WINGELLINA NICKEL PROJECT

ENVIRONMENTAL SCOPING DOCUMENT

Rev	Date	Issued for	Prepared By	Reviewed By	Approved By
0	03/12/2013	Final Document for Issue	TF	AP	AP
1	08/01/2014	Revised Final Document for Issue	AP	AE	AP
2	05/02/2014	Revised document for EPA meeting	AK	AP	AP
3	07/03/2014	Revised document for EPA meeting	AK	AP	AP
4	13/06/2014	Final For EPA approval	AP	AF	AF

REVISION CONTROL

☒ Coordinated Review

☐ Issued for use as Standard Specification

REVISION HISTORY

Revision	Pages Revised	Remarks
0	Various	Various amendments
1	Various	Various amendments in accordance with meeting with OEPA
2	Various	Various amendments in consultation with OEPA
3	Various	Include references to EAG's, statement of compliance with EAG's refinement in scope on advice from EPA
4	22, 23	Updated aspects of Mine Closure to be more specific as to the extent of work in the Mine Closure Plan and PER.

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1.0 INTRODUCTION

1.1 Purpose of Document

Hinckley Range Pty Ltd (Hinckley Range) proposes to develop the Wingellina Nickel Project (the Proposal) in Western Australia (Assessment No. 1986).

This Environmental Scoping Document (ESD) has been prepared to meet the requirements of the *Environmental Protection Act 1986* (EP Act). The EP Act requires that where a proposal is considered likely to have a significant environmental impact; it will be subject to an assessment by the EPA under section 38 of the EP Act. This proposal is to be assessed by way of a Public Environmental Review (PER).

Scoping is required to identify key issues, early in the assessment process. The ESD has been prepared with specific reference to the Environmental Protection Authority's (EPA's) Environmental Assessment Guidelines (EAG) 1, 6, 8, 9, 10 and Sections 10.2.3 and 10.2.4 of Western Australian EP Act *Environmental Impact Assessment Administrative Procedures 2012*.

The purpose of the ESD is to:

Detail the preliminary key environmental factors that will be addressed in the PER document.
Document and initiate the studies to be undertaken to define the environmental setting and enable EPA assessment.
Identify the milestones for the preparation of the PER document.
Identify the decision making authorities for the proposal.

The PER document is required to be prepared in accordance with the ESD. The proponent should ensure that the PER document focuses on the preliminary key environmental factors. The PER document should be prepared in accordance with relevant guidelines including section 10.2.4 of the Western Australian EP Act *Environmental Impact Assessment Administrative Procedures 2012*.

1.2 Proponent Details

The proponent of the Proposal is:

Hinckley Range Pty Ltd (a wholly owned subsidiary of Metals X Limited)
18-32 Parliament Place
West Perth, WA 6005
ABN 64 052 098 496
Phone: (08) 9220 5700

1.3 Summary of the Proposal

Hinckley Range proposes to develop the Wingellina Nickel Mine, located approximately 1,450 kilometres (km) east-northeast of Perth, Western Australia. **Figure 1** shows the location and the regional context of the Proposal.

The Proposal involves open pit mining of nickeliferous limonite ore from the Wingellina deposit at a rate of 4.34 million tonnes per annum (Mtpa), and on-site processing at a processing plant using a high pressure acid leach (HPAL) process, to produce an intermediate mixed nickel-cobalt hydroxide product. The mine has been designed to

produce approximately 40,000 tonnes (t) of nickel and 3,000 t of cobalt metal in concentrate per annum for 40 years based on current reserves. The processed nickel-cobalt hydroxide will be transported to overseas markets, via road and rail to the Port of Darwin or the Port of Adelaide, following outcome of the definitive feasibility study. The transport Route is expected to follow existing road networks.

The proposal requires the construction of associated mine infrastructure; including, workshops, hardstand areas, administration buildings, access roads, borefield, laboratory, processing plant, explosive storage magazine, waste landfill, fuel storage, water storage, septic waste treatment, communications systems, roads, accommodation, co-generation power plant and tailings storage facility (TSF).

Construction of the mine and associated mine infrastructure will require clearing of approximately 2,205 ha of native vegetation within tenement E69/535. A further 211 ha of clearing, outside of this tenement, is required for raw water supply.

Twelve gigalitres (GL) per annum of water is required for the mine (dust suppression), operation of the plant and accommodation village. Water will be sourced from the Officer Basin, 100 km to the south of the proposed mine operation, and supplemented from mine dewatering activities, and TSF recovery. Dewatering will supply a maximum of 860 kL/d (0.3 GL/annum) and approximately 200 m^3/hr of water will be recycled from the TSF.

Tailings from the processing plant will be piped to the TSF at a rate of 5.0 Mtpa.

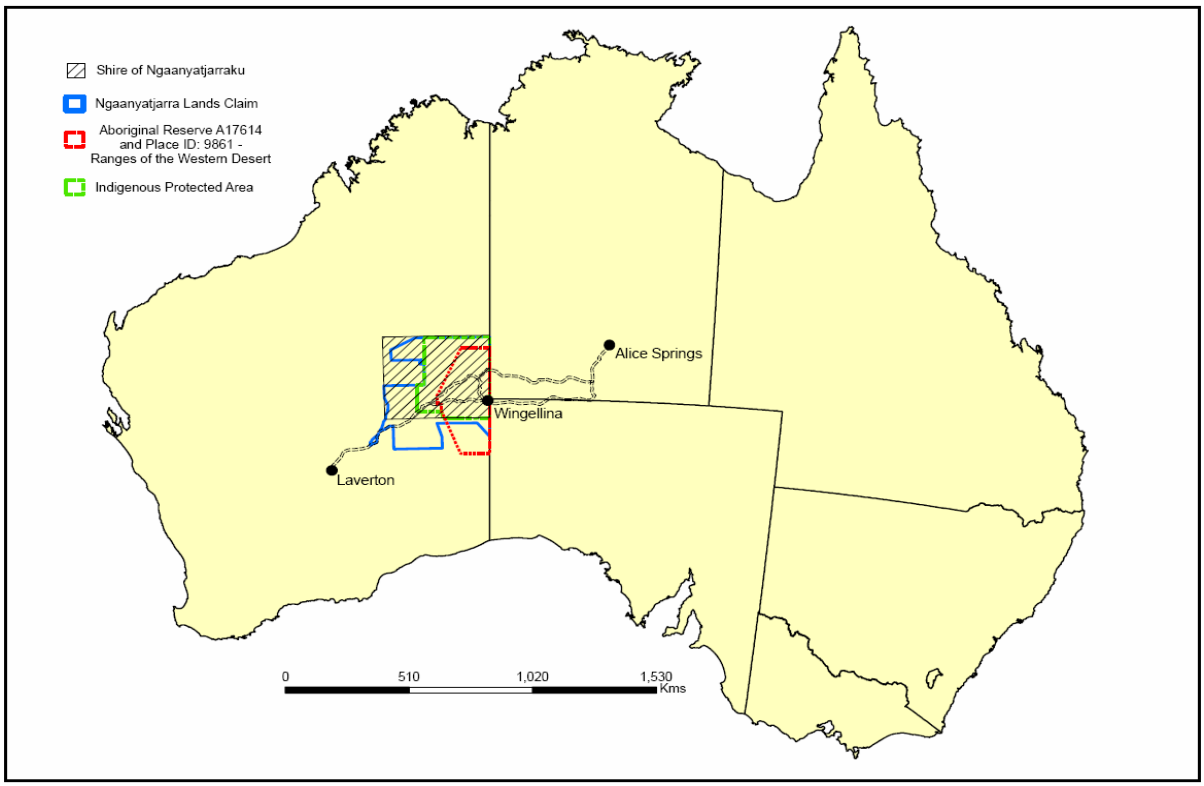


Figure 1: The Location and the Regional Context of the Proposal

Tailings will be neutralised using calcrete sourced from an existing quarry in South Australia, and trucked to the operation on existing roads.

