GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Mr Ivan Vella
Director
Robe River Mining Co. Pty Ltd
152-158 St George Terrace
PERTH WA 6000

Our Ref: *CMS17155*
Enquiries: *Matt Spence, 6364 0819*
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Dear Mr Vella

MESA H PROPOSAL (REVISION TO MESA J IRON ORE DEVELOPMENT) – ASSESSMNET NO: 2121

The Environmental Scoping Document (ESD) dated 31 October 2017 (DWERDA-010464) specifying the scope and content of the Environmental Review Document (ERD) for the above proposal was considered by the Environmental Protection Authority at Meeting No. 1106 on 19 October 2017. The ESD has been approved as providing an acceptable basis for the preparation of the ERD.

During the preparation of the ERD you are encouraged to consult with the Office of the Environmental Protection Authority assessment officer for the proposal, Matt Spence, who can be contacted on telephone number 6364 6805. Please quote the above "Our Ref" on any further correspondence.

Yours sincerely

Dr Robert Harvey
DEPUTY CHAIRMAN

31 October 2017

Encl. Environmental Scoping Document – Mesa H Proposal (Revision to Mesa J Iron Ore Development)

DRAFT ENVIRONMENTAL SCOPING DOCUMENT

Proposal name:	**Mesa H Proposal (Revision to the Mesa J Iron Ore Project)**
Proponent:	**Robe River Mining Co. Pty. Ltd.**
Assessment number:	**2121**
Location:	**16 kilometres south west of Pannawonica in the Pilbara region of Western Australia**
Local Government Area:	**Shire of Ashburton**
Public review period:	**Environmental Review Document – 2 weeks**
EPBC Reference No:	**2017/8017**

1. Introduction

The Environmental Protection Authority (EPA) has determined that the above Proposal is to be assessed under Part IV of the *Environmental Protection Act 1986* (EP Act).

The purpose of the Environmental Scoping Document (ESD) is to define the form, content, timing and procedure of the environmental review, required by s. 40(3) of the EP Act. Robe River Mining Co. Pty. Ltd. (the Proponent) has prepared this draft ESD according to the procedures in the EPA's *Procedures Manual.*

Form

The EPA requires that the form of the report on the environmental review required under s. 40 (Environmental Review Document, ERD) is completed according to the *Environmental Review Document template.*

Content

The EPA requires that the environmental review includes the content outlined in sections **2** to **6** of this ESD.

Timing

Table 1 sets out the timeline for the assessment of the Proposal agreed between the Proponent and the EPA.

Table 1: Assessment timeline

Key assessment milestones	Completion Date
EPA approves Environmental Scoping Document	19 October 2017
Proponent submits first draft Environmental Review Document	5 February 2018
EPA provides comment on first draft Environmental Review Document *(6 weeks from receipt of ERD)*	19 March 2018
Proponent submits revised draft Environmental Review Document	30 April 2018
EPA authorises release of Environmental Review Document for public review *(2 weeks from EPA approval of ERD)*	14 May 2018
Proponent releases Environmental Review Document for public review for 2 weeks	28 May 2018
Close of public review period	11 June 2018
EPA provides Summary of Submissions *(3 weeks from close of public review period)*	2 July 2018
Proponent provides Response to Submissions	13 August 2018
EPA reviews the Response to Submissions *(4 weeks from receipt of Response to Submissions)*	10 September 2018
EPA prepares draft assessment report and completes assessment *(6 weeks from EPA accepting Response to Submissions)*	22 October 2018
EPA finalises assessment report (including two weeks consultation on draft conditions) and gives report to Minister *(6 weeks from completion of assessment)*	10 December 2018

*The Assessment Timeline is yet to be agreed to between the Proponent and the EPA. This will be confirmed once the EPA has endorsed the final ESD.

Procedure

The EPA requires the Proponent to undertake the environmental review according to the procedures in the *Administrative Procedures* and the *Procedures Manual*. This ESD has not been released for public review. The ESD will be available on the EPA website (www.epa.wa.gov.au) upon endorsement and must be appended to the ERD.

Assessment as an accredited assessment

The Proposal has been referred to the Commonwealth Department of Environment and Energy and has been determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Proposal is being assessed as an accredited assessment. The relevant matters of national environmental significance (MNES) for this proposal are:

- Listed threatened species and communities (Sections 18 and 18A).

This ESD includes work required to be carried out and reported on in the ERD document in relation to MNES. The ERD will also address the matters in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000*.

MNES that may be impacted by the Proposal will be identified and the potential impacts on these matters addressed within each relevant preliminary environmental factor as identified in Table 4. The ERD will include a separate section which summarises the potential impacts on MNES and describes, to the extent practicable, any feasible alternatives to the proposed action and possible mitigation measures. Proposed offsets to address significant residual impacts on MNES are also to be discussed.

2. The Proposal and Regional Context

2.1 The Proposal

The subject of this ESD is the proposed development of the Mesa H Proposal (the Proposal) by Robe River Mining Co. Pty. Ltd. (Joint Venture entities include: Robe River Mining Co. Pty. Ltd., North Mining Limited, Mitsui Iron Ore Development Pty. Ltd., Cape Lambert Iron Associates, a partnership carried on by Nippon Steel & Sumitomo Metal Australia Pty Ltd, Nippon Steel & Sumikin Resources Australia Pty Ltd and Mitsui Iron Ore Development Pty Ltd and Pannawonica Iron Associates, a partnership carried on by Nippon Steel & Sumitomo Metal Australia Pty Ltd, Nippon Steel & Sumikin Resources Australia Pty Ltd).

