Surroundings* (EPA 2016)
- *Environmental Factor Guideline – Terrestrial Environmental Quality* (EPA 2016)
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020)
- *Statement of Environmental Principles, Factors and Objectives* (EPA 2020)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures* (State of Western Australia 2016)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures* (State of Western Australia 2016)
- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016)
- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020).

## Appendix F: List of submitters

### Public review of proponent information

#### **Organisations and public**

Aidwatch

ANON-KWJP-3R3J-X

ANON-KWJP-3R36-A

ANON-KWJP-3R3F-T

ANON-KWJP-3R3K-Y

ANON-KWJP-3R35-9

ANON-KWJP-3R3P-4

ANON-KWJP-3R3G-U

ANON-KWJP-3R31-5

ANON-KWJP-3R33-7

ANON-KWJP-3R3B-P

ANON-KWJP-3R3T-8

ANON-KWJP-3R3Z-E

ANON-KWJP-3R34-8

Personal Submitter A

Personal Submitter B

#### **Government agencies**

Department of Mines, Industry Regulation and Safety

Department of Water and Environmental Regulation

## Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
24 November 2020	EPA decided to assess – level of assessment set	
24 November 2020	EPA requested additional information	1 day
14 May 2021	EPA received additional information	25
1 June 2021	EPA accepted additional information	3
9 June 2021	EPA released additional information for public review	1
7 July 2021	Public review period for additional information closed	4
2 September 2021	EPA received final information for assessment	8
16 September 2021	EPA completed its assessment	2
15 October 2021	EPA provided report to the Minister for Environment	4
20 October 2021	EPA report published	3 days
3 November 2021	Appeals period closed	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the Environmental Protection Authority (EPA) decides to assess the proposal and records the level of assessment.

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.



## References

ARPANSA. (2010). *Environmental Protection: Development of an Australian Approach for Assessing Effects of Ionising Radiation on Non-Human Species – Technical Report 154*. Edited by Australian Radiation Protection and Nuclear Safety Agency: ARPANSA.

CER 2017, *National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the estimation of emissions by facilities in Australia Applies to the estimation of emissions in the 2017-18 reporting year*. Clean Energy regulator October 2017.

DISER 2020, *State and Territory Greenhouse Gas Inventories 2018*, Australian Government Department of Industry, Science, Energy and Resources, May 2020

DMIRS 2010, *Managing naturally occurring radioactive material (NORM) in mining and mineral processing guideline. NORM-3.1. Monitoring NORM pre-operational monitoring requirements guideline: Resources Safety*, Department of Mines and Petroleum, Western Australia.

DoE 23006, *Air Quality Modelling Guidance Notes*, Department of Environment Perth WA, March 2006

EPA 2016a, *Environmental Factor Guideline – Flora and Vegetation*, Environmental Protection Authority, Perth, WA.

EPA 2016b, *Environmental Factor Guideline – Terrestrial Fauna*, Environmental Protection Authority, Perth, WA.

EPA 2016c, *Environmental Factor Guideline – Terrestrial Environmental Quality*, Environmental Protection Authority, Perth, WA.

EPA 2018, *Environmental Factor Guideline – Inland Waters*, Environmental Protection Authority, Perth, WA.

EPA 2020a, *Statement of Environmental Principles, Factors and Objectives*, Environmental Protection Authority, Perth, WA

EPA 2020b, *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*, Environmental Protection Authority, Perth WA

EPA 2020c, *Environmental Factor Guideline – Greenhouse Gas Emissions*, Environmental Protection Authority, Perth, WA.

Goldfields EPP, *Environmental Protection (Goldfields Residential Areas) (Sulfur Dioxide) Policy 2003*, Government of Western Australia.

Lynas 2021a, *Environmental Review Document – Lynas Rare Earths Processing Facility and By-product Storage Facility – Kalgoorlie, Version 1*, Lynas Rare Earths Ltd May 2021,

Lynas 2021b, *Lynas rare Earth Processing Facility - Kalgoorlie, Environmental Review Document, Response to Public Submissions*, 2 September 2021

MTS 2021, *Expert Opinion on: Kalgoorlie Rare Earth Processing Facility Air Quality Impact Assessment*, Matisons Toxicology Solutions, 2 September 2021

NEPM 2015, *National Environmental Protection (Ambient Air Quality) Measure*, Commonwealth of Australia, 2015

NEPM 2021, *National Environmental Protection (Ambient Air Quality) Measure*, Commonwealth of Australia, 2021