ENVIRONMENTAL SCOPING DOCUMENT

Proposal name:	Brockman Syncline Proposal
Proponent:	Hamersley Iron Pty Limited
Assessment number:	2219
Location:	The Brockman Syncline Proposal is located approximately 60 km west-north-west of Tom Price in the central Pilbara region of Western Australia.
Local Government Area:	Shire of Ashburton
Public review period:	Environmental Review Document – Public Environmental Review; 8 weeks

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 section 40(3) of the EP Act. Hamersley Iron Pty Limited (the Proponent) has prepared this 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(3) (Environmental Review Document, ERD) is 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. To meet the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the ERD must address the requirements set out in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000*.

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 ESD	20 March 2020
Proponent submits draft Environmental Review Document	30 June 2020
EPA provides comment on draft Environmental Review Document *(6 weeks from receipt of Environmental Review Document)*	11 August 2020
Proponent submits revised final Environmental Review Document	2 November 2020
EPA authorises release of Environmental Review Document for public review *(2 weeks from EPA approval of Environmental Review Document)*	16 November 2020
Proponent releases Environmental Review Document for public review *(8 weeks)*	November 2020
Close of public review period	December 2020

Key Assessment Milestones	Completion Date
EPA provides Submissions *(3 weeks from close of public review period)*	1 February 2021
Proponent provides Response to Submissions	April 2021
EPA reviews the Response to Submissions *(4 weeks from receipt of Response to Submissions)*	May 2021
EPA prepares draft Assessment Report and completes assessment *(6 weeks from EPA accepting Response to Submissions)*	July 2021
EPA finalises Assessment Report (including two weeks consultation on draft conditions) and gives report to Minister *(6 weeks from completion of assessment)*	September 2021

Procedure

The EPA requires the Proponent to undertake the environmental review according to the procedures in the *Administrative Procedures* and the *Procedures Manual*.

Assessment as an accredited assessment (EPBC 2019/8518)

The proposal has been referred to the Commonwealth Department of Agriculture, Water and the Environment (DoAWE) under the EPBC Act. The DoAWE determined that the proposed action is a controlled action on 31 October 2019 (EPBC 2019/8518), with listed threatened species and communities (sections 18 and 18a) as the controlling provision. The Proposal will require assessment and approval under the EPBC Act before it can proceed. The proposal will be assessed by an accredited assessment under the EP Act. The DoAWE will provide comment on the ERD during the public comment period and will also be expected to review the response to submissions.

2 The Proposal

The subject of this ESD is the Proponent's Brockman Syncline Proposal (the Proposal). The Proposal includes the development of new above and below water table deposits as an extension to existing iron ore operations at Nammuldi-Silvergrass, Brockman 2 and Brockman 4.

The regional location of the Proposal is shown in Figure 1 and the proposed Development Envelope and conceptual footprint are delineated in Figure 2. The key characteristics of the Proposal are set out in Tables 2 and 3.

The key components of the Proposal are:

- Above and below water table (AWT and BWT) pits:
  - Extension of the existing Brockman 4 pits R and Q to support BWT mining.
  - Development of new AWT and BWT Silvergrass West pits at the Silvergrass area.
  - Development of new AWT and BWT pits at Brockman 4 (BS3; Endeavour; Marra Mamba pits M, N, O, S and T; Atlantis; BS1; and Vivash East).
  - Development of new AWT and BWT pits at Brockman 2 (BS2SW; Maybelline; Pits 1-7; Lens G; Diesel, Sandleford; Monkey; Lauriston; Creekside; Orbe; and MM-J).
- Activities required to facilitate the development of the new mine pits which may include as relevant, but are not limited to, the following:
  - Mineral waste management: including waste dumps, potentially acid forming materials, land bridges, low grade ore dumps, topsoil and sub-soil stockpiles, waste fines storage.

- Processing infrastructure and new and upgraded processing infrastructure at existing operations.
- Support facilities: including workshops, hydrocarbon storage, ammonium nitrate/fuel oil (ANFO) facilities laydown areas, and offices.
- Linear infrastructure: including heavy and light vehicle access roads, conveyors, pipelines and power (including sub-stations) and communications distribution networks.
- Infrastructure for surface water management: including diversion drains, levees and culverts.
- Infrastructure for groundwater abstraction and utilisation to enable BWT mining including bores and pipelines.
- Surplus water management and associated infrastructure: use in processing, on-site use, irrigated agriculture, options for discharge to surface water systems, discharge to disused mine pits, and aquifer reinjection.

Exclusions

The scope of the Proposal subject to assessment under Part IV of the EP Act excludes:

- Low impact activities required to inform Part IV assessment of the Proposal, including drilling and associated activities for the purposes of resource evaluation, geotechnical assessment and hydrogeological investigations. These activities will be subject to relevant provisions under Part V of the EP Act and the Rights in Water and Irrigation Act 1914 (RiWI Act).
- Activities that are part of or required for continuation of the existing mining operations at Nammuldi-Silvergrass, Brockman 2 and Brockman 4 (as approved under MS 925, 131, 867 and 1000 respectively).
- Construction camp and associated activities (currently authorised under Clearing Permits issued under Part V of the EP Act).
- Environmental, heritage and other studies/investigations involving fieldwork.

  Current operational activities are authorised via statutory environmental approvals under Part V of the EP Act and the RiWI Act. The Proponent notes that, whilst the proposal is under assessment, additional approvals or amendments to existing approvals may be required to support the continuation of existing operations that do not relate to the implementation of this proposal. Therefore, the above exclusions are not limited to only those activities already approved.