The Mesa H Proposal is located approximately 16 kilometres (km) south-east of Pannawonica in the Pilbara region of Western Australia. The Proposal is to sustain production from the existing Mesa J Operation [approved under Ministerial Statement 208 (MS 208)] and includes development of above and below water table mine pits and associated infrastructure, waste dumps, stockpiles and associated infrastructure, as well as processing facilities and water management infrastructure. The Proposal will utilise and integrate with existing infrastructure and facilities of the Mesa J Operation including ore processing facilities, water management infrastructure, power, and rail.

The regional location of the Proposal is shown in Figure 1 and the Development Envelope encompassing the physical elements of the Proposal is delineated in Figure 2.

The key characteristics of the Proposal are set out in Tables 2 and 3. The key Proposal characteristics may change during the EIA process as a result of the findings of studies and investigations conducted and the application of the mitigation hierarchy by the Proponent.

The Mesa H Proposal is predominantly located on Mineral Lease ML248SA granted pursuant to the Iron Ore (Robe River) Agreement Act 1964. The Proposal pits, dumps and the majority of infrastructure are located within ML248SA (section 104 and a portion of section 103). A powerline to the east of Mesa J will require new tenure under the Mining Act 1978. Grant of Land Administration Act 1997 (LAA) tenure for this area will be required prior to construction of the powerline connection.

The main co-existing LAA tenure in the Development Envelope includes the Yarraloola Pastoral Station (Lease N49500) and the Yalleen Pastoral Station (Lease N49492). These pastoral leases are held by the Robe River Iron Associates.

The Mesa J Operation was referred under Part IV of the EP Act and was assessed as Consultative Environmental Review. The EPA published its Report and

Recommendations (Bulletin 574) in August 1991 which described the environmental aspects considered by the EPA, as:

- riparian vegetation communities (Vegetation and Flora);
- groundwater drawdown and surface water discharge (Hydrological Processes and Inland Environmental Water Quality); and
- rehabilitation.

The Minister for Environment approved implementation of the Mesa J Proposal, subject to the conditions of MS 208, on 16 January 1992.

A number of s45c's have been submitted and approved during the life of the Mesa J Operation during 2005 - 2007. These related to rail works and fibre optic cable and one clarified the Part IV disturbance area boundary.

The existing approved environmental management plan for the Mesa J Operation will continue to be implemented and will be updated, in addition to new management plans developed, specifically relating to Mesa H, subject to approval.

2.2 Regional Context

The Proposal is located in the Robe River valley which has a catchment area of approximately 7,500 km^2. Major watercourses occurring within the catchment include the Robe River and creek systems of the Jimmawurrada, Bungaroo, and Mungarathoona Creeks. Groundwater and surface water systems in the area are complex, variable, and linked. For the majority of its course the Robe River is ephemeral with a wide, shallow flood plain that carries a significant underflow in its alluvial bed.

The escarpment of the Robe River valley provides habitat for listed threatened species, including the Northern Quoll, Pilbara Leaf-nosed Bat, Ghost Bat, and the Pilbara Olive Python. Furthermore, riparian habitat containing groundwater dependent vegetation (e.g. *Melaleuca Argentea*) of high local significance are associated with drainage lines along the Robe River.

Surface water and groundwater in the Proposal's locality has been modified and managed for a number of years (since the mid-1990s). This includes pit dewatering and groundwater abstraction, and discharge of surplus water to Jimmawurrada Creek, to allow below water-table mining at the Mesa J operations. Other operating mines located within the catchment include the Mesa A Hub, comprising existing Mesa A operations and the proposed future mining of nearby deposits, including the Mesa B and Mesa C deposits, which will sustain the Mesa A operation.

Noting the above, the cumulative impacts of the Proposal need to be considered in the ERD, in the regional context of the existing and proposed mining activities in the Robe River catchment.

Table 2: Summary of the Proposal

Proposal title	Mesa H Proposal (Revision to the Mesa J Iron Ore Project)
Proponent name	Robe River Mining Co. Pty. Ltd.
Short description	The Proposal is located 16 km south-west of Pannawonica in the Pilbara region of Western Australia. The Proposal is to develop the Mesa H deposit adjacent to the existing Mesa J Iron Ore Project utilising the adjacent Mesa J infrastructure including but not limited to the development of above and below water table open cut iron ore pits and associated infrastructure, including ore processing facilities, waste dumps, waste fines storage facilities, water management infrastructure and rail.

Table 3: Location and proposed extent of physical and operational elements

Element	Location	Existing approval (MS 208)	Proposed Extent (This Proposal)	Proposed Extent (Revised Proposal)
Physical Elements				
Mine and associated infrastructure	Figure 2	Clearing of up to 1,800 ha for mine development.	Clearing of up to 2,200 ha (within a Development Envelope of 4,930 ha).	Clearing of up to 4,000 ha (within a Development Envelope of 6,730 ha).
Rail / Linear Infrastructure	Figure 1	Single gauge railway line with sidings and a voice and radio data communications system with fibre optic cable from Cape Lambert.	N/A.	Single gauge railway line with sidings and communications system with fibre optic cable from Cape Lambert.
Operational Elements				
Pit dewatering	–	Not specified.	Up to 5 GL/annum.	Up to 10 GL/a.
Surplus Water Management	–	Not specified. Surplus water management includes use on site and controlled discharge to the environment at discharge points in Jimmawurrada Creek and a tributary west of Mesa J.	Controlled surface discharge to extend along Jimmawurrada Creek / Robe River no further than 8 km downstream of the discharge point under natural no-flow conditions. Surplus water management options include use on site and discharge to the environment or alternative means of disposal.	Controlled surface discharge to extend along Jimmawurrada Creek / Robe River no further than 8 km downstream of the discharge point under natural no-flow conditions. Surplus water management options include use on site and discharge to the environment or alternative means of disposal.
Water supply	–	Not specified.	Up to 10 GL/annum from a water supply borefield.	Up to 10 GL/annum from a water supply borefield.

