NEOSMELT™

Project NeoSmelt

BlueScope Future Technologies Pty Ltd

Environmental Review Document – Referral

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Abbreviations

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AMC	Australian Marine Complex
ARI	Assessment of Referral Information
ASS	Acid sulfate soils
ATCO	Australian Gas Networks (ATCO Gas Australia)
AWS	Automatic Weather Station
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BCE	Bamford Consulting Ecologists
BF	Blast Furnace
BF-BOF	Blast Furnace–Basic Oxygen Furnace
BHP NiW	BHP Nickel West
BOF	Basic Oxygen Furnace
BoM	Bureau of Meteorology
CALMET	CALMET meteorological model
CALPUFF	CALPUFF air dispersion model
CAMBA	China–Australia Migratory Bird Agreement
CAPEX	Capital expenditure
CDRI	Cold Direct Reduced Iron
CEMP	Construction Environmental Management Plan
CO	Carbon monoxide
CO_2	Carbon dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DA	Development Approval
DAP	Development Assessment Panel
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEED	Department of Energy and Economic Diversification
DER	Department of Environment Regulation
DEWHA	Department of the Environment, Water, Heritage and the Arts
DPAW	Department of Parks and Wildlife
DPIRD	Department of Primary Industries and Regional Development
DRI	Direct Reduced Iron

Term	Definition
DRI–ESF	Direct Reduced Iron–Electric Smelting Furnace
DRP	Direct Reduction Plant
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
ECBZ	Eco-cultural Buffer Zone
EF	Emission factor
EIA	Environmental impact assessment
EMP	Environmental Management Plan
EP Act	Environmental Protection Act 1986 (WA)
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
EPP	Environmental Protection Policy
ERD	Environmental Review Document
ESA	Environmentally Sensitive Area
ESF	Electric Smelting Furnace
ETA	Environmental Technologies & Analytics (air quality consultant)
FEL	Front-end loader
FID	Final Investment Decision
FRTBC	Forest Red-tailed Black Cockatoo
GHG	Greenhouse gas emissions
GJ	Gigajoule
GKBAC	Gnaala Karla Booja Aboriginal Corporation
GLC	Ground-level concentration
GPS	Global Positioning System
GWP	Global warming potential
H_2	Hydrogen
H_2O	Water (vapour)
HBI	Hot-briquetted iron
HRC	Hot rolled coil
IBC	Intermediate bulk container
IBRA	Interim Biogeographic Regionalisation for Australia
IF	Influencing Factor
ILUA	Indigenous Land Use Agreement
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
JAMBA	Japan–Australia Migratory Bird Agreement
JV	Joint Venture
JVPs	Joint Venture Participants
km	Kilometres
kL	Kilolitres

Term	Definition
kV	Kilovolts
KBT	Kwinana Bulk Terminal
KIA	Kwinana Industrial Area
KIC	Kwinana Industries Council
KWRP	Kwinana Water Reclamation Plant
LCU	Landscape Character Unit
LGA	Local Government Area
LPG	Liquefied petroleum gas
mAHD	metres above Australian Height Datum
MEGC	Multi Element Gas Container
mg/L	Milligrams per litre
MIOD	Mitsui Iron Ore Development
MNES	Matters of National Environmental Significance
MP	Management Plan
MS	Ministerial Statement
NEPM	National Environment Protection Measure
NGER	National Greenhouse and Energy Reporting
NGA	National Greenhouse Accounts
NKW	Nickel West Kwinana
NOx	Oxides of nitrogen
NPI	National Pollutant Inventory
NSHA	Noongar Standard Heritage Agreement
OCG	Office of the Coordinator General
PEC	Priority Ecological Community
PER	Public Environmental Review
PFS	Pre-feasibility study
PRIME	Plume Rise Model Enhancements
RIZ	Rockingham Industrial Zone
RO	Reverse osmosis
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SAT	State Administrative Tribunal
SDOOL	Sepia Depression Ocean Outfall Line
SEA	Strategic Environmental Assessment
SERS	Sectoral Emissions Reduction Strategy
SIA	Strategic Industrial Area
SMR	Steam methane reforming
SWALSC	South West Aboriginal Land and Sea Council
SWIS	South West Interconnected System
SWL	Sound power level
TAFE	Technical and Further Education

Term	Definition
TBC	To be confirmed
TEC	Threatened Ecological Community
tph	tonnes per hour
TSP	Total suspended particulates
TSSC	Threatened Species Scientific Committee
USEPA	United States Environmental Protection Agency
WA	Western Australia
WRF	Weather Research and Forecasting model
WTC	Western Trade Coast
ZR	Zero Reformer

Summary

The Proposal is being developed by the NeoSmelt Joint Venture comprising five of Australia's most significant manufacturing, energy and resources companies: BHP, BlueScope, Mitsui Iron Ore Development, Rio Tinto and Woodside Energy. BlueScope Future Technologies Pty Ltd, as manager of the NeoSmelt Joint Venture, is proposing to construct and operate a research and development pilot plant that will combine Direct Reduced Iron technology with Electric Smelting Furnace capability to manufacture lower-emissions iron (relative to a Blast Furnace) from Pilbara iron ores

The Proposal is located approximately 35 kilometres south of Perth in the City of Rockingham and will have the capacity to produce up to 49,000 tonnes of granulated iron per year.

The Proposal is proposed to be located within the Rockingham Industrial Zone, which was referred by Landcorp (now DevelopmentWA) to the Environmental Protection Authority in 2004 as a Strategic Environmental Assessment (Ministerial Statement 863). Several 'derived' proposals were subsequently submitted for industrial subdivision purposes. The Proposal is within Derived Proposal 5, as declared by the Environmental Protection Authority on 3 April 2024.

The Proposal will include the following elements:

- Raw material storage and blending;
- Batching plant;
- Direct Reduction Plant;
- Electric Smelting Furnace;
- Product storage;
- Non-process infrastructure such as control room, maintenance and warehouse shed, laydown area, weighbridge and security office, laboratory, administration and welfare buildings;
- 132 kV switchyard, process and non-process infrastructure substations and power distribution;
- Stormwater retention ponds;
- Carpark, roads and weighbridge; and
- Site fencing and lighting.

A summary of the Proposal is provided in Table S.1, and the Proposal content elements are provided in Table S.2.

Table S.1: Summary of Proposal

Item	Details
Proposal title	Project NeoSmelt
Proponent name	BlueScope Future Technologies Pty Ltd
Short description	The Proposal is to develop a research and development pilot plant that will combine Direct Reduced Iron technology with Electric Smelting Furnace capability to manufacture lower-emissions iron (relative to a Blast Furnace) from Pilbara iron ores. The Proposal is proposed to be located on Patterson Road on the Western Trade Coast, approximately 35 km south of Perth (Figure 1-1). The Proposal is targeted to have the capacity to produce approximately 49,000 tonnes of iron annually.

Table S.2: Summary of key proposal elements and extent

Proposal element	Location / description	Maximum extent, capacity or range
Physical elements		
Materials handling including materials receival and storage	Figure 1-3	21.4 ha of Disturbance Footprint within a 30.5 ha Development Envelope
Direct Reduction Plant		
Feed storage, preparation and mixing batch plant		
Electric Smelting Furnace		
Product storage for slag and pig iron		
Non-process infrastructure, including but not limited to laboratory, road drainage, external road interfaces buildings and administrative areas		
Utilities connections and distribution (overhead and unground), including but not limited to process water, process effluent, electricity, hydrogen and natural gas		
Construction elements		
Laydown for construction and parking	N/A	Within 30.5 ha Development Envelope
Transportation of modules		
Operational elements		
Iron ore pellet storage	N/A	Design capacity 30,000 tonnes total
Cold Direct Reduced Iron (CDRI) storage		Design capacity 10,000 tonnes total
Direct Reduction Plant (DRP)		Design capacity 69,000 tonnes of Cold Direct Reduced Iron (CDRI) per year
Electric Smelting Furnace (ESF)		Design capacity 49,000 tonnes of iron per year
Process effluent		Design discharge 5 kL per hour
Proposal elements with greenhouse gas emissions		
Construction elements:		
Scope 1	Approximately 600 tCO2-e due to vegetation clearing and fuel (diesel) emissions	
Scope 2	None	
Operational elements:		
Scope 1	Approximately 49,000 tCO2-e per year Approximately 242,000 tCO2-e over five-year operational phase	
Scope 2	Approximately 36,000 tCO2-e per year	
Scope 3	Estimated 139,000 tCO2-e per year	
Rehabilitation		
Not applicable		
Commissioning		
Not applicable		

Decommissioning
At the end of the operations phase, all process related infrastructure associated with the Proposal will be removed. Some non-process related infrastructure may remain depending on future industrial land use requirements.

Other elements which affect extent of effects on the environment		
Proposal time (estimates)	Maximum project life	Estimated 10 years
	Construction phase	3 years
	Operations phase	Estimated 5 years with option for extension
	Decommissioning phase	2 years

Environmental Factors

The Environmental Factors relevant to the Proposal are:

- Air quality;
- Greenhouse gas emissions;
- Flora and vegetation;
- Terrestrial fauna, and
- Social surroundings.

The potential impacts, proposed mitigation and environmental outcomes identified for each key factor are summarised in Table S-3.

Table S-3: Summary of potential impacts, proposed mitigation and proposed environmental outcomes

Element	Description
Air quality	
Environmental Protection Authority objective	To maintain air quality and minimise emissions so that environmental values are protected.
Potential significant environmental impacts	The Proposal has the potential to impact human health and amenity via emissions to air, causing a reduction in ambient air quality. Potential pollutants associated with the Proposal include: • Particulate matter; and • Production and combustion gases. Potential sources of the above pollutants include the Direct Reduction Plant and Electric Smelting Furnace, and the balance of the plant for particulate matter only.
Mitigation hierarchy	**Mitigation** The Proposal includes implementation of the following mitigation measures; • Electric Smelting Furnace primary off-gas will be combusted by a thermal oxidiser and pass through a baghouse to remove entrained particulate matter prior to release to the atmosphere; • Extraction of fumes and dust to reduce workplace exposure and mitigate fugitive emissions escaping the plant; • Direct Reduction Plan process and cooling gas will be cooled and cleaned via a wet scrubbed and carbon dioxide absorption system prior to being re-used fuel (offsetting natural gas use) prior to discharge to the atmosphere; • Dust collected at baghouses will be loaded into dust handling totes to facilitate easy transportation ahead of disposal;

Element	Description
	• A close material handling system with dust management at transfer points and dedicated baghouse to mitigate fugitive dust; • Materials arriving at the Proposal will be in sealed bulk bags/ containers and transferred directly into feed hoppers; and • Implementation of a road cleaning program.
Proposed environmental outcomes	**T**he air quality modelling assessment determined ground level concentrations of all pollutants of concern were below relevant assessment guideline values at sensitive receptors. Given the above outcomes, no significant residual impacts associated with the Proposal have been identified and, therefore, it is considered that the Environmental Protection Authority's objective for air quality will be met.
Greenhouse gas emissions	
Environmental Protection Authority objective	To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.
Potential significant environmental impacts	**Construction** During the construction phase, the Proposal has the potential to cause: • Direct emissions during construction primarily related to the combustion of diesel by stationary and mobile equipment (Scope 1 emissions), and • Indirect emissions from the consumption of electricity from the grid during construction (Scope 2 emissions). **Operation** During the operational phase, the Proposal has the potential to cause: • Direct (Scope 1) emissions during operations, primarily from the consumption of natural gas; • Indirect (Scope 2) emissions related to the use of electricity purchased from the State grid; and • Scope 3 emissions mainly associated with downstream production of iron ore and upstream production of steel.
Mitigation hierarchy	**Mitigation** The purpose of the Proposal is to develop pilot plant capable of lower-emission steelmaking when compared to traditional methods. The Proposal includes transitioning from coal-dependent ironmaking to a hydrogen-ready direct reduction and electric smelting process, supported by renewable energy, where possible. Natural gas will be utilised as the primary reductant, with further opportunities to reduce emissions including: • Use of renewable energy sources in the grid; and • Trial of hydrogen to partially replace natural gas in the Direct Reduction Plant. Through the combined use of natural gas and renewable energy as the primary reductant, the Proposal has the potential to reduce greenhouse gas emissions by up to 80% over time, compared to traditional blast furnace ironmaking.
Proposed environmental outcomes	• During construction, the Proposal is predicted to contribute an estimated 600 tCO_2-e Scope 1 and Scope 2 emissions over two years • During operations, the Proposal is estimated to contribute approximately 49,000 t CO_2-e Scope 1 emissions per year, and 36,000 tCO_2-e Scope 2 emissions per year for the design basis. • Scope 3 emissions are subject to further development as Proposal specific details are established, however, estimated emissions based on using natural gas for the Direct Reduction Plant are 139,000 CO_2-e per year

Element	Description
	Based on the above, the Scope 1 and Scope 2 emissions associated with construction and operations of the Proposal are below the 100,000 tCO_2-e per year threshold, and therefore the Proposal is considered to meet the EPA's objective for GHG emissions.
Flora and vegetation	
Environmental Protection Authority objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Potential significant environmental impacts	Potential direct impacts of the Proposal due to vegetation clearing within the Development Envelope include: • Loss of no more than 21.4 ha of native vegetation (noting a portion of this includes existing cleared areas); Potential indirect impacts of the Proposal due to construction and operational activities to retained vegetation include: • Introduction and/or spread of weeds species within the Development Envelope, including areas of retained vegetation; • Altered fire regimes; • Degradation of retained vegetation as a result of dust generation and deposition, and • Degradation of retained vegetation as a result of contaminated stormwater runoff or hazardous chemical spills.
Mitigation hierarchy	**Avoid** Planning and design of Proposal to retain approximately 6 ha of land, including native vegetation, encompassing the Tuart trees along the western boundary of the Development Envelope constituting Threatened Ecological Community within a designated Eco-cultural Buffer Zone. **Minimise** Retained native vegetation within the buffer zone will be managed through implementation of a Construction and Environmental Management Plan and Eco-cultural Buffer Zone Management Plan. Measures include: • Delineation and access measures (i.e., installation of fencing and educational signage on the boundary of the buffer zone); • Site personnel awareness of native vegetation values during inductions; • Weed and pathogen hygiene measures (i.e., cleaning vehicles of soil when entering/ exiting the site); • Waste management; • Dust suppression of cleared areas and topsoil stockpiles; • Bushfire management (i.e., firebreaks); • Monitoring commitments; • Opportunities for retention of grass trees through landscaping design within the Development Envelope, and translocation of grass trees not intended for retention through Traditional Owner and community consultation, and • Native seed collection in consultation with Traditional Owners. **Rehabilitate** Weed monitoring and management will be undertaken within the buffer zone to improve the quality of retained vegetation.
Proposed environmental outcomes	The predicted environmental outcomes resulting from the implementation of the Proposal, with respect to flora and vegetation values are: • Loss of up to 21.4 ha of native vegetation due to clearing;

Element	Description
	• Retention of up to 6 ha of land, including native vegetation and Tuart Threatened Ecological Community, within the buffer zone; • Retention of grass trees within the Development Envelope, or salvage of trees not intended for use, which will instead be translocated in consultation with Traditional Owners and the community; and • The risk of retained vegetation degradation, including through introduction and/or spread of weeds or Phytophthora dieback into the buffer zone will be successfully mitigated through established monitoring and management practices. Through implementation of the mitigation hierarchy, the residual impacts of the Proposal to flora and vegetation are as low as practicable and are not expected to be significant. Given this, it is considered that the Environmental Protection Authority's objective for flora and vegetation will be met.
Terrestrial fauna	
Environmental Protection Authority objective	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

Potential significant environmental impacts	The Proposal has the potential to impact on terrestrial fauna directly and indirectly during construction and operational activities. Potential impacts include:
	• Ground disturbance of up to 21.4 ha, which represents cleared areas and several habitat types in predominately degraded condition, including Quenda habitat and low value foraging habitat for Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo;
	• Fragmentation of fauna habitat;
	• Fauna injury and/or mortality during clearing activities; and
	• Habitat degradation within areas of retained vegetation that may provide fauna habitat through:
	  ○ Introduction and/or spread of weeds or dieback;
	  ○ Introduction of pests and/or feral animals.

Mitigation hierarchy	**Avoid** Proposal avoids impact to up to 6 ha of potential fauna habitat retained within the Eco-cultural Buffer Zone, including Threatened Ecological Community that provides the greatest foraging value of the vegetation within the Development Envelope. **Minimise** Management plans have been prepared to manage potential impacts to fauna and habitat, including: • Pre-clearing fauna assessment and relocation of fauna (i.e., Quenda) if required; • Retained vegetation/ fauna habitat demarcation (i.e., perimeter fencing and signage for the buffer zone); • Weed and dieback monitoring, management and hygiene measures; • Waste and pest management; • Retention of felled vegetation within in the buffer zone that may provide habitat for ground dwelling fauna; • Speed limits and signage to reduce risk of fauna injury/ mortality as a result of vehicle strike; • Site personnel awareness of fauna and habitat values during inductions, and • Clearing works will be undertaken in a slow and progressive manner aimed towards adjacent native vegetation within the buffer zone, allowing fauna to escape ahead of clearing. **Rehabilitation**

Element	Description
	Weed monitoring and management will be undertaken within the ECBZ to improve the quality of retained fauna habitat, as detailed within the ECBZ MP.
Proposed environmental outcomes	The environmental outcomes resulting from the implementation of the Proposal, with respect to terrestrial fauna include: • Loss of up to 21.4 ha of predominately degraded fauna habitat for Quenda and black cockatoos, noting the foraging value of the vegetation is low for black cockatoos and no potential breeding trees with suitable hollows were identified; • Retention of up to 6 ha of Tuart Threatened Ecological Community that provides habitat for Quenda and potential foraging habitat for black cockatoos; and • The risk of retained habitat degradation, including through introduction and/or spread of weeds, Phytophthora dieback or pests into the buffer zone will be successfully mitigated through established monitoring and management practices. Through implementation of the mitigation hierarchy, the residual impacts of the Proposal to terrestrial fauna are as low as practicable and are not expected to be significant. Given this, it is considered that the Environmental Protection Authority's objective for terrestrial fauna will be met.
Social surroundings	
Environmental Protection Authority objective	To protect social surroundings from significant harm.
Potential significant environmental impacts	Potential impacts associate with the Proposal on social surroundings relate to heritage values and identified sensitive receptors. Potential impacts include: • Noise emissions above allowable levels; • Disturbance to cultural (archaeological and ethnographic) values; and • Alteration of visual amenity.
Mitigation hierarchy	**Noise** **Minimise** The Proposal will implement noise control measures to equipment ensuring that received noise levels associated with the Proposal are less than assigned levels defined in accordance with the Environmental Protection (Noise) Regulations 1997. Control measures include: • Substitution of a method of breaking up ingots with a quieter method using a granulator; • Silencers or low noise valves or noise walls to be applies to flares, vents and stacks as required; • Flares, vents and stacks that require silencing will be directed away from sensitive receivers, where practicable; • Silencers, acoustic louvres or noise walls to be applies to fans as required; • Pumps that require silencing will be enclosed or noise barriers will be utilised; • Acoustic enclosures will be utilised for large compressors, and • Mobile equipment operations will be limited to certain time periods, as required.
	Heritage **Avoid** • No registered Aboriginal cultural heritage sites or heritage places were identified within the Development Envelope, nor were any isolated artefacts identified during site inspections; • Retention and protection of the Eco-cultural Buffer Zone, which includes mature Tuart trees associated with cultural values in consultation with Traditional Owners; and

Element	Description
	• Salvage of some Balga (grass) trees, that would otherwise be impacted by clearing works within the Development Envelope. **Minimise** • Cultural monitors will be present during ground disturbance activities within the Development Envelope; • All site personnel will be made aware of the purpose of cultural monitors and potential cultural values; • Implementation of a Construction Environment Management Plan, including Chance Finds Procedure; • Opportunity for seed collection to be completed by Traditional Owners prior to clearing, and • Development of employment and training strategy for opportunities for Noongar people in accordance with NeoSmelt's First Nations Engagement Framework.
	Visual amenity **Avoid** The location of the Development Envelope, within an Industrial Zone avoids, limits impacts to sensitive visual receptors and key views. **Minimise** The retention of native vegetation along the Patterson Road boundary will minimise visual impacts for observers looking into the Development Envelope.
Proposed environmental outcomes	Based on the surveys/studies undertaken within the Development Envelope, no heritage sites or values were identified and, therefore, no impacts are predicted. Additionally, the location of the Proposal avoids impacts to sensitive visual receptors. Noise assessments and proposed mitigation measures ensure the Proposal complies with the Noise Regulations and is, therefore, not expected to result in significant impacts for identified sensitive receptors and minimises the Proposals' contribution to cumulative environmental noise levels within the surrounding industrial land use area. Through application of the mitigation hierarchy, the residual impacts of the Proposal as they relate to social surroundings are as low as reasonably practicable and are not expected to be significant. Based on this, it is considered the Environmental Protection Authority's objective for social surroundings will be met.

1. Introduction

1.1 Background

BlueScope Future Technologies Pty Ltd (the Proponent) is the manager of a joint venture (JV) comprising BHP, BlueScope Rio Tinto, Mitsui Iron Ore Development and Woodside Energy (NeoSmelt). The NeoSmelt JV has been formed to collaborate to develop and demonstrate a lower-emissions ironmaking process.

NeoSmelt is proposing to construct and operate a pilot-scale ironmaking facility using Direct Reduced Iron (DRI) technology in combination with an Electric Smelting Furnace (ESF) (the Proposal). The DRI–ESF process is designed to enable the use of medium-grade Pilbara iron ores and to reduce greenhouse gas (GHG) emissions relative to conventional blast furnace-basic oxygen furnace (BF-BOF) steelmaking processes. The Proposal represents a research and development initiative intended to evaluate the technical feasibility and environmental performance of this alternative ironmaking pathway.

The Proposal will be located within the Western Trade Coast (WTC), approximately 35 kilometres (km) south of Perth in the City of Rockingham. The Development Envelope comprises approximately 30.5 hectares (ha) within the Rockingham Industrial Zone (RIZ) Strategic Environmental Assessment (SEA) area (refer to Figure 1-1). A conceptual image of the Proposal is shown in Plate 1.

The Proposal is a pilot-scale development with a production capacity of up to 49,000 tonnes per year of granulated iron. The outcomes of the Proposal are intended to inform potential future commercial-scale deployment of lower-emissions ironmaking technologies.

The Proposal has received Lead Agency Services from the WA Government and Priority Project Status under the *State Development Act 2025* (WA).

Plate 1: Conceptual image of the Proposal

1.2 Purpose and scope

The Proposal has been referred to the Environmental Protection Authority (EPA) under section 38(1) of the *Environmental Protection Act 1986* (EP Act) as, without mitigation measures applied, it has the potential to have a significant effect on the environment.

The purpose of this ERD is to provide sufficient information to enable the EPA to determine whether the Proposal is expected to have a significant effect on the environment and, if so, the level of assessment required.

The ERD provides detailed information on each of the environmental factors that the Proposal has the potential to have a significant effect on, through all phases of its implementation, including construction, commissioning, operations and closure. The assessment has been informed by technical studies undertaken for the Proposal and considers the relevant environmental factors in accordance with EPA guidance.

Based on the assessments undertaken to support the referral and the predicted outcome of each of the environmental factors considered, the Proposal is not expected to have a significant effect on the environment. The EPA's objectives for each relevant environmental factor are expected to be met through the application of the mitigation hierarchy, including:

- Avoidance of impacts where practicable;
- Minimisation of impacts through design and operational controls; and
- Management of residual impacts through monitoring and adaptive management.

Further, other statutory decision-making processes can adequately manage the potential environmental impacts associated with the Proposal to ensure that the objectives are met (refer to section 1.3).

The ERD has been prepared in accordance with relevant EPA guidance and instructions as reflected in the references, including the following:

- Environmental Impact Assessment Practice Guide Assessment of Proposals in Western Australia under Part IV of the Environmental Protection Act 1986 (EPA, 2025a); and
- Instructions: How to prepare an Environmental Review Document (EPA, 2025b).

The information provided in this document includes:

- The legislative context of the Proposal, including description of the environmental impact assessment process, other relevant approvals and regulation, and description of how the object and principles of the EP Act have been considered in relation to the Proposal (Appendix A);
- A description of the Proposal, including the key characteristics that have the potential to cause an impact on the environment (section 2);
- A summary of stakeholder engagement undertaken in support of the Proposal (section 3), including evidence that other decision-making processes may be able to mitigate the potential impacts of the Proposal on the environment (also refer to the Environmental outcomes in sections 5 to 9, and Appendix B); and
- An assessment of the potential environmental impacts of the Proposal for each of the environmental factors identified as being relevant to the Proposal, including cumulative assessment of the Proposal with relevant past, present and reasonably foreseeable future activities (sections 5 to 9).

In referring the Proposal to the EPA, NeoSmelt is seeking a '**Not assessed**' decision on the basis that the environmental impact assessment process documented in this ERD provides sufficient information on relevant environmental factors to demonstrate that:

- There is not expected to be a significant impact on the environment; and
- Other statutory decision-making processes can effectively mitigate the potential impacts of the Proposal on the environment in a manner that results in an outcome that is consistent with the EPA's environmental objectives.

1.3 Other decision-making authorities

To support the implementation of the Proposal, secondary approvals will be sought following completion of the primary environmental approval processes (i.e., referral to the EPA). Secondary approvals are typically required to authorise specific activities associated with a project such as construction activities that generate emissions and discharges, control of emissions and discharges, vegetation clearing, water use and other regulatory requirements.

These approvals are generally more detailed in scope and are administered under separate legislative frameworks. They play a critical role in ensuring the project complies with all relevant environmental and regulatory standards throughout its lifecycle.

A summary of relevant decision-making authorities, legislation and other approvals required is provided in Table 1-1.

Table 1-1: Other decision-making authority approvals

Decision-making authority	Legislation or Agreement regulating the activity	Proposal element	Approval required/amended
Department of Water and Environmental Regulation (DWER	*Environmental Protection Act 1986;* Environmental Protection Regulations 1987	Construction, commissioning and operation of a prescribed premises	Part V Works Approval and Licence
Metro Outer Development Assessment Panel (DAP) through City of Rockingham	*Planning and Development Act 2005*	Development of the site for industrial use	Development Approval (DA)

The other approvals and statutory decision-making processes relevant to the Proposal are described in more detail in section 1.4 and Appendix A. In summary, the identified processes can comprehensively regulate the Proposal's potential impacts on the environment in a manner that is consistent with the EPA's environmental objectives.

1.4 Existing approvals

1.4.1 Rockingham Industrial Zone approvals

In 2004, areas of the RIZ with significant environmental features were referred by Landcorp (now DevelopmentWA) to the EPA as a SEA under section 38 of the EP Act (RIZ SEA boundary shown in Figure 1-2). The EPA assessed the referral as a strategic proposal at the level of Public Environmental Review (PER) and published its report in April 2011 (Report 1390) (EPA, 2011).

The RIZ SEA was subsequently approved by the Minister for the Environment (the Minister) in May 2011 through Ministerial Statement (MS) 863. MS 863 states that it is expected that future proposals that may be considered by the EPA under the SEA as 'derived' proposals include subdivision for industrial purposes and

the provision of infrastructure. Since the original publication of MS 863, five derived proposals for subdivision have been assessed by the EPA and approved by the Minister.

Derived Proposals 1, 2 and 4 do not extend over the Proposal area. However, Derived Proposal 3 represented a super-lot subdivision over the remainder of the RIZ, including the Proposal. In 2016, a subsequent Ministerial Statement (MS 1043) amended the conditions in the original proposal (MS 863) as relevant to Derived Proposal 3; however, the authorisation to implement this derived proposal lapsed as it had not commenced within five years of approval.

Derived Proposal 5 was subsequently declared by the EPA on 3 April 2024 covering the remainder of the RIZ, including the Proposal, and is valid for a five-year period following the declaration. The extent of the SEA, Derived Proposal 5 area and the Development Envelope is shown in Figure 1-2.

The approvals for the RIZ SEA authorise subdivision of the land for industrial purposes, including clearing of any native vegetation. However, any clearing in the RIZ SEA area must be undertaken in accordance with MS 863, including the approved Water Management Strategy, Construction Environment Management Plan and Environmental Management Plan. This includes measures to retain native vegetation where possible.

The Proposal is being separately referred and will not be undertaken pursuant to MS 863. However, given the spatial overlap between the Proposal and MS 863, the Proposal will be undertaken in a manner that is consistent with commitments and conditions as set out in MS 863 as detailed in Table 1-2, which groups conditions/commitments per environmental factors and referenced the relevant management plan or sections of this ERD where the requirement has been addressed by the Proposal, including:

- Construction Environment Management Plan (CEMP); and
- Eco-cultural Buffer Zone Management Plan (ECBZ MP).

Due to the potential presence of Matters of National Environmental Significance (MNES) within the area, the RIZ SEA development was also referred by DevelopmentWA in 2010 to the then Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), now the Department of Climate Change, Energy, the Environment, and Water (DCCEEW), under the *Environment Protection Biodiversity Conservation Act 1999 (Cth)* (EPBC Act). The referral was to clear native vegetation to create industrial development sites whilst retaining a core 78 ha conservation area to support key environmental factors of the RIZ SEA area (refer to Figure 1-2).

The RIZ SEA was assessed as a 'Controlled Action' (EPBC 2010/5337) and approved in November 2011 with conditions. The controlling provision related to listed threatened species and communities – *Sedgelands in Holocene dune swales of the southern Swan Coastal Plain threatened ecological community* (TEC) and black cockatoo habitat. DevelopmentWA is the holder of the EPBC approval. The Proposal is a separate action and will not be undertaken pursuant to the Controlled Action but will be undertaken in a manner consistent with the approval (EPBC 2010/5337).

A significance assessment for MNES has been undertaken for the Proposal, which concluded that the Proposal is not expected to be a Controlled Action. Some environmental factors were identified that may be relevant to the MNES trigger of 'nationally threatened animal and plant species and ecological communities'; however, these will not be significantly impacted by the Proposal (refer to section 10).

Table 1-2: Summary of MS 863 conditions and commitments and relevance to the Proposal

Key Environmental Factor	MS 863 conditions/ commitments	Relevance to Proposal	Section addressed
Air quality	Not assessed under MS 863. Conditions under MS 863 regarding dust management are specific to clearing activities and impacts to vegetation health, for which mitigation measures have been accounted for within the CEMP developed for the Proposal.	The industrial nature of the Proposal and surrounding land use may result in air quality impacts to sensitive receptors. An assessment of air quality, as it relates to the Proposal, is included within this ERD and the potential impacts can be regulated by DWER under Part V of the EP Act.	ERD section 5 and Appendix A CEMP section 4.5 (Appendix G)
Greenhouse gas emissions	Not assessed under MS 863.	The Proposal will result in some direct and indirect GHG emissions during the construction and operational phases. However, the nature of the Proposal is intended to provide lower-emissions compared to traditional blast furnace ironmaking. An assessment of GHG emission, as they relate to the Proposal, is included within this ERD.	ERD section 6
Flora and vegetation	Clearing controls (i.e., delineation, inductions, site access).	The Development Envelope of the Proposal contains native vegetation, including Tuart TEC. This ERD and associated management plans consider the mitigation hierarchy for potential impacts to native vegetation and efforts to avoid and protect significant vegetation (i.e., Tuart TEC).	ERD section 7.5 CEMP section 4.1 ECBZ MP 5.4 (Appendix H)
	Seed collection and vegetation translocation.		
	Stockpiling.		
	Dieback and weed hygiene and management.		ERD section 7.5 CEMP section 4.4 ECBZ MP section 5.2
Terrestrial fauna	Clearing controls (i.e., delineation, inductions, site access and habitat retention).	The Development Envelope contains suitable habitat for conservation significant fauna, including black cockatoo and Quenda. This ERD and associated management plans consider the mitigation hierarchy for potential impacts to fauna individuals and habitat with efforts to avoid and protect significant fauna habitat.	ERD section 8.5 CEMP section 4.2 and section 4.8 ECBZ MP section 5.3 and 5.4
	Pre-clearance surveys, trapping and relocation.		
	Use/ donation of felled trees/logs.		
	Pest and waste management.		

Key Environmental Factor	MS 863 conditions/ commitments	Relevance to Proposal	Section addressed
Social surroundings	Not assessed under MS 863.	An assessment of social surroundings, including heritage and noise and vibration, as they relate to the Proposal, are included within this ERD and associated management plans. The Proposal will be regulated by DWER under Part V of the EP Act.	ERD section 9 and Appendix A
Reporting	Annual compliance reporting.	Consistent with MS 863, an annual report will be prepared and provided to DevelopmentWA to ensure actions undertaken to facilitate the Proposal are consistent with approved conditions and commitments stipulated within the existing approval, and within this ERD and associated management plans.	ERD Appendix A CEMP section 5.1.2 ECBZ MP section 9

1.4.2 Sepia Depression Ocean Outfall Line approvals

NeoSmelt is proposing to tie into the Sepia Depression Ocean Outfall Line (SDOOL) at a connection point at the East Rockingham Water Resource Recovery Facility. The SDOOL was assessed by the EPA in accordance with the environmental factor of marine environmental quality (ecological and social values). The EPA's report on the assessment concluded that it was unlikely that the EPA's objectives would be compromised provided there was satisfactory implementation by Water Corporation of their commitments and the recommended conditions.

Discharge of wastewater via the SDOOL was approved by the Minister through MS 665 granted to Water Corporation, which includes key characteristics, implementation conditions and proponent commitments, including those for monitoring and management of the outlet, ecological protection zones and toxicant criteria, toxicant and nutrient loads, and sediment quality.

Under Condition 8-1 of MS 665, the Water Corporation must not accept industrial effluent via the SDOOL from industries not specified in Schedule 1 of that Statement unless a proposal has been referred to the EPA. Schedule 1 of MS 665 currently includes the following specified sources:

- Kwinana Wastewater Reclamation Plant (KWRP);
- BP Refinery (Kwinana);
- CSBP Limited; and
- Edison Mission Energy.

Further, Condition 9-2 of MS 665 does not allow Water Corporation to accept discharges into the SDOOL for disposal to the Sepia Depression that are not licenced under Part V of the EP Act.

To facilitate access to the SDOOL in accordance with Conditions 8-1 and 9-2 of MS 665, the Proposal has been referred to the EPA under Part IV of the EP Act on the basis it is not identified in Schedule 1 of MS 665 and will be regulated by DWER under Part V of the EP Act through a works approval and licence.

The discharge of process and cooling wastewater from the Proposal will be made under an Effluent Service Agreement between NeoSmelt and Water Corporation. Under the agreement, any discharge of wastewater via the SDOOL will be required to meet the discharge criteria specified in MS 665.

The East Rockingham Water Resource Recovery Facility is also regulated by DWER under Part V of the EP Act through Licence L8960/2016/1, which authorises the treatment of up to 20 ML per day of sewage received through sewer inflow. The licence does not regulate the final discharge of effluent to the SDOOL noting that this is covered under MS 665. However, it does require that the quality of effluent discharged to the SDOOL from the wastewater treatment plant is monitored quarterly to demonstrate that the relevant discharge criteria are being met.

The discharge of process and cooling wastewater from the Proposal through the SDOOL and evaluation against relevant MS 665 discharge criteria is summarised in Appendix B.

1.5 Land tenure and zoning

The Proposal is located within the City of Rockingham local government area (LGA), adjacent to the City of Kwinana LGA and Cockburn Sound. The RIZ SEA area crosses the City of Rockingham and City of Kwinana LGA boundaries (Figure 1-1).

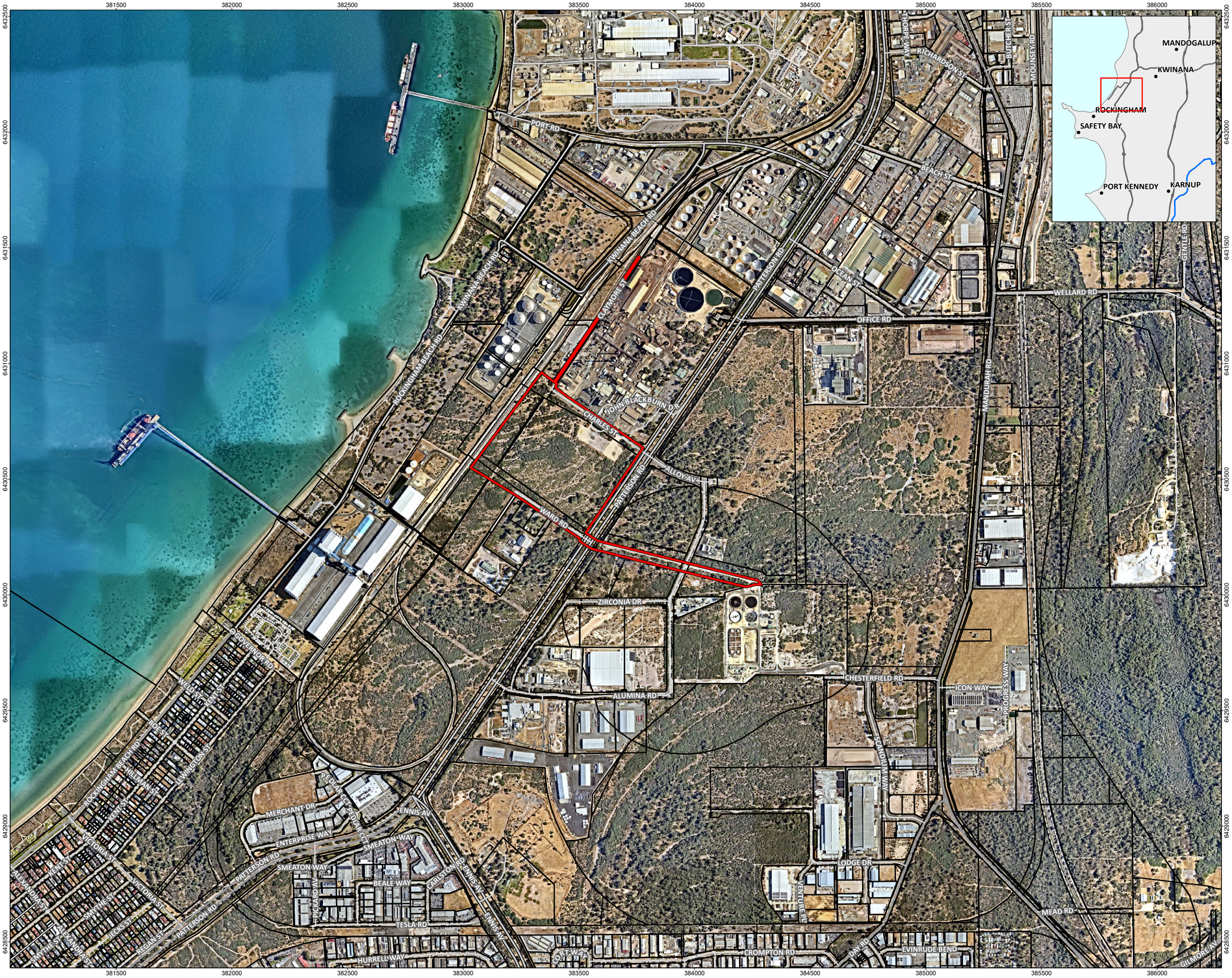
NeoSmelt is currently negotiating an Option to Lease with DevelopmentWA for the following parcels of land within the RIZ that make up the Development Envelope (Figure 1-3).:

- Parts of Lot 9008 on Deposited Plan 421725 (being part of land in Certificate of Title Volume 4065 Folio 485); and

- Lot 109 on Deposited Plan 400167 (being the whole of land in Certificate of Title Volume 2953 Folio 178).