Table 2: Summary of the Proposal

Proposal title	Brockman Syncline Proposal
Proponent name	Hamersley Iron Pty Limited
Short description	The Proposal is located approximately 60 km west-north-west of Tom Price in the central Pilbara region of Western Australia. The Proposal includes the extension and development of new above and below water table deposits as an extension to existing iron ore operations at Nammuldi-Silvergrass, Brockman 2 and Brockman 4. The Proposal includes, but is not limited to the following: • Dewatering and surplus water management, including use in ore processing, on-site use including discharge to disused pits, use at the Nammuldi irrigated agriculture project, discharge to creeklines, and injection to the aquifer. • Mineral waste management, including waste fines storage. • Other associated mine infrastructure and support facilities.

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

Element	Location	Existing extent (MS 131, 867, 925, 1000)	Proposed extent*	Revised Extent
Physical elements				
Mine and associated infrastructure	Figure 2	MS 131 – no clearing limit specified. MS 925 – up to 6,300 ha within the Nammuldi-Silvergrass Development Envelope. MS 1000 – 4,043 ha within the Brockman 4 Development Envelope.	Estimated additional clearing of up to 9,977 ha and an increase of 30,198 ha to the Development Envelope.	Clearing of up to 20,792 ha within a 73,707 ha Development Envelope.
Irrigated agriculture		MS 925 – 2,500 ha within the Nammuldi Irrigated Area within the Nammuldi-Silvergrass Development Envelope.	N/A	Clearing of up to 2,500 ha within the Nammuldi Irrigated Area within the 73,707 ha Development Envelope.
Operational elements				
Management of surplus water		MS 131/867 – discharge of excess water to Pit 5 at 950 ML/a. MS 925 – transfer for offsite use; transfer to the Irrigated Agriculture Area; periodic discharge to Duck Creek. MS 1000 – management through controlled discharge to surface drainage of Boolgeeda Creek, with discharge extending no further than 37km along Boolgeeda Creek from the discharge point under natural no-flow conditions.	Management of surplus water via water management options including but not limited: • use on site; • discharge to disused pits; • irrigated agriculture at Nammuldi; and • controlled discharge to the environment: Duck and Boolgeeda Creeks.	Surplus water management options include: • use on site; • discharge to disused pits; • irrigated agriculture at Nammuldi; and • controlled discharge to the environment: Duck and Boolgeeda Creeks.
Diversion of Creeks		MS 925: permanent realignment of up to a 3 kilometre length of Caves Creek within the Silvergrass area.	Additional permanent realignments of Caves Creek and Purlykuti Creek.	Two permanent realignments (each up to 3 km in length) of Caves Creek within the Silvergrass area. Permanent realignment of Purlykuti Creek.

3 Preliminary key environmental factors and required work

The preliminary key environmental factors to be addressed in the ERD are:

1. Flora and Vegetation
2. Terrestrial Fauna
3. Subterranean Fauna
4. Inland Waters
5. Social Surroundings
6. Air Quality

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

- **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 resulting from the proposal.
- **Required work** for that factor.
- **Relevant policy and guidance** (EPA and other) 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 discharge of surplus dewatering water to surface water systems and aquifer reinjection.
Potential impacts and risks	Direct impacts: • Loss of native vegetation (including riparian vegetation). • Loss of some individuals of Priority flora species. Indirect impacts: • Introduction/spread of weeds. • Degradation/alteration of vegetation as a result of altered surface catchments. • Impacts to riparian vegetation as a result of groundwater drawdown from mine dewatering. • Impacts to riparian vegetation as a result of surplus water discharge to surface water systems. • Degradation of vegetation through dust deposition and potential increase in bushfire risk.
Required work	1. Identify and characterise the flora and vegetation of areas that may be directly or indirectly impacted by the proposal in accordance with the requirements of the EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (2016). This should include sampling more broadly to inform local and regional context. Demonstrate how surveys are relevant and consistent with current EPA policy and guidance. Ensure database searches and taxonomic identifications are up to date. 2. Identify and describe the significant vegetation and flora species present and likely to be present within the conceptual footprint and wider development envelope, and any areas that may be indirectly impacted by the proposal beyond the development envelope. Include an analysis of the significance of flora and vegetation in local, regional and State contexts as appropriate in accordance with the relevant guidance set out below. 3. Provide maps depicting the recorded locations of the significant flora, listed ecological communities and significant vegetation in relation to the development envelope in accordance with the relevant guidelines set out below. 4. Map weed occurrences in areas likely to be directly and indirectly impacted by the Proposal. 5. Assess the potential direct and indirect impacts of the construction and operational elements of the proposal on identified environmental values, including the Brockman Iron cracking clay Priority Ecological Community (PEC) and Themeda grasslands on cracking clay Threatened Ecological Community (TEC). Include an assessment of impacts to groundwater/surface water dependent vegetation, including riparian vegetation. Include a quantitative assessment of levels of impact on significant flora, listed ecological communities and all vegetation units. Describe and assess the extent of any cumulative impacts within local, regional and State contexts as appropriate. 6. Describe and justify any proposed mitigation to reduce the potential impacts of construction and operation of the proposal. Include any proposed management and/or monitoring plans that will be implemented pre- and post-construction to ensure residual impacts to identified environmental values (direct and indirect) are not greater than predicted. 7. Identify, describe and quantify the potential residual impacts to identified environmental values (direct, indirect and cumulative) that may occur following implementation of the proposal after considering and applying avoidance and minimisation measures. 8. Prepare a Mine Closure Plan, consistent with DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (March 2020) and DMIRS *Statutory Guidelines for Mine Closure Plans* (March 2020), which includes methodologies to ensure progressive rehabilitation of disturbed land meets closure objectives, including vegetation composed of native species of local provenance. 9. Provide a report that details the likely success of future Proponent rehabilitation activities in