A summary of the Key Proposal Characteristics is presented in **Table 1.**

Figures 2 and 2a illustrate the proposed development envelope of the mine operations and supporting infrastructure required for the Project.

Figures 3 and 3a depict the disturbance footprint of the implemented proposal and areas of impact. These figures also describe the special representation of the proposal elements listed in the Table 1 for; mining operations, borefield and pipelines.

A spatial dataset defining the elements of the Proposal has been lodged with this ESD.

The EPA has prepared *Environmental Assessment Guideline for Defining the Key Characteristics of a Proposal* (May 2012) (EAG 1) to define the Key Proposal Characteristics for the purposes of assessing the proposal and subsequent incorporation in the Ministerial approval statement.

Table 1: Key Proposal Characteristics

Summary of the Proposal

Proposal title	Wingellina Nickel Mine
Proponent name	Hinckley Range Pty Ltd (Hinckley Range)
Short description	This Proposal is to mine nickeliferous limonite ore from the Wingellina deposit, 1,450 km east-northeast of Perth, WA, including the construction of associated mine infrastructure (workshops, hardstand areas, administration buildings, access roads, borefield (as associated pipelines), laboratory, acid processing plant, explosive storage magazine, waste landfill, fuel storage, water storage, septic waste treatment, communications systems, roads, accommodation and co-generation power plant) and discharge waste to a Tailings Storage facility.

Physical Elements

Element	Location	Proposed Extent Authorised
1. Mining Pits	Figure 3	Clearing of no more than 610 ha within a 4,950 ha development envelope
2. Associated Mine Infrastructure (including HPAL processing plant)	Figure 3	Clearing of no more than 625 ha (excluding TSF and borefield) within a 4,950 ha development envelope.
3. Tailings Storage Facility & Evaporation Dam	Figure 3	Clearing of no more than 970 ha within a 4,950 ha development envelope
4. Raw Water Supply & pipeline	Figure 3a	Clearing of no more than 215 ha within a 2,243 ha development envelope.

Operational Elements

Element	Location	Proposed Extent Authorised
1. Ore Processing (including crushing and screening and the HPAL processing plant)	Figure 3	Treatment of no more than 4.34 Mtpa
2. Tailings Disposal	Figure 3	Disposal of no more than 5.0 Mtpa
3. Dewatering	-	Extraction of approximately 200 m3/hr
4. Groundwater abstraction	Figure 3a	Abstraction of no more than 12 gigalitres per annum

Figure 2: Project Development Envelope (excluding borefield and pipeline)