In addition, NeoSmelt is in negotiations with DevelopmentWA for temporary access to an additional parcel of Lot 9008 (orange shaded area on Figure 1-4) for a temporary laydown and carpark during the construction period, and with Water Corporation for access to the service corridor on Lot 503 for installation of a process effluent pipeline (purple shaded area on Figure 1-4).

The Development Envelope is zoned General Industry under the City of Rockingham Local Planning Scheme No. 2. NeoSmelt is proposing road access and infrastructure connections within City of Rockingham road reserves (dark blue shaded area on Figure 1-4). These areas have been included with the Development Envelope and will be negotiated with City of Rockingham.



Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:15,000 at A3

0 250 500
metres

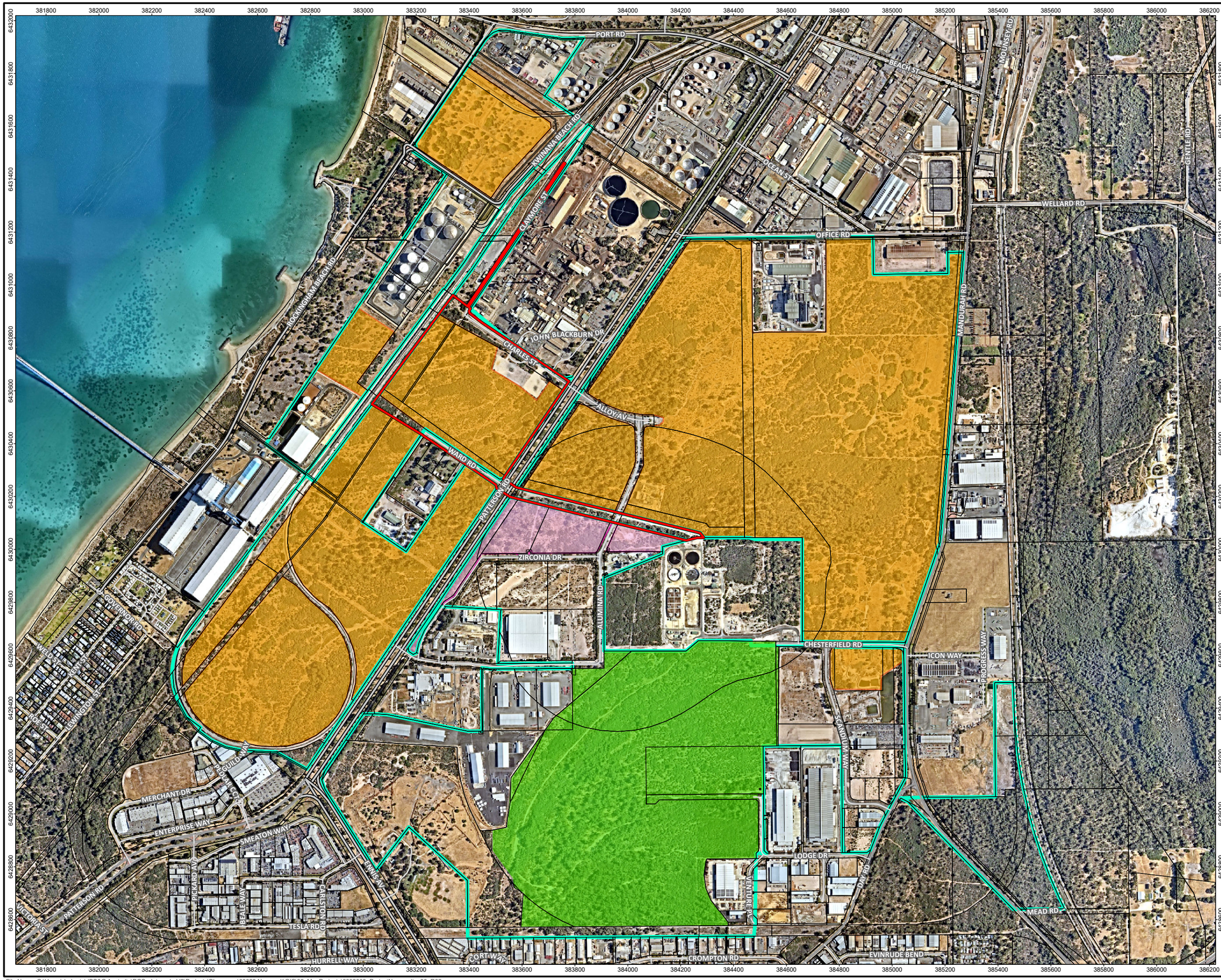
Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

REGIONAL LOCATION

FIGURE 1-1

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_01_01_Regional location



Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Conservation area
- Rockingham Industrial Zone Strategic Environmental Assessment
- Undeveloped Portion of the Final Derived Proposal
- Undeveloped Portion of the Lot 500 Patterson Road Derived Proposal

Roads (LGATE-195)

- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:13,000 at A3

0 250 500
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

ROCKINGHAM INDUSTRIAL ZONE STRATEGIC ENVIRONMENTAL ASSESSMENT AREA

FIGURE 1-2

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_01_02_RIZSEAA

382600 382800 383000 383200 383400 383600 383800 384000 384200 384400 384600

6431400 6431200 6431000 6430800 6430600 6430400 6430200 6430000

KWINANA BEACH RD
ROCKINGHAM BEACH RD
CLAYMORE ST
OCEAN ST
OFFICE RD
JOHN BLACKBURN DR
PATTERSON RD
CHARLES ST
L9008
L109
WARD RD
ALLOY AV
ALUMINA RD
L503
ZIRCONIA DR

Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Indicative Disturbance Footprint
- Eco-cultural Buffer Zone (ECBZ)
- Highway
- Minor road

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 30-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:6,000 at A3

0 100 200
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

THE PROPOSAL

FIGURE 1-3

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_01_03_The Proposal

382600 382800 383000 383200 383400 383600 383800 384000 384200 384400 384600

6431400 6431200 6431000 6430800 6430600 6430400 6430200 6430000

KWINANA BEACH RD
KWINANA BEACH RD
KWINANA BEACH RD
ROCKINGHAM BEACH RD
CLAYMORE ST
OCEAN ST
OFFICE RD
JOHN BLACKBURN DR
PATTERSON RD
PATTERSON RD
CHARLES ST
L9008
L9008
L109
WARD RD
ALLOY AV
ALUMINA RD
L503
L503
ZIRCONIA DR

Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Indicative Disturbance Footprint

Proposal development land parcels

- Lot 9008 (central): Main development area (DRI-ESF plant)
- Lot 9008 (west): Construction laydown and car parking
- Lot 109: Construction laydown and car parking; road access; service corridors
- Lot 503: Service corridor
- Road, access, service corridors
- Highway
- Minor road

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 30-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:6,000 at A3

0 100 200
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

PROPOSAL DEVELOPMENT LAND PARCELS

FIGURE 1-4

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_01_04_Proposal development land parcels

2. Proposal

The Proposal is defined in the Proposal Content Document (PCD) attached to the referral and is described in more detail in the sections below.

2.1 Proponent details

The Proponent for the Proposal is BlueScope Future Technologies Pty Ltd, a wholly owned entity of BlueScope, which is an Australian-based company and leading producer of steel products and technologies, servicing markets across Australia, New Zealand, Asia and the United States. BlueScope currently operates the Port Kembla Steelworks using traditional blast furnace technology in Illawarra, New South Wales.

The Proponent details are summarised in Table 2-1.

Table 2-1: Proponent details

Proponent	BlueScope Future Technologies Pty Ltd (ACN 676 749 456)
Registered address	Level 24, 181 William Street, Melbourne VIC 3000
Corporate contact	Renelle Thorpe, Planning and Approvals Lead P: 0419 509 616 E: Renelle.Thorpe@bluescope.com

The Proposal is being developed by a JV comprising five of Australia's most significant manufacturing, energy and resources companies: BHP, BlueScope, Mitsui Iron Ore Development (MIOD), Rio Tinto and Woodside Energy. Together, the Joint Venture Participants ("JV Participants" or "JVPs") represent every critical node of the lower-emission steel value chain that is proposed to be developed: Pilbara ore production, ironmaking and steelmaking operations, energy supply and access to the Asian markets where commercial adoption must ultimately occur.

The Proponent is the manager of the NeoSmelt JV and lead organisation responsible for overall project management**,** bringing the substantial operational expertise of BlueScope as Australia's largest steelmaker and the operator of the world's only commercial ironmaking ESF at its Glenbrook Steelworks in New Zealand.

2.2 Proposal overview

Traditional iron and steelmaking methods, while highly effective in meeting global steel demand, are energy-intensive and emit significant GHG emissions. Consequently, there is a growing emphasis on developing and implementing alternative, lower-emission ironmaking and steelmaking pathways to move towards decarbonising the industry.

The aim of the Proposal is to test, validate, and potentially upscale an alternative pathway for lower-emissions iron and steelmaking using an ESF to process cold direct reduced iron (CDRI) from Pilbara iron ores.

The Proposal involves the development of a pilot DRI-ESF plant that has the capacity to produce up to 49,000 tonnes of granulated iron per year, with expected production of around 30,000 to 40,000 tonnes per year.

Pilbara and other types of iron ore will be converted into CDRI in a Direct Reduction Plant (DRP) using natural gas or hydrogen as a reductant. The DRP will initially use natural gas to reduce the iron ore to CDRI; however, once fully operational, NeoSmelt aims to trial hydrogen instead of natural gas to reduce iron ore. By replacing the natural gas with hydrogen produced with renewable energy, ironmaking with significantly lower-emissions is possible.

Conversion from the coal-based BF-BOF production route to natural gas based DRI-ESF-BOF has the potential to reduce the overall carbon emissions from 2.33 tonnes of carbon dioxide equivalent (tCO_2-e) per tonne of

crude steel[1] to 0.81-1.22 tCO_2-e per tonne crude steel[2], representing a 65% reduction in emissions intensity. This could decrease further to 0.2-0.51 tCO_2-e per tonne crude steel using lower-emissions hydrogen as the reductant, representing an approximate 85% reduction over the BF-BOF route[1].

As the Proposal is not displacing existing steel production, there are no direct GHG emissions reductions attributable to it. However, proliferation of the DRI-ESF technology to replace existing BF-BOF capacity presents a significant GHG emissions reduction opportunity both for Australia and globally, as outlined below.

An overview of the DRI-ESF process is shown on Plate 2.

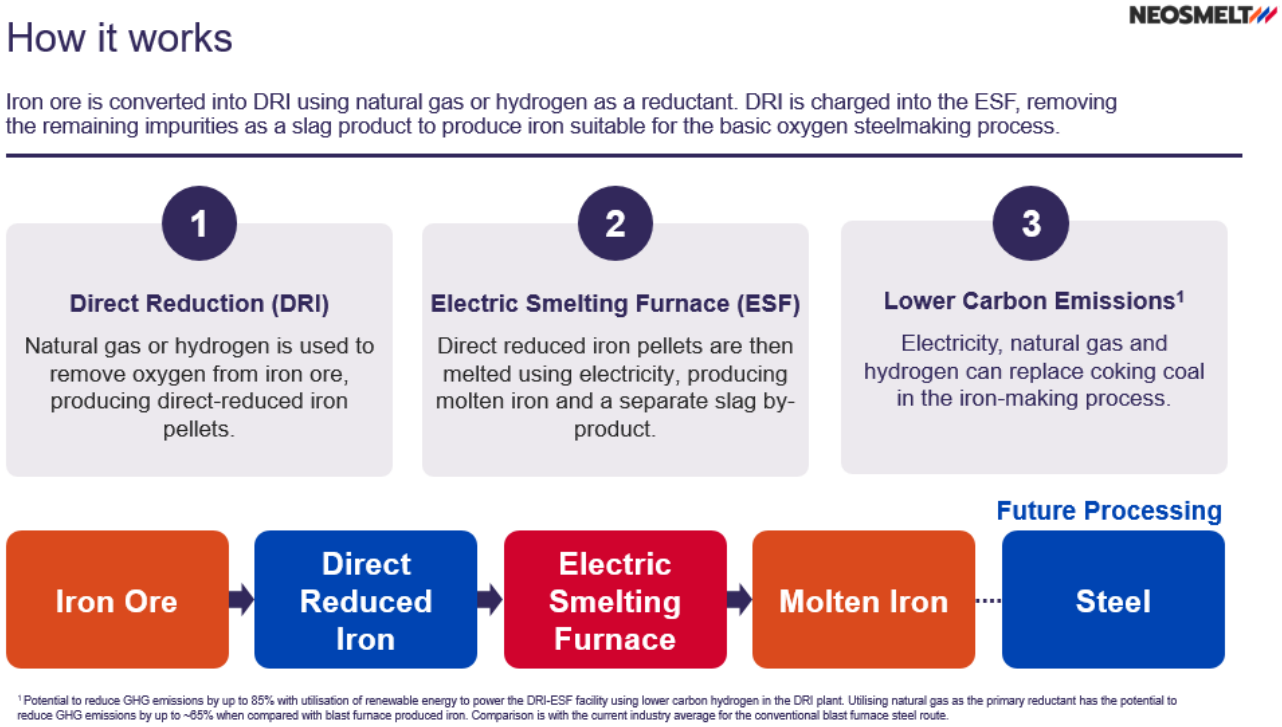


Plate 2: The DRI-ESF Process

Key infrastructure and components of the Proposal include:

- Raw material storage and blending;
- Batching plant;
- DRP;
- ESF;
- Product storage;
- Non-process infrastructure such as control room, maintenance and warehouse shed, laydown area, weighbridge and security office, laboratory, administration and welfare buildings;
- 132 kV switchyard, process and non-process infrastructure substations and power distribution;
- Stormwater retention ponds;

[1] Based on the global average BF-BOF pathway in 2022 per World Steel Association.
[2] Note the intensity of the Proposal is expected to be higher than this given its purpose of a pilot facility with a limited operation life.

- Carpark, roads and weighbridge; and
- Site fencing and lighting.

The layout of the Proposal is shown in Plate 3.

Elements excluded from the Proposal, such as supply and connection of utilities and raw material, product and intermediate product transport, are discussed in section 2.9.

2.2.1 Proposal milestones

The Proposal is currently in the Feasibility Study Phase, which is expected to be completed in the second half of 2026, followed by a Final Investment Decision (FID) targeted for the second half of 2026. The Proposal is expected to have a life of 10 years, with a three-year construction and up to five-year operational phase with an option for extension (refer to Plate 4).

Plate 3: Proposal milestones

The operational phase is expected to run for up to five years in campaigns for a total estimated operating time of 6,000 hours per year, in campaigns (of varying duration) each running 24 hours per day, seven days per week.

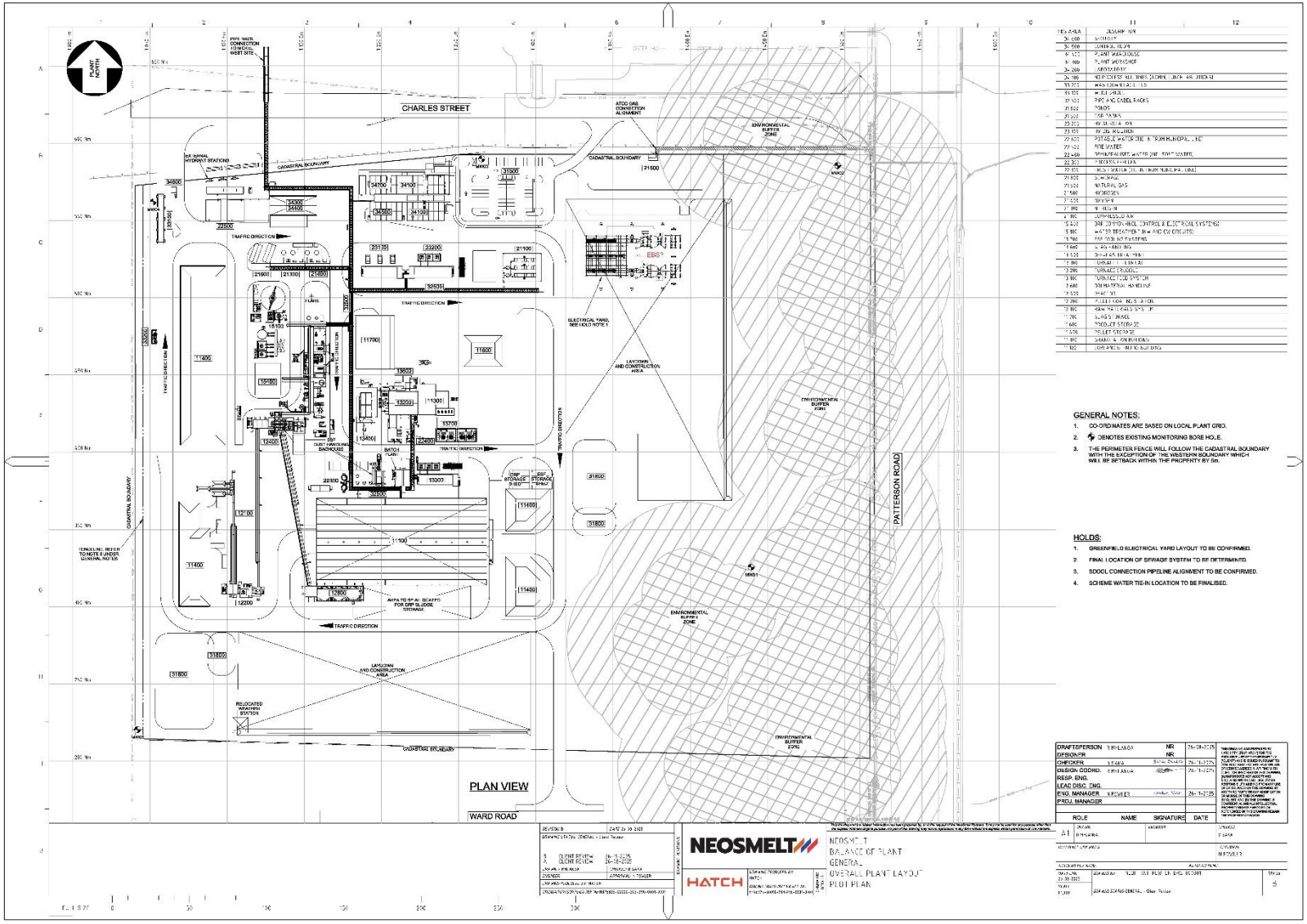


Plate 4: Proposal layout

2.3 Proposal location

The Proposal is located within the RIZ in the City of Rockingham (Figure 1-1), approximately 35 km south of Perth. The RIZ is part of the WTC, a major industrial development corridor along the southern coastline of metropolitan Perth. The area has been established for heavy and strategic industry with services strategically located with major transport, including rail, road and port facilities for access to regional areas to the north and south. Kwinana, Rockingham and their surrounding communities are home to many of the skilled people who work in the area.

Companies with facilities in the WTC include the CBH Group, WesCEF, Coogee Chemicals, BHP Nickel West (BHP NiW) and more. Operations include chemical manufacturing and storage facilities, bitumen plant, light industrial operations, wastewater treatment plant and waste to energy plants. Woodside's proposed H2Perth liquified hydrogen production facility is also planned in the area and is currently under assessment by the EPA.

To support the further development of the WTC into a global advanced industries hub, the Western Australian Government has established the Global Advanced Industries Hub Ministerial Taskforce and Industry Reference Group, and on 16 April 2026, the State Government announced the WTC as WA's first declared State Development Area.

2.4 Proposal description

2.4.1 General proposal content

The general content of the Proposal is described in Table 2-2.

Table 2-2: General proposal content description

Proposal title	Project NeoSmelt
Proponent name	BlueScope Future Technologies Pty Ltd
Short description	The Proposal is to develop a research and development pilot plant that will combine Direct Reduced Iron (DRI) technology with Electric Smelting Furnace (ESF) capability to manufacture lower-emissions iron (relative to a blast furnace) from Pilbara iron ores. The Proposal is located on Patterson Road in the Western Trade Coast, approximately 35 km south of Perth (Figure 1-1). The Proposal is targeted to have the capacity to produce approximately 49,000 tonnes of iron per year.

2.4.2 Proposal terminology

The following terminology is used to describe the extent of the Proposal:

- Development Envelope: Refers to the area where all Proposal activities will occur and comprises land parcels where consent has been granted for the development of the Proposal and covers an area of approximately 30.5 ha; and
- Disturbance Footprint: Refers to the maximum area of land within the Development Envelope that will be disturbed for the Proposal. It is based on the largest possible layout and has been used to calculate the maximum area of native vegetation clearing (21.4 ha). The impact assessment within this document is based on the entire Disturbance Footprint being used.

The above areas are illustrated in Figure 1-3.

2.4.3 Development Envelope

The Development Envelope comprises an approximately 30.5 ha area made up of the following parcels along with their expected use (refer to Figure 1-4):

- Part of Lot 9008 (Land ID 30139700) – the main 18.1 ha central part of the Development Envelope that will be used for the construction of NeoSmelt DRI-ESF plant (shaded light blue);
- Lot 109 (Land ID 4359715) – southwestern portion of the Development Envelope that may be used for construction laydown and car parking. Utility connection corridors and road access points also run through this area (shaded green);
- Part of Lot 9008 (Land ID 30139698) – western portion of the Development Envelope that may be used for a temporary construction laydown and car parking during construction subject to negotiations with DevelopmentWA (shaded orange);
- Road reserve along Charles Street (Land ID 3826049) – managed by the City of Rockingham and used for access to the site, site presentation, landscaping and utility connection corridors to existing infrastructure and utilities from the BHP NiW refinery (shaded dark blue);
- Road reserve along Claymore Street and junction with Charles Street (Land IDs 3826050 and 3994838) – managed by the City of Rockingham and used for potential connection to the KRWP (shaded dark blue);
- Road reserve along Ward Road (Land ID 3994849) – managed by City of Rockingham and used for road access to the site and installation of the effluent pipeline to the SDOOL (shaded dark blue); and
- Water Corporation Service Corridor Lot 503 (Land ID 4291094) – section of Development Envelope east of Patterson Road where the effluent pipeline connection to the SDOOL will run to the East Rockingham Wastewater Treatment Plant (shaded purple).

The road reserve areas and Lot 503 are outside the area approved under Derived Proposal 5 (refer to 1.4.1 and Figure 1 2). Some clearing is likely to be required within the Road Reserve for site access, landscaping and appropriate access/visibility splays. it is expected that this will be done in accordance with approvals held/obtained by the appropriate authority in control of the land (e.g., DevelopmentWA; City of Rockingham). In some cases, exemptions under the EP Act or Environmental Protection (Clearing of Native Vegetation) Regulations 2004 may be used.

2.4.4 Proposal content elements

The Proposal elements and their maximum extent, capacity or range are defined in Table 2-3 and described further in the sections below.

Table 2-3: Key proposal elements and extent

Proposal element	Location / description	Maximum extent, capacity or range
Physical elements		
Materials handling including materials receival and storage Direct Reduction Plant Feed storage, preparation and mixing batch plant Electric Smelting Furnace Product storage for slag and pig iron Non-process infrastructure, including but not limited to laboratory, road drainage, external road interfaces buildings and administrative areas Utilities connections and distribution (overhead and underground), including but not limited to process water, process effluent, electricity, hydrogen and natural gas	Figure 1-3	21.4 ha Disturbance Footprint within a 30.5 ha Development Envelope

Construction elements		
Laydown for construction and parking Transportation of modules	N/A	Within 30.5 ha Development Envelope
Operational elements		
Iron ore pellet storage	N/A	Design capacity 30,000 tonnes total
Cold Direct Reduced Iron (CDRI) storage		Design capacity 10,000 tonnes total
Direct Reduction Plant (DRP)		Design capacity 69,000 tonnes of Cold Direct Reduced Iron (CDRI) per year
Electric Smelting Furnace (ESF)		Design capacity 49,000 tonnes of iron per year
Process effluent		Design discharge 5 kL per hour

Proposal elements with greenhouse gas emissions		
Construction elements:		
Scope 1	Approximately 600 tCO_2-e due to vegetation clearing and fuel (diesel) emissions	
Scope 2	None	
Scope 3	Not estimated	
Operational elements:		
Scope 1	Approximately 49,000 tCO_2-e per year Approximately 242,000 tCO_2-e over five-year operational phase	
Scope 2	Approximately 36,000 tCO_2-e per year	
Scope 3	Estimated 139,000 tCO_2-e per year	
Rehabilitation		
Not applicable		
Commissioning		
Not applicable		
Decommissioning		
At the end of the operations phase, all process related infrastructure associated with the Proposal will be removed. Some non-process related infrastructure may remain depending on future industrial land use requirements.		
Other elements which affect extent of effects on the environment		
Proposal time (estimates)	Maximum project life	Estimated 10 years
	Construction phase	3 years
	Operations phase	Estimated 5 years with option for extension
	Decommissioning phase	2 years

2.5 Process description

The following sections provide a description of the Proposal elements and the DRI-ESF process.

2.5.1 General facilities and supporting infrastructure

Major facilities associated with the Proposal include:

- Materials Handling including materials receival, storage, and materials handling to the DRP and ESF facilities;
- Direct Reduction Plant:
    - Feed preparation;
    - Pellet coating;
    - Shaft furnace feed system;
    - Shaft furnace;
    - Top gas treatment and recycling;
    - CDRI cooling;
    - CDRI silos for passivation;
    - Water treatment plant;
- Raw material storage for fluxes, anthracite, CDRI, ESF secondary materials;
- Feed preparation and a mixing batch plant;
- Electric Smelting Furnace:
    - Furnace feed system;
    - Furnace crucible;
    - High voltage transformer and electrical controls;
    - Electrode arms and control system;
    - Primary off-gas treatment;
    - Secondary off-gas treatment;
    - Metal casting, granulation and handling;
    - Slag casting and handling;
- Product storage for slag and granulated pig iron; and
- Non-process infrastructure, including maintenance and warehouse shed, maintenance office, laboratory, control room, administration building, wash facilities and change rooms and lunch/meeting room.

A 3D flythrough of the process can be viewed at the following link – 3D flythrough (Plate 5).

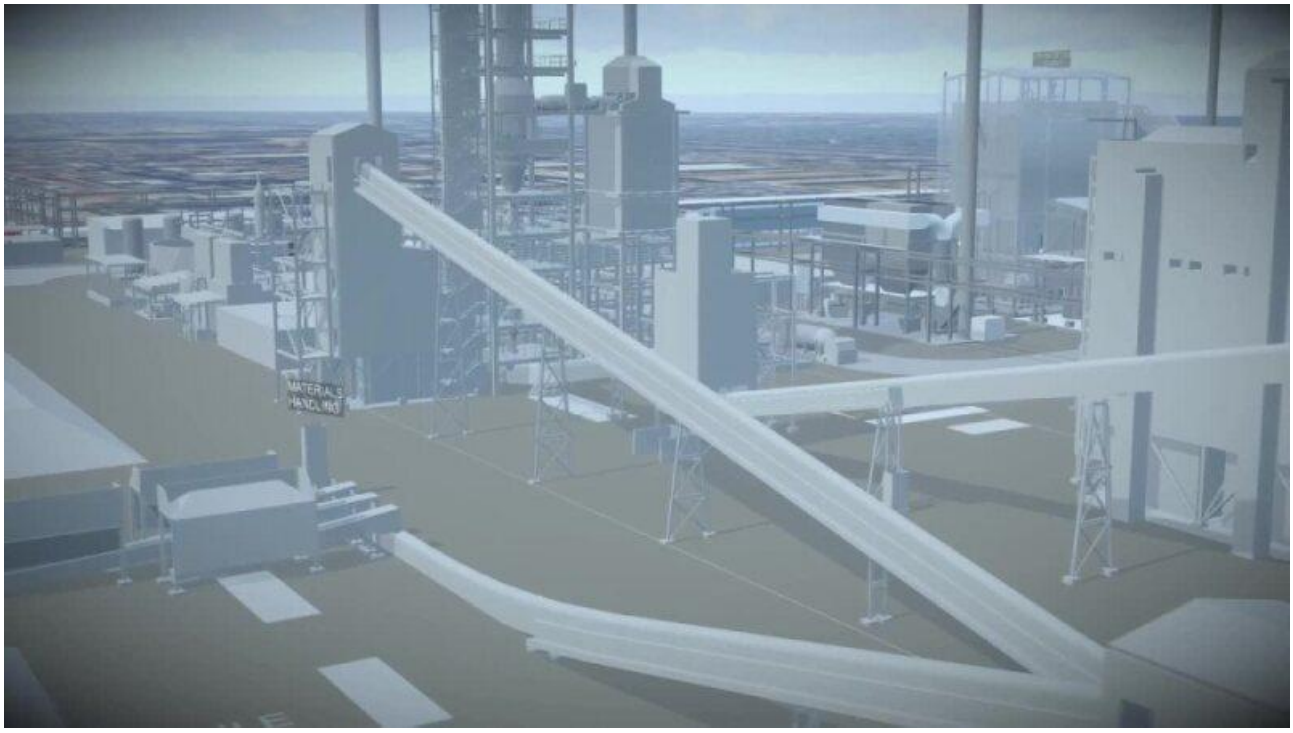


Plate 5: 3D flythrough of the Proposal

2.5.2 Raw materials transport, handling and storage

The transport of raw materials, product and intermediate products to and from the Proposal is excluded from the scope of the referral. However, information on this aspect is provided below for context.

The Proposal will primarily use iron ore originating from the Pilbara region of Western Australia as part of its objective to demonstrate that these ores are suitable for lower-emissions DRI–ESF ironmaking. The ore will be supplied to the Proposal in the form of pellets, lumps or pellet chips, either:

- Produced by a dedicated pellet facility close to the Proposal; or
- Purchased from a third-party producer capable of supplying pellets and/or lumps made from Pilbara ore.

Some CDRI will also be imported to the Proposal for use directly in the ESF.

The ore pellets and CDRI will be transported to the Proposal via existing bulk freight routes, either by road haulage or vessel and road transport via Fremantle Ports (Kwinana Bulk Jetty and Kwinana Bulk Terminal). Containerised material (e.g., fluxes and reductants) will be received at the container terminal at Fremantle Ports Inner Harbour.

Inbound campaigns will be executed sequentially and aligned to staggered sea-vessel arrivals, such that only one major bulk material campaign is active at any given time. This approach avoids overlapping peaks in heavy-vehicle movements and limits congestion at site unloading facilities. Each campaign targets a single bulk material stream and is managed as a controlled mobilisation event.

Fluxes supplied in 1-tonne bulk bags within shipping containers will not be delivered directly to the Proposal as part of a campaign. These containers will be diverted to an off-site logistics hub or consolidation yard for de-stuffing, with subsequent deliveries to the Proposal scheduled as part of the steady-state inbound traffic volume rather than campaign-based movements.

Campaign-based and general inbound material delivery is summarised in Table 2-4.

Table 2-4: Raw materials delivery

Material	Delivery method	Delivery form	Trucks per day	Duration (days)	Frequency/ quantity basis	Receiving location/ storage	Storage capacity (tonnes)
CDRI	B-double truck	Bulk (loose)	70	3	Single campaign, pre-start-up	CDRI building – CDRI stockpile	10,000
Iron ore pellets	B-double truck	Bulk (loose)	14	29	Pre-start-up stockpile, and regular campaign every nine months during plant operation	Pellet stockpile pad	30,000
Pellet chips	B-double truck	Bulk (loose)	4	25	Single campaign, pre-start-up	CDRI building – Oxide bunker	100
Fluxes, reductants and oxides	Truck	1 tonne bulk bags	0.3	N/A	Periodic deliveries based on campaign schedule	CDRI building – Bagged material area	3,000
Chemicals and liquids	Tautliner	IBC	0.4	N/A		Bunded area	25
Blast furnace slag	Single tipper	Bulk (loose)	0.7	N/A		Slag bunker	100
Refractory waste (secondary feed)	Single tipper	Bulk (loose)	0.7	N/A		Refractory waste bunker	100
Oxygen and nitrogen	Tankers	Liquefied gas	0.1	N/A		On-site storage vessels	137 (O_2) 97 (N_2)
Hydrogen	Multi Element Gas Container (MEGC) containers on semi-trailer	Compressed gas	2 (during hydrogen trial periods only)	N/A		MEGC containers	0.3

Other minor raw material includes hydrogen sulfide delivered in 50 litre gas cylinders, and electrodes, consumables, spares and general supplies delivered in boxes, crates and pallets (estimate 1.5 vehicles per day).

During steady-state operations, the Proposal will operate 24-hours per day on two shifts (nominally 6 AM and 6 PM shift change) with approximately 70 personnel on-site.

2.5.3 Direct reduction plant

The DRP involves the reduction of iron oxide material (ore pellets) to metallic iron using a counter-current flow of reducing gases containing hydrogen and carbon monoxide. The plant includes the following aspects:

- Material handling system (preparation and feed to furnace);
- Pellet coating system;
- Shaft furnace feed system;
- Shaft furnace;
- Top gas treatment and recycling system;
- Package boiler;
- CDRI cooling system;
- CDRI passivation system;
- Water treatment plant; and
- Wrap around structures for core process plant.

The DRI process converts iron ore pellets into CDRI without the need for traditional coal-based blast furnaces. Instead of burning coke to remove oxygen from the ore, the DRI process uses hydrogen and carbon monoxide gases to achieve the same result with lower emissions.

The DRP will use the ENERGIRON Zero Reformer (ZR) technology, which is an advanced form of direct reduction developed jointly by Tenova and Danieli with a design throughput of approximately 11.5 tonnes per hour and nominal operational throughput of 5-8 tph. This technology operates in a tall (approximately 68 m high) sealed shaft furnace where reduction gases flow upward through a moving bed of iron ore pellets that slowly descend under gravity. The furnace operates under moderate pressure (around 4–5 bar) and at high temperature (approximately 900 to 950 °C).

The natural gas fed to the system is partially converted, or reformed, within the furnace itself to produce the hydrogen (H_2) and carbon monoxide (CO) gases. These gases react with the oxygen in the iron ore to form water vapour (H_2O) and carbon dioxide (CO_2), leaving behind metallic iron. When operating with hydrogen as a reductant, reforming of the reducing gases is not required.

The process occurs in a continuous loop, i.e., exhaust gases from the top of the furnace are cleaned to remove carbon dioxide, water vapour and fine dust, then compressed and recycled back into the furnace with a small amount of fresh natural gas.

Before leaving the reactor, the DRI is cooled to reduce risk of self-heating. The cooled material (CDRI) is then stored and allowed to age in a controlled atmosphere for at least 72 hours, a process known as passivation, which further stabilises the material before it is transferred to storage.

The DRP process will initially use natural gas as the reducing agent, supporting a potential reduction (approximately 65%) in GHG emissions compared with conventional coal-based ironmaking. Once proven, the plant can also operate using hydrogen instead of natural gas. While natural gas already delivers lower emissions compared with coal-based ironmaking, hydrogen reacts with iron ore to produce water vapour as a by-product, offering the potential for further reductions in GHG emissions when the hydrogen is produced using a renewable energy source.

Solid and liquid by-products from the DRP are managed through standard environmental controls. Dust collected from the gas cleaning system is safely contained and can be blended with other materials for reuse or disposal. Undersize iron oxide pellets generated from the DRP as intermediate products will be discharged into a bin and consumed within the ESF.

2.5.4 Electric smelting furnace

The ESF includes the following aspects:

- Feed preparation;
- Feed handling (including the batch plant);
- Furnace feed system;
- Electric smelting furnace;
- Off-gas handling system;
- Slag casting;
- Hot metal casting and granulation;
- Product handling and storage;
- Smelter building; and
- Cast house consumables storage.

The ESF forms the second stage of the Proposal. It receives the CDRI produced in the first stage (DRP) and melts it to create a molten iron product like that produced in a blast furnace. The ESF is powered by electricity, which means that when renewable power is used, the process can operate with lower GHG emissions. The ESF technology will be provided by Hatch with a design production rate of approximately 10.6 tonnes per hour.

Before entering the ESF, all solid feed materials such as the CDRI, fluxes, carbon material (reductant) and secondary additives are received, stored and then blended through a carefully managed handling system designed to minimise dust, noise and emissions to atmosphere.

The raw materials handling system includes receiving hoppers, covered conveyors and enclosed batching bins that ensure accurate weighing and consistent feed rates to the ESF. Most additive materials will arrive at the Proposal in sealed bulk bags or bulk containers and transferred directly into the feed hoppers using a front-end loader or mechanical lifting system.

The CDRI that forms the main furnace feed is delivered in cold, solid form and stored in covered silos or bins to protect it from moisture. Because the CDRI is a porous material that can react with water, all storage and transfer areas are kept dry and well ventilated, and handling is performed using equipment designed to minimise impact and fines generation.

Other feed materials to the ESF include:

- Fluxes such as lime, dolime, magnesite and silica sand, which help control slag chemistry during smelting;
- Carbon sources such as calcined anthracite, coal char or biochar, which provide additional carbon for the reduction process and final metal composition; and
- Secondary materials, including small quantities of blast furnace slag or refractory waste, which are tested to modify the composition of slag.

All feed materials are weighed and combined in a batching plant, where automated screw feeders and load cells ensure the correct proportions are delivered to the furnace. From the batching bins, materials are transferred via enclosed conveyors to the top of the ESF tower and then fed through sealed chutes into the furnace. This closed system minimises dust generation and prevents materials from becoming contaminated by ambient air or moisture.

To control emissions to air from the handling and feeding systems, dust extraction units and baghouse filters are installed at key transfer points, such as hoppers, conveyors and feed bins. These systems capture fine particles, which are then collected in sealed containers for safe disposal or recycling.

All stormwater runoff from the process area is contained within bunds and treated (such as gross pollutant traps and oil/grease separators) before discharge to the site's infiltration system.

The ESF operates as a large, high-temperature crucible. Inside the furnace, powerful electric arcs generated between graphite electrodes and the metal bath provide the heat necessary to melt the solid feed materials. As the materials melt, the lighter slag floats on top of the denser molten iron. The iron layer collects at the bottom of the ESF, while the slag layer acts as both a protective blanket and a medium for removing unwanted oxides such as silica and alumina.

The hot metal iron product typically contains around 2.2% carbon, which gives it the correct chemistry for later refining into steel. Small amounts of silicon, phosphorus and sulphur are also present. The slag contains oxides such as silica, alumina, lime and magnesia in proportions designed to keep it fluid and targeted to be suitable for downstream use.

When enough molten metal has accumulated, it is tapped from the furnace through a taphole into a channel (launder) that runs to the granulation plant.

Hot metal enters the granulation plant directly from the furnace via a tundish that serves as a buffer, regulating the liquid metal flow and the granulation rate. The tundish is equipped with a bottom pouring nozzle and a lid to minimise heat loss during granulation.

The liquid metal is discharged through the nozzle in a controlled flow and is directed onto a refractory-lined spray head where the metal stream disintegrates into droplets and granules are formed. The granules partially solidify in the air before penetrating a water tank where they are further cooled while sinking through the reactor.

The solidified granules are discharged from the reactor through an air and water ejector onto a dewatering unit. At the inlet of the dewatering unit, a lined box is placed to collect and distribute the granules evenly on the dewatering screen. The granules are transported on the screen through the dewatering unit where water is removed mechanically. The surface water content of the granules is less than 2% after leaving the dewatering unit.