	establishing self-sustaining areas of rehabilitation, taking into account: a) evidence of success of rehabilitation undertaken by the Proponent to date in the region b) relevant contemporary scientific evidence c) the types of area to be rehabilitated d) the scale of rehabilitation activities. 10. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Environmental Offsets Guidelines (2014, or any subsequent revisions). 11. Where significant residual impacts remain, propose an appropriate draft offsets package with due consideration to the WA Environmental Offsets Policy and Guidelines (or any subsequent revisions). 12. Where a contribution to the Pilbara Environmental Offsets Fund is proposed to offset the significant residual impacts, provide an impact reconciliation procedure prepared in accordance with the Instructions on how to prepare *Environmental Protection Act 1986* Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports and the Template for *Environmental Protection Act 1986* Part IV Reconciliation Procedures (or any subsequent revisions). 13. Maps and spatial data should be provided which defines the following areas across the entire development envelope for the Proposal and any other areas where impacts (direct and indirect) are predicted to occur: • Existing and/or already approved clearing (attributed with the relevant approval, such as Ministerial Statement number, or native vegetation clearing permits). • Vegetation condition (e.g. completely degraded, degraded, poor, good, very good, excellent). • Specific flora/vegetation types proposed to be offset (e.g. riparian vegetation, priority ecological community, etc.). • Previous or existing offsets, if relevant. 14. Demonstrate in the ERD how the Proponent proposes to ensure the EPA 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* (2018). 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 an Environmental Review Document* (2018). EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2018). EPA *Instructions on how to prepare* Environmental Protection Act 1986 *Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (2018). EPA *Template for* Environmental Protection Act 1986 *Part IV Reconciliation Procedures* (2018). DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (2020). DMIRS *Statutory Guidelines for Mine Closure Plans* (2020). <u>Other policy and guidance</u> 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 fauna habitat, vehicle and machinery movements, groundwater abstraction, discharge of surplus water to surface water systems, and construction and mining operations (noise, vibration

	and dust).
Potential impacts and risks	Direct impacts: • Loss of potential fauna habitat as a result of clearing. • Loss of fauna individuals as a result of clearing (or other interactions). Indirect impacts: • Degradation/alteration of habitat as a result of altered surface catchments. • Habitat fragmentation and barriers to fauna movement (including access to feeding areas and water sources). • Habitat degradation associated with construction activity and/or increased human activity, including transmission of weeds, dust and increased abundance of introduced fauna species. • Disturbance from light, noise and/or vibration, and possible displacement of fauna associated with construction activity and mining operations.
Required work	15. In accordance with the requirements of EPA Technical Guidance: a) conduct a desktop study, incorporating existing regional terrestrial fauna surveys (including SRE invertebrate species) and databases; and b) undertake terrestrial fauna (including short-range endemic (SRE) invertebrate species) surveys, in accordance with relevant EPA Technical Guidance, in all areas of impact, to identify and characterise terrestrial fauna and fauna habitat, at a local and regional scale, that may be impacted directly and indirectly by the implementation of the Proposal. This should include sampling inside and outside the impact areas and consider cumulative impacts. 16. Describe the values and significance of fauna and fauna habitat, including MNES fauna and MNES habitat, that may be impacted directly and indirectly by implementation of the Proposal during both construction and operations and describe the significance of these values in a local and regional context. Identify important or restricted habitats (e.g. breeding habitat, foraging/ feeding/ dispersal habitat). 17. Provide figures and maps illustrating the recorded locations of conservation or other significant species and SRE invertebrate species in relation to the Proposal impact areas and fauna habitats. 18. Describe and assess the extent of direct and indirect impacts as a result of implementation of the Proposal during both construction and operations to terrestrial fauna and MNES (Pilbara Leaf-nosed Bat *Rhinonicteris aurantia* [Pilbara Form]}; Ghost Bat {*Macroderma gigas};* Pilbara Olive Python *{Liasis olivaceus barroni};* and Northern Quoll *{Dasyurus hallucatus})* taking into consideration cumulative impacts and the significance of fauna and fauna habitat. 19. Quantify the extent of direct, indirect and cumulative impacts, including percentages of habitat types to be disturbed or otherwise impacted. 20. Discuss known existing threats to any significant species, whether or not attributable to the Proposal, with reference to relevant impacts from the Proposal. 21. Describe and justify any proposed mitigation to reduce the potential impacts of construction and operation of the Proposal on significant terrestrial fauna. Include any proposed management and/or monitoring plans that will be implemented pre- and post-construction to ensure residual impacts (direct and indirect) are not greater than predicted. Including for example, consideration of appropriate buffer zones around Pilbara Leaf-nosed Bat and Ghost Bat roost sites based on: • Discussion of the buffer zones around key/critical roost based on characteristics of the geology between the proposed disturbance and identified caves and the caves itself (i.e. fractures, sound transmissions, cave length, cave humidity/temperature (microclimate), direction). • Evaluation of the appropriateness of the proposed buffer width/distance based on the characteristics above. 22. Demonstrate how the Proposal is consistent with relevant statutory recovery plans and threat abatement plans. 23. Prepare a Mine Closure Plan, consistent with DMIRS *Mine Closure Plan Guidance – How to*