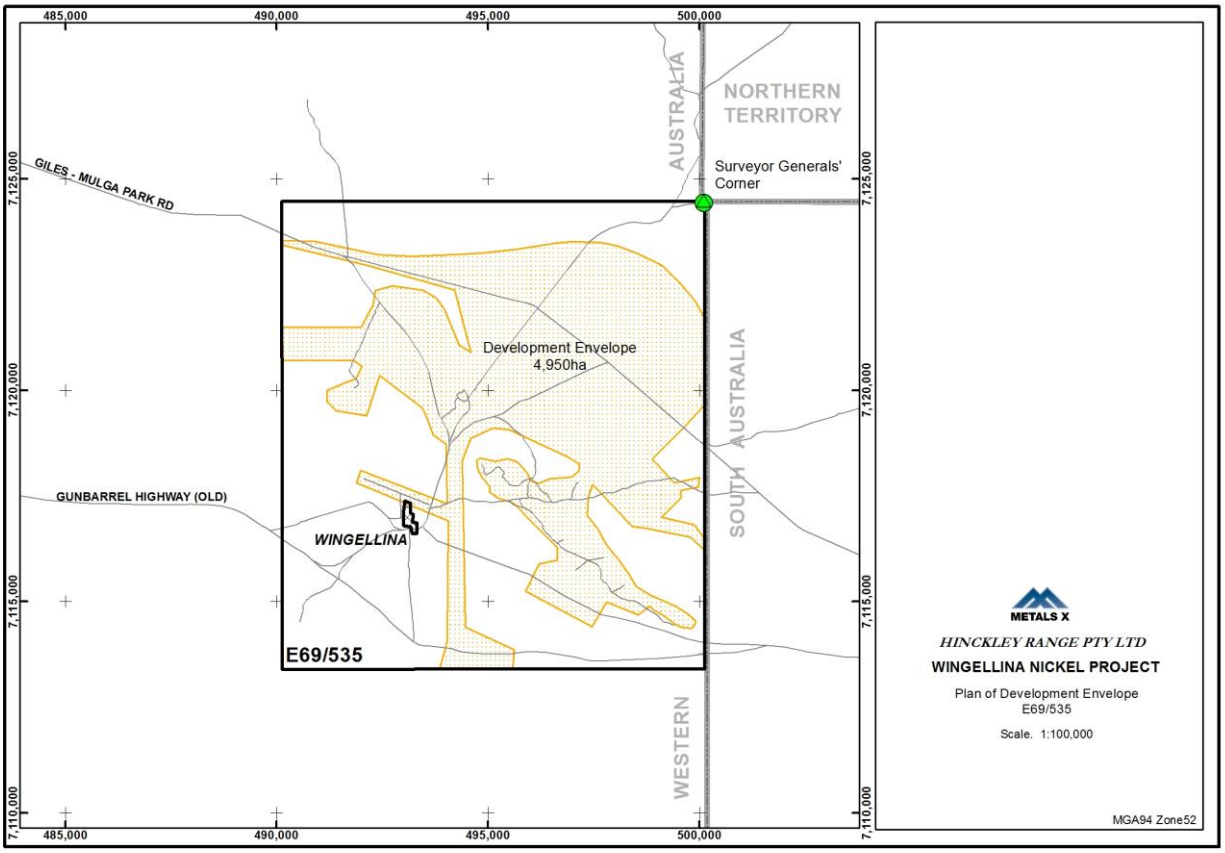


Figure 2a: Proposed Development Envelopes for Officer Borefield and Pipeline

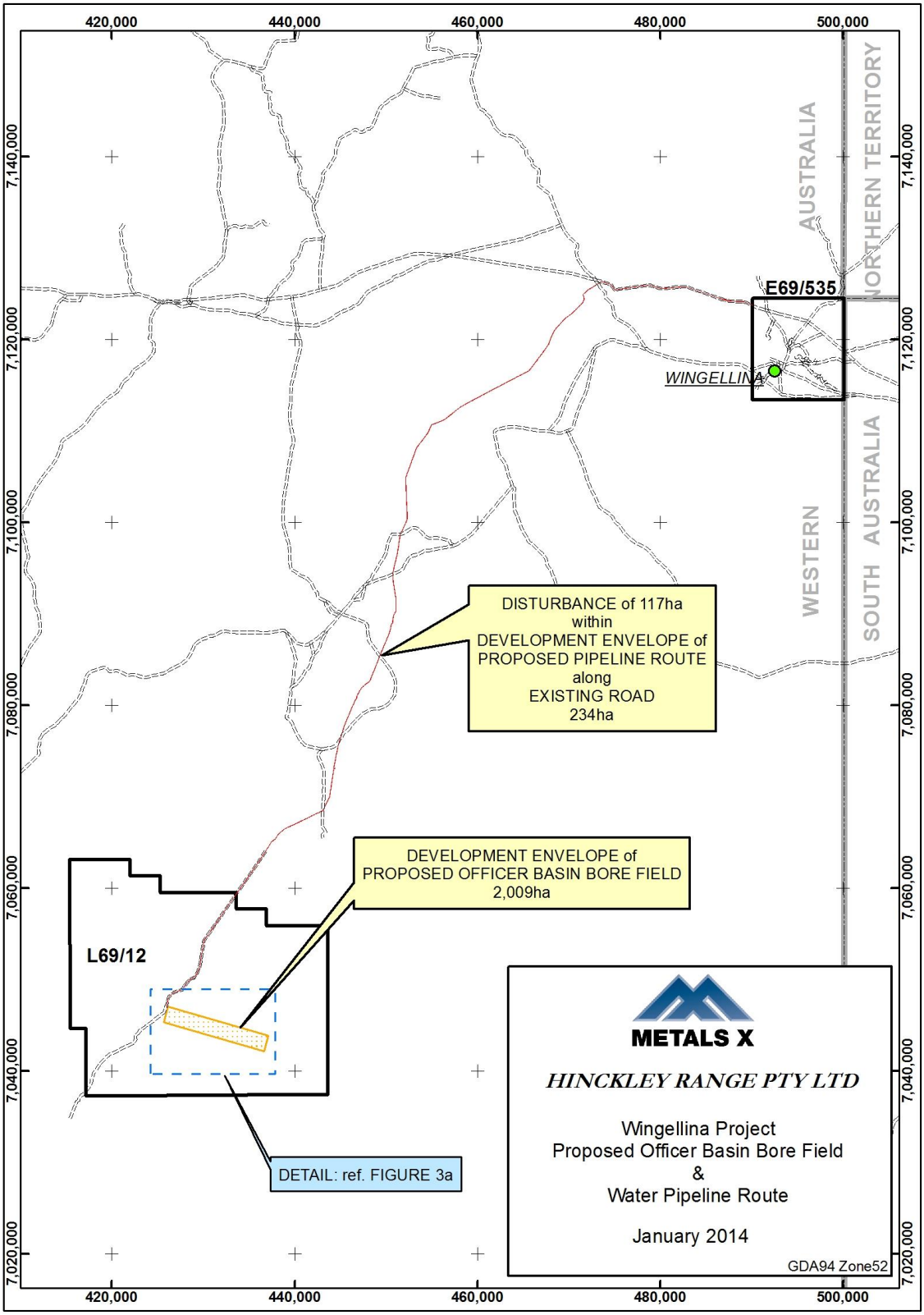


Figure 3: Disturbance Footprint of the Mine and Related Infrastructure (Excluding Borefield) Showing the Proposal Areas of Impact

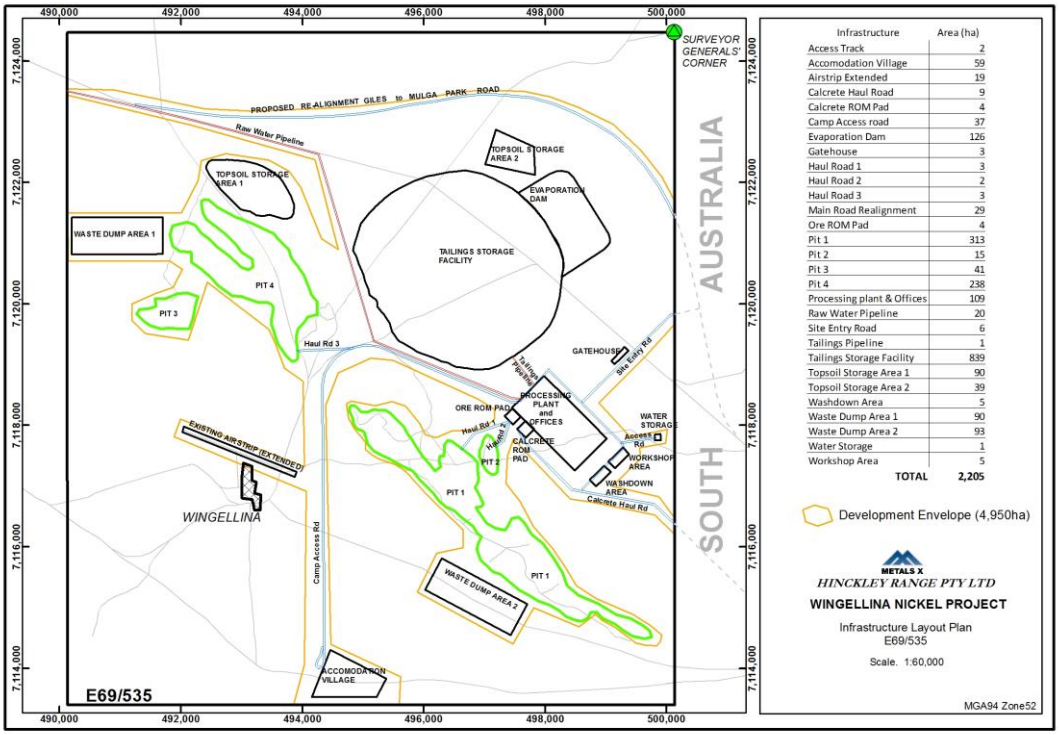
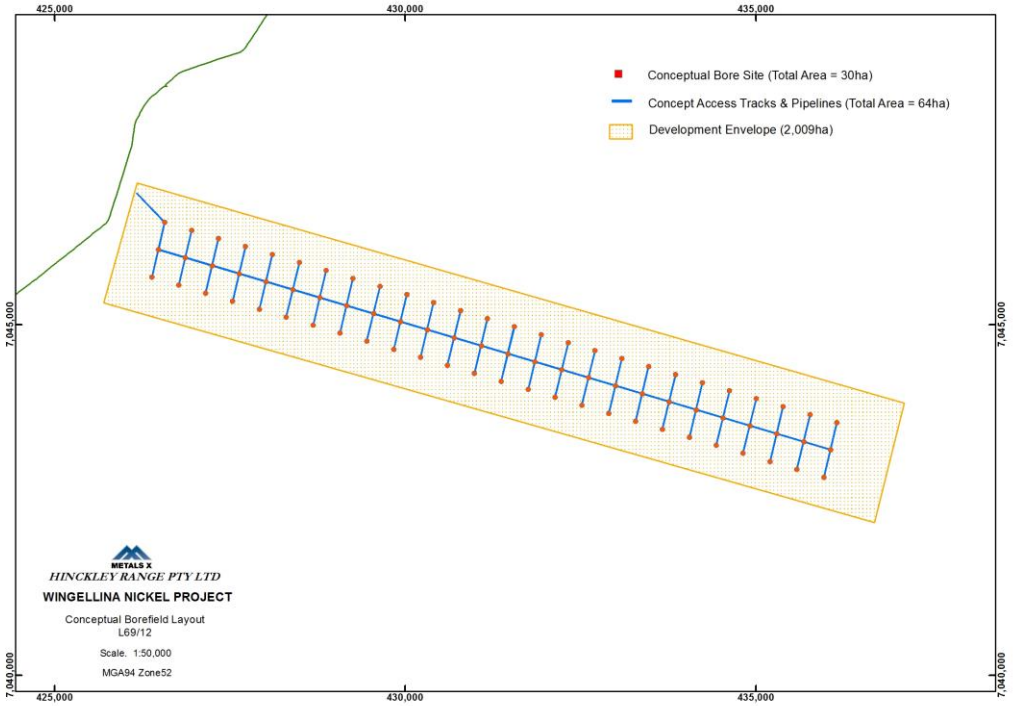