3. Preliminary key environmental factors and required work

The preliminary key environmental factors for the environmental review are:

1. Flora and Vegetation.
2. Subterranean Fauna.
3. Terrestrial Fauna.
4. Hydrological Processes and Inland Waters Environmental Quality.
5. Social Surrounds.
6. Air Quality.

Table 4 outlines the work required for each preliminary key environmental factor and contains the following elements for each factor:

- **EPA factor** and **EPA objective** for that factor.
- **Relevant activities** – the Proposal activities that may have a significant impact on that factor.
- **Potential impacts and risks** to that factor.
- **Required work** for that factor.
- **Relevant policy and guidance** – EPA (and other) guidance and policy relevant to the assessment.

Table 4: Preliminary key environmental factors and required work

Flora and Vegetation	
EPA objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Relevant activities	Clearing of native vegetation, groundwater abstraction, potential alteration of surface water flows, and potential discharge of excess mine dewater.
Potential impacts and risks	• Disturbance to up to 2,200 ha of native vegetation. • Disturbance to riparian vegetation units considered to be of local significance that are present in the Development Envelope and discharge footprint. • Disturbance to three Priority Flora taxa recorded in the Development Envelope: o *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) (Priority 3); o *Indigofera* sp. Bungaroo Creek (S. van Leeuwen 4301) (Priority 3); and o *Rhynchosia bungarensis* (Priority 4).
Required work	1. Identify and characterise flora and vegetation in accordance with the requirements of EPA 2016 Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment*. The survey should take into account areas that are likely to be directly or indirectly impacted as a result of the Proposal. 2. Map weed occurrences in areas likely to be directly or indirectly impacted by the Proposal.

	3. Describe the vegetation and conservation significant flora species present and likely to be present within the Development Envelope and indirect disturbance areas outside of the Development Envelope. Include an assessment of the relevance of any vegetation and conservation significant flora species in a local and regional context. 4. Provide an analysis of any additional potential impacts from the Proposal in relation to dewatering and discharge activities, including consideration of potential impacts from waste fines storage facilities. 5. Provide a detailed description of the cumulative impacts associated with the Proposal, including direct impacts from clearing, and indirect impacts such as groundwater drawdown, altered drainage, changes in water quality, spread of weeds, fragmentation of vegetation, altered fire regime, and dust. 6. Provide tables and maps of the proposed clearing and predicted indirect impact to vegetation and conservation significant flora species, including but not limited to threatened and/or priority ecological communities, threatened flora, Priority flora or new flora species. 7. Discuss, and determine significance of, potential direct, indirect (such as dust, weeds and downstream impacts) and cumulative impacts to conservation listed flora and vegetation as a result of the Proposal at a local and regional level (i.e. the Robe Valley). 8. Demonstrate that all practical measures have been taken to reduce the area of the proposed disturbance footprint based on progress in the Proposal design and understanding of the environmental impacts. 9. Discuss proposed objectives, management, monitoring and mitigation methods to be implemented demonstrating that the design of the Proposal has addressed the mitigation hierarchy to avoid and minimise impacts to flora and vegetation. 10. Review and revise the existing Mesa J environmental management plan to apply to the Proposal. The objective of the plan is to ensure the protection of conservation significant vegetation communities within the Development Envelope and areas of indirect impact. The following should be addressed in the plan: • Invasive species control – control of weeds, in particular through transport and/or entry and exit points, and in areas of vegetation units considered to have high local significance. • Monitoring program – to monitor the health of conservation listed vegetation communities including (but not limited to) the protection of obligate phreatophytic communities that will be impacted by the Proposal. 11. Prepare a Mine Closure Plan consistent with DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015) which considers the proposed rehabilitation methodologies to achieve successful progressive rehabilitation of all areas disturbed by mining with vegetation composed of native species of local provenance. 12. Predict the inherent and residual impacts before and after applying the mitigation hierarchy and identify whether the residual impacts are significant by applying the Significant Residual Impact Model in the WA Environmental Offsets Guideline. 13. Quantify any significant residual impacts by completing the Offset Template, spatially defining the area of 'good' to 'excellent' native vegetation that will be disturbed as a result of this proposal (excluding the approved Mesa J Operation), and propose an appropriate offsets package that demonstrates application of the WA Environmental Offsets Policy and Guideline. 14. Demonstrate and document in the ERD how the EPA's objective for this factor can be met.