	Prepare in Accordance with Part 1 of the Statutory Guidelines (March 2020) and DMIRS *Statutory Guidelines for Mine Closure Plans* (March 2020) which includes methodologies to ensure progressive rehabilitation of disturbed land meets closure objectives. 24. Provide a report that details the likely success of future Proponent rehabilitation activities in establishing self-sustaining areas of rehabilitation, taking into account: a) evidence of success of rehabilitation undertaken by the Proponent to date in the region b) relevant contemporary scientific evidence c) the types of area to be rehabilitated d) the scale of rehabilitation activities. 25. Identify, describe and quantify the potential residual impacts (direct, indirect and cumulative) that may occur following implementation of the Proposal after considering and applying avoidance and minimisation measures. 26. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Environmental Offsets Guidelines (2014, or any subsequent revisions).. 27. Where significant residual impacts remain, propose an appropriate draft offsets package with due consideration to the WA Environmental Offsets Policy and Guidelines (or any subsequent revisions). 28. Where a contribution to the Pilbara Environmental Offsets Fund is proposed to offset the significant residual impacts, provide an impact reconciliation procedure prepared in accordance with the Instructions on how to prepare *Environmental Protection Act 1986* Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports and the Template for *Environmental Protection Act 1986* Part IV Reconciliation Procedures (or any subsequent revisions). 29. Maps and spatial data should be provided which defines the following areas across the entire development envelope for the Proposal and any other areas where impacts (direct and indirect) are predicted to occur: • Existing and/or already approved clearing (attributed with the relevant approval, such as Ministerial Statement number, or native vegetation clearing permits). • Habitat condition (e.g. completely degraded, degraded, poor, good, very good, excellent). • Specific fauna habitats of the species proposed to be offset (attributed with the habitat type e.g. denning, roosting, foraging, etc.). • Previous or existing offsets, if relevant. 30. In the circumstance that offsetting of residual significant impacts on MNES is a requirement, and the WA State Pilbara Environmental Offset Fund is not yet endorsed by DoAWE, include a discussion of the consideration of the *EPBC Environmental Offsets Policy* including, but not limited to: a) The extent to which the proposed offset correlated to the residual significant impacts on MNES. b) The conservation gain to be achieved by the proposed offset, i.e. averting future loss, degradation or damage to the protected matter. 31. Demonstrate in the ERD how the Proponent proposes to ensure the EPA objective for this factor can be met.

Relevant policy and guidance	EPA Policy and Guidance EPA *Statement of Environmental Principles, Factors and Objectives* (2018). 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 an Environmental Review Document* (2018). EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (2018). EPA *Instructions on how to prepare* Environmental Protection Act 1986 *Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (2018). EPA *Template for* Environmental Protection Act 1986 *Part IV Reconciliation Procedures* (2018). DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (2020). DMIRS *Statutory Guidelines for Mine Closure Plans* (2020). Other policy and guidance Government of Western Australia *WA Environmental Offsets Policy* (2011). Government of Western Australia *WA Environmental Offsets Guidelines* (2014). Australian Government *Environmental Management Plan Guidelines* (2014). Commonwealth of Australia *Guidelines for Biological Survey and Mapped Data* (2018). *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy, Department of Sustainability, Environment, Water, Population and Communities, October 2012. Relevant recovery plans, conservation advice and/or threat abatement plans for conservation significant species that are known to occur, or are likely to occur in the vicinity of the Proposal area.
Subterranean Fauna	
EPA objective	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
Relevant activities	Excavation of mine pits, blasting, groundwater abstraction, clearing of native vegetation, placement of infrastructure and waste landforms, exposure of PAF material and post-closure formation of pit lake, in-pit deposition of waste fines, storage and handling of hazardous materials and wastes
Potential impacts and risks	Direct impacts: • Removal and/or loss of potential subterranean fauna habitat. • Loss of subterranean fauna individuals. • Temporary alternation of stygofauna habitat through mine dewatering. Indirect impacts: • Degradation of potential subterranean fauna habitat from: - Clearing - Vibration - Changes in surface hydrology - Contamination
Required work	32. In accordance with EPA Technical Guidance: a) conduct a desktop study, incorporating existing regional subterranean fauna surveys and databases b) undertake surveys, in accordance with the requirements of relevant EPA Technical Guidance, in all areas of impact, to identify and characterise subterranean fauna and subterranean fauna habitat, at a local and regional scale, that may be impacted directly and indirectly by the implementation of the Proposal. This should include sampling inside and outside the impact areas and consider cumulative impacts. 33. Describe the characteristics of subterranean fauna habitat that may be impacted directly and