A water collection trough under the dewatering screen with built-in water flushing collects the water and fines. The metal fines carried over with the trough from the dewatering unit are recovered by a screw classifier. Fines collected in the screw classifier consist of metal/metal oxides and slag and are collected in a bin before being dried and recovered as an iron source for the ESF.

The water in the granulation system is re-circulated in the granulation plant. All water in the system is passed through a cooling circuit (cooling towers or heat exchangers) before re-entering the granulation tank. Centrifugal separators are used to remove the fine suspended particles added to the water circuit during the granulation process.

Slag is tapped directly into one of two graded slag pits, which will allow casting to occur into one pit, while the other is being dug out and refurbished. Cooled slag will be periodically removed using a front-end loader, and additional processing (e.g., sizing) will occur using mobile equipment, if required. Fine, water-based cooling sprays are available if required to achieve suitable cooling to meet operational requirements. This is evaporative cooling only and does not require any additional water treatment or processing.

The ESF operates under a slight vacuum to prevent fumes escaping the process area and is fitted with a comprehensive off-gas handling system to control air emissions. Gases released during smelting are drawn from the furnace through a sealed duct and directed to a thermal oxidiser, where they are burned at a temperature of 850-950 °C to destroy carbon monoxide, hydrogen and other combustible gases. The cleaned gas is then cooled and passed through large fabric filters (baghouses) that remove fine dust particles before

release to the atmosphere via a stack. Dust collected from filters is stored in sealed bins for safe disposal or recovery.

During abnormal conditions, such as emergency events, primary off-gas will be vented and flared via an emergency vent stack. The flare stack is continuously purged with nitrogen to prevent flare tip burn back. Flaring would only occur under the following events:

- Total power outage;
- Thermal oxidiser failure – the ESF would be placed in idling mode until the oxidiser is back online; and
- Loss of induced draft or off-gas failure post the thermal oxidiser (e.g. ID fan trip, high temperature in baghouse).

Water used for cooling the furnace shell and electrical equipment circulates in a closed-loop system, meaning it is continuously reused with only minimal make-up water required. Cooling towers dissipate the heat without discharging contaminated water. In the event of a power outage, back-up diesel pumps and emergency water tie-ins ensure that cooling continues to protect the furnace structure.

2.5.5 Utility pipelines and connections

The utilities required for the Proposal are described in Table 2-5 and include water, effluent, sewage, electricity, hydrogen, natural gas, oxygen and nitrogen.

Table 2-5: Utilities

Utility	Description
Water	The total water consumption for the plant is estimated to be 35 kL per hour, which will be supplied from the KWRP or from the adjacent BHP NiW operations Reverse Osmosis (RO) Plant. Water tie-in to the KWRP and/or BHP NiW site will be located on the northern boundary of the Development Envelope. Potable water will be delivered as required in a separate system from the town water supply via dedicated, separately metered connection. The fire water system will be a separate connection with a dedicated tank supplied from the mains town water.
Electricity	Power tie-in will be via the 132 kV connection (overhead power line) with two options being considered: one located adjacent to Patterson Road and managed by Western Power and one from BHP NiW and across Charles Street.
Hydrogen	Hydrogen tie-in is expected to be via the local Kwinana syngas pipeline, currently used for dual flow movement of hydrogen between BHP NiW and customers/suppliers. The closest access point is on the northern boundary of the refinery site. An easement is proposed along the northwest boundary of the refinery to the Proposal.
Natural gas	Natural gas tie-in will be via the ATCO distribution network that is connected to the Dampier to Bunbury Natural Gas Pipeline (DBNGP). A let down and metering station will be located on the northwest corner of Development Envelope, with connection back to the ATCO easement travelling along the western side of Patterson Road.
Oxygen	Oxygen will be delivered cryogenically to a dedicated storage and letdown/vaporisation station. The oxygen storage vessel will be sized to allow approximately one week's supply.
Nitrogen	Nitrogen will be delivered cryogenically to a dedicated storage and letdown/vaporisation station. The nitrogen storage vessel will be sized to allow approximately one week's supply.
Instrument air	Instrument air will be required for passivation bins, to actuate valves, for instrument control, baghouse pulsing, and general tool use and other maintenance activities (pneumatic testing, drying). On-site production of air will include operating and standby compressors, driers, filters and receivers.
Fuel	There will be no bulk fuel storage for mobile equipment. Refuelling of mobile equipment will be completed via a contracted lease company who will refuel via a mobile delivery service. On-site diesel-powered generators will have their own dedicated stores of fuel, which will be supplied by a contracted lease company utilising a mobile delivery service.

2.5.6 Intermediate products

Intermediate products will be generated by various stages of the process. Where possible, these materials will be reused within the process or removed off-site for reuse or recovery (refer to Table 2-6)

Table 2-6: Intermediate products

Material	Source	Estimated quantity	Description	Management options
Pellet chips	Material handling conveyor prior to coating station	~2000 t per year. Undercover storage of ~500 t factored into design.	Iron ore pellets are screened to improve efficiency and safety of the DRP. The undersize fraction is captured as pellet chips.	Pellet chips will be recycled as a feed option in the ESF. It is not anticipated there will be any remaining pellet chips from the Proposal. If there are any residual chips, they will be transported to BlueScope's Port Kembla Steelworks for recycling.
DRP sludge	Iron ore fines present in the top gas stream settled out during the cooling and subsequent treatment of process water	~450 t per year. Storage capacity of ~1,000 t factored into design.	Predominately iron ore dust fines, mixed with water. Drying bed allows water content to be minimised.	NeoSmelt is working with local industry proponents on pursuing circular economy opportunities for iron fines.
Dedusting fines (oxides)	Dust collection generated by dedusting of all material handling transfer points	~1,300 t per year. Storage capacity of ~200 t factored into design.	Predominately iron ore dust fines with a minor amount of silicates. Anticipated size fraction <100 µm.	NeoSmelt is working with local industry proponents on pursuing circular economy opportunities for iron fines.
Slag	Co-product of Ironmaking process through an ESF	~3,500 t per year. Storage capacity of ~ 3,300 t factored into design.	Slag is a non-metallic, rock-like byproduct of iron smelting, composed of silicates, aluminosilicates and calcium-alumina-silicates.	Slag from ironmaking is a material with known physical and chemical characteristics, established processing pathways and well understood end use applications in the cement and construction materials sectors. NeoSmelt has obtained a Letter of Support from Cement Australia on further collaboration for the subsequent use of this product.
Dedusting fines (metallic)	Dust collection generated from dedusting all material handling transfer points	~2,500 t per year. Storage capacity of approximately 40 t (2 x 20 t hook-lift bins) factored into design.	Predominantly metallic fines with minor components of iron ore, alumina and silicates. Anticipated size fraction <100 µm.	NeoSmelt currently has designed for these to be discharged into covered bins to allow for transport offsite for disposal via a suitable waste classification. The presence of iron and iron ore within this stream means there could be recovery opportunities that NeoSmelt will continue to explore.

2.5.7 Waste management

The Proposal will generate several waste streams as described in Table 2-7.

Table 2-7: Waste streams

Waste	Estimated quantity	Description and management
Process Wastewater	Maximum flowrate 5 kL/hour	The main source of process effluent is from the DRP, which flows to an on-site water treatment plant. There is also a small quantity of cooling water blowdown from the ESF plant. Effluent will be sent via a buried pipeline to the East Rockingham Wastewater Recovery Facility or directly to the SDOOL, depending on confirmation from Water Corporation.
Domestic Sewage	6,000 L (temporary sewage tank)	Raw sewage will be managed via on-site septic system with some temporary facilities with sewage tanks. The storage capacity for sanitary waste will be one week's volume at normal production rate.
Trade waste	0.25 m^3/day	Trade waste wastewater from non-process infrastructure (which may be contaminated with oil, chemicals or surfactants) will be collected separately to sewage and disposed of periodically. The storage capacity for trade waste will be one week's volume at normal production rate.
Solid waste	Minor quantities	Any non-process-related solid waste generated on site, such as general waste and recycling from administration and welfare facilities and clean chemical containers, will be collected by a suitably licenced waste contractor for recycling or disposal.
Hazardous waste	Minor quantities	Hazardous waste may be generated by routine laboratory and maintenance activities. A licenced contractor will be engaged for handling any such waste. Hazardous waste streams may include waste hydrocarbons and spent catalysts.
Stormwater	Southwest basin outlet: • Maximum treated (first flush) flow: 0.451 m^3/s • Maximum design flow: 0.777 m^3/s Southeast basin outlet: • Maximum treated (first flush) flow: 0.118 m^3/s • Maximum design flow: 0.212 m^3/s.	All stormwater runoff that may come in contact with process contaminants is contained within bunds to be collected by vacuum truck for disposal at a registered wastewater treatment facility. Rainfall runoff from plant areas (outside of bunds) and site roads are captured in the pit and pipe stormwater network including two stormwater retention basins. The network includes downstream interceptors for removal of hydrocarbons, suspended solids, gross pollutants and heavy metals before discharge to ground via infiltration basins. Stormwater runoff from roofs, laydown areas and domestic light vehicles carpark will be at-source infiltrated to ground through swales or soak wells.

2.6 Proposal construction

Post clearance of the Disturbance Footprint, consistent with MS 863 and Derived Proposal 5 approval conditions (refer to section 1.4), construction is planned to occur up to seven days per week, primarily during daylight hours. Delivery of major modules may require temporary road closure and is planned to be arranged to minimise impacts to traffic under a Construction Traffic Management Plan.

Construction activities are planned to include:

- Installation of boundary fence;
- Site clean-up;
- Vegetation topsoil clearing, storage and reuse;

- Earthworks by excavation, importation of fill, movement of soil to fill depressions and low-lying areas;
- Site establishment, including preparation of laydown areas and other temporary facilities such as amenities and offices;
- Earthworks and establishment of foundations for buildings and other infrastructure;
- Construction of process equipment and utilities; and
- Provision of car parks.

A peak construction workforce of around 350 persons has been considered for environmental impacts. This peak is expected to predominantly comprise of local labour, with most personnel expected to travel to site via private vehicles. A temporary construction area (located within the Disturbance Footprint) will include laydown, crib rooms, temporary ablutions and waste storage areas.

Various earthwork and civil heavy equipment will be required for construction activities, such as bulldozer, front-end loaders, excavators, water cart, roller, crane trucks and light vehicles.

Any fill required for construction is anticipated to meet clean fill criteria as defined by the Environmental Protection Regulations 1987 (as amended). Construction wastes are expected to include building materials, scrap metals, concrete rubble and bitumen from internal road construction. A licenced waste contractor will be engaged for disposing of any such waste. Waste generated during construction and operation is expected to be minimised through adopting the hierarchy of waste controls: avoid, minimise, re-use, recycle and safely dispose.

Vehicle movements are estimated to peak at around 700 vehicle movements a day during construction. Primary vehicle access to the site will be off Patterson Road via Charles Street, with Ward Road providing secondary access (Figure 1-2).

Temporary stormwater management infrastructure is expected to be used during construction. Surface water is to be retained onsite and infiltrated, consistent with pre-construction conditions. Localised, short-term dewatering activities, if required for construction, will be carried out in accordance with a Dewatering Management Plan to be prepared by the construction contractor.

Water use requirements during construction are anticipated to be supplied by off-site sources.

For construction, power is planned to be sourced through connection to existing local infrastructure adjacent to the Proposal, local third-party renewable electricity supply or the use of on-site diesel generators.

2.7 Proposal commissioning and operation

Given the pilot nature of the Proposal, commissioning and operation will proceed through a series of structured campaigns designed to test different aspects of the DRI-ESF process. A staged approach allows NeoSmelt to safely validate the smelting process, collect metallurgical data and confirm environmental control systems before progressing to full-scale demonstration.

The staged campaigns can be grouped into four main phases described below and summarised in Table 2-8. Beyond these structured campaigns, the facility will be available for future individual partner or third-party trials.

Phase 1 – Commissioning and ramp-up with commercial CDRI

The ESF will be hot-commissioned and ramped up using commercially available, high-grade CDRI. This phase will focus on verifying ESF integrity, establishing operating parameters and calibrating electrical and off-gas systems. Once stable, the DRP will be brought online to produce local high-grade CDRI, maintaining the same feed characteristics to consolidate baseline performance.

Phase 2 – Transition to Pilbara slag system and pellets

After initial stabilisation, the ESF will transition to a Pilbara feed system. Oxide feed (pellet chips) and slag modifiers such as refractory waste, silica sand and blast-furnace slag will be blended with commercial CDRI to simulate Pilbara-type ores.

Phase 3 – Pilbara CDRI proof of concept

Once the DRP is producing CDRI directly from Pilbara based ore pellets, the ESF will be operated on Pilbara based CDRI. This phase will confirm smelting behaviour, hot-metal quality, slag characteristics and emissions performance. Data collected will inform process scale-up and commercial design parameters.

Phase 4 – ESF optimisation and commercialisation trials

The final phase will evaluate alternative materials and operating strategies. Tests will include fines-based CDRI, crushed hot-briquetted iron (HBI), alternative carbon sources (e.g. biochar) and possible dust recycling. Minor modifications to the feed system may be introduced to assess the effect of fines handling and gas-solid interactions. Outcomes are expected to establish the optimum operating envelope for a future large-scale commercial facility.

Table 2-8: Commissioning and operation

#	Phase	Duration (approx.)	Feed material	Objectives/ key activities
1	Commissioning and ramp-up with commercial CDRI	6-12 months	Commercial CDRI	Verify ESF integrity, establish operating parameters and calibrate electrical and off-gas systems
2	Transition to Pilbara type feed	6 months	Commercial CDRI + Pilbara oxide feed, slag modifiers	Transition to Pilbara iron ores
3	Pilbara DRI proof of concept	12-18 months	Pilbara CDRI (from DRP)	Confirm smelting behaviour, hot-metal quality, slag characteristics and emissions performance
4	ESF optimisation and commercialisation trials	6 months	Pilbara CDRI + alternative feeds (fines, HBI, biochar, etc.)	Evaluate alternative materials and operating strategies

2.8 Proposal closure

At the end of the operations phase, all process related infrastructure associated with the Proposal is expected to be removed to return the site to an industrial land use. Some non-process related infrastructure may remain depending on future land use requirements. A detailed Closure Management Plan that incorporates decommissioning and closure activities is planned to be completed six months before closure.

2.9 Proposal exclusions

The following elements are excluded from the Proposal:

- Clearing of native vegetation:
  - Clearing for the main development on part of Lot 9008 of the Development Envelope will be carried out under existing approvals (see section 1.4.1 and Figure 1-4), including management of associated potential impacts to Aboriginal and European heritage, flora and vegetation and terrestrial fauna;
- Connection of water and wastewater infrastructure and associated service pipelines:

- Water and wastewater utility connections to the boundary of the Development Envelope, which are expected to be undertaken by Water Corporation (KWRP) or BHP NiW (RO supply);

- Power infrastructure beyond the Development Envelope boundary:
  - Electricity is proposed to be supplied to the Proposal from the South West Interconnected System (SWIS) via Western Power's high-voltage (330 kV) transmission lines or via BHP NiW operations;
  - Power tie-in is expected to be via the 132 kV connection (overhead power line) located adjacent to Patterson Road or from the BHP NiW site across Charles Street;
- Connection of gas supply infrastructure and associated pipelines:
  - Connection of gas utilities, which is expected to be undertaken by ATCO; and
- Raw material, product and by-product shipping and trucking activities:
  - All shipping and trucking activities will be carried out by third parties.

2.10 Proposal justification

Several benefits will be realised through implementation of the Proposal, including but not limited to:

- Demonstrated lower-emissions steel making;
- Alignment with national and international decarbonisation and net zero policies and obligations (refer to section 6.3);
- A boost to Australian and Western Australian heavy industry;
- Local and regional employment opportunities;
- State economic growth; and
- A pathway for the development and sharing of expertise across industry sectors for innovation.

2.10.1 Greenhouse gas emission reduction

Iron and steelmaking contribute to approximately 8% of global CO_2 emissions[3]. Most of these emissions are created during the industrial process of transforming iron ore into metal. Decarbonising how iron and, therefore, how steel is made can contribute to lower emissions.

As depicted in Plate 6, the current pathways of ironmaking for primary steelmaking are:

- The BF-BOF process; and/or
- DRI with an electric arc furnace.

The BF-BOF process uses coal as a reductant and is carbon intensive. In contrast, DRI-ESF uses natural gas in the reduction process and can reduce the emissions associated with ironmaking by approximately 65% when compared with coal-based BF produced iron. Once fully operational, the Proposal aims to also trial hydrogen

[3] https://www.riotinto.com/en/news/stories/decarbonising-steel-making

to process iron ore into CDRI. By replacing the natural gas with lower-carbon[4] hydrogen produced using renewable energy, near-zero GHG emissions[5] ironmaking is possible.

The DRI-ESF process is viewed as one of the leading technology pathways to support the decarbonisation of steel production. However, this pathway requires high-grade iron ore as impurities in CDRI can cause significant yield and energy losses in the ESF. Iron ores mined from Western Australia's Pilbara region are typically medium grade, higher gangue ores and, as such, the BF-BOF process is the current standard process for Pilbara ores with limited applicability of the DRI-ESF pathway.

The Proposal will use Pilbara iron ores to produce a high-quality molten iron product for use in existing BOF based steel plants. By creating a solution for utilising Pilbara iron ores in a lower-emissions process, the Proposal is expected to contribute to industry's transition to lower-emission steel production and supports Pilbara iron ores remaining a valuable commodity in Australia's transition to a lower-carbon[3] economy.

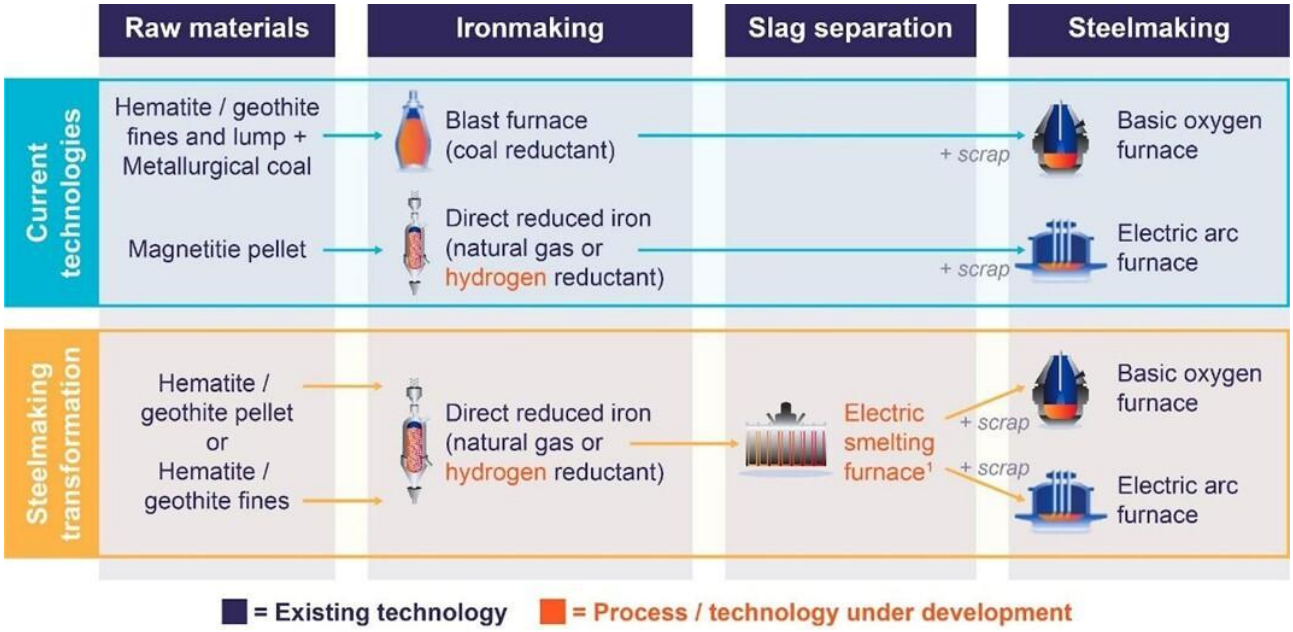


Plate 6: Pathways for ironmaking

2.10.2 Industry benefits

The Proposal supports opportunities for the use of Pilbara iron ores in a future lower-carbon steel value chain. In 2024, Western Australia's Pilbara region produced approximately 972 million tonnes of iron ore, accounting for approximately 37% of global supply[6].

By leveraging domestic iron and steelmaking capacity and capability to execute the Proposal, the potential benefits of the Proposal are widespread for Australian workers and industry, and international trading partners.

4 The term 'lower-carbon' is used to describe the characteristic of having lower levels of associated potential GHG emissions when compared to historical and/or current conventions or analogues, for example relating to an otherwise similar resource, process, production facility, product or service or activity.

5 'Near zero emissions' for steelmaking is 0.4 tonnes of CO2-e per tonne of crude steel for 100% ore-based production (no scrap), as defined by the International Energy Agency (IEA) and implemented in Responsible Steel International Standard V2.0 ('near zero' performance level 4 threshold). IEA (2022), Achieving Net Zero Heavy Industry Sectors in G7 Members, IEA, Paris, License: CC BY 4.0, which also describes the boundary for the emissions intensity calculation (including in relation to upstream emissions).

6 USGS (2026) https://pubs.usgs.gov/periodicals/mcs2026/mcs2026-iron-ore.pdf. Western Australian iron ore was calculated by applying its estimated share (99%) of Australia's production to the Australian total as reported by USGS.

Australian heavy industry is an immediate beneficiary of the Proposal through the development of domestic lower-emissions iron and steel making capability, building specialist knowledge and contributing to a highly skilled workforce in the local area. The demonstration of lower emissions steel production using Pilbara iron ore to support technology proliferation could help to secure continued supply to international partners seeking to decarbonise production and potential to support a significant reduction in Scope 3 GHG emissions.

The learnings from the Proposal will also address a key enabler for domestic adoption of the technology by BlueScope at its Australian facilities at an industrial scale, which will be evaluated and subject to further studies based on the outcome of the pilot. The Proposal promotes a pathway for the reduction of Scope 1 and 2 GHG emissions from Australian steel production and additionally creates domestic expertise in lower-emissions production of iron and steel. Critically, the successful demonstration of the DRI-ESF pathway ensures existing BOF steelmaking assets can continue to be used to produce lower-emissions steel, potentially reducing the cost of decarbonisation.

2.10.3 Industrial workforce

The domestic iron ore and steel sectors are major employers in Australia. The manufacturing and mining industries are both experiencing significant change brought about by the need for decarbonisation. The expertise and skills expansion delivered by the Proposal will help to deliver a level of 'futureproofing' for workers. This will come both in the continued strength of the iron ore sector through collaboration demonstrating the use of Australian iron ore to produce lower-emission steel and individual upskilling in new industry skillsets required for the transition of heavy industry.

2.10.4 State growth

The Proposal enables the State to demonstrate how it supports the development of value-added products through leveraging existing its industry know-how (iron ore expertise in WA) and resources base.

In particular, the Proposal has the potential to contribute to development of a highly skilled workforce in the local area, which could support the longer-term development of a lower-emissions iron and steel industry in WA. This also has the potential to unlock a pathway to a new value-added lower-emissions iron export industry.

The Proposal aims to secure continued participation of Pilbara iron ore in a lower-emissions steel value chain, helping to preserve the value of this export industry for WA and Australia.

Additionally, the Proposal could become a catalyst for future pilot scale or research and development type projects in manufacturing industries within the region.

2.10.5 National significance

At a national level, the Proposal will support the utilisation and decarbonisation of Australia's top export commodity (iron ore) which currently contributes around 5% of annual GDP (Gross Domestic Product). It will support continued trade and growth of Australian medium-grade iron ore as the global steel industry decarbonises. The Proposal also provides a foundation for the production of lower-emission steel and proliferation of key decarbonisation technology in domestic steel production, which is an essential Australian industry.

The Proposal is also strongly aligned with major recent Commonwealth policy announcements, including the *Future Made in Australia Act 2024*. This Act includes, for example, $1.7 billion towards supporting innovation, commercialisation and uptake of pilot and demonstration projects in priority industries such as critical minerals and lower-emissions steel. This represents a recognition of the manufacturing opportunities arising out of the energy transition, and the scope for Australia to develop more sustainable supply chains

2.10.6 International significance

The global transition to lower-emission steel is complex and requires significant collaboration across countries and industry generally. An Australian project demonstrating the application of the DRI-ESF pathway to produce lower-emission steel utilising Australian iron ore will not only be a critical learning opportunity for domestic steel manufacturers but also represents a potential decarbonisation tool for the global industry. The Proponent is committed to the proliferation of knowledge from the Proposal internationally to support the decarbonisation effort.

Steel production accounts for approximately 8% of global CO_2 emissions and 2% of Australia's total. Steel is one of the most vital materials to everyday life; its durability and versatility make it a trusted foundation for homes, bridges, hospitals and public transport networks. Importantly, steel underpins the transition to a lower carbon future, as it is important for renewable energy infrastructure. Decarbonisation of steel production faces many challenges including significant upfront capital costs, decarbonisation technology performance and scalability, availability and cost of key inputs and surety of market demand for lower emissions products. Collaborating across the industry value chain is critical in addressing these challenges.

The Pilbara delivered approximately 972 Mt of iron ore in 2024 and is the foremost global producer at approximately 37% of world supply[6]. Current commercially developed lower-emissions steel technologies rely on high-grade iron ore (high Fe, low gangue), but Pilbara ores are medium grade, limiting their use in these pathways. Developing alternative lower-emissions processing routes is essential to supporting the long-term relevance of Pilbara iron ores. The Proposal aims to address this challenge.

2.11 Proposal alternatives

Traditional iron and steelmaking methods are highly effective in meeting global steel demand. However, these conventional processes, which transform iron ore into molten iron and ultimately into steel (commonly known as 'primary' steelmaking) are energy-intensive and emit significant GHG emissions. The processing of transforming iron ore to molten iron (ironmaking) is the most emissions-intensive stage in the steel value chain.

Consequently, there is a growing emphasis on developing and implementing alternative, lower-emission ironmaking and steelmaking pathways to decarbonise the industry. These emerging pathways are diverse in approach and vary in their effectiveness. The steel industry, researchers and policymakers are actively exploring and investing in these innovative alternatives, acknowledging their crucial role in contributing to sustainable future steel production. NeoSmelt aims to contribute to decarbonising the industry and the Proposal is considered a vital step in improving understanding and fostering innovation in lower-emissions intensity ironmaking.

2.11.1 Do-nothing scenario

Should the Proposal not proceed, and without a viable lower-emissions iron and steel making solution for Pilbara ores, the nation could risk eroding the long-term competitiveness of its largest export industry as major trading partners transition to lower emissions technology.

The absence of a pilot at meaningful scale could delay or foreclose the development of sovereign lower emissions iron and steel making capability and the domestic transition away from existing blast furnace–based ironmaking pathways that are increasingly exposed to tightening global carbon constraints and shifting trade dynamics. It could also potentially diminish Australia's ability to capture downstream value from its iron ore resources and reduce its influence in shaping emerging lower emission industrial standards. As such, the Proposal represents a critical bridge between concept and commercial deployment.

A 'do-nothing' scenario carries material economic, strategic and emissions risks, including lost opportunity to secure industrial investment, regional jobs and significant GHG emissions abatement potential.

2.11.2 Alternative technology considerations

The Proposal represents a pilot-scale project based on previous studies that identified the minimum scale of ESF required to test key metallurgical phenomena. The pilot-scale project minimises environmental impacts while remaining sufficiently sized to test processes, generate design data and reduce scale-up risks for a future commercial-scale ESF. The selected scale of the Proposal will confirm the energy efficiency of the process and optimise the carbon content of the iron product so that it is suitable for downstream refining in a BOF.

A combined DRI-ESF plant and standalone ESF plant were considered during the pre-feasibility stage (PFS) of the Proposal. NeoSmelt opted to progress both technologies as not all the CDRI required for the ESF campaign strategy could be commercially sourced.

During the technology selection process, a review of applicable DRP technologies was carried out to determine the most appropriate option to support the ESF. The evaluation applied multi-criteria assessment, considering:

- Applicability of each technology to lower-emissions ironmaking;
- Technology maturity and operational stability;
- Product quality attributes and suitability of the CDRI for ESF testing; and
- Capital expenditure (CAPEX) requirements.

The DRP technologies considered included shaft furnace, rotary kiln, rotary hearth furnace, fluidised bed and other novel reduction systems. The shaft furnace was ultimately selected as the most suitable technology as it can:

- Process a wide variety of feedstocks;
- Produce CDRI of varying qualities; and
- Is scalable and customisable to a pilot facility's moderate throughput requirement (i.e., producing CDRI sufficient to support approximately 40,000 tpa of molten iron output from the ESF).

2.11.3 Site selection

As part of the PFS, nine locations were assessed for their suitability for the Proposal. Of the nine locations, three were shortlisted through a workshop and using knowledge gained from historical work and industry expertise, with both greenfield and brownfield sites considered. The locations shortlisted for detailed site assessment are outlined in Table 2-9.

Table 2-9: Proposal location assessment for shortlisted locations

Location	Site Type	Rationale
Port Kembla (NSW)	Brownfield	Multiple favourable opportunities present in a brownfield setting not available in other locations.
WTC (WA)	Greenfield	Location suitably zoned with combination of other pre-requisite services for pilot development and operation.
Whyalla (SA)	Greenfield	Home to existing steelmaking synergies and the opportunity for government support.

A detailed assessment of the three shortlisted sites was undertaken against location merit criteria, from which the WTC in WA was deemed the most suitable site. Key advantages of the chosen location are:

- Proximity to import/export infrastructure: The WTC has access to suitable infrastructure, including the Kwinana Bulk Jetty, which can potentially support the proposed operations. The port facility also benefits from equipment for pellet unloading and connectivity via public roads (Figure 1-1);

- Industrial zoning: The WTC is primarily zoned for industrial use, including the Kwinana Industrial Area, RIZ (where the Proposal is located), Australian Marine Complex and Latitude 32 General Industrial Area. A specific buffer zone exists to separate these industrial areas from nearby residential suburbs, preventing sensitive land uses like housing from being established within the industrial precinct;
- Existing approvals: Existing approvals include the RIZ SEA area, which provides a framework for future development, and specific derived proposal approvals for subdivisions and other projects within the zone (refer to section 1.4);
- Pre-existing disturbance and degradation: The industrial and urban setting of the WTC has meant significant historical disturbance to vegetation in the area, with much of the area being cleared and remaining vegetation largely degraded;
- Size and layout: the 21.4 ha Disturbance Footprint meets the size requirements for the Proposal, providing sufficient space for stockpiles and construction laydown;
- Proximity to existing services: Critical services are accessible close to the Proposal, including electricity through overhead 132 kV line, hydrogen connection via pipeline as well as natural gas, water pipelines, wastewater management and industrial gases provided by third-party suppliers:
    - Power: the WTC is a vital node in WA's electricity network. The SWIS extends north, south and east of the area, allowing for geographical flexibility of future renewable generation;
    - Water supply: water is a significant input required for the Proposal. Locating the Proposal in the WTC means there is the potential to reuse wastewater at the Proposal, which would help to ensure no impact on residential water supply and no need for seawater desalination;
    - Water Discharge: the proximity of the Proposal to the SDOOL reduces the need for installing additional wastewater pipelines, marine outfalls and associated environmental impacts;
    - Gas: the ATCO gas distribution network runs adjacent to the Development Envelope, requiring a short pipeline tie-in rather than significant new gas pipeline infrastructure;
    - Port: the WTC is part of a wider Strategic Industrial Area (SIA) with an existing, functional deepwater harbour, requiring significantly less marine development than a new harbour; and
    - Proximity to BHP NiW with the potential availability of RO water and electricity superfluous to its current needs.

2.11.4 Rationalisation of Development Envelope

The preliminary site layout for the Proposal has been determined based on the considerations listed below, which will continue to guide the layout and design as studies progress and additional information becomes available:

- Operational flow efficiency: ensure a logical sequence for processing units (e.g., DRP, ESF) to minimise material handling distances and optimize transportation logistics;
- Safety and environmental control: address specific storage and handling requirements (e.g., covered storage for sensitive fluxes, safe pathways for hot metal and slag handling);
- Minimise capital expenditure: make informed decisions and justify the general arrangements to reduce construction costs considering the Proposal lifetime of up to 10 years (expected operating time of five years);
- Co-locate with potential brownfield options: enable the layout to leverage opportunities from the neighbouring BHP NiW refinery;
- Minimise footprint: condense the plant towards Charles Street (north boundary) and use the full width (from east to west) as far as practicable;

By considering the above, the following has been included in the Proposal design layout:

- Maintenance of a vegetative buffer of tuart trees along the boundary to Patterson Road and an area of tuart trees in the southeast corner;
- Minimisation of overall footprint and land clearing through condensing infrastructure and locating close to the northern boundary;
- Segregation of traffic flow and reduction of impact on Patterson Road through a preference of using Charles Street;
- Minimise visual impact through locating the DRP in the northwest corner, furthest away from Patterson Road and closer to existing industrial infrastructure to reduce overall impact; and
- Allowance for addition of multi-user area/facility.

2.11.5 Changes in design

Since the pre-feasibility stage of the Proposal, NeoSmelt has continued to refine the engineering design of the plant taking into account the findings of preliminary environmental assessments, including air quality and noise. Through this process several design changes have been made with the intention of improving environmental outcomes.

An example of where a significant change was made involved replacing iron metal processing with a granulation process, which has resulted in a lower dust and noise emission footprint despite schedule and cost implications.

Most current iron-making facilities tap hot metal from the furnace and transfer it to foundry style sand casting beds for cooling into flat ingots. The cast flat iron then requires mechanical processing (e.g., breaking with a pneumatic hammer attached to mobile plant) for storage and transport. Initial environmental assessment of this activity identified that there was an increased risk to off-site receptors from fugitive dust and noise emissions.

Because of this, NeoSmelt initiated a design review to understand if additional mitigation was possible. The design review identified granulation as an alternative process with reduced air and noise emissions whereby the hot metal is poured through a nozzle onto a special surface that breaks it into small droplets. These droplets begin to cool in the air and then fall into a water tank, where they fully solidify into small metal granules. The granulation process is described in full in section 2.5.4 and the improved environmental outcomes are further discussed in sections 5 (air emissions) and 9 (noise emissions).

Since the PFS phase there has also been a significant body of work reducing the Disturbance Footprint via layout rationalisation. This has improved environmental outcomes by reducing the footprint disturbed by the NeoSmelt facility and has enabled the retention of native vegetation (i.e., Tuart trees) and associated fauna habitat within the Eco-cultural Buffer Zone (refer to Plate 7 and Plate 8).

Plate 7: Pre-feasibility layout

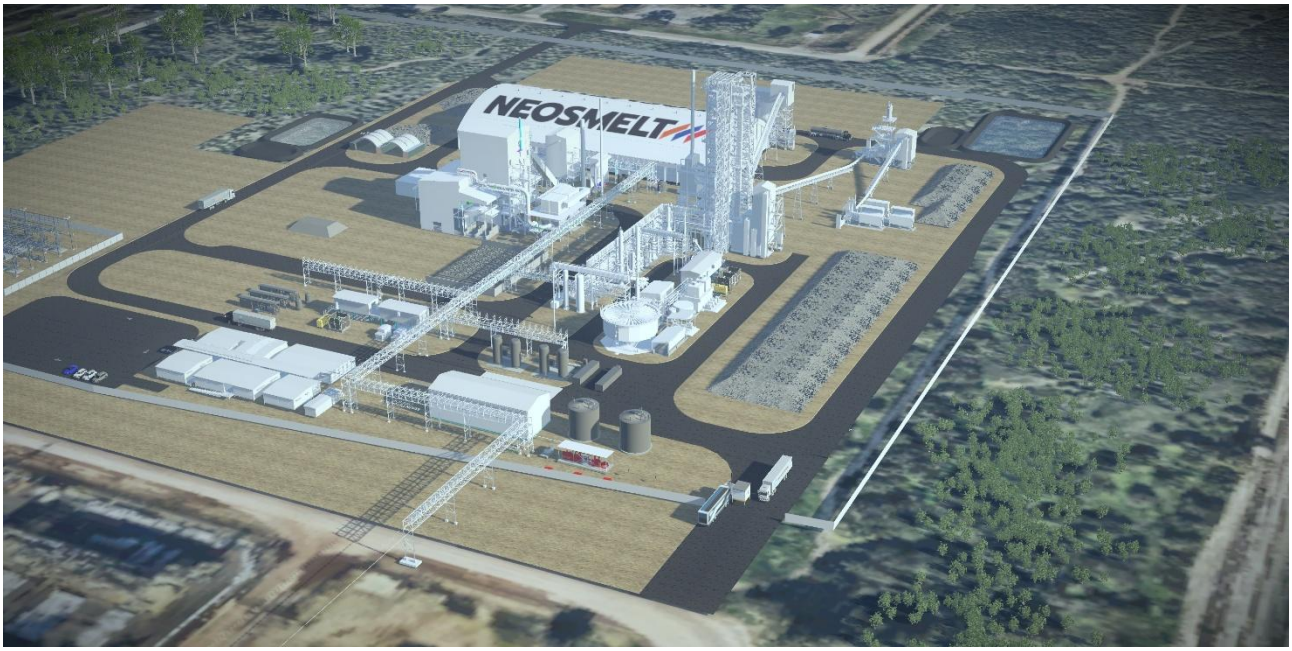


Plate 8: Proposed layout (inclusion of ECBZ)

2.12 Local and regional context

2.12.1 Locality and land use

The Proposal is in the WTC, which is Western Australia's primary heavy industrial precinct, located approximately 30 km south of the Perth metropolitan area between Cockburn and Rockingham (Figure 1-1). Covering approximately 3,900 hectares, the WTC has been progressively developed over more than 60 years and supports a concentration of strategic industries including mineral processing, chemicals manufacturing, energy production, logistics, and maritime services. The precinct is characterised by its proximity to key infrastructure, including the Kwinana Bulk Terminal (KBT), major road and rail networks, and established

utility corridors, which collectively facilitate large-scale industrial operations and export-oriented activities. The WTC is recognised for its high degree of industrial integration, whereby co-located industries share infrastructure, services, and by-products, supporting both operational efficiency and reduced environmental footprint.

The WTC comprises four main industrial areas (Figure 1-1):

- The Kwinana Industrial Area (KIA);
- The Rockingham Industry Zone (RIZ);
- The Australian Marine Complex (AMC); and
- The Latitude 32 Industry Zone.

The KIA forms the core of the precinct and is the most intensively developed, accommodating a wide range of heavy industries, including oil refining, chemical production, and mineral processing. The RIZ provides additional industrial land to support ongoing expansion and diversification of industry within the WTC, with a focus on general industry, logistics, and service-based operations that complement the KIA. The AMC, located at Henderson to the north of the WTC, supports specialised marine, defence, and offshore engineering activities, including shipbuilding, fabrication, and maintenance of large vessels. The Latitude 32 Industry Zone represents a significant future expansion area, intended to accommodate emerging industries such as advanced manufacturing and lower-emissions technologies, while alleviating land constraints within the established industrial areas.

The Proposal is located within the RIZ on the boundary of the KIA, consistent with the strategic planning framework for the WTC, which prioritises the co-location of heavy industry within designated industrial zones to minimise land use conflict and optimise infrastructure utilisation. The siting of the Proposal within the RIZ enables direct access to established transport, port and utility infrastructure, as well as opportunities for integration with existing industrial operations, including the potential for resource and energy sharing. This location is consistent with the long-standing industrial character of the area and aligns with State planning objectives to consolidate industrial development within the WTC, thereby reducing potential impacts on surrounding sensitive land uses and supporting efficient, coordinated industrial growth.