Relevant policy and guidance	<u>EPA Policy and Guidance</u> Advice of the Environmental Protection Authority to the Minister for Environment under Section 16 of the *Environmental Protection Act 1986*, *Cumulative environmental impacts of development in the Pilbara region.* EPA *Statement of Environmental Principles, Factors and Objectives* (2016). EPA *Environmental Factor Guideline: Flora and Vegetation* (2016). EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (2016). EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2016). DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015). <u>Other policy and guidance</u> Department of Water *Western Australian Water in Mining Guideline* (2013). Government of Western Australia *WA Environmental Offsets Policy* (2011). Government of Western Australia *WA Environmental Offsets Guidelines* (2014).
Subterranean Fauna	
EPA objective	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
Relevant activities	Mining (excavation), groundwater abstraction, surplus water discharge and disposal of waste fines.
Potential impacts and risks	Reduction in troglofauna habitat and loss of individuals from mine pit development. Reduction in stygofauna habitat due to abstraction of groundwater. Reduction in subterranean fauna habitat from seepage from waste fines placed in-pit. Reduction in the quality of subterranean habitat due to contaminants (e.g. spills of hydrocarbons). Potential impacts and risks to the EPBC Act listed vulnerable Blind Cave Eel (*Ophisternon candidum*) including the loss of individuals and loss or degradation of habitat due to mining activity and associated abstraction of groundwater.
Required work	15. Conduct Level 2 fauna surveys within areas to be impacted and in surrounding areas in accordance with EPA 2016 Environmental Factor Guideline – Subterranean Fauna. 16. Present the results of the subterranean fauna surveys and discuss the potential for direct, indirect and cumulative impacts to subterranean fauna and habitat including consideration of altered water regimes and water quality as a result of the Proposal, and other operating/planned mining operations within the Robe River Valley. 17. Assess any impacts to subterranean fauna with reference to relevant impacts from the Proposal (including taking into consideration any relevant guidelines, policies, plans and statutory provisions). For species which are likely to be impacted, including MNES listed species (Blind Cave Eel), provide information, including maps on habitat extent and an appropriate explanation of the likely distribution of species within those habitats, including information to support habitat connectivity. 18. Provide a detailed description of the cumulative impacts to conservation significant and other species within the Development Envelope and on a regional scale.

	19. Discuss proposed objectives, management, monitoring and mitigation methods to be implemented demonstrating that the design of the Proposal has addressed the mitigation hierarchy to avoid and minimise impacts to subterranean fauna. 20. Develop a Subterranean fauna management plan(s) to apply to the Proposal. The objective of the plan is to ensure the protection of conservation listed subterranean fauna species within the Development Envelope and areas of indirect impact. 21. Prepare a Mine Closure Plan consistent with DMP and EPA Guidelines for Preparing Mine Closure Plans (2015) which delineate and considers the use of Mining Exclusion Zones (MEZ) to protect troglofauna habitat and takes into consideration groundwater recovery to support stygofauna habitat. 22. Predict the inherent and residual impacts before and after applying the mitigation hierarchy and identify whether the residual impacts are significant by applying the Significant Residual Impact Model in the WA Environmental Offsets Guideline. 23. Quantify any significant residual impacts by completing the Offset Template and propose an appropriate offsets package that demonstrates application of the WA Environmental Offsets Policy and Guideline. 24. Demonstrate and document in the ERD how the EPA's objective for this factor can be met.
Relevant policy and guidance	EPA Policy and Guidance EPA *Statement of Environmental Principles, Factors and Objectives* (2016). EPA *Environmental Factor Guideline: Subterranean Fauna* (2016). EPA Technical Guidance: *Subterranean Fauna Survey* (2016). EPA Technical Guidance: *Sampling Methods for Subterranean Fauna* (2016). DMP and EPA Guidelines for Preparing Mine Closure Plans (2015). EPBC Act Policy and Guidance DoEE: Threatened Species Scientific Committee (TSSC) (2008). *Commonwealth Conservation Advice on Ophisternon candidum (Blind Cave Eel)*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/66678-conservation-advice.pdf. DoEE: *Survey guidelines for Australia's threatened fish*. EPBC Act survey guidelines 6.4 (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011). The EPBC Act Environmental Offsets Policy and Guidelines. Other policy and guidance Department of Water *Western Australian water in mining guideline* (2013). Government of Western Australia *WA Environmental Offsets Policy* (2011). Government of Western Australia *WA Environmental Offsets Guidelines* (2014).
Terrestrial Fauna	
EPA objective	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
Relevant activities	Clearing of native vegetation, abstraction of groundwater, discharge of surplus dewater into Jimmawurrada Creek and / or the Robe River, vehicle strike, generation of noise, vibration and dust.

	Work may also include installation of infrastructure/use of equipment (including vehicles) incorporating lighting and/or fencing (with reference to bat species).
Potential impacts and risks	• Loss of individuals due to vehicle strikes and as a result of construction and operation of the mine. • Reduction in fauna habitat and loss of individuals due to clearing of native vegetation and development of mine pits and associated infrastructure. • Direct and indirect fragmentation of habitat. • Indirect impacts to fauna due to: o altered fire regimes due to clearing of native vegetation; o altered surface and groundwater regimes; o changes to feral animal populations; o introduction or spread of weed species; and o mine related changes / restrictions to habitat (e.g. light, fencing).
Required work	25. Provide a desktop review and analysis of all surveys of the Development Envelope undertaken in accordance with EPA Policy and Assessment, Survey guidelines for Australia's threatened mammals. 26. The study should include: o a justification of how those surveys are relevant and representative of the Development Envelope and if they were carried out using methods consistent with the EPA policy; and o a comprehensive listing of vertebrate fauna and short range endemic (SRE) invertebrate fauna known or likely to occur in the habitats present, and identification of conservation significant fauna species likely to occur in the area. 27. Conduct Level 2 terrestrial fauna and SRE invertebrate surveys (including aquatic fauna) in areas not previously surveyed that are likely to be directly or indirectly impacted as a result of the Proposal. Surveys are to be undertaken in accordance with technical guidance statements and, where available, species-specific survey guidelines for relevant species listed under the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999*. 28. Conduct additional targeted surveys for conservation significant fauna that are known to or likely to occupy habitats in the Development Envelope if demonstrated to be required based on the results of the desktop study and Level 2 surveys. 29. Specify MNES being assessed as part of the accredited assessment. 30. Investigate and provide a description of any potential bat populations, and habitat (including foraging habitat) in the Development Envelope, and potential impacts from the Proposal. 31. For each relevant conservation significant fauna, including MNES (Northern Quoll, Pilbara Olive Python, Pilbara Leaf-nosed Bat, and Ghost Bat) recorded or likely to occur within the Development Envelope, provide where possible: • baseline information on their distribution (including known occurrences), ecology, and habitat preferences at the site level; • information on the conservation value of each habitat type from a local and regional perspective; • if a population of a conservation significant species is present on the site, its size and the importance of that population from a local and regional perspective; and