	indirectly by implementation of the Proposal during both construction and operations, and describe the significance of these values in a local and regional context. Include relevant geological and hydrological information to determine habitat suitability and connectivity, including inside and outside the impact areas. 34. Provide figures and maps showing the extent of subterranean fauna habitat in relation to the Proposal and species distributions. 35. Describe and assess the extent of direct, indirect and cumulative impacts as a result of implementation of the Proposal during both construction and operations to subterranean fauna, taking into consideration the significance of fauna and fauna habitat. 36. Quantify the extent of direct, indirect and cumulative impacts, including where feasible, percentages of habitat types to be disturbed or otherwise impacted. 37. Describe and justify any proposed mitigation to reduce the potential impacts of construction and operation of the Proposal. Include any proposed management and/or monitoring plans that will be implemented pre- and post-construction to ensure residual impacts (direct and indirect) are not greater than predicted. 38. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Environmental Offsets Guidelines (2014, or any subsequent revisions). 39. Where significant residual impacts remain, propose an appropriate draft offsets package that is with due consideration to the WA Environmental Offsets Policy and Guidelines (or any subsequent revisions). 40. Prepare a Mine Closure Plan, consistent with DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (March 2020) and DMIRS *Statutory Guidelines for Mine Closure Plans* (March 2020) which includes consideration of backfilling mine pits, final landforms and rehabilitation of disturbed areas. 41. Demonstrate in the ERD how the Proponent proposes to ensure the EPA 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* (2018). EPA *Environmental Factor Guideline: Subterranean Fauna* (2016). EPA Technical Guidance: *Subterranean Fauna Survey* (2016). EPA Technical Guidance: *Sampling Methods for Subterranean Fauna* (2016). EPA *Instructions on how to prepare an Environmental Review Document* (2018). DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (2020). DMIRS *Statutory Guidelines for Mine Closure Plans* (2020). <u>Other policy and guidance</u> Government of Western Australia *WA Environmental Offsets Policy* (2011). Government of Western Australia *WA Environmental Offsets Guidelines* (2014).
Inland Waters	
EPA objective	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.
Relevant activities	Alteration of watering holes and water sources, abstraction of groundwater, aquifer reinjection, discharge of surplus water to surface water systems, irrigated agriculture and disused mine pits, surface water management, mineral waste management, waste fines storage, below water table excavation for mining activities, storage and handling of hazardous materials, and formation of pit lakes.
Potential impacts and risks	Direct: • Alteration to groundwater aquifers and associated pools due to abstraction of groundwater. • Alteration to hydrological regimes of surface water systems, including pools, from discharge of surplus dewatering water. • Alteration to groundwater aquifers from discharge of surplus dewatering water to disused

	mine pits and via aquifer reinjection. • Alteration to existing surface water catchments, surface water flow paths and sheetflows. Indirect: • Reduction in quality of groundwater and surface water as a result of: - Surface water discharge. - Waste rock dumps. - Waste fines storage. - Post closure formation of permanent and ephemeral pit lakes. - Increased sediments from infrastructure and drainage - Storage and handling of hazardous materials and waste.
Required work	42. Characterise the baseline hydrological and hydrogeological regimes, ecological values and water quality, both in a local and regional context, including, but not limited to, catchment boundaries, creek flows, flood patterns, groundwater levels, aquatic fauna assemblages and water quality. 43. Provide a hydrogeological assessment for the Proposal (including drillings, test pumping and groundwater modelling). 44. Describe and map water dependent ecosystems which may be impacted by changes to hydrological/hydrogeological regimes. Describe/map the area of potential impact, including areas that are downstream and outside of the development envelope. 45. Provide a detailed description of the design and location of the Proposal (including maps/figures where appropriate) as it relates to potential to impact surface or groundwater. 46. Provide a numerical groundwater model and surplus water discharge model for the Proposal. 47. Provide a conceptual site water balance model over the life of the Proposal and provide an assessment of water management options and discuss the capacity to reuse surplus mine dewater. Demonstrate application of the waste hierarchy to minimise discharge of surplus mine dewater to mine pits, surface water and via aquifer reinjection. 48. If surplus discharge is required, include predictions of the extent of the wetting front and assess any environmental impacts from changed flow regimes. 49. If aquifer reinjection is required, undertake groundwater modelling to demonstrate potential impacts. 50. Where pit lakes are proposed to be retained include details on the pit lake characteristics (e.g. flow-through or sink) to inform further studies and closure objectives, completion criteria and preliminary management measures for the Mine Closure Plan. 51. Assess the nature, extent and duration of potential impacts of groundwater abstraction with a focus on possible impacts to groundwater dependent ecosystems. 52. Characterise the geochemical and physical properties of waste rock and waste fines to allow an assessment of the potential risk from waste rock dumps and waste fines storage facilities, including consideration of neutral mine drainage. 53. Analyse, discuss and assess potential groundwater and surface water impacts (direct, indirect and cumulative). This analysis should include, but not be limited to: a) Changes in groundwater levels and surface water flows associated with the proposal b) Presence of PAF materials and risks associated with Acid Mine Drainage (AMD) c) Changes in groundwater and surface water chemistry d) Assessment of the function, reliance and potential impacts to groundwater dependent vegetation e) Assessment and description of direct and indirect impacts to aquatic fauna through drawdown, discharge or changes to hydrological regimes f) The nature, extent and duration of the potential impacts g) Impacts to the environmental values of significant receptors h) Impacts associated with the post-closure formation of permanent pit lakes. 54. Apply the mitigation hierarchy and discuss proposed objectives/outcomes, monitoring, management and mitigation measures where necessary to be implemented to appropriately