The WTC (RIZ and KIA more specifically) has been used to establish a boundary for the cumulative assessment of the Proposal. This is in the context of the two main environmental factors relevant to the Proposal – Air Quality and Social Surroundings (noise) – being assessed against legislation and guidance that has regard to the industrial nature of these areas and potential for cumulative emissions, as follows:

- Environmental Protection (Kwinana) (Atmospheric Wastes) Policy and associated regulations for air quality; and
- Environmental Protection (Noise) Regulations 1999 for social surroundings.

2.12.2 Climate

The southwest of Western Australia is characterised by a Mediterranean climate with mild wet winters and hot dry summers. The closest long-term Bureau of Meteorology weather station to the Proposal with a complete dataset is Perth Airport (Station 9021), located approximately 34 km northeast.

The long-term (1944 to 2025) mean minimum temperature for Perth Airport ranges from 8.1˚C (July) to 17.1 ˚C (January) and the long-term mean maximum temperature ranges from 18.0 ˚C (July) to 31.9 ˚C (January) (Bureau of Meteorology, 2026). The highest temperature recorded at Perth Airport is 46.7 ˚C.

Rainfall falls largely in the winter months of June to August, with the long-term (1944-2025) mean rainfall of approximately 154 mm for both June and July, compared to approximately 10 mm during January and December (Bureau of Meteorology, 2026) (Plate 9).

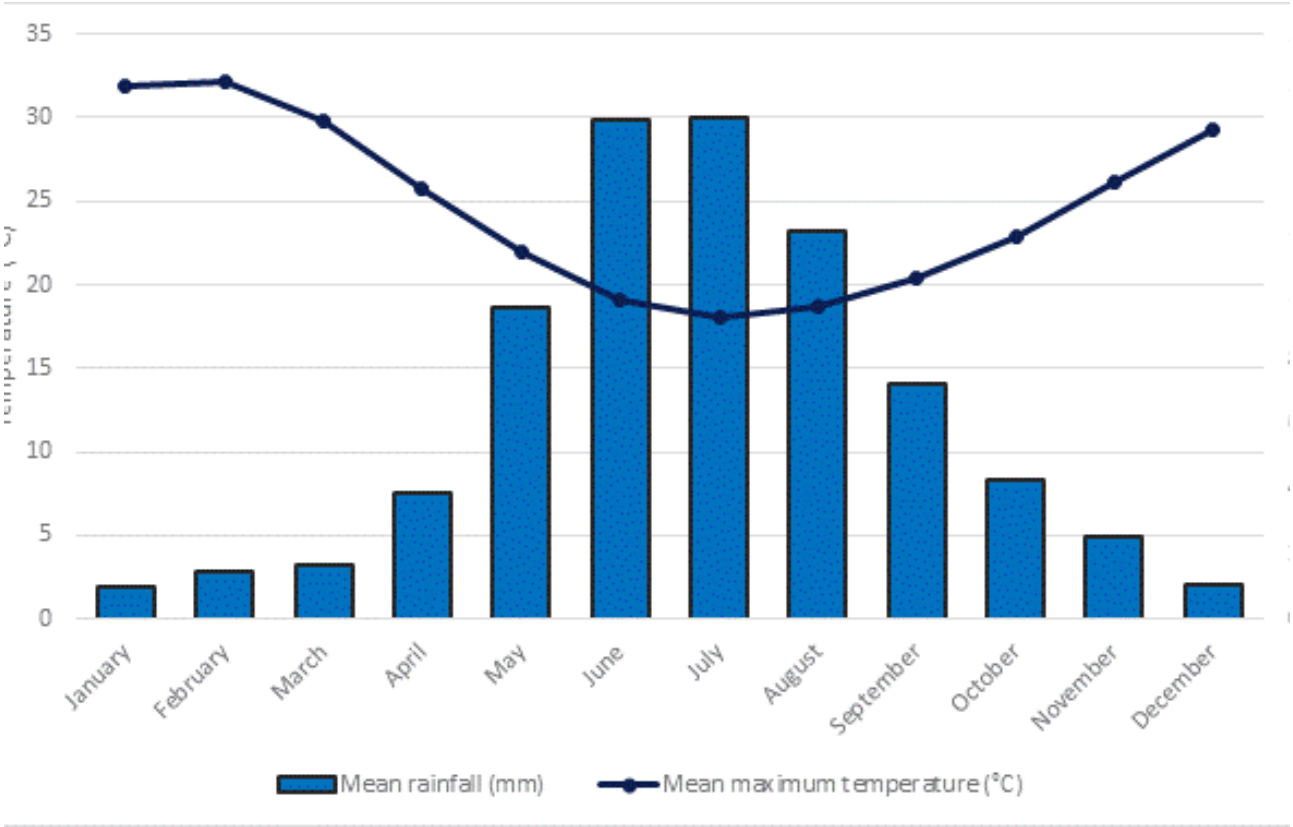


Plate 9: Climate statistics for Perth Airport Station No. 9021 (Bureau of Meteorology, 2026)

Winds in the region result from both large-scale (synoptic) winds associated with low and high pressure systems, and local thermally influenced winds. Typically, strong offshore breezes occur during the daytime followed by corresponding onshore breezes as the land cools during the evening. This sea breeze/land breeze cycle is typical of coastal environments in the Perth Metropolitan Region.

The southwest of Western Australia, along with many other parts of the world, is already experiencing the impacts of climate change (DCCEEW 2021). The climate of Western Australia is projected to continue to change over the coming decades. By mid-century, the following changes are projected (DCCEEW 2021):

- Western Australia will continue to get hotter into the future:
    - Under a high emissions scenario, Western Australia can expect an average annual temperature increase of around 1.5-2.4 °C (central estimate of 2.0 °C);
- Fire season extended with approximately 40% more days of 'very high fire danger';
- Extreme rain events in Western Australia are projected to become more intense; and
- Western Australia is likely to become drier with ongoing significant declines in southwest Western Australia likely.

The National Climate Risk Assessment (Commonwealth of Australia 2025) indicates that changes in the timing, duration, intensity and spatial patterns of climate hazards are likely, with many events occurring more frequently, in combination or affecting new locations.

2.12.3 Landforms

2.12.3.1 Geomorphology and topography

The Proposal is on the coastal fringe of the Swan Coastal Plain and is associated with the Quindalup Dune System, which comprises relic foredunes of calcareous sands (Holocene origin). It is located on the northern

portion of the Rockingham-Becher Plain, a relatively recent feature of the Quindalup Dune System between Kwinana and Mandurah created from coastline accretion caused by sea level fall over the last 6,400 years (Figure 2-1). The region contains a series of ridges parallel to the shore that represent the early formation of the Point Peron peninsula between 5,000 and 6,000 years ago. The sequence of low ridges and swales is continuous but, in parts, is affected by existing development and land uses that disturbed the surface features of the landform (Coffey 2010).

The topography of the Development Envelope is relatively flat with a variation in elevation from 3.5-4.5 m Australian Height Datum (mAHD) (Worley 2025) (Figure 2-1).

2.12.3.2 Geology and soils

The Proposal is within the Perth Basin, an onshore and offshore sedimentary basin extending approximately 1,300 km along the southwestern margin of the Australian continent, with geology that reflects the history of coastal deposits and coastal dunes. Soil landscapes and land system mapping of WA describes the Proposal's location as '*Coastal dunes of the Swan Coastal Plain, with calcareous deep sands and yellow sands with coastal scrub'* (DPIRD, 2018).

Three geological units underlie the Development Envelope:

- The Superficial Formation:
    - Safety Bay Sand: white, unlithified, calcareous fine- to medium-grained quartz sand and shell fragments originating from stable and mobile aeolian dunes (Davidson, 1995);
    - Becher Sand/Becher Clay: grey, fine-grained, quartz and skeletal sand with lenses of silty calcareous clay rich in shell fragments and seagrass peat and mud layers;
    - Tamala Limestone: creamy, white to yellow aeolian calcarenite, varying from limestone to calcareous sand (fine to medium grained shell fragments), with minor siltstone and marl with various proportions of predominantly medium-grained quartz and sand (Davidson, 1995; Commander, 2003);
    - Rockingham Sand defined by brown to pale grey, silty and slightly feldspathic, medium to coarse-grained subangular quartz sand of shallow marine origin, occupying a deep eroded channel incised into the underlying Wanneroo member of the Leederville Formation;
- The Leederville Formation comprising of:
    - Wanneroo Member: interbedded sandstones, siltstones and shales; the siltstones are typically dark grey, micaceous and the sandstone interbeds are weakly consolidated pale grey and fine- to very-coarse-grained;
    - Pinjar Member: grey and olive-green discontinuous interbedded sandstones, siltstones and shales of both marine and non-marine origin (Woodside, 2023).

Soils in the Development Envelope comprise calcareous sands (S13: white medium grained, rounded quartz and shell debris, well sorted of aeolian origin). These soils are typified by limes and with high permeability, low to medium erosion potential, medium slope stability and high ease of excavation (Davidson, 1995).

2.12.3.3 Acid sulfate soils

Acid sulfate soils (ASS) are naturally occurring soils, sediments and peats that contain iron sulphides, predominantly in the form of pyrite materials (DER, 2015). In an anoxic state, these materials remain benign and do not pose a significant risk to human health or the environment; however, if disturbed and exposed to oxygen, they have the potential to cause environmental harm (DER, 2015).

In Western Australia, ASS are commonly associated with riverine, estuarine and coastal lowland areas, wetlands, flood plains, saline inland areas and beneath the water table in podsolised sandy soils that contain

limited amounts of carbonate materials (DER, 2015). ASS risk mapping for the Swan Coastal Plain (DWER, 2017) shows the Development Envelope as having no risk of ASS being present, which is consistent with assessments undertaken by Worley (2025).

2.12.4 Hydrology

2.12.4.1 Surface water

The nearest surface water feature to the Proposal is the non-perennial Lake Cooloongup, 3.5 km south of the Development Envelope (Figure 1-1). There are no waterways, rivers, drains, creeks or surface water features within or that drain into/from the Development Envelope, which is relatively flat with sandy soils and shallow groundwater, conditions that favour local infiltration rather than stormwater runoff. Saturated hydraulic conductivity field testing undertaken in the RIZ found conductivity in sandy areas ranges between 10-20 m per day (Hyd2o, 2013).

2.12.4.2 Groundwater

The Proposal is in the Cockburn Groundwater Area and the Wellard Groundwater and Cockburn Confined subareas. Groundwater generally flows towards Cockburn Sound west of the Development Envelope and discharges to the nearshore environment of the Sound (Smith et al, 2003).

Groundwater in the area is alkaline with pH ranging from 8.30 to 8.77, and predominately fresh with salinity of mapped as 500-1,000 milligrams per litre (mg/L) (EPA, 2011).

Groundwater monitoring identified groundwater levels are relatively shallow (less than 3 m) (Worley 2025). A nearby DWER bore (DR1A CSGS) recorded maximum groundwater levels over the last 20 years range between 1.55 mAHD and 2.25 mAHD, decreasing towards the coast.

There are no groundwater licences intersecting the Development Envelope.

Due to the industrial nature of the RIZ and history of industrial-related pollution of groundwater throughout the area, groundwater abstracted under licences in the immediate vicinity of the Proposal is used for non-potable purposes such as industrial process water.

The nearest public drinking water source area is the Jandakot Underground Water Pollution Control Area, located around 10 km east of the Proposal.

2.12.4.3 Local hydrogeology

The superficial aquifer is the major unconfined aquifer beneath the Proposal, which is divided into three units:

- Safety Bay/Becher Sand (unconfined);
- Becher Clay aquitard (discontinuous); and
- Tamala Limestone (unconfined or semi-confined).

The Safety Bay/Becher Sand layer is in hydraulic continuity, except where Becher Clay is present. The Rockingham Sand layer underlying the Tamala Limestone is a semi-unconfined aquifer and is in hydraulic continuity with the overlying Tamala Limestone. The siltstone and shales of the upper members of the Leederville Formation (Wanneroo and Pinjar Members) act as an aquitard, isolating the deeper, confined Leederville Aquifer from the formations above (Advisian, 2023).

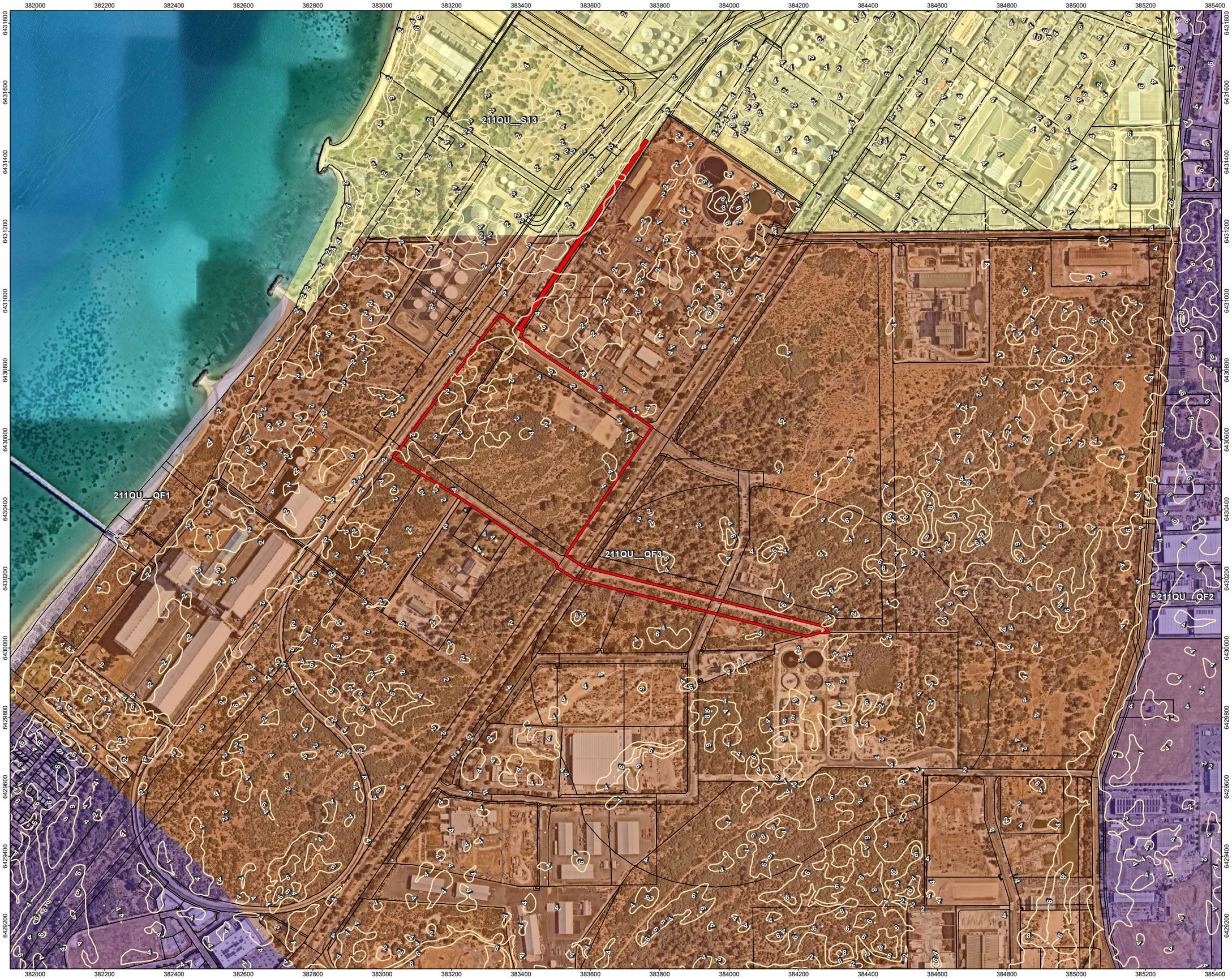
2.12.4.4 Wetlands

Prior to implementation of the RIZ, there were 34 small wetlands (damplands and sumplands) in narrow linear swales to the east of the Development Envelope. The wetlands were part of the Becher Suite of consanguineous wetlands, which are located only on the Rockingham-Becher Plain (EPA, 2011). Development of the RIZ resulted in the direct loss of 22 of the 34 wetlands in the area.

No wetlands are mapped within the Development Envelope. The nearest wetlands are unnamed Conservation and Resource Enhancement category wetlands located approximately 0.6 km south and 1.5 km southeast of the Proposal, respectively (Figure 2-2).

The nearest Ramsar wetlands (DBCA, 2017a) – Forrestdale and Thompsons Lakes – are located approximately 11 km northeast of the Proposal. As per the Directory of Important Wetlands in Australia (DBCA, 2018), the nearest wetland of national significance is the Spectacles Swamp, located approximately 8 km northeast of the Proposal.

A targeted hydrological study for the RIZ SEA confirmed that wetlands in the area are groundwater dependent and governed by annual regional groundwater vertical movements (Coffey, 2010). However, these features are hydrologically upgradient of the Development Envelope and are not anticipated to be impacted by the Proposal.



Legend

- Development Envelope
- Cadastral boundary (LGATE-002)

Soil Landscape (DPIRD-027)

- EnvGeol S13 phase
- Quindalup South Qf1 phase
- Quindalup South Qf2 phase
- Quindalup South Qf3 phase
- Topographic contours in m AHD (DPIRD-072)

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:10,000 at A3

0 150 300
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

TOPOGRAPHY AND SOILS

FIGURE 2-1

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Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
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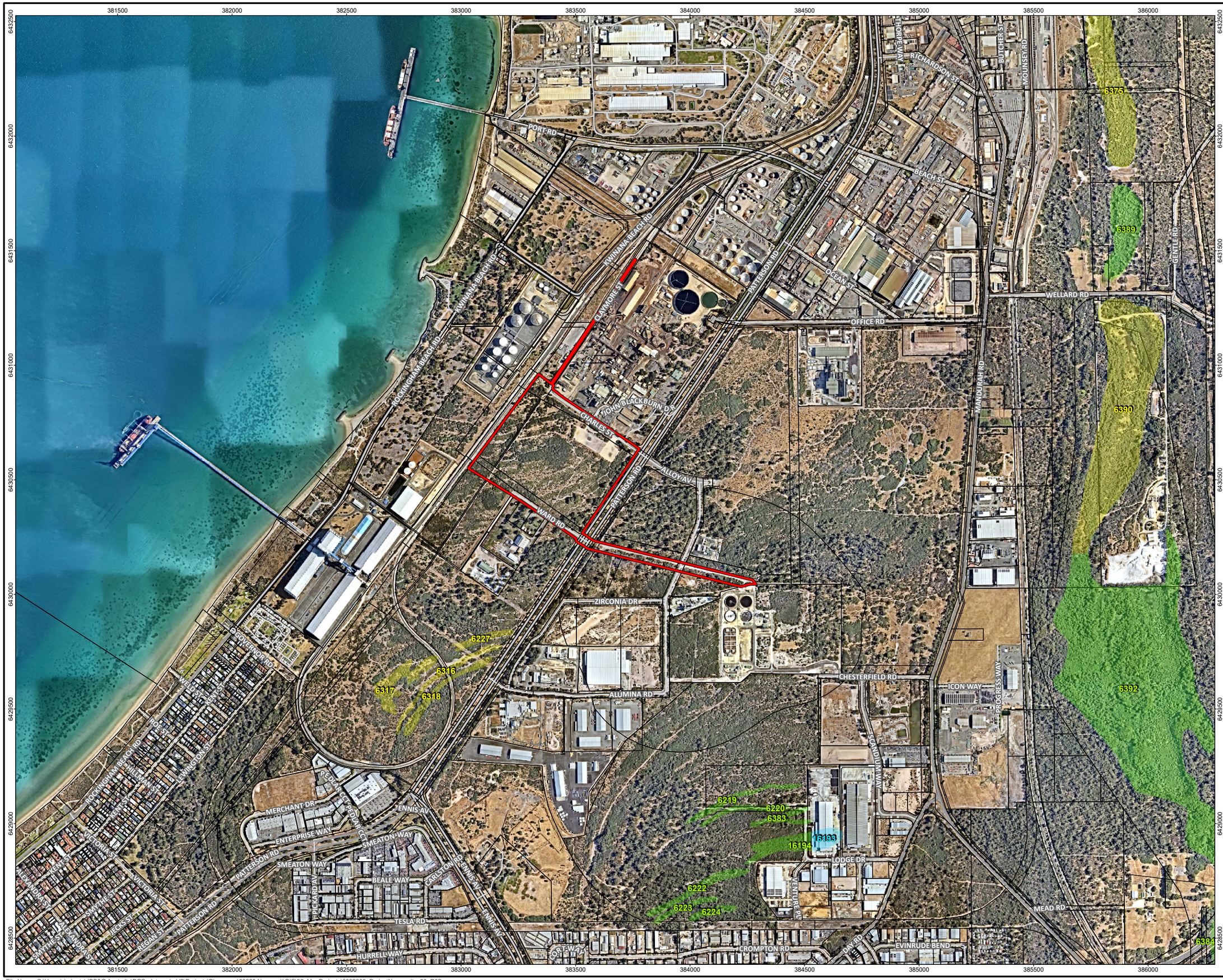

JBS&G

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Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:15,000 at A3

0 100 200
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

HYDROLOGY AND WETLANDS

FIGURE 2-2

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Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_02_02_Hydrology and wetlands

2.12.5 Flora and vegetation

The Proposal sits within an industrial and urban setting, with significant historical disturbance to vegetation. It is located within the Swan Coastal Plain bioregion, one of 85 bioregions recognized under the Interim Biogeographic Regionalisation for Australia (IBRA) (Environment Australia, 2000) and the Perth (SWA2) subregion. The Perth subregion is a low-lying coastal plain, with its vegetation dominated by Banksia or Tuart on sandy soils, *Casuarina obesa* on outwash plains and paperbark in swampy areas.

Regional vegetation mapping (Beard, 1976) shows the Development Envelope is located within the Rockingham (3048) association, comprised of mixed heath with scattered tall shrubs. Based on the most recent available data, it is estimated that this vegetation association has 25.25% remaining on the Swan Coastal Plain (DBCA, 2019). Regional vegetation complex mapping identified the Proposal within the Quindalup Complex, characterised by coastal dune complexes with low closed forest and shrubland (Heddle et al., 1980). The Quindalup Complex has 60.5% of native vegetation remaining on the Swan Coastal Plain based on the pre-European extent (DBCA, 2019).

Vegetation within the Development Envelope is generally classified as degraded shrubland (Coffey, 2010) made up of Tuart trees (*Eucalyptus gomphocephala),* Peppermint trees (*Agonis flexuosa) and* Grass trees (*Xanthorrhoea* sp.) (JBS&G, 2025). The Tuart trees within the Development Envelope are in Moderate condition, with almost 80% in slightly stressed condition (75-90% foliage present).

There is a network of unauthorised tracks and illegal domestic waste dumping sites throughout the Development Envelope, and four significant weeds were identified during an ecological inspection conducted in October 2025 (JBS&G, 2025).

Ecological communities

A search of the Department of Biodiversity, Conservation and Attractions' (DBCA) Threatened and Priority ecological community database identified 15 conservation significant ecological communities within 7 km of the Proposal (Table 2-10), of which only one was identified in the Development Envelope – *Tuart woodlands and forests of the Swan Coastal Plain*.

Table 2-10: Database search of conservation significant ecological communities

Name	ID	Conservation Status	
		State	Federal
Banksia-Dominated Woodlands of the Swan Coastal Plain Region	Banksia WL SCP	Priority 3	Endangered
Banksia *ilicifolia* woodlands	SCP22	Priority 3	Endangered
Callitris preissii (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain	SCP30a	Vulnerable	Not listed
Coastal shrublands on shallow sands	SCP29a	Priority 3	Not listed
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Mount Springs SCP	Critically Endangered	Endangered
Low lying *Banksia attenuata* woodlands or shrublands	SCP21c	Priority 3	Endangered
Melaleuca huegelii - Melaleuca systena shrublands on limestone ridges	SCP26a	Endangered	Not listed
Microbial community of a coastal saline lake (Lake Walyungup)	Walyungup Microbial	Priority 1	Not listed
Northern Spearwood shrublands and woodlands	SCP24	Priority 3	Not listed
Sedgelands in Holocene dune swales of the southern Swan Coastal Plain	SCP19a	Critically Endangered	Endangered

Name	ID	Conservation Status	
		State	Federal
Southern *Eucalyptus gomphocephala-Agonis flexuosa* woodlands	SCP25	Priority 3	Not listed
Stromatolite like microbialite community of coastal freshwater lakes (Lake Richmond)	Richmond-microbial	Critically Endangered	Endangered
Subtropical and Temperate Coastal Saltmarsh	Coastal Saltmarsh	Priority 3	Vulnerable
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	Tuart Woodlands	Priority 3	Critically Endangered
Woodlands over sedgelands in Holocene dune swales of the southern Swan Coastal Plain	SCP19b	Critically Endangered	Endangered

Ecological inspection of the Development Envelope confirmed the presence of a patch of 98 Tuart trees within the main development area of Lot 9008. The patch is considered part of the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain Priority Ecological Community (PEC) in accordance with the condition categories and thresholds in the Approved Conservation Advice (JBS&G, 2025). The Tuart TEC is in Moderate condition (TSSC, 2019) and covers approximately 4.9 ha (including the 30 m canopy buffer and the additional 30 m patch buffer), forming a narrow strip running north to south adjacent to Patterson Road. This area is proposed for retention within the Development Envelope as an Eco-cultural Buffer Zone of approximately 6 ha.

Tuart trees have been identified on the Water Corporation effluent pipeline corridor lot (Lot 503) and alongside Claymore Street where the potential connection to KWRP will run. The trees along Lot 503 are inferred to be part of the Tuart TEC, while the trees on Claymore Street are more isolated and potentially not representative of the TEC. Notwithstanding this, utility connections in these areas will be installed in already cleared areas (existing track and road) avoiding any direct impacts to the trees. Potential indirect impacts will be managed in accordance with the CEMP for the Proposal.

Conservation significant flora

No threatened flora species listed under the EPBC Act or gazetted as Threatened pursuant to the *Biodiversity Conservation Act 2016* (BC Act) were opportunistically observed within the Development Envelope during the JBS&G (2025) ecological inspection.

2.12.6 Conservation and environmental sensitive areas

The nearest conservation area is an unnamed conservation and recreation reserve vested with the Conservation Commission WA, located approximately 900 m southeast of the Development Envelope, associated with the development of the RIZ (refer to section 1.4.1).

Leda Nature Reserve, a 960 ha area of bushland, is approximately 3 km from the Development Envelope. The nearest Bush Forever site (Site 349) incorporates Leda Nature Reserve and extends approximately 2 km east of the Development Envelope. The native vegetation within the Development Envelope has not been identified as being regionally significant.

Regional ecological linkages, as identified by the Perth Biodiversity Project, occur in the vicinity of the Proposal but not within the Development Envelope. These links protect natural areas with other areas of mapped native vegetation and are shown in Figure 2-3.

The Proposal intersects a mapped environmentally sensitive area (ESA) associated with the Woodlands over sedgelands in Holocene dune swales of the southern Swan Coastal Plain TEC (Critical, Endangered) (DWER, 2020a).

Bush Forever sites and ESAs in the vicinity of the Proposal are shown in Figure 2-3.

381500 382000 382500 383000 383500 384000 384500 385000 385500 386000

6432500 6432000 6431500 6431000 6430500 6430000 6429500 6429000 6428500

Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Environmentally Sensitive Areas (DWER-046)
- Ecological Linkages (WALGA)
- Bush forever sites (Regional Scheme Special Area (DPLH-022)

349

JBS&G

Job No: 6892903	
Client: 6892903_A3L_02_03_ESA	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:15,000 at A3

0 200 400
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

ENVIRONMENTALLY SENSITIVE AREAS

FIGURE 2-3

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_02_03_ESA

2.12.7 Fauna and fauna habitat

Fauna species of conservation significance potentially occur within the broader region where the Proposal is located. Given the proximity of the ocean and some lakes, migratory shorebirds and marine and wetland fauna species have the potential to occur in the vicinity of the Proposal; however, none of these species are expected to occur within the Development Envelope due to the lack of suitable habitat (Harewood, 2025).

Similarly, several terrestrial fauna species of conservation significance may be present in the larger remnants of habitat in the region; however, these are also not expected to occur within the Development Envelope due to the lack of suitable habitat or local extinction (Harewood, 2025).

Within the Development Envelope, there are established Tuart trees and associated vegetation that may provide breeding sites for threatened Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Forest Red-tailed Black Cockatoo (*Calyptorynchus banksii naso)* (Commonwealth of Australia, 2019). Based on available vegetation mapping (DPIRD 2025), it is estimated that there is approximately 8,600 ha of native vegetation within 12 km of the Development Envelope and, therefore, there is potential for black cockatoo foraging, breeding and roosting to take place in the wider area (Harewood, 2025).

The native vegetation within the Development Envelope may also have some value to Quenda (*Isodon fusciventer* – P4), which have been recorded on-site. Peregrine Falcon (*Falco peregrinus*) is known to occur in the broader area (Harewood, 2025).

2.12.8 Locality and land use

The Proposal site is zoned for industrial use, consistent with the area's long-standing industrial development, and is positioned with access to key services, including electricity power, process and potable water, natural gas, hydrogen and other industrial gases supplied by local providers. Additionally, port infrastructure is available in Kwinana (bulk material) and Fremantle (containerised material), operated by the Fremantle Port Authority.

The RIZ forms part of the WTC, a major industrial area situated along the southern coast of the Perth region that has been set aside for heavy and strategic industry. Services have been strategically planned with major transport, including rail, road and port facilities for access to WA regions to the north and south. Kwinana, Rockingham and their surrounding communities are home to many of the skilled employees who work in the area.

Other organisations currently operating within the RIZ include the CBH Group, WesCEF, Coogee Chemicals, BHP NiW and more. Operations include chemical manufacturing and storage facilities, bitumen plant, light industrial operations, wastewater treatment plant and waste to energy plants. Woodside's proposed H2Perth liquified hydrogen production facility is also planned in the area and is currently under assessment by the EPA.

2.12.9 Native title and heritage

2.12.9.1 Native title

The Proposal is located within the Gnaala Karla Booja (GKB) Indigenous Land Use Agreement (ILUA) area (WI2015/005), which forms part of the South West Native Title Settlement. The South West Native Title Settlement is the largest native title settlement in Australian history and comprises six ILUA regions across the southwest of Western Australia, each represented by a Noongar Regional Corporation.

The Gnaala Karla Booja Aboriginal Corporation (GKBAC) is the prescribed Noongar Regional Corporation responsible for representing and managing the GKB ILUA area. GKBAC represents four Noongar language/dialect groups: Binjareb/Pinjarup, Wilman, Ganeang and Wardandi.

The GKB ILUA area extends from Garden Island and Kwinana in the northwest, east toward Corrigin, southwest toward Kojonup, and west to the coast near Capel and Greenbushes, encompassing extensive coastal, forested and inland landscapes

Prior to the Settlement, the GKB area was subject to a registered native title claim (WC1998/058). Following negotiations between the Noongar people and the State of Western Australia, six ILUAs were executed and registered as part of the South West Native Title Settlement. Under the terms of the Settlement ILUAs, all native title rights and interests within each ILUA area were surrendered to the State on 13 April 2021. The Federal Court subsequently made consent determinations that native title does not exist within the relevant Agreement Areas.

The surrender of native title formed part of a full and final settlement under the *Native Title Act 1993* (Cth). In place of ongoing native title rights and litigation, the Settlement establishes a framework providing statutory recognition, governance arrangements, cultural heritage processes, economic development opportunities, and land management mechanisms for the Noongar people across the Settlement Area.

Within the GKB ILUA area, GKBAC retains an ongoing role in Aboriginal cultural heritage management. The ILUA framework binds State Government agencies to enter into a Noongar Standard Heritage Agreement (NSHA) where Aboriginal heritage surveys are required and no pre-existing agreement applies.

While primarily developed for government use, the NSHA is also encouraged for industry proponents undertaking activities with potential to impact Aboriginal heritage within the Settlement Area. Accordingly, NeoSmelt entered a NSHA with GKBAC in mid-2025.

The NSHA process ensures that GKB-nominated Traditional Owners are provided with information about the Proposal prior to relevant instances of ground disturbance and are afforded the opportunity to participate in heritage assessments and make informed decisions regarding the protection and management of cultural heritage values. Examples of participation undertaken to date include involvement of Aboriginal Rangers and Heritage Monitors in preliminary site investigation work (e.g., geotechnical surveys) and ecological surveys.

2.12.9.2 Aboriginal heritage

A desktop search of the Aboriginal Cultural Heritage Inquiry System (ACHIS) found no registered Aboriginal sites or Heritage Places within 500 m of the Proposal. The nearest registered heritage location is Aboriginal Cultural Heritage Historic Place 3776 (Indian Ocean) occurring approximately 650 m to the west of the Development Envelope. All other recorded sites are located more than 1 km from the Development Envelope.

In July 2025, NeoSmelt submitted an Activity Notice to GKBAC under the NSHA requesting an archaeological and ethnographic heritage survey of the Development Envelope. The heritage survey was undertaken on 15 October 2025 by seven Noongar Consultants and two Aboriginal Land Services (ALS) Heritage Consultants, with the assistance of four NeoSmelt representatives.

The survey identified the following:

- No registered sites are located within the Development Envelope;
- No lodged heritage places are located within the Development Envelope;
- No historic heritage places are located within the Development Envelope;
- No previously unreported heritage places were identified; and
- No isolated artefacts were identified.

In addition, no isolated artefacts were encountered during preliminary geotechnical works and surveys attended by Heritage Monitors.

In summary, the archaeological and ethnographic assessments confirmed that the Proposal is not expected to impact Aboriginal cultural heritage.

The Noongar Consultants reviewed and assessed the location of the Proposal and were satisfied that further consultation with GKBAC could proceed subject to recommendations to mitigate the risk of disturbing or impinging on any cultural heritage values present within the Development Envelope. These recommendations have been implemented through stakeholder engagement and environmental management plans developed for the Proposal.

The heritage survey report is provided in Appendix F.

2.12.9.3 European heritage

The Rockingham LGA and the nearby Kwinana LGA hold some European heritage value. Europeans initially settled in the town of Rockingham in 1829 when Sulphur Town was also founded on Garden Island. In the 1870s, the town further developed as a timber port; however, when the need for timber declined, Rockingham became increasingly well known as a recreational/holiday destination. In the 1950s, Kwinana was established as WA's principal industrial area, leading to the expansion of nearby Rockingham.

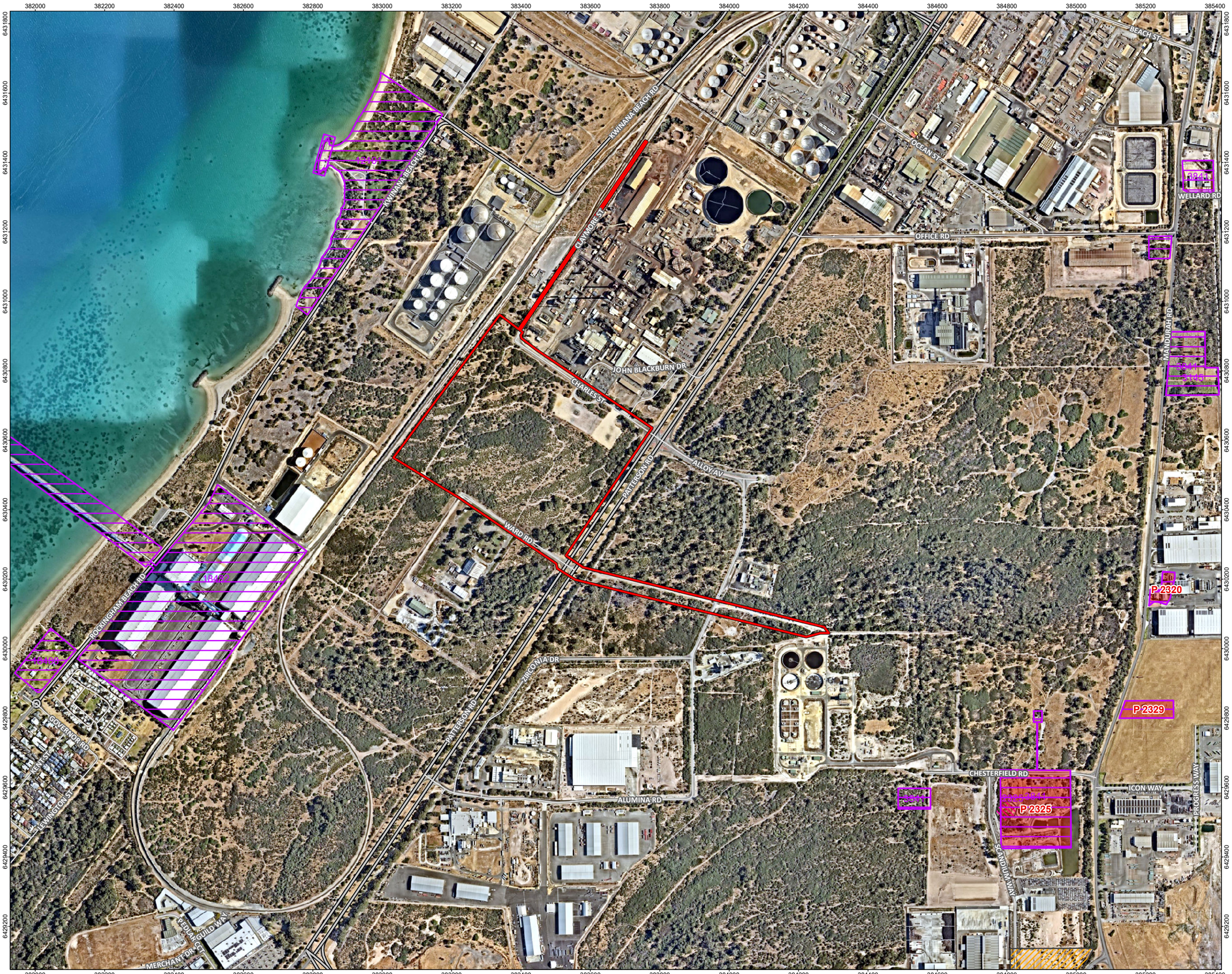
The National Trust applies a 'classified' designation to items that have been assessed as places and objects of cultural heritage significance to WA. The classification has no legal status and does not impinge on rights of ownership in any way, nor does it imply a right of access by the public.

The State Register of Heritage Places is a statutory list of places that represent the story of WA's history and development. Entry onto the State Register is reserved for places of State cultural heritage significance and is the highest recognition afforded at the State level. Heritage places are entered in the State Register after an assessment and registration process that includes extensive consultation with owners, local governments and other stakeholders (GoWA, 2024).

A desktop review of heritage registers via InHerit was conducted for any registered sites within 500 m of the Development Envelope. One location was identified outside the Development Envelope as outlined in Table 2-11 and Figure 2-4.