	• maps illustrating the known recorded locations of conservation significant species and short-range endemic invertebrates in relation to the proposed disturbance and areas to be impacted. 32. Identify the fauna habitat types within and outside the areas of impact. Consider habitat types that provide important ecological function within the Development Envelope. 33. Discuss known existing threats to conservation significant fauna, whether or not attributable to the Proposal, with reference to relevant impacts from the Proposal (including taking into consideration any relevant guidelines, policies, plans and statutory provisions). 34. Provide a detailed description of the potential direct, indirect and cumulative impacts to conservation significant fauna within the Development Envelope on a local and regional scale. Propose areas of key significance that may be considered for mine exclusion zones (including cave habitats, rocky outcrops and pools). 35. For all conservation significant fauna that are not likely to be impacted by the Proposal, but for which suitable habitat is present, demonstrate that an impact on the species will not or is unlikely to occur. 36. Discuss proposed objectives, management, monitoring and mitigation methods to be implemented demonstrating that the design of the Proposal has addressed the mitigation hierarchy to avoid and minimise impacts to terrestrial fauna. 37. Develop a conservation significant fauna management plan to apply to the Proposal. The objective of the plan is to ensure the protection of threatened species that will be impacted by the Proposal and their habitat within the Development Envelope. 38. Prepare a Mine Closure Plan consistent with DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015), which addresses the need for progressive rehabilitation of habitat for conservation significant species. 39. Predict the inherent and residual impacts before and after applying the mitigation hierarchy and identify whether the residual impacts are significant by applying the Significant Residual Impact Model in the WA Environmental Offsets Guideline. 40. Quantify any significant residual impacts by completing the Offset Template, spatially defining the habitat area for each significant fauna species that will be disturbed as a result of this proposal (excluding the approved Mesa J Operation), and propose an appropriate offsets package that demonstrates application of the WA Environmental Offsets Policy and Guideline. 41. Demonstrate and document in the ERD how the EPA's objective for this factor can be met. Note: Conservation significant fauna are defined as species that are listed under the *Environment Protection and Biodiversity Conservation Act 1999* and *Wildlife Conservation Act 1950*, and the Department of Biodiversity, Conservation and Attractions Priority Species that are likely to have their conservation status changed by the proposal.
Relevant policy and guidance	<u>EPA Policy and Guidance</u> EPA *Statement of Environmental Principles, Factors and Objectives* (2016). EPA *Environmental Factor Guideline: Terrestrial Fauna* (2016). EPA Technical Guidance: *Sampling Methods for Terrestrial Vertebrate Fauna* (2016). EPA Technical Guidance: *Terrestrial Fauna Surveys* (2016). EPA Technical Guidance: *Sampling of Short Range Endemic Invertebrate Fauna* (2016).

	EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2016). DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015). EPBC Act Policy and Guidance DOEE: *Survey Guidelines for Australia's Threatened Mammals.* EPBC Act survey guidelines 6.5 (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011). DoEE: *Survey Guidelines for Australia's Threatened Bats.* EPBC Act survey guidelines 6.1 (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010). DoEE: *Survey guidelines for Australia's threatened reptiles.* EPBC Act survey guidelines *6.6* (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011). Threatened Species Scientific Committee (2005). *Commonwealth Listing Advice on Northern Quoll (Dasyurus hallucatus).* Available from: http://www.environment.gov.au/biodiversity/threatened/species/dasyurus-hallucatus.html. Department of Sustainability, Environment, Water, Population and Communities (2012). *Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses.* Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Liasis olivaceus barroni (Olive Python (Pilbara subspecies)).* Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/66699-conservation-advice.pdf. Threatened Species Scientific Committee (2016). *Approved Conservation Advice for Macroderma gigas (Ghost Bat).* Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/174-conservation-advice-05052016.pdf. Threatened Species Scientific Committee (2016). *Approved Conservation Advice for Rhinonicteris aurantia (Pilbara form) (Pilbara Leaf-nosed Bat).* Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/82790-conservation-advice-10032016.pdf. Other policy and guidance Government of Western Australia *WA Environmental Offsets Policy* (2011). Government of Western Australia *WA Environmental Offsets Guidelines* (2014).
Hydrological Processes and Inland Waters Environmental Quality	
EPA objective	To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected. To maintain the quality of groundwater and surface water so that environmental values are protected.
Relevant activities	Abstraction of groundwater. Discharge of surplus dewater into Jimmawurrada Creek / Robe River. Alteration of surface water flows through the Development Envelope.
Potential impacts and risks	Groundwater drawdown due to mine pit dewatering and abstraction for operational water use (processing, dust management, potable water) may result in: • reduction to water levels in semi-permanent and permanent pools in the Robe River; and