	avoid and minimise impacts to inland waters. 55. Prepare a Closure Plan consistent with DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (March 2020) and DMIRS *Statutory Guidelines for Mine Closure Plans* (March 2020), which includes criteria to ensure hydrological regimes and the quality of groundwater and surface water resources are suitable so that any dependent environmental values are maintained post closure. 56. Demonstrate in the ERD how the Proponent proposes to ensure the EPA 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* (2018). EPA *Environmental Factor Guideline: Inland Waters* (2018). *Inland Waters of the Pilbara Western Australia (Part 1)* (EPA 1998a). *Inland Waters of the Pilbara Western Australia (Part 2)* (EPA 1998b). EPA *Instructions on how to prepare an Environmental Review Document* (2018). DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (2020). DMIRS *Statutory Guidelines for Mine Closure Plans* (2020). DWER *Operational Policy 5.12 – Hydrogeological reporting associated with a groundwater well licence* (2009). <u>Other policy and guidance</u> Department of Water *Western Australian water in mining guideline* (2013).
Social Surroundings (Aboriginal heritage and culture)	
EPA objective	To protect social surroundings from significant harm.
Relevant activities	Clearing and excavation for mining, placement of waste dumps and other infrastructure, abstraction of groundwater, discharge of surplus water to surface water systems, surface water management, vehicle and rail movements, presence of workforce personnel.
Potential impacts and risks	Direct: • Disturbance of sites of cultural and heritage significance, including disturbance from workforce visitation. • Changes to local landforms which may result in altered visual landscapes within the region and at specific areas supporting social, cultural and heritage values. Indirect: • Changes to the physical (including noise and dust levels) and biological attributes of the environment which may impact social, cultural and heritage values, including changes to access by Traditional Owners to areas of social, cultural and heritage value.
Required work	57. Characterise and describe the social, cultural and heritage values within the Development Envelope and any sensitive receptors that may be directly or indirectly impacted as a result of this Proposal to identify sites of social significance and their significance within a regional context, in consultation with the Traditional Owners. 58. Conduct investigations, including ethnographic and archaeological surveys in consultation with the Traditional Owners, to determine the significance of potential impacts (direct, indirect and cumulative) to social surroundings as a result of this Proposal. 59. Describe and assess the potential impacts (direct, indirect and cumulative) to social surroundings as a result of changes to the environment from the Proposal giving consideration to Traditional Owners and Pastoral Stations and their activities on the land. 60. Prepare a Social, Cultural and Heritage Management Plan which provides evidence of consultation with relevant stakeholders and specifies how the Proponent will minimise impacts to social, cultural and heritage values within the Development Envelope. 61. Apply the mitigation hierarchy and discuss proposed objectives/outcomes, monitoring, management and mitigation measures where necessary to be implemented to appropriately avoid and minimise impacts to social surroundings.

	62. Prepare a Mine Closure Plan consistent with DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (March 2020) and DMIRS *Statutory Guidelines for Mine Closure Plans* (March 2020), which considers social surroundings. 63. Demonstrate in the ERD how the Proponent proposes to ensure the EPA 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* (2018). EPA *Environmental Factor Guideline: Social surroundings* (2016). EPA *Instructions on how to prepare an Environmental Review Document* (2018). DMIRS *Mine Closure Plan Guidance – How to Prepare in Accordance with Part 1 of the Statutory Guidelines* (2020). DMIRS *Statutory Guidelines for Mine Closure Plans* (2020). <u>Other policy and guidance</u> Department of Aboriginal Affairs and Department of Premier and Cabinet *Due Diligence Guidelines, Version 3.0* (2013).
Air Quality	
EPA objective	To maintain air quality and minimise emissions so that environmental values are protected.
Relevant activities	Operation of vehicles, plant equipment and processing infrastructure. Dust/particle emissions from excavation of mine pits, construction activities, vehicle movements (on unsealed roads) and dumps/stockpiles.
Potential impacts and risks	Direct: • Generation of greenhouse gases through power generation and combustion of fossil fuels. • Increased dust particulates generated through construction and operation. • Exposure of asbestiform materials.
Required work	64. Describe the environmental setting of the Proposal in relation to proximity to sensitive receptors. 65. Describe the scale and nature of power generation/combustion activities associated with the Proposal. 66. Characterisation of greenhouse gas emission sources from the Proposal. 67. Estimation of expected Scope 1 (direct) and Scope 2 (indirect) greenhouse gas emissions in accordance with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and analysis of greenhouse gas intensity (i.e. quantity of CO_2-e generated per tonne of product produced) and comparison with published benchmarked practices. 68. Demonstrate application of hierarchy to avoid and minimise impacts to air quality (including greenhouse gases). 69. Prepare a Greenhouse Gas Management Plan which predicts the extent, severity, and duration of any residual impacts associated with greenhouse gas emissions from the project that may be expected after implementing the proposed management and mitigation measures. 70. Demonstrate in the ERD how the Proponent proposes to ensure the EPA 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* (2018). EPA *Environmental Factor Guideline: Air Quality* (2016). <u>Other policy and guidance</u> State Government of Western Australia *Greenhouse Gas Emissions Policy for Major Projects* (2019). *National Greenhouse and Energy Reporting Act 2007* (NGER Act).

4 Other environmental factors

At time of preparing this ESD, the Proponent was not aware of any other environmental factors or matters that warrant addressing in the ERD. If the Proponent identifies, or a recognised stakeholder informs the Proponent in writing, of any other environmental factors or matters during the course of the environmental review, the Proponent will consult with the DWER – EPA Services, within one week of becoming aware of the factors or matters, 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 will continue to consult with relevant stakeholders during the EPA's environmental impact assessment process. This includes the decision-making authorities (see section 6), other relevant state government agencies and local government authorities, local communities and environmental non-government organisations.