Figure 3a: Footprint of the Proposed Borefield Layout Showing the Areas of Impact



1.4 Approvals History

The environmental approvals of the Wingellina Nickel Project have been progressed by Hinckley Range since 2010. In March 2010, Hinckley Range referred the Wingellina Nickel Project to the EPA under Section 38 (Part IV) of the EP Act. On 22 March 2010 the EPA set the level of assessment for the Proposal at PER, with an eight weeks public review period. The basis of the referral was that the existing township of Wingellina was to be relocated away from operations.

Subsequently results of predictive modelling on air, noise and vibration indicate there is unlikely to be an impact on the current Wingellina Township during normal operations. As a result Hinckley Range has sought to have the Project assessed considering Wingellina as a sensitive receptor.

Hinckley Range remains committed to the orderly relocation of the existing Wingellina township but the separation of the environmental and town planning approvals will provide greater certainty on the Project should the planning approval process be protracted.

The EPA confirmed assessing the existing Wingellina Township as a sensitive receptor posed a significant change to the original referral, predominately due to the previously limited understanding of the impacts on the existing Wingellina Township and requested the proponent refer the new proposal to the EPA.

From the information provided in the Section 38 Referral, the EPA determined in November 2013 that the Project required assessment at the level of a PER, with eight weeks public review.

The EPA has requested Hinckley Range prepare this ESD.

The Project was also referred at the Commonwealth level, to the Department of the Environment, who assessed the proposed mine site area is “Not a Controlled Action”. The borefield and pipeline is to be assessed once these components of the Project have been finalised.

2.0 ENVIRONMENTAL FACTORS

2.1 Preliminary Key Environmental factors

The EPA has developed a set of environmental factors and objectives (*Environmental Assessment Guideline for Environmental factors and objectives* (EAG 8)). Key preliminary environmental factors for this Proposal were determined by the EPA at the time of its decision to assess the Proposal at the level of PER.

The PER will provide a detailed assessment of the preliminary key environmental factors. The preliminary key environmental factors and work required to be undertaken, are listed in Table 2, with consideration of the relevant EPA objectives.

Table 2 also identifies a list of policy documents that outline how the preliminary key environmental factors and scope of work relevant to the proposal are to be considered. The PER will assess the preliminary key environmental factors in a manner that is consistent with these documents.

Table 2: Preliminary Key Environmental Factors and scope of works relevant to the proposal

Air Quality	
EPA objective	To maintain air quality for the protection of the environment and human health and amenity.
Construction and Operational Phase and post closure	
Potential Impact	Dust impacts from the mine (nearest pit is approximately 2.1 kilometres (km) and the tailings storage facility is 3.4 km from the Township) and emissions from the processing plant on the Township of Wingellina (4.5 kilometres away) and proposed workers accommodation (5 kilometres away). Generation of greenhouse gas emissions (up to 520,000 t/annum).
Work and output required	Investigate and model impacts of dust from the mine (including tailings storage facility) as well as processing plant emissions (NO_x, SO_x, acid vapour) on the Wingellina community, transient communities, public areas and proposed workers accommodation. Address greenhouse gas emissions as per EPA guidance statement 12, in particular provide a greenhouse gas inventory and benchmarking against similar technologies producing similar products or their analogues. Discussion of mitigation measures taken/proposed to avoid, minimise, and reduce impacts/emissions. Provide an analysis of emissions intensity.(i.e. quantity of significant emissions per tonne of product produced) compared to published benchmarked best practice for equivalent plants and equipment. Explanation of best practice for managing air emissions. Describe the proposed management, monitoring and validation for all predictions for all significant emissions. Carry out air quality modelling in accordance with the Department of Environment (2006) *Air Quality Modelling Guidance Notes.* Cumulative air emission impacts should be modelled taking into account any locally significant emissions sources (i.e. existing power generator) and cumulative emissions. If the actual information is not available an estimate from an equivalent plant should be used. Prepare contingency plans for air emissions should predicted emissions be exceeded. Conduct consultation with stakeholders, record stakeholder comments and provide proponent responses.
Relevant policy/guidance documents	EPA Guidance Statement No. 3 *Separation Distance between Industrial and Sensitive Land Uses*. EPA Guidance Statement No. 12. *Minimising Greenhouse Gas Emissions*. *Clean Energy Act 2011.* *National Greenhouse and Energy Reporting Act 2007*