Table 2-11: European heritage places within 500 m of the Development Envelope

Place Name	Place Number	Management category	Distance from Development Envelope
Kwinana Grain Terminal, Granary Museum & Jetty	18482	Category B – High level of protection for places of considerable cultural heritage significance to the City of Rockingham	500 m southwest



Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Heritage List (DPLH-090)
- Aboriginal Cultural Heritage - Register (DPLH-099)
- Aboriginal Cultural Heritage - Lodged (DPLH-100)

Heritage Council WA - State Register (DPLH-006)

- Individual Place
- Highway
- Major road
- Minor road
- Track

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:10,000 at A3

0 150 300
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

HERITAGE PLACES

FIGURE 2-4

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: Heritage List (DPLH-090):
Heritage Council WA - State Register (DPLH-006): © Government of Western Australia 2014. State Heritage Office. Licensed under a Creative Commons Attribution 3.0 Australia License.
Aboriginal Cultural Heritage - Register (DPLH-099):

3. Stakeholder engagement

NeoSmelt and the JV Participants maintain comprehensive consultation programs with all stakeholders in relation to their global operations, which have expanded to include the Proposal and associated stakeholders from initial concept through to project development, with feedback informing the evolution of the Proposal.

3.1 Key stakeholders

The following broad categories of stakeholders relevant to the Proposal have been identified:

- Government:
  - WA State Government (Premier and Cabinet; departments like Department of Energy and Economic Diversification [DEED] and EPA);
  - Commonwealth Government (Ministers and agencies like ARENA, Industry, Science and Resources; Climate Change; Energy; Industry and Innovation);
  - Local government (City of Rockingham, City of Kwinana);
  - Regulators: Environmental regulators (DEED, EPA, DWER), safety and planning authorities.
- JV Participants: BlueScope, BHP, Rio Tinto, Mitsui Iron Ore Development and Woodside Energy;
- Industry participants:
  - Foreign steelmakers and other industry participants who may be potential technology adopters (key target areas include Japan, South Korea, China and India);
  - Other industry in the WTC;
- Community: Residents (especially in Kwinana and Rockingham areas), Traditional Owners, community groups, local business owners, the Kwinana Industries Council (KIC), unions and workforce; and
- Media and public: News outlets (print, TV, digital, trade press) and members of the public interested in industrial decarbonisation or local developments.

A list of potentially interested stakeholders identified is provided in Table 3-1.

Table 3-1: Relevant Stakeholders

Stakeholder Type	Stakeholder
State and Commonwealth Government	Office of the Premier, Minister for State Development; Trade and Investment; Economic Diversification. Member for Kwinana
	Office of the Minister for Regional Development; Ports; Science and Innovation; Medical Research; Kimberley
	Office of the Minister for Energy and Decarbonisation; Manufacturing; Skills and TAFE; Pilbara
	Office of the Minister for Planning and Lands; Housing and Works; Health Infrastructure
	Office of the Minister for Aboriginal Affairs; Water; Climate Resilience; South West
	Office of the Minister for Mines and Petroleum; Finance; Electoral Affairs; Goldfields-Esperance
	Office of the Minister for the Environment; Community Services; Homelessness
	Member for Rockingham
	Department of Water Environment and Regulation

Stakeholder Type	Stakeholder
	Federal Department of Climate Change, Energy, the Environment and Water
	Federal Department of Industry, Science and Resources
	Department of Planning, Lands and Heritage
	Fremantle Port Authority
	Water Corporation
	Western Power
	Westport
	Department of Energy and Economic Diversification
	DevelopmentWA
	WA EPA
	Synergy
	Main Roads WA
Local Government	City of Rockingham
	City of Kwinana
	City of Cockburn
Traditional Owners	Gnaala Karla Booja
	South West Aboriginal Land and Sea Council (SWALSC)
Industry and Neighbours	Kwinana Industries Council
	BHP Nickel West
	Rockingham Kwinana Chamber of Commerce
	East Rockingham Waste to Energy Project

3.2 Stakeholder engagement process

NeoSmelt has adopted a targeted, transparent and collaborative approach in all stakeholder interactions, as follows:

- Targeted: a strategic outreach program to consult with key stakeholders on a regular basis;
- Transparent: communicate in an open and honest manner about the Proposal's goals, progress, and challenges (to build credibility) becoming a trusted source of information; and
- Collaborative: the JV Participants will collectively work together and where possible integrate stakeholder feedback, adjusting plans, where practicable, to address community and government input.

The stakeholder engagement strategy prepared for the Proposal outlines the following objectives:

1. Obtain regulatory approvals and social licence: Ensure the Proposal meets all regulatory requirements and maintains community support.
2. Secure government funding (support enhancing commercial interests) and investment to address the funding gap for the Proposal.
3. Increase industry profile (to support proliferation objectives): Attend key industry events to raise the profile of the Proposal and cultivate interest from steel industry participants.
4. Maintain positive reputation and stakeholder trust: Keep stakeholders informed, supportive, with a goal to maintain positive sentiment toward the Proposal.

Government and community consultation is a key component of the environmental approvals process to ensure all stakeholders are adequately informed of the Proposal, and potential environmental and social issues are identified. If local communities, nearby stakeholders and key parties are not adequately engaged, provided timely and accurate project information or feel unable to interact with decision-making processes, it may result in perceptions of procedural unfairness, uncertainty and potential objection to the Proposal.

A planned, integrated and consistent approach to stakeholder engagement contributes to enhancing and protecting NeoSmelt's and the JV Participants' reputations, supporting the social and economic prosperity of the area in which it operates and securing and maintaining its social licence to operate through:

- Understanding community stakeholder perceptions of potential proposal impacts and opportunities;
- Identifying and developing appropriate management and mitigation measures that take stakeholder views into account;
- Improving stakeholder awareness and understanding of the Proposal; and
- Increasing mutual trust and motivation to collaborate.

To ensure the objectives of the stakeholder engagement strategy are met, NeoSmelt has developed a suite of Stakeholder Engagement and Communications Plans that outline how it will build trust, manage potential social impacts and generate meaningful local benefits:

- Government Engagement Plan focused on JV Participant and government engagement to support project funding requirements;
- A Community and Approvals Engagement Plan focused on Proposal-level stakeholder engagement; and
- A Media and Communications Plan focused on media engagement and public communications.

The plans recognise the significant social and economic value of the Proposal in testing a lower-emissions DRI–ESF ironmaking route using Pilbara iron ore, which is a significant contributor to Western Australia's prosperity. The plans focus on four pillars:

1. Trusted Relationships.
2. Economic Diversification and Local Value.
3. Partnering with First Nations.
4. Skills and Learning.

Each pillar sets out the context, expectations and initial actions. Key priorities include transparent engagement with communities and regulators; partnering with Gnaala Karla Booja to co-design cultural heritage and benefit pathways; supporting economic diversification through local content and regional employment; and contributing to the State's skills agenda through collaboration with colleges, universities and the KIC.

Identified actions have been put in place to enable tracking social value performance.

The plans will be reviewed at the end of each project phase, with a more detailed implementation plan developed for the subsequent stage. This approach ensures the Proposal maintains alignment with stakeholder expectations, regulatory requirements and a commitment to delivering clear, measurable social value outcomes.

Engagements with stakeholders are aligned to the Proposal schedule and support the timing of regulatory processes as shown in Table 3-2.

Table 3-2: Stakeholder engagement plan

Stakeholder group	Prefeasibility	Pre-referral	Assessment	Construction	Operation
State and Commonwealth Government	One on one briefing	One on one briefing.	As required	One on one briefing.	One on one briefing.
Regulators and utility providers	One on one briefing	Scoping meeting held September 2025. Pre-referral meeting held early 2026.	Regular meetings	Regular meetings.	Regular meetings. Annual reporting.
Local Government	One on one briefing	Updated meeting September 2025.	Regular meetings	Meetings as required.	Meetings as required.
Traditional Owners	One on one briefing	NSHA endorsed and in place August 2025. Activity Notice and Cultural Heritage survey August-October 2025. Monthly meetings focused on each technical aspect.	Regular meetings	Regular meetings.	Regular meetings.
Industry and neighbours	One on one briefing	KIC membership August 2025. Public Community Information Session (with support of KIC). Information sheet developed September 2025. Website launch September 2025.	KIC membership	KIC membership. Community hotline for complaints/ issues management.	KIC membership.
Community and other special interest groups	N/A	Q&A developed.	Meetings if required	Meetings if required.	Meetings if required.

3.3 Stakeholder consultation outcomes

NeoSmelt commenced stakeholder engagement in support of its early plans to progress the Proposal during PFS, ahead of a public announcement and launch event in December 2024. Since that time, NeoSmelt has refined its plans to progress the Proposal as described in this ERD.

NeoSmelt maintains a detailed consultation register that records each relevant interaction with a stakeholder. Stakeholder engagements to date are summarised in Table 3-3. In addition to this summary, the following specific activities are noted in the section below.

3.3.1 Lead agency status

The Proposal has received Priority Project Status under the *State Development Act 2025* and has been assigned as a 'State Significant Proposal' under the WA Lead Agency Framework[7]. The lead agency supporting NeoSmelt is the Department of Energy & Economic Diversification (DEED) through the Major

[7] Lead Agency Framework

Projects Facilitation group. In addition, the Office of the Coordinator General (OCG) has been nominated to support the Proposal and ensure the highest level of facilitation and coordination across State Government.

3.3.2 Other decision-making authorities

NeoSmelt has met with other decision-making authorities on several occasions through the consultation process carried out to date, including the Department of Water and Environmental Regulation (DWER) and the City of Rockingham (refer to Table 3-3).

The discussions have confirmed the secondary approvals pathways as discussed in section 1.3, including the opportunity for parallel processing of approvals. Consequently, the application for a works approval under Part V of the EP Act will be submitted to DWER concurrent with this referral to the EPA.

3.3.3 Community forum in Kwinana

NeoSmelt, with the support of the KIC, hosted a dedicated Community Forum on 30 October 2025 to provide local stakeholders with an opportunity to learn more about the Proposal, its progress and environmental approvals process.

The forum attracted approximately 35 attendees, including strong representation from local industry and government. Notably, Magenta Marshall MLA, State Member for Rockingham (the local member for the Proposal location), attended and actively engaged with the NeoSmelt team throughout the session. Lorna Buchanan, newly elected Mayor of the City of Rockingham, was also in attendance along with a representative from the City of Cockburn.

The session included a presentation-style overview of the Proposal followed by a Q&A, providing attendees with the opportunity to ask questions, seek clarifications and explore areas of mutual interest.

Engagement at the forum was generally constructive and positive, and no concerns were raised regarding the Proposal or the environmental approvals process. Feedback on the day reflected strong support for the initiative and a shared interest in exploring synergies that may deliver broader benefits to the local industrial community.

Several follow-up questions were submitted to NeoSmelt via a dedicated portal after the forum, mainly from businesses looking for ways to actively become involved in the Proposal as it progresses.

Some photos from the event are provided in Plate 10.

Plate 10: Community forum

3.3.4 Summary of key topics raised

Stakeholders engaged during the current phase of the Proposal have been broadly supportive and have shared information and perspectives that have enhanced NeoSmelt's understanding of the local context and surrounding environment.

The dominant topic in engagements with the public has been local employment and supply opportunities. NeoSmelt plans to conduct an economic benefits analysis during the next phase of more detailed project development to be able to engage with greater certainty on aspects like workforce size and scopes of work that could be procured locally.

Topics where stakeholders have raised concerns or sought further clarification include:

- Scope and timing of third-party proposal engagements;
- Ability of the Proposal to co-exist with other industries and long-established community recreation;
- GHG emissions and management;
- Visual impacts, including the retention of vegetation around the perimeter;
- Water supply solution and potential impacts on other users;
- Aboriginal cultural heritage impacts;
- Cumulative marine environmental impacts; and
- Short-term construction impacts, with potential for compounding alongside other proposed initiatives in the same area.

Responses to the topics raised and associated consultation outcomes are provided in Table 3-3.

Table 3-3: Summary of stakeholder consultation

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome
State Government agencies				
Department of Energy and Economic Diversification (DEED)	22/11/2024	In person meeting	Discussion regarding NeoSmelt potential approval pathways	• Confirm pre-referral engagements – complete. • Confirm DWER pre-referral meeting time – complete.
	30/01/2025	In person meeting	Pre-referral discussion regarding ERD including: • State environmental approval requirements. • EPA factors.	• Confirm additional pre-referral engagements – complete. • Undertake stage 1 air quality monitoring – complete.
	07/02/2025	Letter	General Proposal overview and queries, regarding: • Access to development lots. • Tenure. • Kwinana-Rockingham Strategic Industrial Area. • Industrial lands panel. • Land allocation.	No outstanding actions.
	25/06/2025	Virtual meeting	Discussion regarding ERD including: • State environmental approval requirements. • Traditional owner engagement. • Preparation of engagement schedule.	• Confirm construction date – complete • Confirm option to lease signed with DevelopmentWA and copy provided to DEED – complete. • Confirm meeting with the Premier – complete.

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome

	22/07/2025 - ongoing	Virtual meetings	Discussion regarding ERD including consultation and project schedule.	• DEED to set up joint meeting to discuss EP Act Part IV and Part V approvals for end of August/early September to discuss:
				  ○ Nature of the development.
				  ○ Studies undertaken to date.
				  ○ Consultation and any outstanding questions - complete.
				• DEED to set up ongoing engagements with the Water Corporation – complete.
				• DEED to set up meeting with DMPE on relevant safety regulations and Major Hazard Facility requirements – complete.

DevelopmentWA (DevWA)	20/06/2025	Letter	Social Licence and ERD: • Site access and unauthorised access. • Unauthorised dumping of waste. • Waste. • Site security.	No outstanding actions.
	02/09/2025 - Ongoing bimonthly meetings	Site meeting	General project discussions, including: • Lease agreement. • ERD. • Site access. • Fire management. • Signage. • Bollards. • Clearing of vegetation. • Rough sleeper.	No Further actions for the ERD.
Main Roads WA (MRWA)	01/02/2025	In person meeting	Project overview.	No outstanding actions.

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome
	14/04/2026	Virtual Meeting	• Update Proposal overview. • Primary and Secondary approvals timing. • Transport Impact Assessment.	Online submission of Transport Impact Assessment for review.
Department of Water and Environmental Regulation (DWER)	01/02/2025	In person meeting	Project overview, including discussions regarding the ERD and secondary approvals.	No outstanding actions.
	03/09/2025	In person meeting	Discussions regarding Proposal schedule and Part IV and Part V approvals, including ERD (GHG emissions, noise, air quality, and vegetation.	NeoSmelt to confirm registration for Environment Online ahead of referral – complete.
	10/03/2026	In person meeting	Project update and discussions regarding Noise and Air quality and assessment timeframes.	Consideration if WC premise licence allows NeoSmelt effluent to be brought on to the site – complete.
	10/09/2025 - monthly - ongoing	Virtual	• Water supply - process, potable and fire. • Process water disposal options. • Locations, engineering specification and agreements.	Water Supply Agreements to be put in place.
	19/01/2026	In person meeting	Meeting with EPA Chair regarding Proposal update and ERD, including: • GHG emissions. • Air quality. • Social surroundings. • Timing of referral.	Address Development WA Derived Proposal and associated management plan conditions in the referral – completed.

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome

Department of Energy and Economic Diversification (DEED)	23/07/2025	In person meeting	Discussions regarding funding including:
			• Commercial working group.
			• Funding for execution.
			• Project timeframes:
			  ○ Development of key terms (August/September).
			  ○ Funding agreement in place early 2026 (aligning with ARENA process).
			  ○ Flexibility of drafting conditions included in WA Premier letter.
				NeoSmelt drafting key terms, including milestone structure and proposed deliverables for further discussion.

Minister for Energy and Decarbonisation; Manufacturing; Skills and TAFE; Pilbara	25/06/2025	In person meeting	Project overview discussions noting: • Introduction to the Proposal and NeoSmelt. • Proposal update. • Meeting scheduled with WA premier (support from Premier's department). • Positive relationship with DEED through Executive Director Major Projects Facilitation.	No outstanding actions.
Hon Minister Amber Jade Sanderon MLA	26/08/2025	In person meeting	Discussions regarding project overview and JV, including: • KIC • WTC. • Western Power. • Approvals. • Decarbonisation. • Kwinana Bulk Jetty. • Employment and training.	No outstanding actions.

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome
Chris Clark / Steve Dawson Coordinator General / Executive Director – DPC	04/05/2026	In person meeting	Provided a Proposal update, highlighting EPA referral. Outlined next steps and pathway to FID.	No outstanding actions.
WA Premier Roger Cook	28/11/2025	Workshop	Discussions regarding: • Social Licence. • Funding/investment. • Approvals (i.e., ERD and secondary approvals). • Infrastructure. • KIC.	No outstanding actions
Luke Clarke Chief of Staff/ Chief Policy Advisor – Office of the Premier	25/03/2026	In person meeting	• Overview of upcoming referral submission. • Flag upcoming meeting with the Premier (June). • ARENA application	No outstanding actions.
Tom Samuels / Ryan Pavlinovich Chief of Staff / Senior Policy Advisor (Environment) - Office of Minister Swinbourn	25/03/2026	In person meeting	Overview of upcoming referral submission. Alignment on anticipated timeframes and expectations.	Advise when Referral is submitted
Chief of Staff to Minister Michael	25/03/2026	In person meeting	• Ensure awareness of upcoming referral submission. • Focus on relationship building as the Chief of Staff to a relevant minister. • Raise intent to meet with the Minister in April/May.	No outstanding actions.
Local Government				

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome
City of Rockingham	01/01/2025	In person meeting	Discussion regarding project overview, including ERD, Social Licence and secondary approvals.	No outstanding actions.
	19/11/2025	In person meeting	Discussion regarding secondary approvals including: • Proposal overview. • Bushfire. • Stormwater. • Development application. • Piperack. • Charles Street. • Ward Road. • Septic tank. • Environment. • Community. • Culture.	No outstanding actions.
Community				
Community Forum	30/10/2025	In person meeting	Discussions regarding project overview, including: • Infrastructure. • Employment. • Contracting. • Environment. • Approvals. • Air quality and noise.	• Responses to questions via QR code – complete. • Follow up questions submitted to NeoSmelt after the forum were from businesses looking for ways to actively become involved in the Proposal as it progresses.
Industry				
Kwinana Industries Council (KIC)	01/02/2025	In person meeting	Overview of Proposal, including: • ERD. • Social Licence. • Secondary approvals.	No outstanding actions.

Stakeholder	Date	Nature of consultation	Issues/topics raised	Response/outcome
	31/07/2025	Letter	Discussions regarding membership, ERD, Social Licence and secondary approvals	No outstanding actions
Traditional Owners				
Gnaala Karla Booja (GKB)	23/06/2025	Site meeting	Discussions regarding site impacts associated with the Proposal and opportunities for management	No outstanding actions.
Gnaala Karla Booja Aboriginal Corporation (GKBAC)	11/07/2025	Virtual meeting	Contact regarding the Noongar Standard Heritage Agreement (NSHA), activity notice, mutual benefits and engagement.	• Prepare ongoing engagement schedule – ongoing task. • Consideration of Moorditj Mila Strategic Plan in consultation – complete.
South West Aboriginal Land and Sea Council (SWALC)	17/07/2025	Email	NSHA submission.	No outstanding actions.
	14/08/2025	Letter	Letter regarding Social Licence and ERD.	NSHA signed – complete.
	08/08/2025	Letter	Activity notice, regarding Social Licence and ERD.	No outstanding actions.
GKB and GKBAC and Impact	11/11/2025	In person meeting	Meeting regarding Social Licence, ERD and secondary approvals. Specifically: • Project overview. • Approvals. • Social values. • Rangers. • Employment. • Contracting. • Investment.	Ongoing work to set up engagement process (i.e., working group) – ongoing.

4. Environmental factor assessments

Environmental factors are those parts of the environment that may be impacted by an aspect of a proposed development. The EPA identifies 14 environmental factors organised into five themes: sea, land, water, air and people. Each factor has a specific associated environmental objective (EPA, 2018). The EPA assesses the significance of environmental impacts of a proposal against each of the 14 environmental factors and their associated objectives.

4.1 Identification of environmental factors relevant to the Proposal

Several desktop and field-based studies have been commissioned during the planning and design of the Proposal. Results of these studies and the significance criteria outlined in the EPA's Statement of Environmental Principles, Factors and Aims of the EIA (EPA, 2018) have been used to determine the relevance of each factor to the Proposal, as follows:

- Environmental factor: the Proposal may potentially cause a significant impact to the environment;
- Other environmental factor: the Proposal will not cause a significant impact but has potential to interact with the environment; and
- Not relevant: the Proposal will not cause an environmental impact.

The outcomes of the consideration of each of the factors are provided in Table 4-1.

Table 4-1: Environmental factors

Theme	Factor	Objective	Consideration
Air	Air quality	*To maintain air quality and minimise emissions so that environmental values are protected.*	**Environmental factor** Local air quality has the potential to be impacted by emissions to air from the Proposal. Refer to section 5.
	Greenhouse gas emissions	*To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.*	**Environmental factor** The Proposal will emit GHG emissions; however, total Scope 1 and Scope 2 emissions will each be below 100,000 tCO_2-e per year. Refer to section 6.
Land	Flora and vegetation	*To protect flora and vegetation so that biological diversity and ecological integrity are maintained.*	**Environmental factor** Clearing activities and impacts to flora, vegetation and associated fauna habitat will be predominantly managed in accordance with the conditions of Derived Proposal 5 for the RIZ SEA (refer to section 1.4). The Proposal also involves the installation of a pipeline associated with wastewater; however, no clearing is required for construction and installation due to the use of an existing cleared track. Refer to sections 7 and 8.
	Terrestrial fauna	*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	
	Landforms	*To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.*	**Not relevant** No distinct landform features are present within or in proximity to the Development Envelope.

Theme	Factor	Objective	Consideration
	Subterranean fauna	*To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*	**Not relevant** The Proposal has limited potential to impact subterranean fauna, features or groundwater associated with construction, dewatering and the management of ASS (refer to Appendix B).
	Terrestrial environmental quality	*To maintain the quality of land and soils so that environmental values are protected.*	**Not relevant** Impacts are deemed low risk, with routine management procedures put in place to manage any potential impacts during both construction and operation, e.g., through the accidental or emergency release (e.g., spill or leak) of environmentally hazardous liquids.
People	Social surroundings	*To protect social surroundings from significant harm.*	**Environmental factor** Social surroundings in the vicinity of the Proposal have the potential to be impacted by noise. Refer to section 9. **Other environmental factor** Potential impacts associated with heritage, traffic and visual aspects of the Proposal are not expected to be significant in the context of the industrial nature of the location. Studies have been completed or are underway to confirm and predict impacts, which will be considered by other decision-making authorities through applications for secondary approvals, where relevant. Note: potential impacts to social surroundings associated with fugitive dust and odour emissions are discussed under the Air Quality environmental factor.
	Human health	*To protect human health from significant harm.*	**Not relevant** The Proposal will not handle, store or transport radioactive materials or result in the build-up and release of radioactive substances and emissions that could significantly impact on human health. Note: the Proposal will quantitatively assess potential major process safety events with potential for off-site impacts and implement controls to maintain injurious consequence contours within the site boundary.
Sea	Coastal processes	*To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.*	**Not relevant** The Proposal does not result in any modification of the coastline or near-shore environment.
	Benthic communities & habitats	*To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.*	**Other environmental factor** Marine environmental quality could be indirectly impacted through changes to marine environmental quality as a result of discharge

Theme	Factor	Objective	Consideration
	Marine environmental quality	*To maintain the quality of water, sediment and biota so that environmental values are protected.*	of wastewater to the marine environment via the SDOOL. (refer to Appendix B).
	Marine fauna	*To protect marine fauna so that biological diversity and ecological integrity are maintained.*	
Water	Inland waters	*To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.*	**Other environmental factor** The Proposal is not expected to result in significant impacts to Inland Waters, due to routine management and monitoring procedures that will be in place to manage any potential impacts during both construction and operation.

4.2 Summary of environmental factors relevant to the Proposal

Based on the assessment of the potential environmental impacts associated with the Proposal, the environmental factors considered relevant to the Proposal and addressed in this ERD are:

1. Air quality (section 5);
2. Greenhouse gas emissions (section 6);
3. Flora and vegetation (section 7);
4. Terrestrial fauna (section 8); and
5. Social surroundings (section 9);

These environmental factors are addressed in this ERD in the following format:

- Statement of relevant EPA objective;
- Relevant policy and guidance;
- Description of the receiving environment relevant to the environmental factor;
- Description of mitigation, including application of the mitigation hierarchy (i.e., avoid, minimise, rehabilitate and offset);
- Definition of identified and predicted direct and indirect impacts on the environmental values for the environmental factor;
- Assessment of the extent and significance of residual impacts to the environmental values of the environmental factor of the proposal, including cumulative impacts; and
- Description of the predicted environmental outcome as assessed against the EPA's objective for the environmental factor.

Other environmental factors considered relevant to the Proposal are discussed in Appendix B:

- Social surroundings (other);
- Benthic communities and habitats, marine environmental quality and marine fauna; and
- Inland waters.

5. Air quality

This section provides a detailed assessment of potential air quality impacts associated with the Proposal in the context of the EPA's objective for the environmental factor air quality. The assessment describes the receiving environment, identifies key emission sources and pollutants of interest, and presents the methodology and outcomes of air dispersion modelling undertaken for the Proposal. The effectiveness of embedded design controls and proposed mitigation measures is evaluated, including consideration of normal and upset operating conditions and cumulative impacts within the RIZ and wider WTC area. The significance of residual impacts is then assessed against relevant criteria and guidance to demonstrate whether the EPA's objective can be met.

5.1 Summary

The air quality assessment undertaken for the Proposal demonstrates that emissions to air can be effectively managed such that impacts to sensitive receptors are not significant, comply with relevant criteria. Consequerntly, the EPA's objective to maintain air quality and minimise emissions is expected to be met.

Air emissions associated with construction and operation of the Proposal have been comprehensively characterised and assessed through detailed dispersion modelling, including consideration of point and non-point sources, upset conditions (including flaring events) and cumulative impacts within the RIZ. Predicted ground level concentrations (GLCs) of key pollutants at sensitive receptors are within applicable assessment criteria, including relevant ambient air quality guideline values and the requirements of the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999. Cumulative modelling confirms that the Proposal contributes a minor increment to existing background air quality and does not result in exceedances of applicable standards.

A range of embedded design controls and operational mitigation measures have been incorporated to avoid and minimise emissions, including enclosed materials handling systems, dust extraction and filtration, off-gas treatment (including thermal oxidisers and baghouses) and controlled management of abnormal operating conditions. These measures represent application of the mitigation hierarchy and are consistent with contemporary industry practice.

Based on the assessment of predicted impacts and the implementation of proposed mitigation measures, residual air quality impacts are not significant, including under reasonably foreseeable upset conditions. The Proposal is, therefore, not expected to adversely affect environmental values or human health and amenity.

Accordingly, it is concluded that the Proposal will meet the EPA's objective for air quality, and that potential impacts can be adequately regulated through other statutory processes, including Part V approvals under the EP Act.

5.2 EPA environmental factor and objective

The EPA's objective for the air quality environmental factor is "*To maintain air quality and minimise emissions so that environmental values are protected"* (EPA, 2020).

5.3 Relevant policy and guidance

Legislation, policy and guidance relevant to the assessment of air quality is described in Table 5-1.

Table 5-1: Relevant legislation, policy and guidance

Policy or guidance	How the policy or guidance has been considered
National	
National Environment Protection Measure for Ambient Air Quality (Ambient Air Quality NEPM) (DWER, 2021b)	Established national standards for key ambient pollutants (NO_2, SO_2, CO, O_3, $PM_{2.5}$ and PM_{10})
State	
Environmental Factor Guideline: Air quality	Sets out the air quality factor objectives and the information required for a Part IV assessment.
Environmental Factor Guideline: Social surroundings	Focuses on protecting people from significant harm to amenity, heritage and other social values where these are affected by physical environmental changes including odour and dust emissions.
Environmental Protection (Kwinana) (Atmospheric Wastes) Policy (Kwinana EPP), and associated Regulations 1992	Establishes air quality standards specifically for the Kwinana industrial areas of the KIA and RIZ. Delineates areas to provide a basis for allocating emission limits to industry to ensure cumulative concentrations remain below specified limits (Areas A, B and C as shown on Figure 5-1). As the Proposal is situated within the RIZ, the Kwinana EPP requires that modelled results must be considered not only at nominated receptors but must also be interpreted in line with the EPP Policy areas.
Guideline - Air Emissions (draft)	Guidance on ambient air quality guideline values (AGVs) with the aim of protecting human health. Currently in draft format but used where the Ambient Air Quality NEPM does not provide more stringent standards and is specifically applicable to assessment of prescribed premises under Part V of the EP Act with an identified air emission component. Defines SO_2, NO_2 and PM_{10} as criteria pollutants for which the assessment approach requires AGVs to be met at all existing and future off-site sensitive receptors in the modelling domain.
Guideline - Dust Emissions (draft)	Details the requirements for dust emission impact assessment (source characterisation, modelling or monitoring, meteorology, receptors) for prescribed premises; still listed as draft but used as contemporary guidance.
Air Quality Modelling Guidance Notes	Technical guidance for emissions and air dispersion modelling.

5.4 Receiving environment

5.4.1 Studies and surveys

The assessment of potential air quality impacts associated with the Proposal has been informed by a modelling assessment (ETA, 2026). The following sections outline the assessment approach and include the methodology applied to define the meteorological characteristics of the Proposal relevant to the location, the emissions estimation, the air dispersion model, and the ambient assessment criteria (AGVs) selected for the purposes of determining the significance of the dispersion model results and, therefore, the potential impact.

The study structure is summarised in Plate 11.

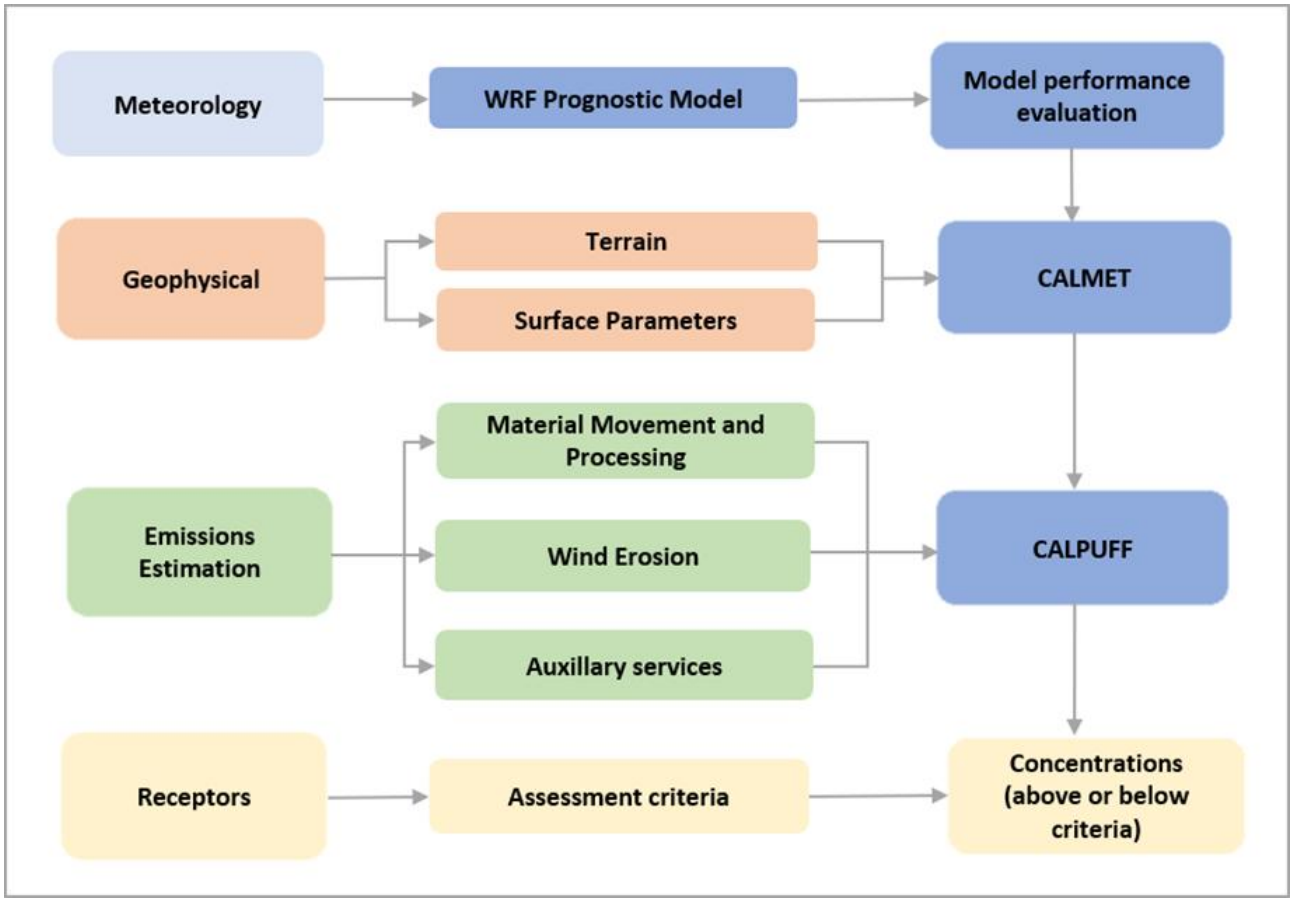


Plate 11: Air quality assessment – study approach (ETA, 2026)

5.4.2 Existing environment

The climate and meteorological characteristics of any region control the dispersion, transformation and removal (or deposition) of pollutants from the atmosphere. This section outlines the key climate and meteorological characteristics relevant to pollutant dispersion, transformation and deposition and, therefore, ambient air quality.

5.4.2.1 Local wind conditions

Representative meteorological monitoring data was sourced from three Automatic Weather Stations (AWS) (as shown on Figure 5-1):

- Bureau of Meteorology (BoM) weather station at Jandakot Airport;
- KIC meteorological monitoring station, Alcoa Lake “A”, located approximately 2.5 km northeast of the Proposal; and
- BHP NiW (NKW) Charles Street AWS, noting that this station is currently located in the Development Envelope.

Each station measures wind at 10 m above ground level and is situated in a relatively clear area with minimal obstructions.

Legend

- Development Envelope
- Kwinana Atmospheric Waste Policy Boundary (DWER_065)
- Air quality receptors
- Weather stations (DPIRD-075)

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:78,125 at A3

0 1 2
Kilometers

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

AIR QUALITY ASSESSMENT

FIGURE 5-1

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_05_01_Air Quality Assessment

Data availability was assessed for each meteorological station:

- BoM Jandakot Airport data was available from 1996 to 2024 with data recovery above 96%;
- Data was made available for the KIC station from 2010 to November 2025 with data recovery above 98%; and
- Data was available for the NKW Charles Street station (31T7) from June 2020 to June 2024 with data recovery above 98% for wind speed, direction, and rainfall (temperature data recovery was 78%).

A comparison of the wind characteristics as measured at the KIC and NKW locations is shown in the wind roses in Figure 5-2. Wind roses provide a graphical representation of the frequency distribution of wind speed and direction. Moderate easterlies and stronger south-westerlies dominate the wind pattern at both locations.

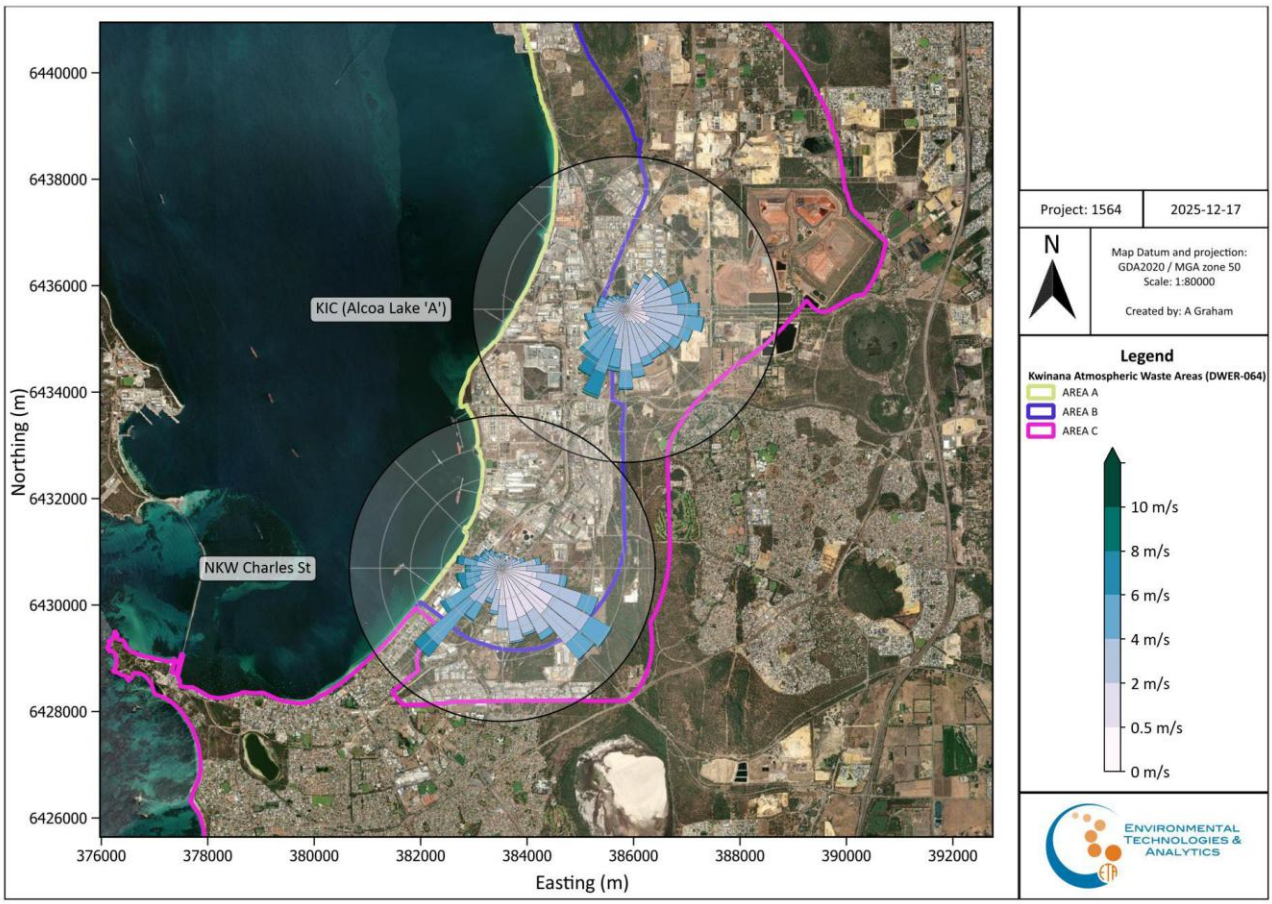


Figure 5-2: Wind rose overlay (ETA, 2026)

5.4.2.2 Local air quality

The existing air quality in the region is influenced by industries located within the WTC and from other localised anthropogenic sources, including vehicles and commercial activities. On a broader regional scale, natural sources such as the ocean winds, wind erosion and smoke from hazard reduction burning and bushfires also influence air quality. Long-term ambient air quality monitoring data, undertaken by DWER, is available for the community locations adjacent to the WTC (Table 5-2).

Table 5-2: DWER ambient air quality monitoring locations

Monitoring location	Parameter measured					
	PM_{10}	$PM_{2.5}$	TSP	SO_2	NO_2	CO
Wattleup				✓		
South Lake	✓	✓		✓	✓	✓
Rockingham				✓	✓	

DWER modelling guidelines (DoE, 2006) do not specify a preferred statistic for representing background ambient air quality. Procedures published by the Victorian Government (2001) specify the use of the 70th percentile of measured ambient concentrations as a constant background for air modelling; however, this statistic is not reported by DWER in its ambient data reports.