	• reduction in groundwater levels in Jimmawurrada Creek. The discharge of surplus dewater into Jimmawurrada Creek / Robe River will result in surface flow downstream of the discharge point under natural no-flow conditions and could lead to erosion of the creek bank, alteration to fauna habitat. The discharge of surplus dewater into Jimmawurrada Creek / Robe River may reduce water quality. Surface water flows through the Development Envelope may become contaminated (e.g. by sediment or hydrocarbon spills).
Required work	42. Characterise the baseline hydrology and hydrogeological regimes and water quality, both in a local and regional context, including but not limited to, water levels, water chemistry, stream flows, flood patterns, and water quantity and quality. 43. Provide a detailed description of the design and location of the Proposal with the potential to impact surface water or groundwater. A figure should be provided in the ERD which depicts the predicted location of the wetting front (under natural no-flow conditions). 44. Provide a conceptual model of the surface and groundwater systems including the extent of connectivity between surface and groundwater systems and demonstrate that there will be no migration of seepage from infrastructure towards the Bungaroo Creek P1 Water Reserve. 45. Provide a conceptual mine water balance over the life of the Proposal to discuss the capacity to reuse surplus mine dewater. 46. Provide a geochemical risk characterisation of the waste material to be backfilled in pit which may be exposed to groundwater. 47. Discuss the potential environmental impacts and benefits of identified surplus water management options (i.e. discharge of excess mine dewater, reuse on site, local water supply, aquifer recharge etc.) and discuss the most appropriate water management strategy for the Proposal. 48. Analyse, discuss and assess surface water and groundwater impacts, including alternatives options to water management and the feasibility of each option: • changes in groundwater levels and changes to surface water flows associated with the Proposal; • the nature, extent, and duration of impacts; • cumulative impacts with other projects and referred proposals in the Robe Valley, for which relevant information is publicly available; and • impacts on the environmental values of significant receptors including but not limited to the Robe River catchment. 49. Demonstrate application of the mitigation hierarchy to avoid and minimise impacts to Hydrological Processes and Inland Waters Environmental Quality. 50. Prepare a Mine Closure Plan consistent with DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015) which addresses the development of completion criteria to maintain of the hydrological regimes and the quality of groundwater and surface water so that environmental values are maintained post closure. Specify whether the below water table pits will be backfilled to a level to prevent post-closure exposure of the groundwater table and the formation of permanent pit lakes. 51. Demonstrate and document in the ERD how the EPA's objective for this factor can be met.
Relevant policy and guidance	<u>EPA Policy and Guidance</u> EPA *Statement of Environmental Principles, Factors and Objectives* (2016).

	EPA *Environmental Factor Guideline: Hydrological Processes* (2016). EPA *Environmental Factor Guideline: Inland Waters Environmental Quality* (2016). EPA *Inland Waters of the Pilbara Western Australian (Part 1).* EPA *Inland Waters of the Pilbara Western Australian (Part 2).* EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2016). DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015). <u>Other policy and guidance</u> The Government of Western Australia 2011, *WA Environmental Offsets Policy.* The Government of Western Australia 2014, *WA Environmental Offsets Guidelines.*
Social Surroundings	
EPA objective	To protect social surroundings from significant harm.
Relevant activities	Clearing and excavation for mining activities. Abstraction of groundwater for mining and related activities. Discharge of surplus dewater. Alteration to hydrological processes.
Potential impacts and risks	Disturbance of sites of cultural significance. Prevention or change to access to a site. Changes to the physical and biological attributes of the environment which would impact on sites of heritage significance.
Required work	52. Characterise the heritage and cultural values of proposed disturbance areas and any other areas that may be indirectly impacted to identify sites of significance and their relevance within a wider regional context. 53. Conduct Aboriginal heritage surveys in conjunction with the native title claim (WCD2016/006) holders Kuruma Marthudunera and other local people to identify Aboriginal sites of significance and identify concerns in regard to impacts from proposed mining operations. 54. Provide a description of the heritage values within the Development Envelope and proposed disturbance. 55. Assess the impacts of the Proposal on heritage sites and/or cultural associations as a result of implementation of the Proposal, including those arising from changes to the environment which may impact on ethnographic and archaeological heritage significance. 56. Demonstrate the application of the mitigation hierarchy to avoid and minimise impacts to social surroundings. 57. Provide detail on consultation that will be undertaken with Traditional Owners in preparing the mine closure plan, particularly in relation to water management. 58. Prepare a Mine Closure Plan consistent with DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015), which addresses the need to protect the social surrounds from significant harm post closure. 59. Demonstrate and document in the ERD how the EPA's objective for this factor can be met.
Relevant policy and guidance	<u>EPA Policy and Guidance</u> EPA *Statement of Environmental Principles, Factors and Objectives* (2016).

	EPA *Environmental Factor Guideline: Social surroundings* (2016). EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2016). DMP and EPA *Guidelines for Preparing Mine Closure Plans* (2015). Other policy and guidance Department of Aboriginal Affairs and Department of Premier and Cabinet, 2013, *Due Diligence Guidelines, Version 3.0.* Perth, Western Australia.
Air Quality	
EPA objective	To maintain air quality and minimise emissions so that environmental values are protected.
Relevant activities	Clearing of native vegetation. Mining and ore processing activities.
Potential impacts and risks	Increase in Greenhouse Gas Emissions due to additional mining activities. Increase in dust to sensitive receptors due to blasting, excavation and haulage of ore.
Required work	60. Characterise the greenhouse gas emission key sources from the Proposal and estimation of expected Scope 1 (direct) and Scope 2 (energy indirect) greenhouse gas emissions. 61. Analysis of greenhouse gas intensity (i.e. quantity of CO2-e generated per tonne of product produced). 62. Demonstrate and document in the ERD how the EPA's objective for this factor can be met.
Relevant policy and guidance	EPA Policy and Guidance EPA *Statement of Environmental Principles, Factors and Objectives* (2016). EPA Environmental Factor Guideline: *Air quality* (2016). Other policy and guidance *Clean Energy Act 2011.* *National Greenhouse and Energy Reporting Act 2007.*