	Environmental Protection Regulations 1987 Australian Standard AS 2985 Workplace Atmospheres – Method for sampling and gravimetric determination of respirable dust. National Environmental Protection Council (Ambient Air Quality) Measure (NEPM) 2003. Department of Environment 2006 *Air Quality Modelling Guidance Notes* http://portal.environment.wa.gov.au/pls/portal/docs/PAGE/DOE_ADMIN/GUIDELINE_REPOSITORY/AIRQUALITYMODELLINGGUIDANCENOTES_MAR2006WEB.PDF Department of Environment and Conservation 2011 *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*.
Human Health	
EPA objective	To ensure that human health is not adversely affected.
Construction and Operational Phase and post closure	
Potential Impact	Reduced air quality in the location of the Wingellina town (population of 80-150), transient communities and mine workers accommodation (population of 1500 during construction and 500 during operation) from emissions from the HPAL Processing Plant and power station and generation of dust from mining, tailings storage and waste dumps. Potential impacts of toxic and/or bio-accumulating emissions.
Work and output required	Undertake a Health Impact Assessment and Health Risk Assessment on air emissions and potential for human health impacts from toxic, bio-accumulating emission, to the requirements of the Department of Health. Develop an emissions inventory (based on similar operating processes and mining operations), identify exposure pathways, and provide interpretation of outputs from modelling data and comparison with published standards protective of public health. Provide a comprehensive baseline study of the health status of the Wingellina community. . Provide information on the bioavailability of nickel and other metals of concern (eg hexavalent chromium) including management strategies for fugitive dust, including fibrous or asbestiform materials (adopting a risk-based approach in the event such materials are present) from the project, including from roads and from tailing storage facilities, during construction and operations, and post-closure. Discuss mitigation measures taken/proposed to avoid, minimise and reduce impacts. Identification of appropriate mitigations to reduce any identified or residual risks. Conduct consultation with stakeholders, record stakeholder comments and provide proponent responses. Comprehensive and meaningful consultation with the Wingellina community and Land Council is required.
Relevant policy/guidance documents	Department of Health 2008, *Health Risk Assessment in WA*, taken from http://www.public.health.wa.gov.au/cproot/1499/2/Health_Risk_Assessment.pdf, April 2008. Department of Health 2010, *Health Risk Assessment (Scoping) Guidelines*, taken

	from http://www.public.health.wa.gov.au/cproot/3087/2/HRA_Scoping.pdf, July 2010. Department of Health 2013, *Guidance Note on Public Health Risk Management of Asbestiform Minerals Associated with Mining* taken from http://www.public.health.wa.gov.au/cproot/5387/2/Guidance%20Note%20on%20Public%20Health%20Risk%20Management%20of%20Asbestos%20Associated%20with%20Mining%20Activities.pdf July 2013 Department of Mines and Petroleum, 2010, *Management of fibrous materials in Western Australian Mining Operations* http://www.dmp.wa.gov.au/documents/Factsheets/MSH_G__ManagementOfFibrousMinerals.pdf Department of Health, undated, *Public Health Consultation: A Guide for Developers* taken from http://www.public.health.wa.gov.au/cproot/1503/2/Public_Health_Consultation_Guide.pdf enHealth (2012), *Environmental Health Risk Assessment – Guidelines for Assessing Human Health Risks from Environmental Hazards, 2012.* EPA Guidance Statement No. 3 *Separation Distance between Industrial and Sensitive Land Uses*.
Heritage	
EPA objective	To ensure that historical and cultural associations are not adversely affected.
Construction and Operational Phase and post closure	
Potential Impact	Disturbance of archaeological and ethnological sites and artefacts. Loss of access to areas for local Aboriginal cultural activities and traditional ways of living.
Work and output required	Consult with both the Ngaanyatjarra people and the Department of Aboriginal Affairs in regards to heritage matters. Undertake ethnographic surveys in consultation with local Ngaanyatjarra people and the Department of Aboriginal Affairs. Consult with local Ngaanyatjarra people to ascertain social and cultural associations with the land and enable identification of environmental impacts as they affect heritage and cultural matters, such as hunting, collection of bush tucker, and access to traditional water holes and ceremonial sites. Report on concerns raised and provide mitigations for management of any changes to cultural and heritage environments relevant to the proposed development. Discussion of mitigation measures taken/proposed to avoid, minimise and reduce impacts. Discussion of potential impacts on Aboriginal cultural and heritage matters and how these impacts will be managed. Conduct consultation with stakeholders, in particular the Wingellina community and Department of Aboriginal Affairs, record stakeholder comments and provide proponent responses.
Relevant policy/guidance documents	EPA Guidance Statement No. 41 *Assessment of Aboriginal Heritage*. *Aboriginal Heritage Act 1972*

	Department of Aboriginal Affairs *Aboriginal Heritage Due Diligence Guidelines, Version 3, 2013*
Amenity (noise, light and vibration)	
EPA objective	To ensure that impacts to amenity are reduced as low as reasonably practicable.
Construction and Operational Phase	
Potential Impact	Noise, light and vibration from the mine, processing plant and power station impacting on Wingellina community (distance 4.4 kilometres) and mine workers accommodation area (distance 5 kilometres). Impacts from an increase in aircraft noise on the Wingellina community.
Work and output required	Assess the visual impacts, of; the proposal (including mine, tailings storage, waste dumps and processing plant) on the local community, from local view sheds. Assess impacts of light overspill on the local community. Propose measures / design considerations to reduce and manage impacts from light overspill. Provide a map showing the locations of all noise sensitive receptors affected or likely to be affected by the Project. Investigate sources of noise from the Project and estimate sound power levels based on best practice. Model predicted noise impacts on the Wingellina Community and proposed mine workers accommodation to assess whether noise from the proposal can be managed to comply with Noise Regulations at identified receptors. Provide noise, air blast and ground vibration predictions for sensitive receivers in relation to the Project operations. Noise impact assessment including ambient noise measurements at all neighbouring noise sensitive premises, should be conducted by strictly following the Section 5 Detailed Assessment procedure set out it EPA Guidance No. 8. Assessment of predicted noise on the Wingellina community from the airstrip expansion and the increase in aircraft movement. The methodology for assessing noise impacts from the airstrip expansion should be selected in consultation with the OEPA and the Department of Environment Regulation Noise Branch. Use the outcomes of the Noise Impact Assessment to discuss how noise from the Project activities can be managed to comply with the Environmental Protection (Noise) Regulations 1997. Cumulative noise impacts should be modelled taking into account any locally significant emissions sources (i.e. power generator). If the actual information is not available an estimate from an equivalent plant should be used. Modelling information should demonstrate that the proponent can demonstrate whether they can meet the *Environmental Protection (Noise) Regulations 1997*. Discussions of mitigation measures taken/proposed to avoid, minimise and reduce impacts.at boundaries, including local sources influencing the analysis. In the situation that noise control measures are required, details of the design of the noise controls and their incorporation into the noise modelling to demonstrate compliance. Develop and document measures to mitigate impacts to amenity, based on modelling and assessments undertaken. Conduct consultation with stakeholders, record stakeholder comments and provide