The 75th percentile is considered a suitably conservative statistic to define typical short-term (1-hour and 24-hour average) background concentrations for evaluating the potential cumulative impacts of the Proposal, with the annual average being used for the longer-term assessment period. Although the 75th percentile and annual average concentrations do not vary considerably over the period that monitoring records were reviewed, the highest concentrations recorded have generally been used in this assessment to provide an added level of conservatism.

The values adopted as representing background (existing) air quality in the region are summarised in Table 5-3.

Table 5-3: Background air quality – values adopted for cumulative impact assessment

Pollutant	Location	Averaging period	Statistic	Concentration (µg/m^3)	% of criteria
PM_{10}	South Lake	24-hour	75th percentile	22	43%
		Annual	Average	18	71%
$PM_{2.5}$	South Lake	24-hour	75th percentile	11	42%
		Annual	Average	9	110%
SO_2	Wattleup	1-hour	75th percentile	54	11%
		24-hour	75th percentile	9	6%
		Annual	Average	6	11%
NO_2	Rockingham	1-hour	75th percentile	37	23%
		Annual	Average	10.3	33%

5.4.2.3 Topography

The Proposal is on the coastal flats at approximately 5 mAHD with the ocean to the west (Figure 2-1). Approximately 4 km to the east there is a line of dunes with elevations of up to approximately 60 mAHD. The topography of the area is not expected to influence plume dispersion at nearby sensitive receptors.

5.4.2.4 Sensitive receptors

Sensitive receptors are located within the industrial area and at greater distances in the suburbs of North Rockingham, Leda, Calista and Medina. The receptors considered in this assessment include:

- Cee & See Caravan Park, North Rockingham to the southwest of the Proposal (represents the nearest residential area);
- Residential locations in North Rockingham, Calista and Hillman located within Kwinana EPP Area C to the south-southwest, east and south-southeast of the Proposal, respectively; and

- Community receptor locations (recreational and commercial premises [bottle shop, café and caretaker residence]) in Wells Park (Kwinana EPP Area A).

Potential impacts to neighbouring premises in the WTC (Kwinana EPP Area A) will be considered in future iteration of the Air Quality Modelling Assessment, which will inform the application for works approval to be submitted to DWER.

The discrete model receptors used in the assessment are described in Table 5-4 and shown on Figure 5-1.

Table 5-4: Discrete model receptors of interest and classification

Receptor ID	Description	Location	Co-ordinates		Receptor Type
			mE	mN	
R1	North Rockingham	Boundary of Cee & See Caravan Park with CBH (Kwinana EPP Area B).	382130	6429960	Sensitive – residential area
R2	North Rockingham		382273	6429850	
R3	Hillman West	Residential suburb (Kwinana EPP Area C).	383316	6427956	
R4	Hillman West		384195	6427941	
R5	Calista South (Runnymead Gate)	Residential suburb (Kwinana EPP Area C).	387208	6429266	
R6	Calista Central (Wellard Road)		387252	6431124	
R7	Wells Park	• Single residential premises – attached to commercial premises. • Recreational area.	383062	6431509	Sensitive – commercial and recreational area

5.5 Proposed mitigation

The following mitigation measures will be applied at the Proposal:

- ESF primary off-gas from the metallurgical baths and furnace ingress air will be combusted by a thermal oxidiser and, after cooling via dilution, pass through a baghouse to remove entrained particulate matter prior to release to atmosphere via the stack;
- Secondary emissions in the ESF are controlled by extraction of fumes and dust generated at the tapholes and metal casting area, reducing workplace exposure and mitigating fugitive emissions escaping the plant, and directed to the primary off-gas baghouse and stack;
- DRP process and cooling gas is cooled and cleaned via a wet scrubber and CO_2 absorption system prior to being re-used as a fuel for process heating (offsetting natural gas use) prior to discharge to the atmosphere via the process gas heater stack;
- Dust collected at the baghouses will be loaded into a dust handling tote to facilitate easy transportation ahead of disposal of the dust; and
- Fugitive dust will be mitigated by a closed material handling system with dust management at all transfer points and a dedicated baghouse. The raw materials handling system includes receiving hoppers, covered conveyors and enclosed batching bins. Most materials arrive at the Proposal in sealed bulk bags or bulk containers and are transferred directly into the feed hoppers using a front-end loader or mechanical lifting system. The site will also have a road cleaning program in place.

5.6 Potential environmental impacts

Potential air quality impacts associated with the Proposal are described in the following sections.

5.6.1 Identified environmental impacts

The Proposal has the potential to impact human health and amenity via emissions to air causing a reduction in ambient air quality.

5.6.1.1 Pollutants of interest

Based on the key processes associated with the Proposal, the pollutants of interest that have been assessed are summarised in Table 5-5.

Table 5-5: Air pollutants of interest

Pollutant to be assessed		
Particulate matter (PM)	Airborne particles are a broad class of diverse substances that may be solid or liquid (liquid particles are often called aerosols) and are produced by a wide range of natural and human activities. Airborne particles are commonly classified by their size as total suspended particles (TSP), visibility reducing particles (PM_2), and inhalable particles (coarse fraction PM_{10} and fine fraction $PM_{2.5}$). Proposal sources are principally handling of ore/intermediate products, processing and wind generated surface erosion.	
	PM_{10}	Inhalable particles are grouped into two size categories: those with a diameter of up to 10 µm (PM_{10}) and those with a diameter of up to 2.5 µm ($PM_{2.5}$). Inhalable particles are associated with increases in respiratory illnesses such as asthma, bronchitis and emphysema, with an increase in risk related to their size, chemical composition and concentration. Particles in the PM_{10} size fraction have been strongly associated with increases in the daily prevalence of respiratory symptoms, hospital admissions and mortality.
	PM2.5	Particles in the $PM_{2.5}$ size fraction can be inhaled more deeply into the lungs than PM_{10} and have been associated with health effects like those of PM_{10}. There is some evidence to suggest that $PM_{2.5}$ might be more harmful to health than other size fractions. No lower limit for the onset of adverse health effects has yet been observed.
	TSP	Total suspended particulates (TSP) refers to the total amount of the PM suspended in air, typically up to 50 µm. These larger particles are usually filtered by the human nose and throat so do not enter the lungs. These size particles are primarily associated with amenity or visibility issues and are likely to be removed by gravitational settling within a short time of being emitted (i.e. they settle to the ground or other surfaces quickly).
Production and combustion gases	Nitrogen dioxide	Nitrogen dioxide (NO_2) is a brownish coloured gas with a pungent odour. It exists in the atmosphere in equilibrium with nitric oxide (NO). The mixture of these two gases is referred to as oxide of nitrogen or nitrogen oxides (NOx). NOx is a product of combustion processes. NO_2 can cause damage to the human respiratory tract, increasing a person's susceptibility to respiratory infections and asthma. Sensitive populations, such as the elderly, children and people with existing health conditions are most susceptible to the adverse effects of NO_2 exposure. NO_2 can also cause damage to plants, especially in the presence of other pollutants such as ozone and sulphur dioxide. NOx is also present in the reactions that lead to photochemical smog formation.
	Sulphur dioxide	Sulphur dioxide (SO_2) is a strong-smelling, colourless gas that can irritate the lungs, and can be particularly harmful for people with asthma.
	Hydrogen sulfide	Hydrogen sulfide (H_2S) is a toxic, odorous gas that can cause both acute and chronic environmental impacts when released to the atmosphere. At elevated concentrations, H_2S is harmful to humans and fauna, causing respiratory irritation, neurological effects and, in extreme cases, fatality; at lower concentrations it can generate odour nuisance, and has the potential for amenity impacts to nearby communities.

Pollutant to be assessed		
		In the environment, H_2S can oxidise to form sulfur dioxide (SO_2) and subsequently sulfuric acid, contributing to acid deposition that may alter soil and surface water chemistry, mobilise metals and stress vegetation and aquatic ecosystems.
	Carbon monoxide	Carbon monoxide (CO) is a colourless, odourless gas that can cause significant environmental and human health impacts when emitted at elevated concentrations. CO is highly toxic because it binds to haemoglobin more readily than oxygen, reducing the blood's oxygen-carrying capacity and potentially causing headaches, dizziness, impaired cognition and, at high concentrations, unconsciousness or death in humans and fauna. CO contributes indirectly to ground-level ozone (O_3) formation through atmospheric photochemical reactions with nitrogen oxides (NO_x), thereby exacerbating associated impacts on vegetation and respiratory health.

5.6.1.2 Emission sources

The sources of the air emissions and associated pollutants in the Proposal are summarised in Table 5-6.

Table 5-6: Pollutant sources

Source	Pollutant				
	Particulate matter[1]	NOx	SOx	H_2S	CO
DRP	✓	✓	✓	✓	✓
ESF	✓	✓	✓	✓	✓
Balance of plant	✓				

(1) TSP, PM_{10} and $PM_{2.5}$ size fractions

5.6.1.3 Assessment criteria

Comparison of the modelled ground level concentrations (GLCs) to ambient air quality assessment criteria (AGVs) provides an objective evaluation of the potential impact of the Proposal at the identified receptors. Ambient air quality assessment criteria are referenced from the Kwinana EPP, and draft Guideline - Air Emissions released for public consultation by DWER (2019), specifically:

- The *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999* (Kwinana EPP) for sulphur dioxide (SO_2) noting that the statutory standards and limits are applicable (and take precedence) within defined policy areas where:
    - Area A is the area of land on which heavy industry is located;
    - Area B is a buffer area surrounding industry and is zoned for industrial purposes from time to time under a Metropolitan Region Scheme or a town planning scheme;
    - Area C is beyond Areas A and B and is predominantly rural and residential;
- The Kwinana EPP also specifies criteria for TSP; and
- DWER draft ambient air quality guideline values (DWER 2019b; 2021) for all other pollutants of interest.

It is noted that DWER (2019) reference the numerical values from the Ambient Air Quality NEPM prior to 2021 update. The assessment criteria relevant to emissions from the Proposal are summarised in Table 5-7 and Table 5-8.

Table 5-7: Summary of adopted assessment criteria – particulates

Pollutant	Averaging period	National Ambient Standard µg/m³		EPP Kwinana[a]						DWER Ambient Guideline Value[b]		
				Standard			Limit			ppm	µg/m³	
		at 0°C	at 25°C	A	B	C	A	B	C		at 0°C	at 25°C
PM_{10}	24-hour	50	46	N/A						-	50	46
	Annual	25	23							-	25	23
$PM_{2.5}$	24-hour	20[c]	18							-	25	23
	Annual	7[a]	6							-	8	7
TSP	15-minute	N/A		N/A			1,000			N/A		
	24-hour			150	90	90	260	260	150	-	90	82

Notes:

- The Kwinana EPP defines 'standard' as the "*concentration of an atmospheric waste which it is desirable not to exceed*" and 'limit' as the "*concentration of an atmospheric waste which is not to be exceeded.*"
- Assessment criteria is relevant to cumulative sources (i.e. Proposal + Background | Existing Air Quality) with the Proposal considered in terms of incremental contribution.
- NEPM goal from 2025.

Table 5-8: Summary of adopted assessment criteria – gases

Pollutant	Averaging period	National Ambient Standard			EPP Kwinana[a]						DWER Ambient Guideline Value		
					Area Standard			Area Limit					
			µg/m³		µg/m³ at 0°C							µg/m³	
		ppm	at 0°C	at 25°C	A	B	C	A	B	C	ppm	at 0°C	at 25°C
SO_2	1-hour	0.075[a]	215	196	700	500	350	1,400	1,000	700	0.2	570	524
	24-hour	0.02	60	52	200	150	125	365	200	200	0.08	228	210
	1-year	N/A	N/A			60			80		0.02	60	52
NO_2	1-hour	0.08	164	151	N/A						0.12	246	226
	Annual	0.015	31	28							0.03	62	56
CO	1-hour	N/A									25	-	30,000
	8-hour	9.0	11,250	10,000							9	-	10,000
H_2S[c]	30-min	N/A									2[d]	-	-
	1-hour										-	2,800	2,560
	24-hour										-	150	137
	1-year										-	2	1.8

Notes:

[a] The Kwinana EPP defines 'standard' as the "*concentration of an atmospheric waste which it is desirable not to exceed*" and 'limit' as the "*concentration of an atmospheric waste which is not to be exceeded.*"

[b] Assessment criteria is relevant to cumulative sources (i.e. Proposal + Background | Existing Air Quality) with the Proposal considered in terms of incremental contribution.

[c] Health-based assessment criteria (DWER 2019b) lists H_2S in Table A2 (Ambient air quality guidelines for principal toxic substances), where the assessment expectation is for the guideline value to be met at, or everywhere within the modelling domain, excluding industry premises. DWER also notes that odour criteria may be applied, however no quantitative value is advised.

[d] Department of Health WA (DoH) recommended H_2S exposure limits for public protection. DoH notes the 2 ppm limit value (based on the World Health Organisation guidelines) is associated with bronchial effects in some sensitive asthmatics and should not be exceeded. (DoH: Hydrogen sulfide and public health).

5.6.2 Predicted environmental impacts

The objectives of the air quality modelling assessment of the Proposal are to:

- Estimate the potential operational air quality impact (i.e. maximum GLC of air pollutants attributable to the Proposal) during the planned phasing of the Proposal; and
- Estimate the potential cumulative air quality impact with the implementation of the Proposal.

5.6.2.1 Dispersion model

For this assessment, air dispersion modelling was conducted using the WRF-CALMET-CALPUFF modelling suite. CALPUFF is listed by the USEPA as an alternative regulatory dispersion model for assessing certain near-field applications involving complex meteorological conditions (US Federal Register 2017) and is used extensively throughout Australia for regulatory assessments of industrial facilities. Based on the coastal location and the campaign operating regime of the Proposal, CALPUFF was determined to be suitable for use.

Meteorology – Weather Research Forecast (WRF) model

The Weather Research and Forecast (WRF V4.1) model[8] was used to generate hourly 3-dimensional data for the region. WRF is the next-generation mesoscale numerical weather prediction system. The model was primarily designed to serve both operational forecasting and atmospheric research. WRF features multiple dynamical cores, a 3-dimensional variational data assimilation system and a software architecture allowing for computational parallelism and system extensibility.

CALMET-CALPUFF

The 3-Dimensional meteorological data generated by WRF was input to CALMET for further processing to the finer resolution used in the dispersion modelling (the 'WRF-CALMET methodology'). The output from the CALMET meteorological model is then used to drive the pollution dispersion in the CALPUFF model. Evaluation of model performance, i.e. observational data comparison with WRF predictions was also carried out.

CALPUFF is the dispersion module of the CALMET/CALPUFF suite of models. It is a multi-layer, multi species, non-steady-state puff dispersion model that can simulate the effects of time-varying and space-varying meteorological conditions on pollutant transport, transformation, and removal. The model contains algorithms for near-source effects such as building downwash, partial plume penetration, sub-grid scale interactions as well as longer range effects such as pollutant removal, chemical transformation, vertical wind shear and coastal interaction effects. The model employs dispersion equations based on a Gaussian distribution of pollutants across released puffs and considers the complex arrangement of emissions from point, area, volume and line sources (Scire et al., 2011).

Modelling configuration

The CALPUFF model was configured based on best practice, taking into account principles discussed in the guidelines on air quality models (USEPA, 2016) and the CALPUFF user manual (TRC, 2009). Settings defined in the New South Wales (NSW) Modelling Guidance document (TRC, 2011), which details recommended configuration for model settings by the model developers, were considered. While this document was prepared specifically for dispersion modelling in NSW (Australia), it should be noted that the discussions cover general principles of dispersion that are applicable to any location.

The model was run over a full year of meteorological data (i.e. 2019 was used as a representative meteorological year). The CALPUFF model was set to calculate concentrations both on a network of uniform

[8] Weather Research & Forecasting Model (WRF) | Mesoscale & Microscale Meteorology

gridded receptors (30 km x 20 km domain, with a grid resolution of 200 m) and at the nominated discrete receptor locations. The grid network was consistent with the coverage of the CALMET domain.

Conversion of NOx to NO_2

The atmospheric transformation of nitric oxide (NO) must be accounted for in the modelling, particularly the estimation of NO_2 from modelled NOx concentrations. The amount of NO_2 in the emissions at the point of release is typically in the order of 10% of total NOx (expressed as NO_2 equivalents) for combustion sources, although this can range from between 5% to 40% of total NOx dependent on the nature of the source.

Following the initial release, the NO proportion of the emitted NOx changes through a multi-step process that relies on the complex photochemical reactions of atmospheric ozone and volatile organic compounds. Factors that affect this process include:

- Existing atmospheric and dispersion conditions;
- Presence of pre-cursor pollutants in the plume that affect NO_X to NO_2 conversion, including ozone and volatile organic compounds;
- Solar radiation;
- Distance and duration of plume transport; and
- Combustion conditions.

There are several alternative approaches to account for the transformation of NO to NO_2 that occurs after the exhaust gases are discharged. Measurements around power stations show that a conversion of 25% to 40% can occur within the first 10 km of plume travel. During days with elevated background levels of hydrocarbons (generally originating from bushfires), the conversion is usually below 50% in the first 30 km of travel (Bofinger et al, 1986).

Building wake effects

Airflow around buildings can create zones of strong turbulence and downward mixing on the lee side of a building, known as building downwash. In such cases, the entrainment of exhaust gases released by short stacks or rooftop vents in the wake of a building can result in much higher GLCs close to the source than the model would otherwise predict.

The Plume Rise Model Enhancements (PRIME) module has been used to simulate building downwash effects in the model. Building downwash was accounted for all sources using the PRIME algorithm. Ground elevations for the sources and buildings were extracted from the CALMET dataset to ensure consistency. The major structures associated with the Proposal are summarised in Table 5-9.

Table 5-9: Proposal major structures

Description	Width (m)	Length (m)	Height (m)
CDRI Storage Structure Building	50	145	17
DRP Reactor Tower	10	10	68
Feed Receiving and Storage Structure Building	50	85	17
ESF Smelter Building	13	18	26
Metal Aisle	11	42	15
Batching Plant	TBC	TBC	TBC

Model uncertainty and limitations

As with any modelling assessment of this nature, there are areas of uncertainty in this air quality assessment. To ensure that potential air quality impacts are not underestimated, conservative assumptions have been applied, as appropriate, to provide over-predictions rather than under-predictions of GLCs.

The uncertainty in modelling of extreme events, such as the maximum 1-hour ground-level concentration, is greater than the uncertainty in predicting concentrations averaged over a longer period. Similarly, uncertainty in modelling the maximum predicted GLCs at a discrete location is greater than the uncertainty in the maximum concentration predicted across the entire modelled domain. This is because the modelled concentration at a particular location is very sensitive to small changes in wind direction.

A combination of modelled ground-level concentration statistics (i.e. maximum, 99.9th percentile, 99.5th percentile, 99th percentile, 95th percentile, 90th percentile and 70th percentile) was used to evaluate potential impacts and to account for unusual (stochastic) events (i.e. infrequent adverse meteorology) that can result in significantly higher maximum predicted GLCs at discrete locations compared to other predicted statistics.

5.6.2.2 Emissions inventory

Emissions from all key sources associated with the Proposal have been identified according to accepted methods. The emphasis of the emission estimation and modelling is on the potential impact from the operating phase of the Proposal. Emission estimation for construction and commissioning activities is excluded from the assessment due to their intermittent nature over the life of the Proposal.

In terms of the operational phases and the emissions profile, the following should be noted:

- Start-up of the DRP and ESF plants:
  - Occurs on commercially available ore for the DRP and Commercially available CDRI for the ESF
  - The start-up sequence timings of the plants may not align;
- Operating protocols and procedures will be established on commercial CDRI and pellets before switching to custom made Pilbara pellets and DRI products;
- Independent operation of the DRP and ESF:
  - Operations, when online, will be 24 hours per day and 7 days per week on a 12-hour shift basis (6:00am – 6:00pm nominally);
  - The total CDRI requirement is dependent on the test campaign schedule and operates on a campaign basis to align with the ESF;
  - When not producing CDRI, the shaft furnace will be shut-down;
  - The ESF has two idle regimes:
    - High Idle where the ESF is online with minimal feed being introduced to the furnace, which is maintained hot, and tapping of product performed infrequently;
    - Low Idle where the ESF is drained and inventory minimised except for a small volume of slag in the furnace, which is maintained at ‘warm’ and there is no tapping;
- Shut-down regimes:
  - DRP – three major shut-downs per year between each 2,000 hour campaign. Further shutdowns (i.e. cold shutdown) will occur periodically;
  - ESF – two major shut-downs per year of approximately 4-week duration (each), and two minor shut-downs per year of approximately 1-week duration (each). Cold shut-down involves the ESF being drained, shutdown and allowed to cool in a controlled manner; and
- Reasonably foreseeable process upset conditions resulting in waste process gases being diverted to the DRP Flare or ESF Flare, as relevant.

Based on the process overview, the main emission discharge points and modelled emission characteristics from the Proposal have been identified.

Non-point sources (i.e. modelled area and volume sources assigned to material handling transfer emissions) are described in Table 5-10 and point sources (i.e. stacks and vents) in Table 5-11, with their relative positions shown in Table 5-11. Each point source is defined in terms of physical characteristics (stack location, height above ground and stack diameter at discharge point) and exhaust characteristics (exit velocity and temperature). Note that discharge points with emissions deemed insignificant i.e., contributing to less than 5% of the overall emission profile (based on mass emission rate in g/s) for the corresponding parameter during normal operating conditions are not included in the inventory.

Emission estimates associated with the reasonably foreseeable process upset conditions resulting in waste process gases being diverted to the DRP Flare or ESF Flare (as relevant) are summarised in Table 5-12.

Table 5-10: Modelled non-point source parameters and emission rates

Model Source ID	Emission Source description	Source type (model)	Base Elevation	Height	Area	Modelled Emission Rate (NPI default emission factors)			Units
			m	m	m^2	TSP	PM_{10}	$PM_{2.5}$	
S10	Pellet Stockpile 1	Area	4	5.5	3295	1.11E-05	5.56E-06	1.39E-06	g/m2/s
S11	Pellet Stockpile 2	Area	4	5.5	1237	1.11E-05	5.56E-06	1.39E-06	g/m2/s
S12	Loading Pad	Area	4		1748	1.11E-05	5.56E-06	1.39E-06	g/m2/s
S13	Load hopper 1	Volume	4	2	-	3.00E-01	1.50E-01	7.00E-02	g/s
S14	Load hopper 2	Volume	4	2	-	3.00E-01	1.50E-01	7.00E-02	g/s
S15	Load hopper 3	Volume	4	2	-	3.00E-01	1.50E-01	7.00E-02	g/s
S16	FEL 1	Volume	4	4	-	3.00E-01	1.50E-01	7.00E-02	g/s
	FEL 2	Volume	4	4	-	3.00E-01	1.50E-01	7.00E-02	g/s
S18	Transfer Point 1	Volume	4	10	-	2.50E-04	1.00E-04	5.00E-05	g/s
S19	Transfer Point 2	Volume	4	10	-	2.50E-04	1.00E-04	5.00E-05	g/s
S20	Transfer Point 3	Volume	4	10	-	2.50E-04	1.00E-04	5.00E-05	g/s
S21	Slag Stockpile	Area	4	5.5	823	1.11E-05	5.56E-06	1.39E-06	$g/m^2/s$
S22	Pellet Stockpile 3	Area	4	5.5	755	1.11E-05	5.56E-06	1.39E-06	$g/m^2/s$
S23	Pellet Stockpile 4	Area	4	5.5	1160	1.11E-05	5.56E-06	1.39E-06	$g/m^2/s$
S24	FEL 3	Volume	4	4	-	3.00E-01	1.50E-01	7.00E-02	g/s

Table 5-11: Modelled point source parameters and emission rates

Description	Model ID	Location		Stack height	Stack diam.	Exit velocity	Stack temp.	Maximum emission rates (g/s)						Building wake
		mE	mN	m	m	m/s	K	SO_2	NO_x	PM_{10}	$PM_{2.5}$	H_2S	CO	Y/N
Process Gas Heater exhaust + CO_2 rich stream	S1	383359.38	6430655.84	59	0.811	15.0	500.45	0.201	0.0603	3.43E-02	1.71E-02	0.003629	0.0362	Y
Package Boiler Stack	S2	383403.25	6430698.73	8	0.498	15.0	570.15	2.80E-03	1.40E-01	1.47E-02	7.33E-03	0	8.39E-02	Y
Charging Equipment filter vent 1 (screen house)	S3	383282.21	6430580.74	13	0.393	15.0	298.15	0	0	1.67E-02	8.33E-03	0	0	Y
Charging Equipment filter vent 2 (coating station)	S4	383259.73	6430595.43	6	0.393	15.0	298.15	0	0	1.67E-02	8.33E-03	0	0	Y
Product Equipment filter vent	S5	383351.54	6430659.32	59	0.393	15.0	298.15	0	0	1.67E-02	8.33E-03	0	0	Y
DRP Emergency Flare Stack	S6	383412.77	6430719.95	30	0.138	15.0	1896.85	3.25E-06	3.25E-03	0	0	0	1.95E-03	Y
Material handing baghouse stack	S7	383388.73	6430607.7	38	1.150	20.0	298.15	0	0	5.83E-01	2.92E-01	0	0	Y
ESF Exhaust Stack	S8	383393.18	6430630.49	36	1.350	20.7	382.15	0.406	0.0450	N/A	0.806	0.00217	2.35	Y
ESF Emergency Flare Stack	S9	383405.11	6430617.2	36	0.500	5.6	1383.15	0.408	N/A	2.2	8.7	0.00444	4.69	Y
CDRI Bin baghouse	S25	383305.49	6430561.96	24	0.393	15.0	298.15	0	0	5.00E-02	2.50E-02	0	0	Y

Table 5-12: Point source parameters and emission rates – reasonably foreseeable upset events leading to flaring

Description	Model ID	Location		Stack height	Stack diam.	Exit velocity	Stack temp.	Maximum emission rates (g/s)						Building wake
		mE	mN	m	m	m/s	K	SO_2	NO_x	PM_{10}	$PM_{2.5}$	H_2S	CO	Y/N
DRP Emergency Flare Stack	S6	383412.77	6430719.95	30	0.300	15	1896.85	0	0	0	0	-	-	Y
ESF Emergency Flare Stack – State1[3]	S9	383405.11	6430617.2	40	0.5	5.6	1023.15	6.13E-03	2.92E-02	8.75E-03	4.38E-03	4.67E-03	TBC	Y
ESF Emergency Flare Stack – State2[3]						10.3	1223.15	9.50E-03	4.52E-02	1.36E-02	6.78E-03	7.24E-03	TBC	Y
ESF Emergency Flare Stack – State3[3]						8.9	1123.15	8.91E-03	4.25E-02	1.27E-02	6.36E-03	6.79E-03	TBC	Y
ESF Emergency Flare Stack – State4[3]						18.4	1383.15	1.50E-2	7.14E-02	2.14E-02	1.07E-02	1.14E-02	TBC	Y

5.6.2.3 Model scenarios

Consistent with DWER modelling guidelines (DoE, 2006), the modelling scenario for the Proposal needs to represent the estimate of emissions such that they are "*realistic and that uncertainty is balanced by conservatism*". The model estimates need to account for emissions that are continuous in nature as well as those that are intermittent.

The model scenarios included in this air quality assessment are as follows (refer to section 2.7 for description of operational phases):

- Normal operations:
  - Scenario 1A: Proposal only representative of Phase 1 operations;
  - Scenario 1B: Proposal only representative of Phase 2, 3 and 4 operations;
  - Scenario 2A: Proposal cumulative impact representative of Phase 1 operation with other air quality (sources) in the airshed;
  - Scenario 2B: Proposal cumulative impact representative of Phase 2, 3 and 4 operations with other air quality sources in the airshed;
- Reasonably foreseeable upset conditions:
  - Scenario 3: Short-term high emission rate associated with waste gas flaring:
    - DRP Flare event; and
    - ESF Flare event (under different operating regimes).

5.6.3 Cumulative emissions

Other emission sources approved in the airshed but not yet operational and, therefore, not represented in the background air quality estimates have been considered in the cumulative assessment.

The East Rockingham Waste-To-Energy (WtE) Facility is currently under construction with commissioning pending, and the Rio Tinto proposed BioIron Pilot Plant Project was granted a Works Approval by DWER in July 2025. Both facilities are close enough to the Proposal to require an estimated emission contribution inclusion.

An appropriate and conservative approach to the inclusion of the potential impacts from these facilities involves consideration of the modelled highest GLCs predicted anywhere in the modelling domain for the relevant pollutants. Relevant GLCs for the WtE facility were obtained from the air quality impact assessment report for the facility (EnvAll, 2017), and for the BioIron facility from the DWER Works Approval Decision Report[9] (the associated air quality modelling assessment is not publicly available).

5.7 Assessment of significance of residual impacts

Modelled GLCs attributable to emissions from the Proposal have been compared to ambient air quality assessment criteria (AGVs) to determine the potential impact at nearest sensitive receptors. Operating scenarios representing both normal and possible upset operating conditions have been considered.

The results are presented as GLCs with the respective AGVs, and GLCs as percentages of the AGV for the seven residential receptors. The 99.9th percentile 1-hour average GLCs are also reported in accordance with the DWER (2019) guideline.

[9] https://www.der.wa.gov.au/images/documents/our-work/licences-and-works-approvals/Decisions_/W6964/W6964%2028-07-2025%20DR.pdf

For the purposes of this assessment, the most stringent AGVs have been used, noting these are typically from the NEPM. Consideration of other AGVs (e.g., Kwinana EPP) is described in section 5.6.

5.7.1 Proposal only – normal operating conditions

Predicted GLCs for emissions and comparison with the AGVs at sensitive receptor locations are shown in Table 5-13 with GLCs reported as a percentage of the AGVs in Table 5-14.

Contours (isopleths) of the modelled maximum 1-hour average, 24-hour average and annual average ground-level concentrations predicted across the model domain are presented (where relevant) in Appendix C.

Table 5-13: Predicted GLCs (µg/m^3) at sensitive receptors

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
Scenario 1A – NeoSmelt Phase 1 Operating Regime (Predicted ground level concentration µg/m^3)										
NO_2	1-hour (max)	21	20	6	8	7	6	18	164	Based on NEPC 2021
	1-hour (P99.9)	10	11	4	3	4	5	12		
	Annual	<1	<1	<1	<1	<1	<1	<1	31	
CO	1-hour (max)	15	20	7	6	6	7	14	30,000[2]	DWER 2019, based on NEPC 2021
	1-hour (P99.9)	13	13	5	4	4	6	11		
	8-hour	10	10	3	3	3	3	7	10,000	
SO_2	1-hour (max)	20	19	6	7	7	6	16	350	Kwinana EPP standard for Area C
	1-hour (P99.9)	9	10	4	3	4	5	11		
	24-hour	3	3	<1	<1	<1	1	4	125	
	Annual	<1	<1	<1	<1	<1	<1	<1	60	
PM_{10}	24-hour (max)	10	10	1	1	2	1	16	50	DWER 2019 & DWER 2021, based on NEPC 2021
	Annual	<1	<1	<1	<1	<1	<1	<1	25	
$PM_{2.5}$	24-hour (max)	3	2	<1	<1	<1	<1	4	20	
	Annual	<1	<1	<1	<1	<1	<1	<1	7	
TSP	24-hour (max)	21	19	2	3	4	2	33	90	DWER 2019 & DWER 2021, based on Kwinana EPP standard for Area C and Area B
Scenario 1B – NeoSmelt Phase 2|3 Operating Regime (Predicted ground level concentration µg/m3)										
NO_2	1-hour (max)	21	20	6	8	7	6	18	164	Based on NEPC 2021
	1-hour (P99.9)	10	11	4	3	4	5	12		
	Annual	<1	<1	<1	<1	<1	<1	<1	31	

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
CO	1-hour (max)	15	20	7	6	6	7	14	30,000[2]	DWER 2019, based on NEPC 2021
	1-hour (P99.9)	13	13	5	4	4	6	11		
	8-hour	10	10	3	3	3	3	7	10,000	
SO_2	1-hour (max)	20	19	6	7	7	6	16	350	Kwinana EPP standard for Area C
	1-hour (P99.9)	9	10	4	3	4	5	11		
	24-hour	3	3	<1	<1	<1	1	4	125	
	Annual	<1	<1	<1	<1	<1	<1	<1	60	
PM_{10}	24-hour (max)	10	10	1	1	2	1	16	50	DWER 2019 & DWER 2021, based on NEPC 2021
	Annual	<1	<1	<1	<1	<1	<1	<1	25	
$PM_{2.5}$	24-hour (max)	3	2	<1	<1	<1	<1	4	20	
	Annual	<1	<1	<1	<1	<1	<1	<1	7	
TSP	24-hour (max)	21	19	2	3	4	2	33	90	DWER 2019 & DWER 2021, based on Kwinana EPP standard for Area C and Area B

Note:
[1] At 0°C conditions unless otherwise stated.
[2] At 25°C.

Table 5-14: Predicted GLCs as percentages of AGVs at sensitive receptors

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
Scenario 1A – NeoSmelt Phase 1 Operating Regime (Predicted GLCs as percentages of AGVs)										
NO_2	1-hour (max)	12.8%	12.2%	3.7%	4.9%	4.3%	3.7%	11.0%	164	Based on NEPC 2021
	1-hour (P99.9)	6.1%	6.7%	2.4%	1.8%	2.4%	3.0%	7.3%		
	Annual	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	31	
CO	1-hour (max.)	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	30000	DWER 2019, based on NEPC 2021
	1-hour (P99.9)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
	8-hour (max.)	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	10000	
SO_2	1-hour (max)	5.7%	5.4%	1.7%	2.0%	2.0%	1.7%	4.6%	350	Kwinana EPP standard for Area C
	1-hour (P99.9)	2.6%	2.9%	1.1%	0.9%	1.1%	1.4%	3.1%		
	24-hour	2.4%	2.4%	0.8%	0.8%	0.8%	0.8%	3.2%	125	
	Annual	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	60	
PM_{10}	24-hour (max)	20.0%	20.0%	2.0%	2.0%	4.0%	2.0%	32.0%	50	DWER 2019 & DWER 2021, based
	Annual	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	25	
$PM_{2.5}$	24-hour (max)	15.0%	10.0%	5.0%	5.0%	5.0%	5.0%	20.0%	20	

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
	Annual	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	7	on NEPC 2021
TSP	24-hour (max)	23.3%	21.1%	2.2%	3.3%	4.4%	2.2%	36.7%	90	DWER 2019 & DWER 2021, based on Kwinana EPP standard for Area C and Area B
Scenario 1B – NeoSmelt Phase 2|3 Operating Regime (Predicted GLCs as percentages of AGVs)										
NO_2	1-hour (max)	12.8%	12.2%	3.7%	4.9%	4.3%	3.7%	11.0%	164	Based on NEPC 2021
	1-hour (P99.9)	6.1%	6.7%	2.4%	1.8%	2.4%	3.0%	7.3%		
	Annual	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	31	
CO	1-hour (max.)	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	30000	DWER 2019, based on NEPC 2021
	1-hour (P99.9)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
	8-hour (max.)	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	10000	
SO_2	1-hour (max)	5.7%	5.4%	1.7%	2.0%	2.0%	1.7%	4.6%	350	Kwinana EPP standard for Area C
	1-hour (P99.9)	2.6%	2.9%	1.1%	0.9%	1.1%	1.4%	3.1%		
	24-hour	2.4%	2.4%	0.8%	0.8%	0.8%	0.8%	3.2%	125	
	Annual	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	60	
PM_{10}	24-hour (max)	20.0%	20.0%	2.0%	2.0%	4.0%	2.0%	32.0%	50	DWER 2019 & DWER 2021, based on NEPC 2021
	Annual	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	25	
$PM_{2.5}$	24-hour (max)	15.0%	10.0%	5.0%	5.0%	5.0%	5.0%	20.0%	20	
	Annual	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	7	
TSP	24-hour (max)	23.3%	21.1%	2.2%	3.3%	4.4%	2.2%	36.7%	90	DWER 2019 & DWER 2021, based on Kwinana EPP standard for Area C and Area B

Note:
[1] At 0°C conditions unless otherwise stated.
[2] Assumed background concentration based on DWER measured data.

5.7.2 Proposal only – possible upset operating conditions

Upset conditions that may lead to short-term high emission rates are associated with flaring events of either the DRP or ESF flare. Flaring events are assumed to be, at worst-case, a 1-hour event, with plant design specifications indicating that this event would have the potential to occur once a week (i.e. 52 individual hours in a year). This is a conservative and, therefore, likely over estimation noting the Proposal's plant operating factor is 68% for both the DRP Pilot Plant and ESF Pilot Plant.

The dispersion modelling for each of the flare events described has been modelled with the emissions assumed to occur over all hours in the modelling year. On this basis, only 1-hour modelled results are presented.

Modelled flaring event scenarios are as follows:

- DRP waste gas to flare.
- ESF (with various gas flow rates depending on Phase of process at the time of event):
  - Event Type 1 occurring during Phase 1 i.e. an upset when operating within Model Scenario 1A.
  - Event Type 2 occurring during Phases 2, 3 and 4 i.e. an upset when operating within Model Scenario 1B.
  - Event Type 3 occurring during Phase 2, 3 and 4 i.e. an upset when operating within Model Scenario 1B.
  - Event Type 4 - positive pressure event - assumed to have the potential to occur during any operating phase of the Proposal i.e. an upset when operating within Model Scenario 1A or Scenario 1B.

Predicted GLCs for emissions and comparison with the AGVs at sensitive receptor locations are shown in Table 5-15 with GLCs reported as a percentage of the AGVs in Table 5-16.

Contours (isopleths) of the modelled maximum 1-hour average, 24-hour average and annual average ground-level concentrations predicted across the model domain are presented (where relevant) in Appendix C.

Table 5-15: Summary of modelling results – Scenario 3 upset event leading to flaring (DRP Flare)

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
SO_2	1-hour (max)	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00004	215	Based on NEPC 2021[2]
	1-hour (P99.9)	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00004		
NO_2	1-hour (max)	0.0072	0.0071	0.0037	0.0043	0.0032	0.0031	0.0133	164	Based on NEPC 2021
	1-hour (P99.9)	0.0053	0.0055	0.0017	0.0016	0.0021	0.0022	0.0124		
H_2S	1-hour (max)	-	-	-	-	-	-	-	2,560	DWER, 2019
	1-hour (P99.9)	-	-	-	-	-	-	-		
CO	1-hour (max)	0.004	0.004	0.002	0.003	0.002	0.002	0.008	30,000	DWER, 2019
	1-hour (P99.9)	0.003	0.003	0.001	0.001	0.001	0.001	0.007		
PM_{10}	1-hour (max)	0.018	0.018	0.009	0.011	0.008	0.008	0.033		
	1-hour (P99.9)	0.013	0.014	0.004	0.004	0.005	0.006	0.031		
$PM_{2.5}$	1-hour (max)	0.07	0.07	0.04	0.04	0.03	0.03	0.13		N/A
	1-hour (P99.9)	0.05	0.06	0.02	0.01	0.02	0.02	0.12		

Note:

[1] At ambient conditions unless otherwise stated.

[2] For upset operating conditions (which are expected for short term durations) reference has been made to the NEPC criteria (health based) noting this is more stringent than the Kwinana EPP standard for Area C.