4. Other environmental factors or matters

The EPA has identified the following other environmental factor or matter relevant to the proposal that must be addressed during the public environmental review and discussed in the ERD:

1. Landforms

There is potential for significant cumulative impacts on landforms (particularly the mesa structures) within the Robe River valley. Taking into consideration Section 2.1 – Regional Context, the cumulative impacts on the mesa structures of the Robe River valley should be considered and detailed in the ERD, including the following required work:

- A description of the geology and morphology of the landforms within the Robe River valley;

- Spatially define the significant mesa habitat (including rocky ridge, gorge and breakaway habitat) along the Robe River, and the location of the operating and proposed mining operations; and
- Describe the cumulative impacts on the landforms from historic and reasonably foreseeable future developments.

It is also important that the Proponent be aware that other factors or matters may be identified during the course of the environmental review that were not apparent at the time that this ESD was prepared. If this situation arises, the Proponent must consult with the EPA to determine whether these factors and/or matters are to be addressed in the ERD, and if so, to what extent.

5. Stakeholder consultation

The Proponent must consult with stakeholders who are affected by, or are interested in the Proposal. This includes the decision-making authorities (see section 6), other relevant state (and Commonwealth) government agencies and local government authorities, the local community, and environmental non-government organisations.

The Proponent must document the following in the ERD:

- identified stakeholders;
- the stakeholder consultation undertaken and the outcomes, including decision-making authorities' specific regulatory approvals and any adjustments to the Proposal as a result of consultation; and
- any future plans for consultation.

6. Decision-making authorities

At this stage, the EPA has identified the authorities listed in Table 6 as decision-making authorities (DMAs) for the Proposal. Additional DMAs may be identified during the course of the assessment.

Table 6: Decision-making authorities

Decision-making authority	Relevant legislation
1. Minister for State Development.	*Iron Ore (Robe River) Agreement Act 1964.*
2. Minister for Mines and Petroleum.	*Mining Act 1978.*
3. Minister for Lands.	*Land Administration Act 1997.*
4. Minister for Environment.	*Wildlife Conservation Act 1950.*
5. Chief Executive Officer, Department of Water and Environmental Regulation.	*Environmental Protection Act 1986.*
6. Executive Director: Environment, Department of Mines, Industry, Regulation and Safety.	*Mining Act 1978.*
7. State Mining Engineer, Department of Mines, Industry, Regulation and Safety.	*Mines Safety and Inspection Act 1994.*
8. Chief Executive Officer: Department of Mines, Industry, Regulation and Safety.	*Dangerous Goods Safety Act 2004.*
9. Department of Water and Environmental Regulation.	*Rights in Water and Irrigation Act 1914.*
10. Minister for Aboriginal Affairs.	*Aboriginal Heritage Act 1972.*
11. Chief Executive Officer: Shire of Ashburton.	*Health Act 1911 & Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974.*