	proponent responses.
Relevant policy/guidance documents	EPA Guidance Statement No. 3. *Separation Distance between Industrial and Sensitive Land Uses*. Guidance Statement No. 8. *Environmental Noise*, May 2007. Environmental Protection Regulations (Noise)1997. Australian Standard AS 2436 - 1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites. *Dangerous Goods Safety Act 2004* and Regulations (2007). Australian Standard 1940 - 2004: The storage and handling of flammable and combustible liquids. Guidance Note S301, Storage of Dangerous Goods Licensing and Exemptions (DoCEP 2006). Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007. Dangerous Goods Safety (Explosives) Regulations 2007. Australian Standard AS 4282 - 1997 'Control of the obtrusive effects of Outdoor Lighting'.
Hydrological Processes	
EPA objective	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.
Construction and Operational Phase and post-closure	
Potential Impact	The abstraction of water from the proposed borefield and dewatering may result in impacts to groundwater dependent ecosystems and stygofauna. Impacts to existing and potential users as a result of abstraction of water.
Work and output required	Determine and identify the location of potential water resources available to meet water requirements for the proposal for life of mine. Discuss the results from hydrogeological investigations and modelling to provide predictions of hydrogeological change and impact as a result of abstraction and dewatering. Assess the effects of the borefield on the groundwater quality and quantity of the area and means through which water use can be minimised. Assess groundwater drawdown including from dewatering, associated with the proposal. Discussion of proposed management, monitoring and mitigation methods to be implemented. Assess any impacts to existing users resulting from the proposed abstraction of groundwater and dewatering of pit water. Discuss mitigation measures to be implemented at the tailings storage facility to prevent groundwater contamination. Discussions of mitigation measures taken/proposed to avoid, minimise and reduce impacts. Conduct consultation with stakeholders, in particular the Wingellina community,

	record stakeholder comments and provide proponent responses.
Relevant policy/guidance documents	*Rights in Water and Irrigation Act 1914.* Department of Water. *Water Quality Protection Guidelines No. 1. Water Quality Management in Mining and Mineral Processing: An Overview,* 2000. Department of Water. *Western Australian Water In Mining Guideline* May 2013. ANZECC/ARMCANZ Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCAZ 2000). Department of Water. *Field Sampling Guidelines.* National Water Commission 2012 *Australian groundwater modelling guideline.*
Flora and Vegetation	
EPA objective	To maintain representation, diversity, viability and ecological function at the species, population and community level.
Construction and Operational Phase and post closure	
Potential Impact	The proposal involves the clearing of up to 2,416 ha of native vegetation, including clearing for the mine, haul road, tracks, borefield, pipelines, accommodation camp, waste dumps and TSF. Indirect impacts on flora and vegetation may result from dust deposition, altered fire patterns, spread of weeds, altered water regimes and accelerated erosion/soil loss. Loss of biological diversity and reduced regional representation of flora and vegetation communities from direct and indirect impacts. Loss of conservation significant flora from direct and indirect impacts.
Work and output required	Undertake flora and vegetation surveys in accordance with EPA Guidance Statement 51 to define vegetation communities, including groundwater dependent vegetation, and locations of conservation significant species within the mine site area, borefield and service corridors. Surveys should be conducted during the optimal period for detection and identification of the range of flora likely to be occur. Optimal survey timing may vary from year to year but surveys should be undertaken 6-8 weeks after the occurrence of major “break of season” rainfall event. Provide a detailed description of the extent of clearing associated with the Project, including hectares of each vegetation community disturbed within the mine site area. Analyse and describe impacts to flora and vegetation, with reference to flora and vegetation identified and mapped during vegetation and flora surveys of the mine site and Officer borefield. Provide information on the impact to the extent and quality of flora and vegetation in the local and regional context, including impacts to flora and vegetation of conservation significance. Assess groundwater drawdown associated with the proposal and discuss any impacts to groundwater-dependent vegetation, expected as a result of the proposal operations. Discussions of mitigation measures taken/proposed to avoid, minimise and reduce impacts including environmental offsets (if necessary). Discussion of proposed management, monitoring and mitigation methods to be implemented. Conduct consultation with stakeholders, record stakeholder comments and provide

	proponent responses.
Relevant policy/guidance documents	Position Statement No. 2 *Environmental Protection of Native Vegetation in Western Australia* (2000). Position Statement No. 3 *Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia*, March 2002. EPA Guidance Statement No. 51. *Terrestrial Flora and vegetation Surveys for Environmental Impact Assessment* (2004). Department of Water. *Western Australian Water In Mining Guideline*, May 2013. EPA. *Checklist for documents submitted for EIA on marine and terrestrial biodiversity*. Policy Statement No 9 - *Conserving Threatened Species and Ecological Communities* (CALM 2003). *Wildlife Conservation Act 1950.* *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).* Environmental Protection (Clearing of Native Vegetation) Regulations 2004. EPA. *Checklist for documents submitted for EIA on marine and terrestrial biodiversity*. Australian Government, National Waster Commission (2011) S Richardson (SKM), E Irvine (SKM), R Froend (Edith Cowan University), P Boon (Dodo Environmental), S Barber (SKM), B Bonneville (SKM) (2011) *Australian groundwater-dependent ecosystems toolbox part 1: assessment framework.*
Terrestrial Fauna	
EPA objective	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Construction and Operational Phase and post closure	
Potential Impact	The proposal involves the clearing of not more than 2,416 ha of native vegetation which provides habitat for fauna. Vegetation clearing may result in loss or fragmentation of fauna habitat and consequential displacement of fauna. Construction of a 135 km water pipeline and increased vehicle traffic may impact upon fauna. Death or injury of fauna may also occur during clearing and construction and from ongoing operations. Increased numbers of predators such as cats and dogs attracted to the accommodation village and rubbish dumps. Increased numbers of grazing animals attracted by new water sources Death of animals and birds from drinking contaminated water from TSF and other sources. Construction and operation of the proposal has the potential to cause indirect impacts through impacts of weeds and obstruction of fauna movements due to increased presence of human activity.

Work and output required	(1) Undertake a Level 2 fauna survey of the mine proposal area including habitat assessment. (2) Undertake a Level 1 fauna survey of the pipeline corridor, including habitat assessment. Survey to include both a desktop study and a basic ground truthing through a reconnaissance survey. Surveys should be conducted for different faunal groups during the optimal periods as outlined in Table 2 in the fauna Technical Guide. Consultation with traditional owners in relation to fauna surveys. Assess potential impacts to vertebrate fauna and Short Range Endemic invertebrate species (SRE's), with consideration made to findings from fauna surveys of the Project areas. Discussion of conservation significant fauna species recorded in the proposal area or likely to occur in the proposal area. Discussion of potential direct and indirect impacts, and protection of, Specially Protected (Threatened) fauna, consistent with the provisions of the *Wildlife Conservation Act 1950. A targeted survey may be required if conservation significant fauna are found.* Discussions of mitigation measures taken/proposed to avoid, minimise and reduce impacts including environmental offsets (if necessary). Discussion of proposed management, monitoring and mitigation methods to be implemented. Conduct consultation with stakeholders, record stakeholder comments and provide proponent responses.
Relevant policy/guidance documents	EPA Guidance Statement No. 20. *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia*, 2009. EPA Guidance Statement No. 56. *Terrestrial Fauna Surveys for Environmental Impact Assessment in WA*, 2004. Position Statement No. 3. *Terrestrial Biological Surveys as an Element of Biodiversity Protection*, March 2002. EPA and Department of Conservation Technical Guide – *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*, September 2010. *Wildlife Conservation Act 1950.* EPA. *Checklist for documents submitted for EIA on marine and terrestrial biodiversity*. *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).* Environment Protection and Biodiversity Conservation Regulations 2000, Schedule 4. Department of Water (2013) WA Water in Mining Guideline. Report No 12 *Table parts A5-7, B10-11, C5-6.*