Table 5-16: Summary of modelling results – Scenario 3 upset event leading to flaring (ESF Flare)

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
ESF Flare event Type 1										
SO_2	1-hour (max)	3.4	3.3	1.7	1.8	1.3	1.3	4.4	215	Based on NEPC 2021[2]
	1-hour (P99.9)	2.3	2.4	0.72	0.74	0.85	0.98	3.1		
NO_2	1-hour (max)	0.24	0.24	0.12	0.13	0.09	0.10	0.32	164	Based on NEPC 2021
	1-hour (P99.9)	0.16	0.17	0.05	0.05	0.06	0.07	0.22		
H_2S	1-hour (max)	0.037	0.036	0.018	0.020	0.014	0.015	0.048	2,560	DWER, 2019
	1-hour (P99.9)	0.025	0.026	0.008	0.008	0.009	0.011	0.034		
CO	1-hour (max)	39.3	38.0	19.4	20.9	14.7	15.4	50.9	30,000	DWER, 2019
	1-hour (P99.9)	26.0	27.5	8.3	8.5	9.8	1.1	3.5		
PM_{10}	1-hour (max)	18.4	17.8	9.1	9.7	6.9	7.2	23.8		
	1-hour (P99.9)	12.1	12.9	3.9	4.0	4.6	5.3	16.6		N/A
$PM_{2.5}$	1-hour (max)	72.9	70.5	36.0	38.7	27.3	28.5	93.4		
	1-hour (P99.9)	48.2	51.0	15.3	15.7	18.2	20.9	65.8		
ESF Flare event Type 2										
SO_2	1-hour (max)	2.9	2.8	0.94	1.0	1.1	1.0	2.6	215	Based on NEPC 2021[2]
	1-hour (P99.9)	1.3	1.7	0.57	0.50	0.66	0.78	1.9		
NO_2	1-hour (max)	0.32	0.31	0.10	0.11	0.12	0.11	0.29	164	Based on NEPC 2021
	1-hour (P99.9)	0.14	0.19	0.06	0.06	0.07	0.09	021		
H_2S	1-hour (max)	0.031	0.031	0.010	0.011	0.012	0.011	0.028	2,560	DWER, 2019
	1-hour (P99.9)	0.014	0.019	0.006	0.005	0.007	0.009	0.020		
CO	1-hour (max)	33.1	32.4	10.8	11.8	12.4	11.6	29.9	30,000	DWER, 2019
	1-hour (P99.9)	14.5	19.6	6.61	5.78	7.61	9.03	21.6		
PM_{10}	1-hour (max)	15.5	15.2	0.51	0.55	0.58	0.55	14.0		N/A
	1-hour (P99.9)	6.8	9.2	3.1	2.7	3.6	4.2	10.1		
$PM_{2.5}$	1-hour (max)	61.4	60.0	20.1	21.9	23.1	21.6	55.6		
	1-hour (P99.9)	27.0	36.5	12.3	10.7	14.1	16.8	10.1		
ESF Flare event Type 3										
SO_2	1-hour (max)	2.9	2.8	1.1	1.1	1.3	1.2	3.1	215	Based on NEPC 2021[2]
	1-hour (P99.9)	1.5	2.1	0.67	0.53	0.74	0.86	2.2		
NO_2	1-hour (max)	0.31	0.29	0.12	0.11	0.13	0.13	0.32	164	Based on NEPC 2021
	1-hour (P99.9)	0.16	0.22	0.07	0.05	0.08	0.09	0.23		
H_2S	1-hour (max)	0.032	0.030	0.012	0.012	0.014	0.013	0.034	2,560	DWER, 2019
	1-hour (P99.9)	0.017	0.023	0.007	0.006	0.008	0.009	0.024		
CO	1-hour (max)	33.7	32.1	12.8	12.6	14.4	14.0	35.6	30,000	DWER, 2019
	1-hour (P99.9)	17.6	23.9	7.8	6.0	8.5	9.9	25.0		
PM_{10}	1-hour (max)	15.8	15.0	6.0	5.9	6.7	6.6	16.7		N/A
	1-hour (P99.9)	8.2	11.2	3.7	2.8	4.0	4.6	11.7		
$PM_{2.5}$	1-hour (max)	62.6	59.4	23.9	23.3	26.7	25.9	66.0		

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
	1-hour (P99.9)	32.6	44.3	14.4	11.2	15.8	18.3	46.4		
ESF Flare event Type 4										
Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	AGV Reference
SO_2	1-hour (max)	3.0	2.8	1.2	1.2	1.3	1.2	3.1	215	Based on NEPC 2021[2]
	1-hour (P99.9)	1.5	2.1	0.69	0.50	0.75	0.90	2.2		
NO_2	1-hour (max)	0.033	0.031	0.013	0.013	0.014	0.014	0.034	164	Based on NEPC 2021[2]
	1-hour (P99.9)	0.017	0.023	0.008	0.005	0.008	0.010	0.024		
H_2S	1-hour (max)	0.033	0.031	0.013	0.013	0.014	0.014	0.034	2,560	DWER, 2019
	1-hour (P99.9)	0.017	0.023	0.008	0.005	0.008	0.010	0.024		
CO	1-hour (max)	34.8	32.4	13.5	13.5	14.8	14.3	36.1	30,000	DWER, 2019
	1-hour (P99.9)	17.8	24.1	8.0	5.7	8.7	10.3	25.7		
PM_{10}	1-hour (max)	16.3	15.2	6.3	6.3	6.9	6.7	16.9		N/A
	1-hour (P99.9)	8.4	11.3	3.7	2.7	4.1	4.9	12.1		
$PM_{2.5}$	1-hour (max)	64.5	60.1	25.1	25.1	27.4	26.5	67.0		
	1-hour (P99.9)	33.1	44.6	14.8	10.6	16.1	19.2	47.7		

Note:

[1] At ambient conditions unless otherwise stated.

[2] For upset operating conditions (which are expected for short term durations) reference has been made to the NEPC criteria (health based) noting this is more stringent than the Kwinana EPP standard for Area C.

5.7.3 Cumulative impacts

Where there is available ambient air quality monitoring data to represent existing ambient air quality, the incremental change in air quality emissions due to the Proposal has been shown in conjunction with this data as an indication of potential cumulative impact.

Predicted GLCs for emissions and comparison with the AGVs at sensitive receptor locations are shown in Table 5-17 with GLCs reported as a percentage of the AGVs in Table 5-18.

Table 5-17: Predicted cumulative GLCs (µg/m³) at sensitive receptors

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	Background[2]	AGV Reference
Scenario 2A – Cumulative Phase 1 Operating Regime (Predicted ground level concentration µg/m³)											
NO_2	1-hour (max)	58	57	43	45	44	43	55	164	37	Based on NEPC 2021
	1-hour (P99.9)	47	48	41	40	41	42	49			
	Annual	10	10	10	10	10	10	10	31	10	
SO_2	1-hour (max)	74	73	60	61	61	60	70	350	54	Kwinana EPP standard for Area C
	1-hour (P99.9)	63	64	58	57	58	59	65			
	24-hour	12	12	9	9	9	10	13	125	9	
	Annual	6	6	6	6	6	6	6	60	6	
PM_{10}	24-hour (max)	32	32	23	23	24	23	38	50	22	DWER, 2019 and DWER, 2021, based on NEPC, 2021
	Annual	18	18	18	18	18	18	18	25	18	
$PM_{2.5}$	24-hour (max)	14	13	11	11	11	11	15	20	11	
	Annual	9	9	9	9	9	9	9	7	9	

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	Background[2]	AGV Reference
Scenario 2B – Cumulative Phase 2|3 Operating Regime (Predicted ground level concentration µg/m³)											
NO_2	1-hour (max)	58	57	43	45	44	43	55	164	37	Based on NEPC 2021
	1-hour (P99.9)	47	48	41	40	41	42	49			
	Annual	10	10	10	10	10	10	10	31	10	
SO_2	1-hour (max)	74	73	60	61	61	60	70	350	54	Kwinana EPP standard for Area C
	1-hour (P99.9)	63	64	58	57	58	59	65			
	24-hour	12	12	9	9	9	10	13	125	9	
	Annual	6	6	6	6	6	6	6	60	6	
PM_{10}	24-hour (max)	32	32	23	23	24	23	38	50	22	DWER 2019 & DWER 2021, based on NEPC 2021
	Annual	18	18	18	18	18	18	18	25	18	
$PM_{2.5}$	24-hour (max)	14	13	11	11	11	11	15	20	11	
	Annual	9	9	9	9	9	9	9	7	9	

Note:

[1] At 0°C conditions unless otherwise stated.

[2] Assumed background concentration based on DWER measured data.

Table 5-18: Predicted cumulative GLCs as percentages of AGVs at sensitive receptors

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	Background[2]	AGV Reference
Scenario 2A – Cumulative Phase 1 Operating Regime (Predicted cumulative GLCs as percentages of AGVs)											
NO_2	1-hour (max)	35	35	26	27	27	26	34	164	23	Based on NEPC 2021
	1-hour (P99.9)	29	29	25	24	25	26	30			
	Annual	32	32	32	32	32	32	32	31	32	
SO_2	1-hour (max)	21	21	17	17	17	17	0%	350	15	Kwinana EPP standard for Area C
	1-hour (P99.9)	18	18	17	16	17	17	19			
	24-hour	10	10	7	7	7	8	10	125	7	
	Annual	10	10	10	10	10	10	10	60	10	
PM_{10}	24-hour (max)	64	64	46	46	48	46	76	50	44	DWER 2019 & DWER 2021, based on NEPC 2021
	Annual	72	72	72	72	72	72	72	25	72	
$PM_{2.5}$	24-hour (max)	70	65	55	55	55	55	75	20	55	
	Annual	129	129	129	129	129	129	129	7	129	
Scenario 2B – Cumulative Phase 2|3 Operating Regime (Predicted cumulative GLCs as percentages of AGVs)											
NO_2	1-hour (max)	35	35	26	27	27	26	34	164	23	Based on NEPC 2021
	1-hour (P99.9)	29	29	25	24	25	26	30		23	
	Annual	32	32	32	32	32	32	32	31	32	
SO_2	1-hour (max)	21	21	17	17	17	17	20	350	15	Kwinana EPP standard for Area C
	1-hour (P99.9)	18	18	17	16	17	17	19		15	
	24-hour	10	10	7	7	7	8	10	125	7	
	Annual	10	10	10	10	10	10	10	60	10	
PM_{10}	24-hour (max)	64	64	46	46	48	46	76	50	44	

Parameter	Average period	R1	R2	R3	R4	R5	R6	R7	AGV[1]	Background[2]	AGV Reference
	Annual	72	72	72	72	72	72	72	25	72	DWER 2019 & DWER 2021, based on NEPC 2021
$PM_{2.5}$	24-hour (max)	70	65	55	55	55	55	75	20	55	
	Annual	129	129	129	129	129	129	129	7	129	

Note:
[1] At 0°C conditions unless otherwise stated.
[2] Assumed background concentration based on DWER measured data.

5.8 Environmental outcomes

Based on the results of the air quality assessment, it is expected that the Proposal will result in the following residual impacts and outcomes in relation to air quality (Table 5-19). Notwithstanding, the potential impacts identified are not expected to result in significant residual environmental impacts that would be at variance with the EPA's objective for the air quality environmental factor.

Table 5-19: Summary of air quality assessment results

Parameter	Normal Operations (NeoSmelt in Isolation and Cumulative Impact)
PM_{10}	Minimal difference in results between Scenario 1A and Scenario 1B. Proposal results influenced notably by material handling activities, as does the assumed background in the cumulative impact scenarios. Community receptor locations (residential): • Proposal contribution generally less than 25% of the 24-hour assessment criteria increasing to 70% for the cumulative impact. • Highest at the nearest sensitive receptor locations (R1 and R2 i.e. Cee & See Caravan Park, North Rockingham (21% to 23% increasing to 68% to 70% for cumulative impact). • Less than 4% of the 24-hour assessment criteria at the residential suburbs of Hillman, Medina and Calista increasing to less than 52% of the 24-hour assessment criteria for the cumulative impact. • Approximately 36% of the 24-hour assessment criteria at Wells Park (R7) increasing to 84% for the cumulative impact.
$PM_{2.5}$	Minimal difference in results between Scenario 1A and Scenario 1B. Proposal results influenced notably by material handling activities, as does the assumed background in the cumulative impact scenarios. Community receptor locations (residential): • Proposal contribution generally less than 20% of the 24-hour assessment criteria increasing to 66% for the cumulative impact. • Highest at the nearest sensitive receptor locations (R1 and R2 i.e. Cee & See Caravan Park, North Rockingham (10% to 12% of the 24-hour assessment criteria increasing to 59% for cumulative impact). • Less than 2% of the 24-hour assessment criteria at the residential suburbs of Hillman, Medina and Calista increasing to less than 50% of the 24-hour assessment criteria for the cumulative impact. • Approximately 18% of the 24-hour assessment criteria at Wells Park (R7) increasing to 66% for the cumulative impact.
TSP	Minimal difference in results between Scenario 1A and Scenario 1B. Proposal results influenced notably by material handling activities. Community receptor locations (residential): • Proposal contribution generally less than 40% of the 24-hour assessment criteria.

Parameter	Normal Operations (NeoSmelt in Isolation and Cumulative Impact)
	• Highest at the nearest sensitive receptor locations (R1 and R2 i.e. Cee & See Caravan Park, North Rockingham (21% to 23%). • Less than 4% of the 24-hour assessment criteria at the residential suburbs of Hillman, Medina and Calista. • Approximately 36% of the 24-hour assessment criteria at Wells Park (R7).
NO_2	Minimal difference in results between Scenario 1A and Scenario 1B. Community receptor locations (residential): • Generally, less than 10% of the DWER 1-hour assessment criteria and 15% of the more stringent NEPM criteria. • Highest at the nearest sensitive receptor locations (R1 and R2 i.e. Cee & See Caravan Park, North Rockingham) to the south-west of the Proposal. • Less than 5% of both the DWER and NEPM 1-hour assessment criteria at the residential suburbs of Hillman, Medina and Calista. • Less than 8% of the 1-hour criteria at Wells Park (i.e. Community recreation area and commercial premises) and 12% of the NEPM 1-hour assessment criteria reducing by the 99.5th percentile. • Cumulative impact remains less than 36% of assessment criteria. • Annual average criteria (based on 24-hour averages) is not challenged by incremental contribution of NO_2 to the airshed from the Proposal.
SO_2	Minimal difference in results between Scenario 1A and Scenario 1B. Community receptor locations (residential) – compared to the relevant Kwinana EPP Area standard: • R1 and R2 (i.e. Cee & See Caravan Park, North Rockingham within Area B) up to 4% of the 1-hour standard with the 99.9th modelled result reducing to 2% of the EPP Area B standard; approximately 2% of the 24-hour EPP Area B standard. • R3 to R6 (i.e. suburbs of Hillman, Medina and Calista, within EPP Area C – the most stringent of the EPP Areas) are up to 2% of the 1-hour EPP Area C standard; less than 2% of the 24-hour EPP Area C standard. • R7 (i.e. Wells Park, within EPP Area A – the least stringent of the EPP Areas) is 5% of the Area C 1-hour standard and 3% of the Area C 24-hour standard. When compared to the most stringent of the 1-hour average assessment criteria (i.e. the NEPM standard), estimated Proposal emissions lead to ground level concentrations (maximum): • Approach 10% of the assessment criteria at R1 and R2, noting that the 99.9th percentile reduces to 5% indicating few hours in the modelled year when results are at this higher percentage. • R1 and R2 are relatively close together (i.e. and positioned in a non-prevailing wind direction relative to the Proposal). Compared to the most stringent of the 24-hour average assessment criteria (i.e. the NEPM standard): • Approach 5% of the assessment criteria at R1 and R2. • The 99th percentile is less than 1% of the criteria. For cumulative impact, background concentration is 15% of the EPP Area C standard, and 28% comparatively to the NEPC criteria and is more prominent in the cumulative assessment than the Proposal estimates.

Given the above outcomes, no significant residual impacts associated with the Proposal have been identified. Therefore, it is considered that the EPA's management objective for air quality will be met.

6. Greenhouse gas emissions

This section provides a detailed assessment of GHG emissions associated with the Proposal in the context of the EPA's objective for the environmental factor greenhouse gas emissions. The assessment quantifies Scope 1, Scope 2 and relevant Scope 3 emissions for construction and operation, outlines the methodologies and assumptions applied and considers the emissions profile of the Proposal relative to conventional ironmaking processes. The effectiveness of design and operational measures to minimise emissions is evaluated, including opportunities for transition to lower-emissions energy sources. The significance of residual emissions is then assessed to determine whether the Proposal is consistent with the EPA's objective and broader emissions reduction frameworks.

6.1 Summary

The GHG emissions assessment demonstrates that the Proposal will not result in a significant contribution to net GHG emissions and that the EPA's objective to reduce net GHG emissions is expected to be met.

GHG emissions associated with construction and operation of the Proposal have been quantified in accordance with established methodologies, including Scope 1, Scope 2 and relevant Scope 3 emissions. The Proposal represents a pilot-scale operation with total Scope 1 and Scope 2 emissions below 100,000 tCO_2-e per year and is intended to demonstrate a lower-emissions alternative to conventional blast furnace ironmaking. The use of DRI technology, with the potential transition from natural gas to hydrogen produced from renewable energy, provides a pathway to materially reduce emissions intensity relative to traditional steelmaking processes.

Design and operational measures to minimise emissions have been incorporated, including energy efficiency, process optimisation and the future integration of lower-emissions energy sources. These measures are consistent with the mitigation hierarchy and reflect contemporary approaches for industrial decarbonisation.

The Proposal is designed as a pilot plant, which has a slightly different operating configuration and philosophy to a future potential commercial scale facility, including more frequent plant start-up and shutdown. This results in a higher GHG emissions intensity (per tonne of product) than is possible at commercial scale. The intent of the operation of the pilot is to provide the necessary operational inputs to ensure efficient design of the potential future commercial scale DRI-ESF facility, to enable GHG emissions intensity reductions to be maximised.

Based on the scale and nature of the Proposal, and the application of mitigation measures, residual GHG emissions are not considered significant. The Proposal is not expected to materially contribute to climate change risk at a State or national level and is consistent with broader policy objectives to reduce emissions intensity. Accordingly, it is concluded that the Proposal will meet the EPA's objective for greenhouse gas emissions.

6.2 EPA objective

The EPA's objective for the GHG emissions environmental factor is *'to reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.'* (EPA, 2024).

6.3 Relevant policy and guidance

Legislation, policy and guidance relevant to the assessment of GHG emissions is described in Table 6-1.

Table 6-1: Relevant legislation, policy and guidance

Policy or guidance	How the policy or guidance has been considered
State	
Major Projects Policy 2024[10]	The policy was introduced to streamline approvals and align large-scale industrial projects with the State's net-zero goals. As the Proposal is a decarbonisation project, it benefits from the policy's intent to accelerate projects that are important for the energy transition.
Greenhouse gas emissions factor guidance	The receiving environment and the significance of the factor on the receiving environment has been identified and described; and GHG emission-generating activities that may lead to impacts relevant to this environmental factor have been identified. NeoSmelt has estimated its Scope 1 and Scope 2 GHG emissions and found they are expected to remain below 100,000 tCO_2-e per year. As a result, the Proposal is not expected to require formal assessment by the EPA (EPA, 2024).
Western Australian Climate Change Policy 2020[11]	Outlines the State's plan for a low carbon and climate resilient future and commits to working with all sectors of the economy to achieve net zero by 2050. Priority themes identified are clean manufacturing, transforming energy systems, lower-carbon transport, carbon sequestration, resilient regions and strong government leadership. The Proposal supports the plan for a lower-carbon future with the implementation of lower-emissions manufacturing technology for the steel industry.
Sectoral emissions reduction strategy for Western Australia	The Proposal is a flagship industrial project designed to align directly with the Sectoral Emissions Reduction Strategy (SERS) for Western Australia, which provides a roadmap for the State to reach net zero by 2050, with a specific focus on "hard-to-abate" sectors like iron and steelmaking. The Proposal addresses the SERS by providing a decarbonisation pathway for iron ore, being WA's most significant export.
Commonwealth	
National Greenhouse and Energy Reporting Act 2007 (NGER Act)[12]	Establishes a national framework for corporations to report GHG emissions, energy production, and energy consumption. Reporting is mandatory for facilities or corporations exceeding annual thresholds for combined Scope 1 and Scope 2 emissions (25,000 tonnes of carbon dioxide

[10] https://www.wa.gov.au/system/files/2024-10/greenhouse-gas-emissions-policy-major-projects.pdf
[11] https://www.wa.gov.au/system/files/2020-12/Western_Australian_Climate_Policy.pdf
[12] National Greenhouse and Energy Reporting Act 2007 as amended 2024

Policy or guidance	How the policy or guidance has been considered
	equivalents [tCO_2-e] for facilities; 50,000 tCO_2-e for corporations). Scope 1 (direct) and Scope 2 (indirect from purchased electricity) emissions must be reported; Scope 3 (other indirect) emissions are not required but are often included in best-practice assessments. The energy use and consequent GHG emissions associated with the Proposal will exceed the 25,000 tCO_2-e facility reporting threshold. Therefore, reporting to the National Greenhouse and Energy Reporting Scheme will be required.
Climate Change Act 2022 (Cwlth)[13]	Legislates Australia's commitments to reduce net GHG emissions by 43% below 2005 levels by 2030 and achieve net zero by 2050. The *Climate Change (Consequential Amendments) Act* 2022 (Cwlth) is a critical companion to the *Climate Change Act 2022*, ensuring that Australia's emissions reduction targets are operationalized across the federal legislative framework. Drives sector-based reforms and signals the direction for emissions reduction across all jurisdictions.
National Greenhouse and Energy Reporting (Measurement) Determination 2008[14]	Legislative instrument under the NGER Act specifying the methods, criteria and measurement standards that companies must use to calculate and report their GHG emissions (Scope 1 and 2) and energy production and consumption in Australia. Informs emissions calculation methodology and energy content and emissions factors applied to the Proposal.

6.4 Receiving environment

The scientific consensus among leading authorities such as the Intergovernmental Panel on Climate Change (IPCC 2022) and CSIRO is that rising GHG levels are driving anthropogenic (human-caused) climate change (CSIRO & BOM 2024).

GHGs, released during the construction and operation of the Proposal, will disperse into the atmosphere contributing to cumulative global GHG concentrations regardless of the point of emission.

The CSIRO State of the Climate 2024 Report (CSIRO, 2024) draws on the latest national and international climate research, encompassing observations, analyses and future projections to describe year-to-year variability and longer term changes in Australia's climate. Key points from this report on measured warming trends and forecast trajectories include the following:

- Australia's climate has warmed by an average of 1.51 ± 0.23 °C since national records began in 1910;
- Sea surface temperatures have increased by an average of 1.08 °C since 1900;
- The warming has led to an increase in the frequency of extreme heat events over land and in the oceans;

[13] Climate Change Act 2022 - Federal Register of Legislation
[14] National Greenhouse and Energy Reporting (Measurement) Determination 2008 as amended 2024

- Mass coral bleaching is a stress response of corals occurring primarily due to elevated ocean temperature, with five bleaching events associated with marine heatwaves occurring on the Great Barrier Reef over the past 10 years: in 2016, 2017, 2020, 2022 and 2024:
    - In 2016, bleaching was associated with then record high sea surface temperatures, which in turn led to the largest recorded mass bleaching to date on the Great Barrier Reef;
    - The 2022 event was the first time that mass bleaching occurred on the Reef during a La Niña year. Accumulated thermal stress during the 2024 event was higher than in 2016, although the full impact in terms of bleaching is still being assessed;
    - In 2022 bleaching was also observed on some reefs on Australia's west coast, including Ningaloo Reef. This was due to warm ocean temperatures, driven by the 2021–2022 La Niña. The region's previous severe marine heatwave was driven by the 2010–2011 La Niña, which resulted in bleaching being recorded for the first time on Ningaloo and the closure of several Western Australian fisheries;
- In the south-west of Australia there has been a decrease of around 16% in April to October rainfall since 1970. Across the same region, May to July rainfall has seen the largest reduction, by around 20% since 1970;
- In the south-east of Australia, there has been a decrease of around 9% in April to October rainfall since 1994;
- Heavy short-term rainfall events are becoming more intense;
- There has been a decrease in streamflow at most gauges across Australia since 1970;
- There has been an increase in rainfall and streamflow across parts of northern Australia since the 1970s;
- There has been an increase in extreme fire weather, and a longer fire season, across large parts of the country since the 1950s;
- There has been a decrease in the number of tropical cyclones observed in the Australian region since at least 1982;
- Snow depth, snow cover and number of snow days have decreased in alpine regions since the late 1950s;
- Oceans around Australia are becoming more acidic, with changes happening faster in recent decades; and
- Sea levels are rising around Australia, including more frequent extreme high levels that increase the risk of inundation and damage to coastal infrastructure and communities.

The CSIRO report states that in the coming decades; Australia will experience ongoing changes to its weather and climate which are projected to include:

- Continued increase in air temperatures, with more heat extremes and fewer cold extremes;
- Continued decrease, on average, in cool season rainfall across many regions of southern and eastern Australia, which will likely lead to more time in drought;
- More intense short-duration heavy rainfall events even in regions where the average rainfall decreases or stays the same;
- Continued increase in the number of dangerous fire weather days and a longer fire season for much of southern and eastern Australia;
- Further sea level rise and continued warming and acidification of the oceans around Australia;

- Increased and longer-lasting marine heatwaves that will affect marine environments such as kelp forests and increase the likelihood of more frequent and severe bleaching events in coral reefs around Australia, including the Great Barrier Reef and Ningaloo Reef;
- Fewer tropical cyclones, but with higher intensity on average, and greater impacts when they occur through higher rain rates and higher sea level; and
- Reduced average snow depth in alpine regions, but with variations from year to year.

6.5 Proposed mitigation

The objective of the Proposal is to develop an exportable technology pathway to support decarbonisation of iron and steel supply chains internationally, with the potential to reduce GHG emissions over time. This would include transitioning from coal-dependent ironmaking with an innovative hydrogen-ready direct reduction and electric smelting process, supported by renewable energy where available.

Using natural gas as the primary reductant, combined with renewable electricity, the Proposal has the potential to reduce emissions by approximately 65% compared to traditional blast furnace ironmaking. Further utilisation of renewable energy to power the DRI-ESF facility and hydrogen as a reductant in the DRP could cut the emissions intensity of iron production by up to 80% compared with the traditional methods.

Consistent with the intent of the Proposal, Scope 1 and Scope 2 reductions in GHG emissions from the Proposal are expected to be achieved using renewable energy sources in the grid and the trial of hydrogen to partially replace natural gas in the DRP.

The ability to reduce Scope 3 emissions is limited given that the Proposal is a pilot facility with a relatively short operational life. However, reduction in Proposal Scope 3 emissions is expected as decarbonisation initiatives are progressively applied across the value chain.

Downstream processing of iron at Port Kembla (Safeguard Mechanism covered facility and thus subject to a declining baseline) to finished steel products is expected to comprise most Scope 3 emissions. BlueScope has 2030 reduction targets (relative to a 2018 baseline), including a 12% reduction by 2030 target for steelmaking and 30% reduction target for non-steelmaking, applicable to mid-stream processing comprising cold rolled, coated and painted product processing lines. Thus, the emissions associated with downstream processing are expected to decline within the Proposal lifetime.

Upstream Scope 3 emissions are primarily associated with iron ore mining, pelletising and international maritime transport. Potential reductions are expected due to regulatory frameworks. In particular:

- Australian iron ore suppliers are subject to the Safeguard Mechanism declining baselines on covered facilities;
- International maritime transport emissions are regulated through the International Maritime Organisation driving reductions in GHG emissions from international shipping via binding global standards and enforced by national maritime authorities for vessels trading to their ports; and
- China has made decarbonisation commitments under its Nationally Determined Contribution and, therefore, the pelletisation intensity may reduce as industrial decarbonisation occurs.

Periodic reviews of Scope 3 emissions sources and relevant policy, regulatory and market developments will be carried out over the life of the Proposal.

6.6 Potential environmental impacts

Potential environmental impacts of the Proposal resulting from GHG emissions are described in the following sections.

6.6.1 Greenhouse gas emissions

National and international GHG reporting standards define a set of distinct classes (scopes) of GHG emissions that delineate sources and associated responsibilities. The EPA (2019) defines these scopes as:

- Scope 1 GHG emissions are those released to the atmosphere as a direct result of an activity, or a series of activities, which are part of a proposal being considered by the EPA;
- Scope 2 GHG emissions are those from the independent consumption of an energy product by the proposal; and
- Scope 3 emissions are indirect GHG emissions other than scope 2 emissions that are generated in the wider community. Scope 3 emissions (both upstream and downstream) occur because of the activities of a proposal, but from sources not owned or controlled by the proponent as part of the proposal.

GHG emissions are expressed in units of carbon dioxide equivalent (CO_2-e), which is an aggregate of GHG emissions, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF_3) calculated as an equivalent CO_2 emission by factoring in the global warming potential (GWP) of each gas. The GWP is applied in accordance with the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (the Measurement Determination).

6.6.2 Construction emissions

The direct (Scope 1) GHG emissions during the construction phase of the Proposal will be predominantly related to the combustion of diesel by stationary and mobile equipment. A total of 553 tCO_2-e Scope 1 emissions have been estimated for the construction period, which will occur over a two to three year period.

Some indirect (Scope 2) emissions from the consumption of electricity from the grid may also occur during the construction period; however, these are expected to partially displace Scope 1 emissions described above. Total Scope 1 and Scope 2 emissions would, therefore, be at or below the total predicted Scope 1 emissions described above.

Scope 3 emissions associated with construction have not been estimated at this time due to the high uncertainty during the current phase of the Proposal.

6.6.3 Operational emissions

Emissions associated with the operation of the Proposal are described and estimated in the sections below.

6.6.3.1 Assessment boundary

The organisational boundary is the Proposal comprising the DRP, ESF and auxiliary systems, which is treated for the purposes of the assessment as an isolated entity.

The assessment operational boundary includes all operations that occur at the Proposal, including receipt of goods (e.g., iron ore pellets), processes to convert ore to hot metal, and ancillary activities supporting the process (e.g., workshops, wastewater treatment, waste handling, project vehicles etc).

The hot metal processing via Basic Oxygen Furnace (BOF) and further processing to saleable products are outside the scope of the Proposal and have been considered under Scope 3 emissions.

6.6.4 Assumptions

The following assumptions have been made in the assessment of GHG emissions:

- Energy and resource usage derived from the projections current at the feasibility phase of the Proposal are representative of future emissions;
- The design life of the Proposal is 12 years with an estimated five years of operation; and

- Iron ore pellets have trace carbon content (not included in reported analysis; therefore, assumed to be <0.5%).

Emissions have been calculated for 6,000 hours of operation per year for the scenarios outlined in Table 6-2.

Table 6-2: Operating scenarios

Activity	Parameter	Nominal	Design	Units
DRP & ESF	Operating hours	6,000	6,000	h/year
DRP	CDRI throughput	8.2	11.5	t/hr
DRP	CDRI production	49,200	69,000	tpa
ESF	Hot metal throughput	6.4	8.2	t/hr
ESF	Hot metal production	38,400	49,380	tpa

6.6.5 Exclusions

Potential GHG emissions sources omitted from the assessment include:

- All other facilities outside the Proposal;
- Petroleum based oils and lubricants due to the high uncertainty at this stage of project maturity;
- Petroleum – all mobile equipment and vehicles are assumed to be diesel fuelled; any petroleum or LPG usage is expected to be trivial compared to emissions from other sources;
- Carbon rich materials (including Carbon 94) used as additives to adjust carbon content of the hot metal due to the assumption added carbon would report to the hot metal product and not be emitted as CO_2;
- Carbon reporting to the product has not been subtracted – expected range of 2.5-3.5% equivalent to up to 3,972-6,320 tCO_2-e for the design basis. Excluded due to uncertainty in source of carbon (i.e., may come predominantly from carbon additives also excluded from the inventory);
- SF_6 used in electrical switch gear due to the high uncertainty at this stage of project maturity;
- Fugitive emissions, including methane slip, leaks of refrigerant from building air conditioning units and fugitive gas from Proposal infrastructure are excluded – these emissions are expected to be negligible compared to other emissions sources;
- Scope 3 categories determined not relevant to the Proposal including Category 8 upstream leased assets, Category 13 downstream leased assets, Category 14 franchises and Category 15 investments;
- Use of potentially saleable byproducts (e.g., slag for cement making, solid waste products for sinter plant) are excluded from Scope 3 Category 10 due to high uncertainty; and
- Inbound and outbound logistics are excluded from the direct emissions as they are not included with the scope of the Proposal but are accounted for in the Scope 3 estimates.
- Despite their exclusion, the above sources as relevant to Scope 1 emissions from the Proposal are not expected to be significant and result in emissions exceeding the 100,000 tCO_2-e per year threshold.

6.6.6 Calculation method and emission factors

Scope 1 and 2 emissions were calculated using Method 1 which utilises standard emissions factors prescribed by the Measurement Determination and activity data (projected energy, fuel or materials consumption data) to derive emissions estimates. Fuel energy content and emissions factors used in this assessment are summarised in Table 6-3.

Table 6-3: Hydrocarbon energy content and emissions factors

Fuel Type	Unit	GJ/unit	Emissions factor			Source
			CH_4 ($kgCO_2$-e/GJ)	N_2O ($kgCO_2$-e/GJ)	CO_2 ($kgCO_2$-e/GJ)	
Natural Gas transmitted or distributed in a pipeline	m^3	39.3 x 10^{-3}	51.4	0.1	0.03	NGER Measurement Determination 2025
Diesel oil	kL	38.6	0.1	0.2	69.9	
Anthracite	t	29	90.0	0.04	0.2	

Scope 2 emissions were calculated using the 2024/2025 location based grid emissions factor prescribed by the Measurement Determination (2025) for the South West Interconnected System (SWIS) of 0.5 $kgCO_2$-e per kWh.

6.6.7 Scope 1 emissions

Activities resulting in Scope 1 emissions, primarily from the consumption of natural gas supplied in a pipeline to the Proposal, include:

- Direct reduction of iron ore to CDRI in the DRP using in-situ catalytic gas reforming to produce reducing gases from natural gas;
- Natural gas fuel for the process gas heater in the DRP
- Natural gas fuel for the sulfur oxidiser in the DRP
- Natural gas fuel for pilots on the DRP flare stack
- Natural gas fuel for the ESF thermal oxidiser;
- Natural gas fired launder, tundish and other preheating stations;
- Natural gas fuel for pilots on the ESF flare stack
- Diesel emissions from on-site mobile equipment, including forklift, front end loader and excavator, and backup generator; and
- Use of reagents (anthracite, carbon 94).

Projected fuel and reagent consumption and associated Scope 1 emissions are summarised in Table 6-4.

Table 6-4: Scope 1 emission summary

Activity	Parameter	Consumption/year		Emissions tCO_2-e/year	
		Nominal	Design	Nominal	Design
DRP	Natural gas	565,800 GJ	792,120 GJ	29,156	40,818
ESF	Natural gas	18,104 GJ		933	
ESF	Anthracite	1,020 tpa	2,880 tpa	2,669	7,537
Proposal	Diesel consumption	445 kL		1,201	
Total	**Scope 1 emissions**			**33,959**	**48,355**

6.6.8 Scope 2 emissions

Scope 2 emissions relate to use of electricity purchased from the SWIS. The predominant electricity demand comes from operation of the ESF; the remaining projected electricity requirements are to support the following site functions:

- Core DRP;

- Water treatment plant including the cooling circuit; and
- Balance of plant and ancillary services (e.g., water pumps, lighting, offices, control and crib rooms).

Electricity consumption is summarised in Table 6-5.

Table 6-5: Electricity consumption

Activity	Consumption/year kWh	
-	*Nominal*	*Design*
DRP	8,863,020	11,716,620
ESF	35,259,000	45,759,000
Balance of plant and ancillary	13,516,080	13,516,080
Total electricity consumption	57,638,100	70,991,700

Total Scope 2 emissions from the use of electricity are projected to be 28,819 tCO_2-e per year for the nominal basis and 35,496 tCO_2-e per year for the design basis.

6.6.9 Scope 3 Emissions

A preliminary Scope 3 inventory has been compiled, subject to further development as Proposal specific details are established. Key relevant Scope 3 categories (GHG Protocol, 2013) identified are:

- Category 1: Purchased goods and services;
- Category 2: Capital goods;
- Category 3: Fuel- and energy-related activities (Not included in Scope 1 or Scope 2);
- Category 4: Upstream transportation and distribution;
- Category 9: Downstream transportation and distribution; and
- Category 10: Processing of sold products.

Other categories that are relevant but not expected to be material to the Scope 3 inventory are:

- Category 5: Waste generation;
- Category 6: Business Travel – not expected to be significant; and
- Category 7: Employee commuting – local workforce due to location within Perth Metro area.
- Category 11: Use of sold products and Category 12: End-of-life treatment of sold products, while relevant, are considered beyond the boundary of the Scope 3 inventory due to the high degree of uncertainty.

Relevant Scope 3 categories and emissions estimates are presented in Table 6-6.