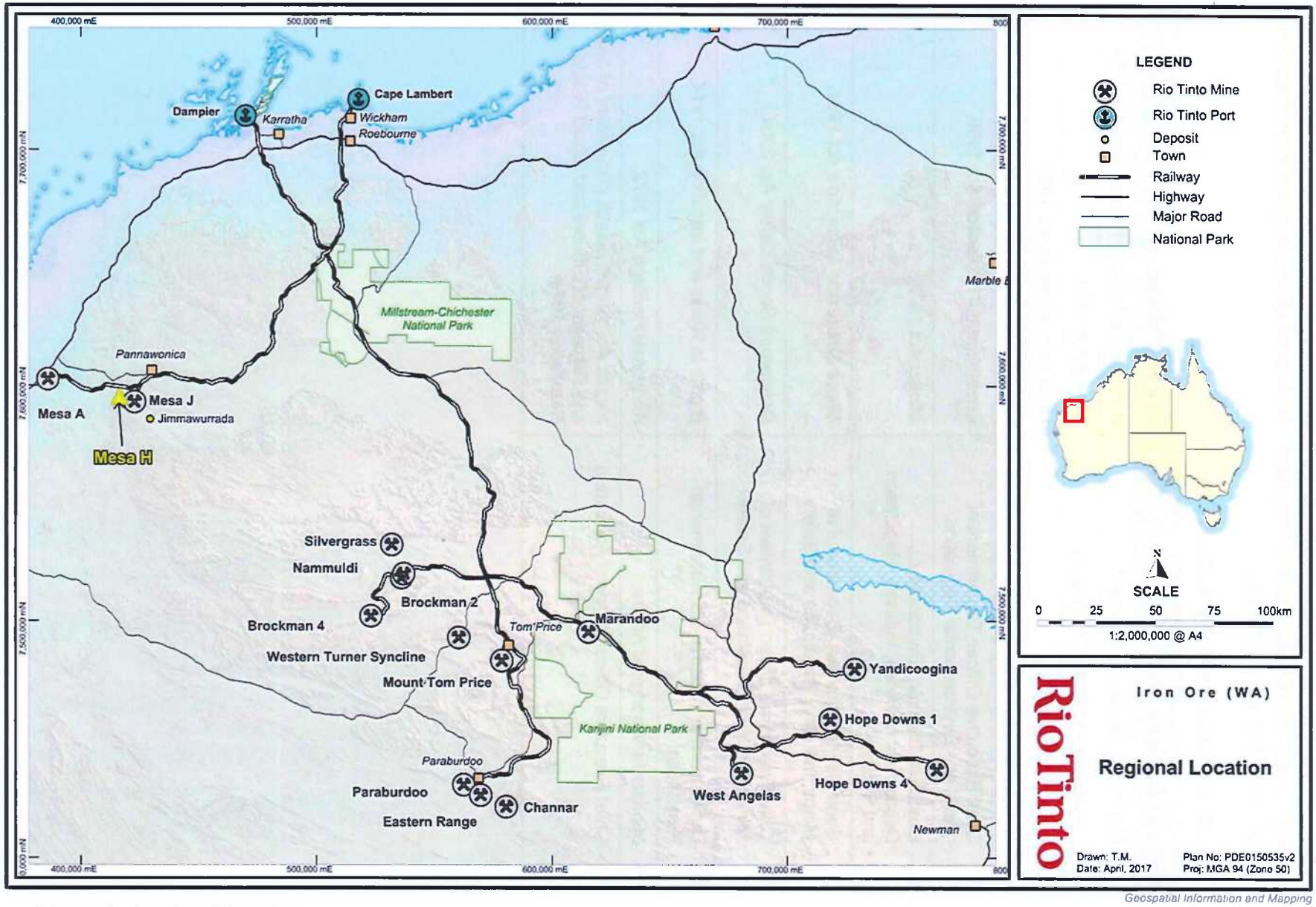

Figure 1 – Regional location

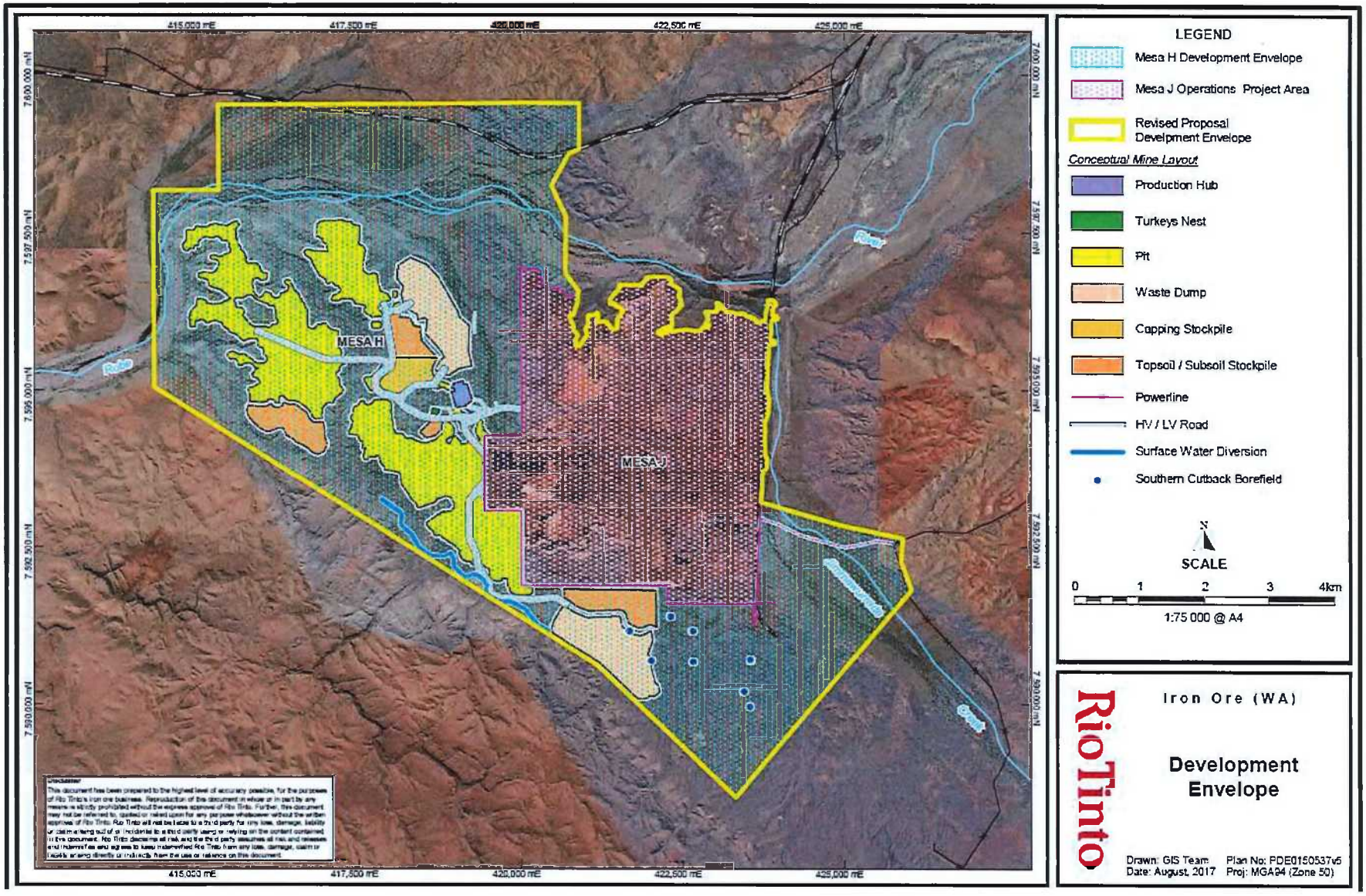

Figure 2 – Revised Development Envelope