Subterranean Fauna	
EPA objective	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Construction and Operational Phases	
Potential Impact	Potential direct and indirect impacts on habitat of stygofauna and troglofauna. This includes effects of groundwater drawdown including dewatering on stygofauna, excavation of habitat of troglofauna, and possible indirect effects from clearing of surface vegetation.
Work and output required	Surveys of all areas likely to be directly or indirectly impacted by the proposal are to be undertaken in accordance with Environmental Assessment Guideline (EAG) No. 12 (EPA 2013) and Guidance Statement 54a (EPA 2007). The results of the level 1 study will be used to determine whether further survey will be undertaken in accordance with criteria in EPA (2013) and EPA (2007). <u>Stygofauna</u> Level 1 study and description of the potential impacts from water abstraction from the borefield and determination of the likely presence of subterranean fauna (stygofauna) habitat. <u>Troglofauna</u> Conduct a Level 1 survey according to the criteria in EAG No.12 to determine if limestone, karst, calcrete or other suitable geology likely to provide habitat for troglofauna is present in the area proposed to be mined. If habitat suitable for troglofauna is present a Level 2 survey consistent with criteria in EAG No.12 and Guidance Statement 54a should be conducted. For both stygofauna and troglofauna, a description of boreholes sampled will be provided together with maps showing their location indicating bores sampled including those where no specimens were recorded. Mapping should show the extent of known or predicted subterranean fauna habitat and the extent of impact area including drawdown contours. Results of the studies should include discussion of potential impacts (direct and indirect, including from dewatering associated with the proposal, to subterranean fauna (both stygofauna and troglofauna) as a result of the proposal, the regional context of the project. Discussions of mitigation measures taken/proposed to avoid, minimise and reduce impacts. Discussion of proposed management, monitoring and mitigation methods to be implemented for subterranean fauna. Conduct consultation with stakeholders, record stakeholder comments and provide proponent responses. Complete the biodiversity checklist.
Relevant policy/guidance documents	EPA (2013) *Environmental Assessment Guidelines for Consideration of subterranean fauna in environmental impact assessment in Western Australia*. EAG No.12. Environmental Protection Authority, Perth. Guidance Statement No. 54a *Sampling methods and survey considerations for*

	subterranean fauna in Western Australia July 2007. DOW (2013) *Western Australia Water in Mining Guideline.* May 2013. *Environment Protection and Biodiversity Conservation Act 1999.* Checklist for documents submitted for EIA on marine and terrestrial biodiversity. Richardson, S et al. (2011) *Australian groundwater-dependent ecosystems toolbox, parts 1 and 2.* Waterlines report No 67 and 70, National Water Commission, Canberra. Department of Water (2013) *WA Water in Mining Guideline*. Report No 12 *Table parts A5-7, B10-11, C5-6.*
Rehabilitation and Closure (Integrating factor)	
EPA objective	To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.
Construction and operational phase, closure phase and post-closure	
Potential Impact	The abundance of clays throughout the profile is likely to be highly-dispersive. The variability of water holding characteristics of the sub-surface soils has the potential to affect rehabilitation outcomes. Potential risk of ongoing dust lift-off / erosion / pollution from the tailings storage facility (TSF) and waste dumps if they are not closed progressively and sustainably rehabilitated. If the TSF and or waste dumps are to be closed by rock armouring, sustainable closure may fail if there is an inadequate supply of suitable geochemically inert and competent rock. Potential for acid drainage from the tailings storage facility (acid will be used in ore processing). There may be potential for increased soil toxicity due to the dispersion and re-deposition of fine-grained ore materials by wind and mine-site traffic. Lateritic nickel and similar ore-types often contain weakly adsorbed metals such as nickel, hexavalent chromium and cobalt. In this case the metals would be in a bioavailable form and mining may lead to increased quantities being taken up from the soil by plant species and potentially entering local food-webs (including bush tucker). Based on the geology of the area there would appear to be minimal risk of acid drainage, however there may be potential for neutral (metalliferous) and/or saline mine drainage. Potential risks to humans and fauna from mine pits and mine pit lakes. . Through processes such as oxidation reactions on exposed pit walls and evaporative concentration, pit lake(s) which form after mine closure may develop elevated concentrations of metals, salt or other inorganic constituents. In addition, outflow of pit water may affect the quality of surrounding groundwater.

Work and output required	Submit with the PER a project-specific mine closure plan compliant with the Department of Mines and Petroleum (DMP)/EPA 2011 *Guidelines for Preparing Mine Closure Plans.* Consistent with the DMP/EPA Guidelines, the mine closure plan provided with the PER document needs to contain workable solutions to all significant closure risks. Identify all stakeholders and their role in the mine closure process. Conduct consultation with stakeholders, in particular the Wingellina community, record stakeholder comments and provide proponent responses. Discuss mitigation measures taken/proposed to avoid, minimise and reduce impacts and (if necessary) environmental offsets. Assess potential risks associated with decommissioning and closure of the Wingellina Project, including unplanned or temporary closure. Identify artificial landforms to remain within the mine site area, post closure and provide a diagram indicating their locations. Characterise physical and chemical properties of materials based on representative sampling. An assessment on total metals within the ore, waste rock and tailings materials will be evaluated to determine potential for bio-availability of metals. The total metal values above the Ecological and Baseline Investigation Levels will be captured within the Mine Closure Plan Risk Assessment and appropriate mitigations identified. Additional testing methodology (if required) will be selected in consultation with the Department of Environment Regulation (Contaminated Sites Branch) and documented in the PER. Desktop study of successful and unsuccessful rehabilitation strategies and outcomes in similar climates, geologies and vegetation types. Include a discussion of the different available methodologies and success rates for rehabilitation of the various proposed disturbance types including: • created landforms (e.g. waste rock dumps, tailings storage facility). • short-term disturbances (e.g. borrow pits and access tracks). • long-term disturbances (e.g. construction camp, permanent accommodation village and administration buildings). • linear and/or fragmentation disturbances (e.g. roads, powerlines, bore fields). Identify relevant closure learnings from other comparable projects. Propose workable site-specific mine closure methods for post-mining land forms including waste dumps, TSF and mine pits. Identify workable methods for managing dispersive, sodic or saline materials, if present, and any other problem materials (e.g. fibrous or asbestiform materials) identified through materials characterisation. Identify materials for closure of the TSF and waste dumps. If rock armouring is to be used, is there sufficient competent and geochemically inert rock available and, given the quantities required, will it be economically feasible to transport the rock to the TSF? Will there be additional significant environmental impacts from quarrying the rock? Based on learnings from other projects in similar environment, propose workable rehabilitation and revegetation techniques appropriate to this arid desert environment and the soils present at the site. Describe site specific contingencies to make landforms sate, stable and non-polluting in the event of unexpected or temporary closure.