The Proponent has identified the following stakeholders for this Proposal:

- Department of Water and Environmental Regulation (DWER)
- Department of Agriculture, Water and the Environment (DoAWE) (Cwth)
- Department of Biodiversity, Conservation and Attractions (DBCA)
- Department of Mines, Industry Regulation and Safety (DMIRS)
- Department of Planning, Lands and Heritage (DPLH)
- Shire of Ashburton
- Cheela Plains Pastoral Station
- Mt Stuart Pastoral Station
- Eastern Guruma (EG) people (Traditional Owners)
- Puutu Kunti Kurrama and Pinikura (PKKP) people (Traditional Owners)
- Robe River Kuruma (RRK) people (Traditional Owners)

The Proponent will document the following in the ERD:

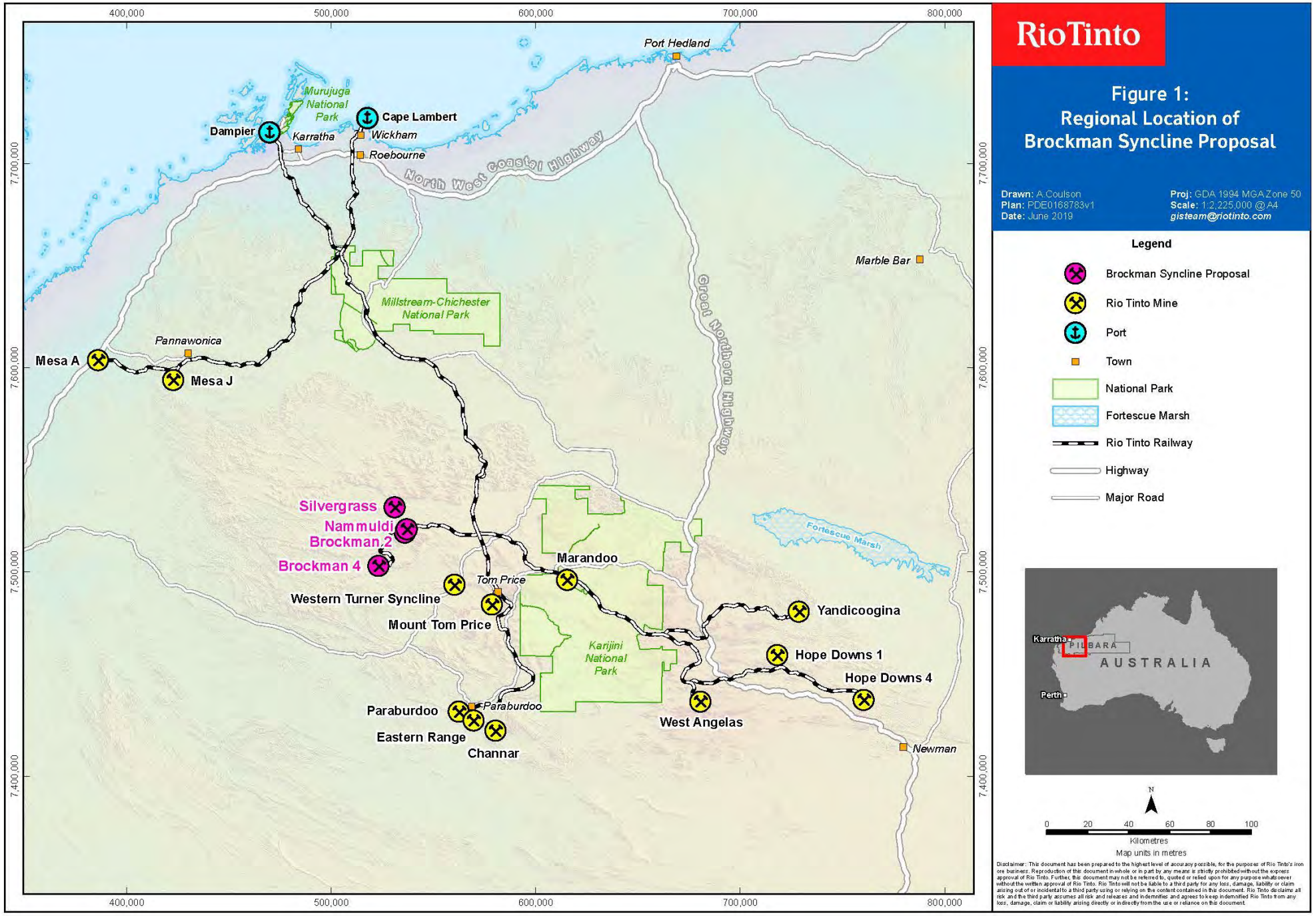
- identified stakeholders;
- the stakeholder consultation undertaken and the outcomes, including decision-making authorities' specific regulatory approvals and any adjustments to the Proposal as a result of consultation; and
- plans for future consultation.

6 Decision-making authorities

The Proponent has identified the decision-making authorities listed in Table 5 for this Proposal. Additional decision-making authorities may be identified during the course of the assessment.