	Extending the hydrological processes work and outputs from hydrogeological investigations and modeling assess hydrogeological change from closing the water supply borefield and discontinuing dewatering as follows:: (1) Predict rates of groundwater recovery following cessation of pumping from the water supply borefield and discontinuing pit dewatering; (2) Assess the potential for processes such as groundwater inflow, changes in pH, and/or evaporative concentration which may develop after closure, and the risk (if any) of the development of harmful concentrations of metals or other inorganic constituents in the pit lakes over time; (3) Calculate seepage velocity and flow directions based on the conceptual hydrogeology and groundwater model particle tracking to estimate the magnitude and direction of potential contamination from the mine pit(s) after mine closure and risk (if any) of contamination plumes; (4) Evaluate the risk that water remaining in the pit after closure, and/or any water flowing or seeping out of the pit over time, will have a significant impact on human health, wildlife, surrounding ground or surface water, or on water holes or other water sources of significance to Aboriginal people; and (5) Outline the process for developing a strategy for decommissioning of water assets associated with the water supply borefield, water storage facilities, and the dewatering system when no longer required; If there is potential for significant risks to human health or the environment, further work will be undertaken during the Detailed Feasibility Study to provide workable management measures to either avoid those risks or to reduce or remediate to acceptable levels to ensure a sustainable “walk-away” closure solution.
Relevant policy/guidance documents	DMP/EPA *Guidelines for Preparing Mine Closure Plans*, June 2011. DMP 2013 *Tailings Storage Facilities in Western Australia – Code of Practice* http://www.dmp.wa.gov.au/documents/Code_of_Practice/MSH_COP_TailingsStorageFacilities.pdf EPA Environmental Protection Bulletin No. 19 *EPA Involvement in Mine Closure*, July 2013. Department of Health 2013, *Guidance Note on Public Health Risk Management of Asbestiform Minerals Associated with Mining* taken from http://www.public.health.wa.gov.au/cproot/5387/2/Guidance%20Note%20on%20Public%20Health%20Risk%20Management%20of%20Asbestos%20Associated%20with%20Mining%20Activities.pdf July 2013 Department of Mines and Petroleum, 2010, *Management of fibrous materials in Western Australian Mining Operations* http://www.dmp.wa.gov.au/documents/Factsheets/MSH_G__ManagementOfFibrousMinerals.pdf Department of Water. *Western Australian Water In Mining Guideline* May 2013. National Water Commission. *Australian groundwater modeling guidelines*, Waterlines Report No. 82, June 2012, Strategic Framework for Mine Closure (ANZMECC/MCA 2000). Oldham CE 2013 *Environmental sampling and modelling for the prediction of long-term water quality of mine pit lakes*, The University of Western Australia Publishing, Perth

	International Network For Acid Prevention 2012, *Global Acid Rock Drainage Guide (GARD Guide).* Note this publication is relevant to both acid drainage and to neutral (metalliferous) and saline drainage. Department of Industry, Tourism and Resources 2007, *Managing Acid and Metalliferous Drainage, Leading Practice Sustainable Development Project for the Mining Industry.* International Council on Mining and Metals 2008, *Planning for Integrated Mine Closure.* CRC-CARE. *Guidance document for the revegetation of land contaminated by metal(loid)s*, Technical Report No. 20, March 2012 EPA Guidance Statement No. 6. *Rehabilitation of Terrestrial Ecosystems.*
Offsets (Integrating Factor)	
EPA objective	To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.
Potential impacts	Potential significant residual impacts on vegetation, flora, fauna habitat and species of State and National significance.
Work required	Examination of significant residual impacts and, if required, development of a draft program of environmental offsets. Inclusion in the PER of a completed Environmental Offsets Reporting Form and any offsets required and proposed. Conduct consultation with stakeholders, record stakeholder comments and provide proponent responses.
Relevant policy/guidance documents	EPA (2006) Position Statement 9: Environmental Offsets. EPA (2008) Environmental Protection Bulletin No. 1 – Environmental Offsets – Biodiversity. EPA (2008) Guidance Statement No. 19 – Environmental Offsets – Biodiversity. Government of Western Australia (2011) WA Environmental Offsets Policy. EPA (2013) EPA Offsets Reporting Form.

2.2 Factors Not Requiring Further Evaluation in the PER Document

Consistent with the EPA's Significance Framework (EAG 9), Hinckley Range will only be required to undertake further studies to address the preliminary key environmental factors identified in this ESD.

Environmental factors likely to be affected by the Proposal that are not significant or can be managed to meet the EPA's objectives are identified below. These environmental factors were not identified by the EPA as preliminary key environmental factors at the time of its decision to assess the Proposal at the level of PER.

These environmental factors will not be evaluated in the PER document:

- Landforms

- Terrestrial Environmental Quality
- Inland Waters Environmental Quality

If, during the preparation of the PER document, other potential environmental factors are identified, the OEPA will be consulted.

3.0 ASSESSMENT MILESTONES

EPA Environmental Assessment Guideline for Timelines for EIA of Proposals (EAG 6) addresses the responsibilities of proponents and the EPA for achieving timely and effective assessment of proposals.

The timeline proposed by Hinckley Range for the submission of Project assessment documents is provided in Table 3 and has been agreed upon by the EPA.

Table 3: Milestones for the project

Key Stage of Proposal	Agreed Milestone
ESD document submitted to EPA	07 March 2014
EPA approval of the ESD Document	30 June 2014
First draft of the PER Document submitted to EPA	11 Sept 2014
OEPA provides comment on first draft PER Document	6 weeks 23 Oct 2014
Revised PER Document submitted to EPA	31 Oct 2014
EPA authorises release of PER Document	2 weeks 17 Nov 2014
Hinckley Range releases approved PER Document	24 Nov 2014
Public Review of PER Document	8 weeks 30 Jan 2015

4.0 DECISION MAKING AUTHORITIES

Key Decisions Making Authorities (DMAs) identified for this Project are identified in the table below. These DMAs are constrained from making any decision that could have the effect of causing or allowing the Proposal to be implemented. DMA's may undertake parallel processing of approvals, up to the point of their decision.

Table 4: Decision Making Authorities

Decision Making Authority	Relevant Legislation
Department of Mines and Petroleum (DMP)	*Mining Act 1978.*
Minister for Water (c/- Department of Water)	*Rights in Water and Irrigation Act 1914.*
Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972.*
Department of Environment Regulation (formerly DEC)	*Environmental Protection Act 1986 (Part V).*
Department of Health	*Health Act 1911.*
Shire of Ngaaanyatjarraku	*Local Government Act 1995*

5.0 PREPARATION OF THE ENVIRONMENTAL REVIEW DOCUMENT

The PER will be prepared in accordance with this ESD and EPA's Guide to Preparing a Public Environmental Review.

When the EPA is satisfied with the standard of the environmental review document it will provide a written sign-off, giving approval to advertise the document for public review. The review document may not be advertised for release before written approval is received.

The proponent is responsible for advertising the release and availability of the PER document in accordance with the guidelines which will be issued to the proponent by the OEPA. The EPA will be consulted on the timing and details for advertising the document.

This ESD will be included as an appendix to the PER.