Table 5: Decision-making authorities

Decision-making authority	Relevant legislation
Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972*
Minister for Environment	*Biodiversity Conservation Act 2016*
Minister for State Development	*Iron Ore (Hamersley Iron) Agreement Act 1968 (Paraburdoo)*
Minister for Water	*Rights in Water and Irrigation Act 1914*
Chief Dangerous Goods Officer, Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004*
Chief Executive Officer, Department of Water and Environmental Regulation	*Environmental Protection Act 1986* – Part V Environmental Protection (Clearing of Native Vegetation) Regulations 2004
State Mining Engineer, Department of Mines, Industry Regulation and Safety.	*Mines Safety and Inspection Act 1994*
Minister for Mines and Petroleum	*Mining Act 1978*



RioTinto

Figure 1: Regional Location of Brockman Syncline Proposal

Drawn: A.Coulson
Plan: PDE0168783v1
Date: June 2019

Proj: GDA 1994 MGA Zone 50
Scale: 1:2,225,000 @ A4
gisteam@riotinto.com

Legend

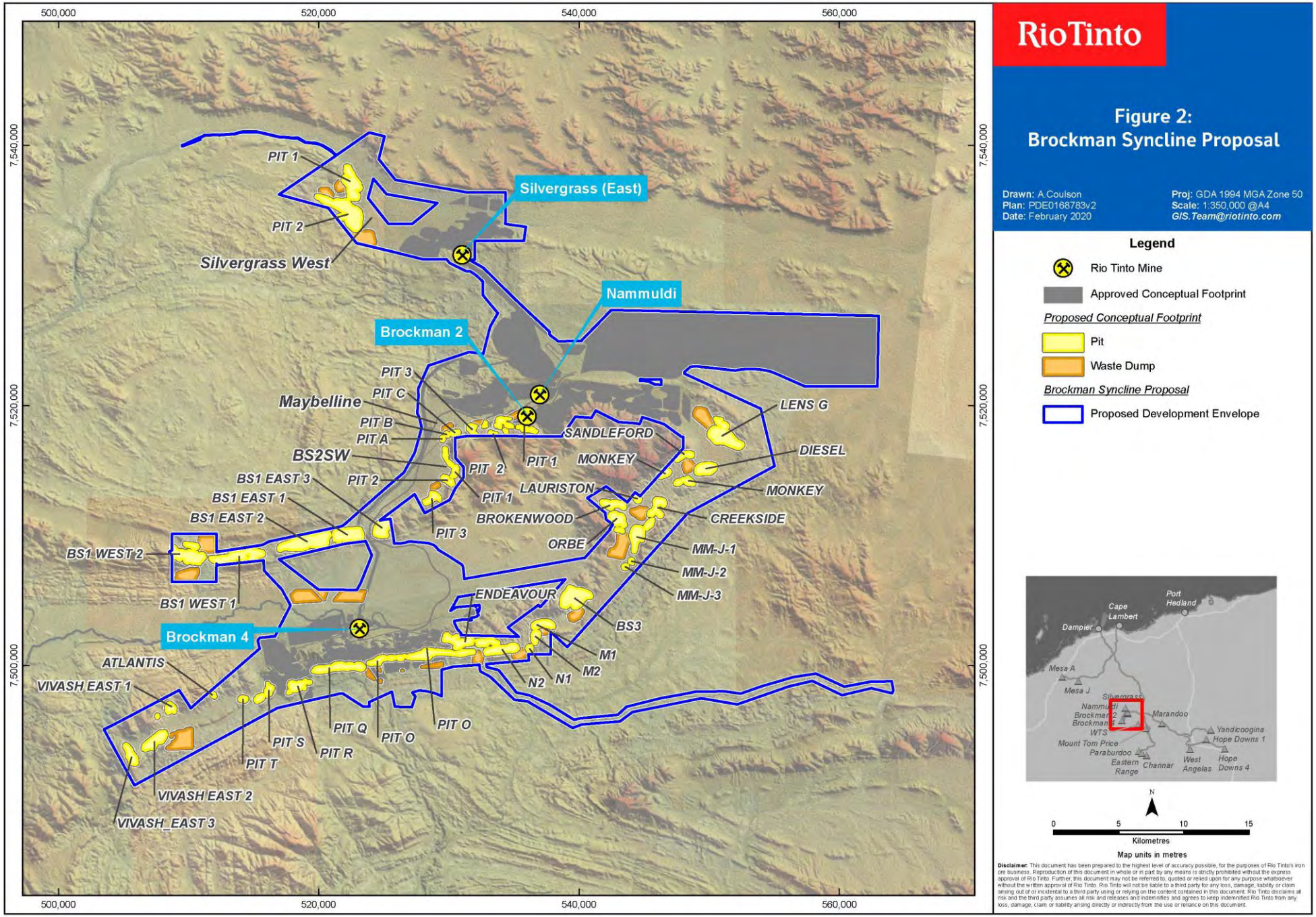
- Brockman Syncline Proposal
- Rio Tinto Mine
- Port
- Town
- National Park
- Fortescue Marsh
- Rio Tinto Railway
- Highway
- Major Road

N

0 20 40 60 80 100

Kilometres

Map units in metres



RioTinto

Figure 2:
Brockman Syncline Proposal

Drawn: A.Coulson
Plan: PDE0168783v2
Date: February 2020

Proj: GDA 1994 MGA Zone 50
Scale: 1:350,000 @A4
GIS.Team@riotinto.com

Legend

- Rio Tinto Mine
- Approved Conceptual Footprint

Proposed Conceptual Footprint

- Pit
- Waste Dump

Brockman Syncline Proposal

- Proposed Development Envelope

N

0 5 10 15

Kilometres

Map units in metres