Table 6-6: Relevant Scope 3 categories

Scope 3 category		GHG Protocol Definition	Scope	Inclusion	Exclusion	Calculation method	Estimated emissions tCO_2-e/year
1	Purchased goods and services	Extraction, production, and transportation of goods/services purchased by the company	Cradle-to-gate emissions of all purchases	Process inputs: • Iron ore pellets (mining and pelletisation). • Anthracite, dolime and quick lime.	Exclusions, due to lack of available information, are: • Laboratory reagents and consumables, reductants, equipment and maintenance services and consumables, oils and lubricants. • Emissions associated with provision of services such as accounting, legal, consulting etc. • Emissions from the transportation of iron ore pellets (these are accounted for in Category 4 where not accounted for in the applied emission factor).	**Iron ore pellets:** *Iron ore mining* Assumed 20% attrition of iron ore to generate 93,600 t of iron ore pellets EF= 0.014 tCO_2-e/t ore *Pelletisation* 93,600 t of pellets with an EF = 0.014 tCO_2-e/t ore **Quicklime:** 2,100 tpa consumed with a cradle to grave EF of 1.24 tCO_2-e/t (Adbri 2024) **Dolime:** 2,100 tpa consumed with an estimated cradle to grave EF of 1.4 tCO_2-e/t scaled from quicklime EF based on ratio available from EC (EC 2009) **Anthracite:** 2,880 tpa consumed with EC 29 GJ/t and scope 3 EF of 6.4 kg/GJ – assumed coking coal Scope 3 EF applicable (NGA 2025)	8,248 2,604 3,585 535 **Total 14,971**
2	Capital goods	Extraction, production, and transport of capital goods acquired by the company	Machinery, plant, equipment	-	Due to lack of available information, emissions associated with machinery, plant and equipment are not estimated.	Not estimated	Not estimated
3	Fuel- and energy-related (not in Scope 1 or 2)	Emissions from extraction/production/transport of energy/fuel acquired, plus transmission and distribution (T&D) losses	Upstream energy emissions	Diesel, natural gas or hydrogen, electricity T&D losses	Any petroleum or LPG usage Reduction of emission from using hydrogen from renewable sources (SMR assumed for purposes of the trial)	**Electricity:** Consumption of 70,991,700 kWh/year from grid with Scope 3 EF of 0.06 kg CO_2/kWh (NGA 2025) **Gas**: Consumption of 810,224 GJ/year from reticulated supply with scope 3 EF of 4.1 kg CO_2/GJ (NGA 2025) **Diesel:** Consumption of 17,188 GJ/year with scope 3 EF of 17.3 kg CO_2/GJ (NGA 2025) **Hydrogen:** Consumption of 68,880 kg/year, if derived from Steam Methane Reforming applying a lifecycle EF of 11.2 kg CO_2-e/kg H_2 (Cho *et al* 2022)	4,260 3,322 297 41,459 **Total when using natural gas for DRP 7,879** **Total when using SMR derived H_2 for DRP 46,290**

Scope 3 category		GHG Protocol Definition	Scope	Inclusion	Exclusion	Calculation method	Estimated emissions tCO_2-e/year
4	Upstream transportation & distribution	Transport/distribution of goods between suppliers and company; not owned by company	Third-party freight/logistics	Transportation of iron ore from Pilbara mine site assumed to be maximum of 400 km from mine to port via rail and shipped via Port Hedland to Qingdao China assuming 100 km journey via road to processing plant. Assumed 10% attrition of ore during pelletisation. Pellets then transported 100 km by road back for export via sea to Kwinana then by road to the Proposal. Transport of lime and dolime within WA. Transport of anthracite, mill scale and BF slag from East Coast Australia.	Transport of anthracite, diesel and gas; Scope 3 emissions factors include a delivery component accounted for under Categories 1 and 3.	Transport of 93,600 t iron ore pellets via: • Rail 400 km (estimate max distance from Pilbara mine to Port Hedland • Shipping Port Hedland to China (5,766 km) and back to Kwinana (6,955 km) Truck: • 4 km Kwinana to Proposal • 4,620 tonnes lime and dolime transported 14.1 km from Adbri Munster facility. • 3,500 t mill scale and BF slag imported from Port Kembla - sea freight distance 2,104 km plus 4 km truck transport. • 2,880 t anthracite assumed imported from East coast with journey comparable to mill scale and BF slag import. UK transport EFs: • Rail EF 0.02779 kg CO_2-e/net tonne km • Shipping product tanker average EF 0.00902 kg CO_2-e/net tonne km • Truck all HGVs 50% laden EF 0.12226 tCO_2-e/net tonne km	31,318
5	Waste generated in operations	Disposal and treatment of company waste (not owned by company)	Landfill, recycling, wastewater	-	Solid process residue, including dust and sludge from DRP and ESF are expected to be recycled either within the process (subject to agglomeration) or sold to a sinter plant. The feasibility of recycling options for other process related wastes, including dirty casting sand, coating station sludges and water treatment sludge, is still ongoing. Off-site treatment of non-process wastes, including raw sewage, trade waste and office waste are expected to be a small contributor to Scope 3 emissions. Wastewater will be treated on-site (included in Scope 1 and 2 emissions) prior to being sent to the Sepia Depression Ocean Outfall Landline and is also expected to be a negligible contributor to Scope 3 emissions.	Not estimated	Not estimated
6	Business travel	Emissions from employee travel for work in vehicles not owned/controlled by company	Flights, rental car, trains	-	All business travel due to high uncertainty at pre-implementation phase.	Not estimated	Not estimated
7	Employee commuting	Daily travel of employees between home and work	Cars, buses, public transport	-	Commuting expected to be minor contributor due to workforce commuting from Perth metropolitan area.	Not estimated	Not estimated
8	Upstream leased assets	Operation of leased assets (by company, assets not owned)	Offices, warehouses leased	-	No upstream leased assets associated with the Proposal	Not estimated	Not estimated
9	Downstream transportation & distribution	Transport/distribution of products sold, after leaving company control	Freight to customer, retail logistics	Truck to port, shipping to Port Kembla for further processing	Port emissions	Transport of 49,200 t/year hot metal product. 4 km truck and 2,104 km sea freight (see Category 4 for EFs).	1,916

Scope 3 category		GHG Protocol Definition	Scope	Inclusion	Exclusion	Calculation method	Estimated emissions tCO_2-e/year
10	Processing of sold products	Emissions from processing sold intermediate products by third parties	Conversion of sold goods by customers	Blast oxygen furnace, casting, production of hot rolled steel and Colourbond ®	-	Processing of 49,200 t/year hot metal with 33% scrap charge to Basic Oxygen furnace to yield 52,859 t COLORBOND® steel product **Processing hot metal to hot rolled coil (HRC):** EF 0.46 tCO_2/t HRC with a 89% liquid steel yield with respect to total metal inputs. **HRC to Colourbond product (covers processes such as cold rolling, metal coating and painting of the coil):** EF 0.06 tCO_2-e /t treated steel, assumed 97% yield.	26,580 55,935 **Total 82.515**
						Total (using natural gas for DRP)	**138,598**

6.6.10 Emissions summary

Annual and total Scope 1, 2 and 3 emissions associated with the Proposal are summarised in Table 6-7. Total emissions are referenced to a five-year operational life.

Table 6-7: Emissions summary

Emissions tCO_2-e	Annual		Proposal	
	Nominal	Design	Nominal	Design
Scope 1	33,959	50,489	169,797	252,446
Scope 2	28,819	35,496	144,095	177,479
Scope 1 and 2	**62,778**	**85,985**	**313,892**	**429,925**
Scope 3	138,598	-	692,991	-

6.7 Assessment of significance of residual impact

6.7.1 Proposal

To inform the assessment of the impact of emissions from the Proposal, the maximum annual estimated Scope 1 emissions have been compared against Western Australian, domestic, and global yearly anthropogenic emissions (Table 6-8). The analysis uses emissions data reported for the 2022-23 calendar year as this is the most recent complete dataset.

Table 6-8: Comparison against state, national and global GHG emissions

Description	Total annual GHG emissions ($MtCO_2$-e)	Contribution of Proposal emissions
Western Australia[15]	89.4	0.56%
Australia[16]	453	0.11%
Global[17]	53,000	0.001%

A contribution of 0.56% to the total State emissions is not considered significant in the context of the Proposal providing a lower-emissions pathway for producing molten iron suitable for steelmaking, using Australian (including Pilbara) iron ore, in place of traditional coal-fired blast furnace technology.

6.7.2 Cumulative impacts

The Proposal expects to contribute only a small proportion (0.001%) of total global GHG emissions (Table 6-8). While its direct and indirect emissions will add to cumulative global emissions, this impact is considered minimal relative to the Proposal's expected contribution to the decarbonisation of global steel production.

6.8 Environmental outcomes

It is expected that the Proposal will result in the following residual impacts and outcomes in relation to GHG emissions:

- Maximum annual Scope 1 emissions of 50,489 tCO_2-e;
- Total Scope 1 emissions of 601,895 tCO_2-e over the operational life of the Proposal;

[15] State and Territory Greenhouse Gas Inventories 20230 (Australian Government Department of Climate Change, Energy, the Environment and Water 2022)
[16] https://www.dcceew.gov.au/climate-change/publications/national-inventory-report-2023
[17] https://edgar.jrc.ec.europa.eu/report_2024?utm_source=chatgpt.com

- Scope 1 emissions will contribute an annual maximum of approximately 0.56% to State emissions, 0.11% to national emissions and 0.001% to global emissions; and
- The Proposal intends to benefit the State’s aspiration of net zero emissions by 2050 and contribute to the decarbonisation of global steel production.

There will be no significant residual impacts associated with the Proposal. Therefore, it is considered that the EPA's management objective for GHG emissions will be met.

7. Flora and vegetation

This section provides a detailed assessment of potential impacts to native vegetation associated with the Proposal in the context of the EPA's objective for flora and vegetation. The assessment describes the receiving environment, including vegetation type, condition and conservation values, and identifies the extent and nature of direct and indirect impacts. The application of the mitigation hierarchy is outlined, including measures to avoid, minimise and rehabilitate impacts to native vegetation and conservation significant communities. The significance of residual impacts is then assessed at local and regional scales to determine whether the EPA's objective can be met.

7.1 Summary

The flora and vegetation assessment demonstrates that impacts associated with the Proposal can be effectively avoided and minimised such that residual impacts are not significant and the EPA's objective is expected to be met.

The Proposal will require clearing within the Development Envelope, including areas that contain native vegetation. Surveys and assessments have been undertaken to characterise vegetation condition, extent and conservation value. The impact assessment has considered both direct clearing and indirect impacts such as edge effects, dust deposition and potential spread of dieback.

Application of the mitigation hierarchy has been embedded in the design and implementation of the Proposal, including avoidance of conservation significant communities (Tuart TEC), minimisation of the Disturbance Footprint, implementation of vegetation protection measures, and management of weeds and dieback.

With the implementation of these measures, residual impacts to flora and vegetation, including conservation significant communities, are low and not significant. The Proposal is not expected to result in unacceptable loss or degradation of vegetation values at a local or regional scale.

Accordingly, it is concluded that the Proposal will meet the EPA's objective for flora and vegetation, and that potential impacts can be adequately managed through other statutory processes, including vegetation clearing controls and management plans implemented in accordance with existing approvals for the RIZ.

7.2 EPA objective

The EPA's objective for the flora and vegetation environmental factor is *'to protect flora and vegetation so that biological diversity and ecological integrity are maintained'* (EPA, 2016).

7.3 Relevant legislation, policy and guidance

Legislation, policy and guidance relevant to the assessment of flora and vegetation is described in Table 7-1.

Table 7-1: Relevant legislation, policy and guidance

Policy or guidance	How the policy or guidance has been considered
State	
Environmental Factor Guideline – Flora and Vegetation (EPA, 2016a)	Surveys and analyses undertaken to describe the receiving environment and potential significance. Identification of activities that could result in impacts to flora and vegetation. Application of the mitigation hierarchy.
Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016b)	Planning, design and implementation of ecological inspection of the Development Envelope.

Policy or guidance	How the policy or guidance has been considered
Commonwealth	
Environment Protection and Biodiversity Conservation Act 1999 (Cth) - Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DoE 2013)	Planning, design and implementation of Proposal elements with consideration of potential MNES to occur within the Development Envelope.
Tuart Woodlands and Forests of the Swan Coastal Plain: A nationally significant ecological community (DoEE 2019)	Planning, design and implementation of Proposal elements with consideration of conservation requirements for Tuart Woodland TEC.

7.4 Receiving environment

7.4.1 Studies and surveys

To support the assessment of flora and vegetation, NeoSmelt commissioned the following investigations/surveys:

- JBS&G, 2025. *Project NeoSmelt – Ecology Site Inspection.* Memo to BlueScope. 27 August 2025; and
- A follow-up inspection of the Development Envelope along Lot 9008 (western boundary proposed for construction laydown and carparking), Lot 503 (effluent connection to SDOOL, and Claymore Street (potential KRWP connection) (refer to Figure 1-4) was carried out by JBS&G on 24 April 2026 . The purpose of the survey was to identify any conservation significant flora and fauna habitat (i.e., Tuart trees) and confirm that the status of the vegetation in these areas is consistent with that on the main development part of Lot 9008. Outcomes of this inspection have been incorporated in this section and section 8 for terrestrial fauna.

Further context, regarding flora and vegetation within the Development Envelope was also analysed using regional mapping, aerial imagery and extrapolating data from the following reports:

- Harewood, G., 2025. *Fauna Assessment, Miscellaneous Lots, Patterson Road – East Rockingham*, Prepared for BlueScope Future Technologies Pty Ltd, October 2025 V1.
- 360 Environmental. H2Perth Hydrogen Plant: Kwinana - *Landscape and Visual Impact Assessment.* Prepared for Advisian, May 2023.

7.4.2 Existing environment

Based on the regional mapping (Beard, 1976), the Development Envelope comprises native vegetation, mapped over one broad vegetation system (Rockingham 3048) which consists of mixed heath with scattered tall shrubs, *Acacia* spp., Proteaceae and Myrtaceae. This is further evidenced by assessments undertaken by JBS&G (2025), with observations of Tuart trees (*Eucalyptus gomphocephala*), Peppermint trees (*Agonis flexuosa*) and Grass trees (*Xanthorrhoea sp.*) (JBS&G 2025).

JBS&G (2025) undertook a visual assessment within the Development Envelope to identify the Tuart trees and other potential ecological values and threats. The assessment noted the presence of 98 Tuart trees, of which 79% were assessed as being in slightly stressed condition. An additional site inspection carried out by JBS&G in April 2026, noted one Tuart tree present in the north-west corner of the Development Envelope (Figure 7-1), and several Tuart trees on the road verge of the planned KWRP connection in the northwest corridor of the Development Envelope. These trees are not considered to constitute part of the TEC.

The Tuart trees were considered to meet the diagnostic criteria for the TEC under the EPBC Act (TSSC, 2019 cited in JBS&G, 2025), and Priority 3 (PEC) under the EP Act. The TEC covers approximately 4.9 ha, which includes a 30 m canopy buffer and an additional 30 m patch buffer, and was identified as being in Moderate condition (Figure 7-2). Additionally, based on the known presence of Tuart trees within the southeastern corridor of Lot 503, a conservative approach has been adopted whereby the entire corridor is conservatively

assumed to comprise Tuart TEC, and TEC mapping has been inferred for this portion of the Development Envelope, noting a cleared access track also exists within this corridor (Figure 7-2).

JBS&G (2025) noted that vegetation within the Development Envelope was in degraded condition due to historical land use and the presence of weed species, including the following species listed under the BAM Act:

- Bridal Creeper (*Asparagus asparagoides*) - listed as a Declared Pest;
- Narrow Leaf Cotton Bush (*Gomphocarpus fruticosus*) – listed as a Declared Pest;
- Century Plant (*Agave americana*) – listed as a Permitted Organism; and
- Brazilian Pepper Tree (*Schinus terebinthifolia*) – listed as a Permitted Organism.

No threatened flora species listed under the EPBC Act or gazetted as Threatened pursuant to the *Biodiversity Conservation Act 2016* (BC Act) were opportunistically observed within the Development Envelope.

382600 382800 383000 383200 383400 383600 383800 384000 384200 384400 384600

6431400 6431200 6431000 6430800 6430600 6430400 6430200 6430000

ROCKINGHAM BEACH RD
KWINANA BEACH RD
CLAYMORE ST
OCEAN ST
OFFICE RD
JOHN BLACKBURN DR
CHARLES ST
PATTERSON RD
ALLOY AV
WARD RD
ALUMINA RD
ZIRCONIA DR

Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Eco-cultural Buffer Zone (ECBZ)
- Highway
- Minor road

Tuart tree condition

- healthy (90% foliage present)
- slightly stressed (75-90% foliage present)
- very stressed (< 50% foliage present)
- stressed (50-75% foliage present)
- dead medium (foliage absent, bark and fine twigs still present)
- Unknown

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:6,000 at A3

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

TUART TREE CONDITION

FIGURE 7-1

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_07_01_Tuart tree condition

Legend

- Development Envelope
- Cadastral boundary (LGATE-002)
- Eco-cultural Buffer Zone (ECBZ)

Tuart Threatened Ecological Community

- TEC buffer
- Tuart TEC patch buffer
- Highway
- Minor road

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:6,000 at A3

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

THREATENED ECOLOGICAL COMMUNITIES

FIGURE 7-2

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_07_02_TEC

7.5 Proposed mitigation

7.5.1 Avoid

Assessments of vegetation within the main development area of Lot 9008 (light blue shaded area on Figure 1-4) confirmed the presence of a patch of Tuart trees consistent with the diagnostic criteria for the TEC. NeoSmelt has proactively invested significant effort into the design of the Proposal to create a layout that achieves optimal environmental benefit, whereby there will be no clearing of the Tuart TEC in this area, including the 60 m buffer (30 m canopy buffer and 30 m patch buffer), which will instead be retained within a designated Eco-cultural Buffer Zone (ECBZ; Figure 1-2).

For the infrastructure lots no clearing of Tuart Trees will be applied. For the Tuart trees identified along the road verge of the north-western corridor for the proposed KWRP connection (along Claymore Street) and in the single tree in northwestern corner, GPS coordinates of all identified trees will be provided to construction personnel to ensure the trees are identified and avoided.

Additionally, given the known presence of Tuart trees within the Water Corporation southeastern corridor of Lot 503, where the effluent pipeline is proposed, a conservative approach has been adopted whereby the entire corridor is assumed to comprise Tuart TEC. Works in this area will be confined to the existing cleared access track, and appropriate management measures implemented to prevent any unauthorised clearing of native vegetation, such as demarcation and provision of GPS coordinates of approved clearing areas to contractors.

Overall, up to approximately 6 ha of land, comprising native vegetation and areas of significant ecological values will be retained within the Development Envelope. Efforts to retain vegetation throughout the Development Envelope will be considered, where practicable.

7.5.2 Minimise

To ensure protection of, and potentially improve, the Tuart TEC within the ECBZ, NeoSmelt has prepared an Eco-cultural Buffer Zone Management Plan (ECBZ MP). The plan includes waste management, delineation and access measures, weed, pathogen and hygiene measures, bushfire management and monitoring commitments (Appendix H).

The Proponent has also developed a CEMP to minimise potential indirect impacts to retained flora and vegetation during construction of the Proposal, associated with the proposed clearing outside of the ECBZ (Appendix G). The CEMP includes commitments to retain native vegetation within the Development Envelope, where practicable, and measures such as seed collection for native species, translocation of grass trees from within the Development Envelope, dust suppression, waste management and delineation and access measures.

7.5.3 Rehabilitate

Vegetation within the Development Envelope was noted as being in Degraded condition, whilst the Tuart TEC patch is of Moderate condition but considered likely to decline as a result of environmental threats, including the presence of invasive flora (JBS&G 2025). As such, NeoSmelt has committed to improve the quality of retained vegetation within the ECBZ using measures outlined within the ECBZ MP, including delineation to restrict unauthorised access (i.e., fencing and signage), undertaking weed and pathogen monitoring and management, as required.

7.6 Potential environmental impacts

7.6.1 Identified environmental impacts

Potential direct and identified environmental impacts associated with the Proposal on flora and vegetation are described in Table 7-2.

Table 7-2: Potential direct and indirect impacts to flora and vegetation

Environmental Value	Potential Impact	Pathway	Relevance
Direct Impacts			
Native Vegetation	Loss of native vegetation	Clearing of Native Vegetation for construction of the Proposal	The Proposal includes ground disturbance of up to 21.4 ha within the Disturbance Footprint, to facilitate construction and operational infrastructure. This will include clearing of native vegetation, noting a portion of the Disturbance Footprint is already cleared. Clearing of native vegetation will be regulated by DWER under Part V of the EP Act.
Indirect Impacts			
Native vegetation (Tuart PEC/TEC)	Degradation and/or loss of retained native vegetation	Introduction or spread of weeds and/or pathogens (i.e., dieback)	The Proposal may result in the potential reduction of vegetation condition within the Development Envelope due to construction and implementation activities (e.g., topsoil storage, site access and vehicle movements). Four weeds listed under the BAM Act were identified within the Development Envelope (JBS&G 2025).
		Altered fire regimes	The Proposal includes activities that may result in increased fire risk for surrounding vegetation, that would result in a loss of vegetation and fauna habitat.
		Generation and deposition of dust	The Proposal includes activities that will result in increased dust generation that may result in the loss or degradation of retained native vegetation (Tuart trees) within the Development Envelope.
		Contamination from stormwater runoff or hazardous chemical spills	The Proposal may result in direct and indirect impacts to inland waters, and subsequently, the surrounding environment as a result of potential contaminated water impacting the health of native vegetation. The extent of impacts to Inland Waters, as a result of the Proposal, is negligible, and has therefore been considered as an 'other environmental factor' within this ERD. An assessment of potential impacts in this regard, and application of the mitigation hierarchy is included in Table B.10-1.

7.6.2 Predicted environmental impacts

7.6.2.1 Direct impacts

The Proposal will result in the ground disturbance of up to 21.4 ha (Disturbance Footprint), within a 30.5 ha Development Envelope, this will include both existing cleared areas and areas of native vegetation.

The impact to native vegetation has already been considered in the EPA's assessment of the RIZ (MS 863), and further in April 2024 within Derived Proposal 5, which includes the Development Envelope.

Derived Proposal 5 allows for the clearing of up to 269.08 ha, with implementation of conditions related to MS 863. Notwithstanding this, the entirety of the Tuart TEC patch within the main development part of Lot 9008 of the Development Envelope will be retained within a 6 ha ECBZ. Additional efforts for the retention of native vegetation throughout the Development Envelope will also be considered, where practicable, during construction.

7.6.2.2 Indirect Impacts

Indirect impacts associated with the Proposal are the loss and degradation of retained native vegetation within the Development Envelope. The extent of potential indirect impacts are listed in Table 7-2, and are proposed to be managed in accordance with the CEMP which includes commitments as required under MS 863, as well as the ECBZ MP, which has been prepared to address the avoidance and management of the Tuart TEC/PEC within the Development Envelope.

7.7 Assessment of significance of residual impacts

7.7.1 Proposal

The Proposal will result in the ground disturbance of up to 21.4 ha (Disturbance Footprint), within a 30.5 ha Development Envelope, this will include both existing cleared areas and areas of native vegetation. The impact area represents a minor portion of the RIZ, for which clearing of the Development Envelope has already been assessed and approved under Derived Proposal 5. In accordance with MS 863, the RIZ SEA included a Conservation Area to offset perceived impacts of the RIZ, and NeoSmelt has prepared a CEMP, specific to the Proposal, with additional efforts for the retention of vegetation where practicable. Clearing of vegetation to facilitate the proposal will be regulated by DWER under Part V of the EP Act via a Native Vegetation Clearing Permit.

Since the issue of MS 863, Tuart Woodlands were uplisted as Priority 3 (PEC) under the BC Act in November 2016, and as a Critically Endangered TEC under the EPBC Act in July 2019. However, the Proposal does not include the clearing of this TEC/PEC, which will instead be retained within the ECBZ within the Development Envelope, and managed via the ECBZ MP.

7.7.2 Cumulative impacts

The assessment of the significance of the environmental impacts of a proposal considers the cumulative impacts with other existing or foreseeable activities (EPA, 2026). The Development is consistent with the current land use zoning, as the Development Envelope is located within the RIZ. Accordingly, the surrounding land uses are predominantly industrial, comprising both established industrial operations and vacant lots containing native vegetation that are designated for future industrial development. Cumulative impacts on flora and vegetation in the RIZ were considered in the SEA (EPA report 1390), which identified the highest conservation values as:

- 32 ha of TEC (*Sedgeland in Holocene dune swales of the southern Swan Coastal Plain*) listed as Endangered under the EPBC Act and listed as Critically Endangered by DBCA. Only 142 ha of this TEC remains, and 17 ha was proposed to be cleared, which represented approximately 12% of the remaining extent of the TEC;
- 34 wetlands (50 ha) of which at least 29 are Conservation Category Wetland (CCW). The wetlands are part of the Becher Suite of wetlands and are in swales estimated to be 5,000-6,000 years old. Wetlands of this suite and age-range are not currently protected in the Conservation Estate (Coffey 2009). The proposal would protect only 12 CCWs.

- *Melaleuca huegelii* dominated vegetation community in limestone wetlands that may not occur elsewhere in the Perth Metropolitan Region; and
- 34 ha of a Tuart/*Melaleuca rhaphiophylla* vegetation community on wetlands that is uncommon in the Perth Metropolitan Region (only recorded elsewhere at Moore River, Yanchep and Lake Cooloongup Leda).

The EPA noted the strategic regional significance of the RIZ as a future industrial area but highlighted that it also contains significant environmental values that require protection. The environmental values of the SEA Area were noted as being in decline due to rubbish dumping, illegal tracks for off road vehicles, fires, weeds, feral animals and the potential impact of a drying climate on groundwater levels.

Given that the Derived Proposal was determined to have residual adverse impacts on the TEC within the developable area, the EPA determined that an offsets package was appropriate (EPA report 1390). As such, DevelopmentWA established a conservation area (Figure 1-1) that contains areas of the highest environmental value within the RIZ, including the most viable long-term TEC and wetlands. This became an ongoing managed offset area known as the Conservation Area.

The highest conservation values identified for the RIZ SEA are not constraints for the Proposal, whereby the highest value flora and vegetation comprise the Tuart TEC, which is proposed for retention within the ECBZ. Therefore, the extent of impacts is limited to the minor reduction of native vegetation extent associated with the clearing of up to 21.4 ha of native vegetation, which represents 0.54% of the total extent of the local vegetation system (Rockingham 3048), of which 25.25% remains from the pre-European extent. Within 20 km of the Development Envelope, there is an estimated 19,300 ha of native vegetation (DPIRD 2025), some of which is located within designated conservation areas, providing important ecological linkages. Accordingly, the extent of clearing associated with the Proposal represents a loss of less than 0.11% of local native vegetation.

When considered in combination with existing disturbance and reasonably foreseeable or approved activities, the total extent of vegetation clearing is not expected to result in a significant cumulative impact in terms of vegetation loss or degradation, given the substantial extent of native vegetation remaining in the local area. Furthermore, the implementation of management measures through the CEMP and ECBZ MP is expected to minimise indirect impacts such as dust deposition, altered fire regimes, and the introduction or spread of weeds, pathogens and pests, or waste accumulation that could otherwise result in the loss or degradation of native vegetation.

Given the minor reduction of native vegetation, the protection of high-value vegetation (Tuart TEC) within the ECBZ and surrounding conservation and reserve areas, and the implementation of management measures, the cumulative impacts to flora and vegetation are not considered significant.

7.8 Environmental outcomes

In accordance with the mitigation hierarchy, the Proposal has been designed to avoid and minimise disturbance to flora and vegetation where practicable, with a focus on the retention and protection of significant vegetation values within the ECBZ.

The Proposal will result in the ground disturbance of up to 21.4 ha, comprising both cleared and native vegetation areas in Degraded condition within the Development Envelope of 30.5 ha. All Tuart trees (Tuart TEC) will be avoided and retained within the ECBZ. Management measures included within the ECBZ MP and CEMP will be implemented to protect retained vegetation and to minimise potential indirect impacts during construction and operation.

The environmental outcomes for flora and vegetation are:

- Avoidance of direct impacts to the Tuart TEC through establishment and maintenance of an ECBZ;
- Protection and improvement of the Tuart TEC through implementation of an ECBZ MP; and

- Avoidance and minimisation of indirect impacts to retained vegetation through implementation of the CEMP.

Overall, the Proposal has been strategically designed to retain the most significant flora and vegetation values (Tuart trees) and to ensure that the direct and potential indirect impacts to retained vegetation and associated ecological values are appropriately managed through the ECBZ MP and CEMP.

Through the implementation of the mitigation hierarchy, the construction and operation of the Proposal will not result in a significant environmental impact to flora and vegetation, and the EPA's objective will be met.

8. Terrestrial fauna

This section provides a detailed assessment of potential impacts to fauna and fauna habitat associated with the Proposal in the context of the EPA's objective for the environmental factor terrestrial fauna. The assessment describes the receiving environment, including habitat values and the presence or likelihood of conservation significant species, and identifies potential direct and indirect impacts arising from the Proposal. The application of the mitigation hierarchy is outlined, including avoidance and minimisation of habitat disturbance, implementation of fauna management measures and rehabilitation of disturbed areas. The significance of residual impacts is then assessed to determine whether the Proposal is consistent with the EPA's objective.

8.1 Summary

The terrestrial fauna assessment demonstrates that impacts to fauna and fauna habitat can be effectively managed such that residual impacts are not significant and the EPA's objective is expected to be met.

The Development Envelope contains habitat that may support conservation significant fauna species, including species of regional and national significance. Potential impacts associated with the Proposal include habitat loss and fragmentation, disturbance during construction, and indirect impacts such as noise and light.

A fauna assessment has been undertaken to identify habitat values and the likelihood of occurrence of conservation significant species. The assessment has considered both direct and indirect impacts to fauna individuals and habitat.

The mitigation hierarchy has been applied through avoidance of higher value habitat where practicable, minimisation of clearing extent, implementation of pre-clearance surveys and fauna management procedures, and retention of habitat features where feasible. Additional controls, such as fauna relocation and the management of lighting and noise, further reduce potential impacts.

With these measures in place, residual impacts to terrestrial fauna and fauna habitat are considered to be low and not significant. The Proposal is not expected to adversely affect the viability of local or regional fauna populations, including conservation significant species.

Accordingly, it is concluded that the Proposal will meet the EPA's objective for terrestrial fauna, and that potential impacts can be adequately managed through other statutory processes and management plans.

8.2 EPA objective

The EPA's objective for the environmental factor of terrestrial fauna is '*to protect terrestrial fauna so that biological diversity and ecological integrity are maintained*' (EPA, 2016).

8.3 Relevant legislation, policy and guidance

Legislation, policy and guidance relevant to the assessment of terrestrial fauna is described in Table 8-1.

Table 8-1: Relevant legislation, policy and guidance

Policy or Guidance	How the Policy or Guidance has been considered
State	
Environmental Factor Guidelines – Terrestrial Fauna (EPA, 2016c)	Surveys and analyses undertaken to describe the receiving environment and potential significance. Identification of activities which may result in impacts to terrestrial fauna. Application of the mitigation hierarchy.

Policy or Guidance	How the Policy or Guidance has been considered
Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (Department of Parks and Wildlife (DPAW, 2013)	Considered in the assessment of conservation significant fauna.
Commonwealth	
Survey Guidelines for Australia's Threatened Mammals (DSEWPaC, 2011a)	Considered in design (methods and approach) of terrestrial fauna inspection.
Environment Protection and Biodiversity Conservation Act 1999 (Cth) - Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DoE 2013)	Planning, design and implementation of Proposal elements with consideration of MNES identified within the Development Envelope.
Survey Guidelines for Australia's Threatened Birds Under the *Environment Protection and Biodiversity Conservation Act 1999* (DEWHA, 2010)	Considered in design (methods and approach) of terrestrial fauna survey.
EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (DSEWPaC, 2012c)	Considered in design (methods and approach) of terrestrial fauna survey and habitat assessment.
Referral Guideline for 3 WA Threatened Black Cockatoo Species (DAWE, 2022).	

8.4 Receiving environment

8.4.1 Studies and surveys

To support the assessment of terrestrial fauna, NeoSmelt commissioned the following investigations and surveys:

- Harewood, G., 2025. *Fauna Assessment, Miscellaneous Lots, Patterson Road – East Rockingham*, Prepared for BlueScope Future Technologies Pty Ltd, October 2025 V1.
- JBS&G, 2025. *Project NeoSmelt – Ecology Site Inspection.* Memo to BlueScope. 27 August 2025 and follow up inspection on 24 April 2026.

A fauna survey was undertaken in September and October 2025 by Harewood (2025) to inform Proposal planning and identify potential fauna species of conservation significance that may be present in the Development Envelope. Vegetation units identified during the field survey were used to define broad scale fauna habitats across the Development Envelope.

A list of conservation significant fauna recorded or likely to occur within the survey area was compiled using available databases and literature including, but not limited to, the following data sources:

- DBCA Threatened Fauna Database (Dandjoo) search – a 10 km buffer around the Development Envelope was applied to capture previous fauna records within the immediate vicinity.
- Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Protected Matters database search for fauna listed as being of national environmental significance (NES) under the EPBC Act (DCCEEW, 2025). The minimum buffer (0 km) was applied to this search as the database contains distribution data (areas) and not actual fauna records.

The conservation status of the listed fauna species has been assessed using data from the following sources:

- EPBC Act, Administered by DCCEEW;
- *Biodiversity Conservation Act 2016* (BC Act) Administered by the DBCA (Gov of WA, 2025);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for

Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and

- DBCA Priority Fauna list. A non-statutory list maintained by the DBCA for management purposes.

The EPBC Act and BC Act also requires the compilation of a list of migratory species that are recognised under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA);
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

Evidence of the presence or likely presence of fauna species of conservation significance (or suitable habitat) was searched for and recorded concurrent with other site surveys. Opportunistic observations of all fauna species were made during all field survey work and recorded where positive species identifications were made. This aspect of the assessment included but was not limited to:

- Undertaking a series of transects across the Development Envelope;
- Searching for evidence (i.e. individuals, tracks, scats, calls) of potential conservation significant species under logs, rocks and leaf litter; and
- Observing bird species with binoculars.

Along with the basic fauna assessment, Harewood (2025) undertook a targeted survey for black cockatoo habitat to determine the presence of black cockatoos and evaluate habitat quality and suitability, including availability of food sources, nesting hollows and potential habitat trees (Appendix E). The black cockatoo habitat assessment was based on Commonwealth of Australia (2012 and 2022) guidelines and related to breeding, foraging and night roosting habitat.

Breeding habitat assessment identified all suitable breeding tree species within the Development Envelope that have a diameter at breast height (DBH) of 30 cm or more and categorised as:

- Not a potential or suitable nesting tree - Tree <30 cm DBH or an unsuitable species (these were not recorded);
- Potential nesting tree (no hollows) - Tree >30 cm DBH, no hollows seen;
- Potential nesting tree (hollows or possible hollows) - Tree >30 cm DBH, one or more hollows seen, none of which were considered suitable for black cockatoos to use for nesting;
- Suitable nesting tree - Tree >30 cm DBH, one or more hollows seen, with at least one considered suitable for black cockatoos to use for nesting, but with no evidence of use; and
- Known nesting tree - Tree >30 cm DBH, one or more hollows seen, where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).

Foraging habitat reflected plant species that are known to provide a food source for black cockatoos, including seeds, flowers and boring grubs that are extracted from some plant species. The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded. The nature and extent of potential foraging habitat present was documented irrespective of the presence of any actual foraging evidence.

Based on these observations (and other relevant information), the black cockatoo foraging value of each of the identified vegetation units present was assessed for each of the three black cockatoo species using two methods:

- Bamford's scoring methodology - Bamford Consulting Ecologists (BCE 2020). Scoring system for the Assessment of Foraging Value of Vegetation for Black-Cockatoos; and
- DCCEEW's scoring methodology - Commonwealth of Australia (DAWE, 2022). Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo. Commonwealth of Australia, Canberra, Australian Capital Territory.

A full description of the process involved in calculating scores and the moderation process are described in detail in Appendix E (Harewood, 2025).

Direct and indirect evidence of black cockatoos roosting within trees on or within the Development Envelope was noted where observed (e.g. branch clippings, droppings or moulted feathers). A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo roosting habitat areas in the vicinity.

8.4.2 Existing environment

8.4.2.1 Fauna habitat

Four habitats were recorded within the Development Envelope:

1. Open Woodland of tuart (*Eucalyptus gomphocephala*) over peppermint (*Agonis flexuosa*), basket bush (*Spyridium globulosum*) summer-scented wattle (*Acacia rostellifera*), Western Australian golden wattle (*Acacia saligna*) over grass trees (*Xanthorrhoea preissii*) over annual weeds in calcareous sand. This habitat runs in a narrow strip bordering Patterson Road and along the pipeline south of Patterson Road. The density and age of this habitat type is various, and understorey ranges from totally absent to patches of relatively dense shrubs.
2. Open Low Heath of grass trees (*Xanthorrhoea preissii*) with some scattered small shrubs over annual weeds (grassland) in calcareous sand. This habitat type is mainly distributed across the centre of the Development Envelope.
3. Tall open Shrub / Tall Open Shrubland of Chenille honey-myrtle (*Melaleuca huegelii*) and Western Australian golden wattle (*Acacia saligna*) over annual weeds in calcareous sand. This is mainly located in the northern half of the Development Envelope, dissected by patches of grass tree heath and grasslands.
4. Existing cleared areas, including hardstand and vehicle tracks.

In general, the habitat within the Development Envelope is expected to support a small range of its original fauna assemblage given its relatively small size and history of disturbance. The area does, however, adjoin other areas of native vegetation which increases its capacity to support species that require larger remnants to persist. The highest value habitat within the Development Envelope coincides with the identified Tuart TEC (Figure 7-2), which encompasses over 98 Tuart trees with a DBH greater than 150 mm.

While the most likely fauna species to occur are common, widespread bird species, the Development Envelope may provide some limited value to a small number of conservation significant species, as discussed below.

8.4.2.2 Likelihood of occurrence

The likelihood of occurrence within the Development Envelope of species of conservation significance has been assessed, based on the field survey results and their documented distribution and habitat preferences. A summary of this assessment is in Table 8-2.

Table 8-2: Likelihood of occurrence – conservation significant fauna

Species	Conservation status		Habitat preferences	Habitat present	Likelihood of occurrence	Comments/possible impacts
	BC Act	EPBC Act				
Perth Slider *Lerista lineata*	P3	-	Inhabits loose white sands and leaf litter under areas of shrubs and heath particularly in association with banksias.	No/Marginal	Unlikely to Occur	Current status in area uncertain but possibly locally extinct. Habitat appears marginal at best. Impacts to this species are considered unlikely.
Jewelled South-west Ctenotus *Ctenotus gemmula*	P3	-	Prefers pale sandplains supporting either banksia or mallee with heath. Seeks shelter beneath leaf litter, in abandoned stick-ant nest and burrows at the base of trees and shrubs	No/Marginal	Unlikely to Occur	Current status in area uncertain but possibly locally extinct. Habitat appears marginal at best. Impacts to this species are considered unlikely.
Black-striped Burrowing Snake *Neelaps calonotos*	P3	-	Favours sandy soils supporting heath and banksia/eucalypt woodland	No/Marginal	Unlikely to Occur	Current status in area uncertain but possibly locally extinct. Habitat appears marginal at best. Impacts to this species are considered unlikely.
Abrolhos dwarf bearded dragon *Pogona minor minima*	VU	-	Found only on islands at Houtman Abrolhos	No	Would Not Occur.	DBCA Database error. No impact on this species will occur.
Australasian Bittern *Botaurus poiciloptilus*	EN	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense *Typha, Baumea* and sedges in freshwater swamps.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Black-backed Bittern *Botaurus dubius*	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of Typha, Baumea and tall rushes in freshwater swamps around lakes and along rivers.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Malleefowl *Leipoa ocellata*	VU	VU	Mainly scrubs and thickets of mallee *Eucalyptus* spp., boree *Melaleuca lanceolata* and bowgada *Acacia linophylla*, also dense litter forming shrublands.	No	Would Not Occur.	Regionally extinct. No impact on this species will occur.
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	MI, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No	Would Not Occur.	No suitable habitat. No impact on these species will occur.
Blue Billed Duck *Oxyura australis*	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.

Species	Conservation status		Habitat preferences	Habitat present	Likelihood of occurrence	Comments/possible impacts
	BC Act	EPBC Act				
Peregrine Falcon *Falco peregrinus*	OS	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	May forage in general area. Modification of areas of foraging habitat. No significant impact on this species will occur.
Grey Falcon *Falco hypoleucos*	VU	VU	Usually confined to the arid inland. Inhabits *Triodia* grassland, Acacia shrubland, and lightly timbered arid woodland. Most sightings of the grey falcon have been within the arid zones	No	Would Not Occur.	Rarely if ever recorded on coastal plain. No suitable habitat. No impact on this species will occur.
Osprey *Pandion haliaetus*	Mi	Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Unlikely to Occur.	Occasional flyovers possible but this species would mainly confine its activities to coastal areas in this region. Therefore, impacts to this species are considered unlikely
Carnaby's Cockatoo *Zanda latirostris*	EN	EN	Forests, woodlands, heathlands, farms; feeds on *Banksia*, *Hakea* and Marri.	Yes	Possibly Occurs.	Known to occur in general area. Modification/loss of small areas of low quality foraging habitat, however, no significant impact on this species overall conservation status is anticipated given limited area of likely impact.
Baudin`s Cockatoo *Zanda baudinii*	EN	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Unlikely to Occur	Known to occur in general area but only occasionally relative to the other two species. Modification/loss of small areas of low-quality foraging habitat, however, no significant impact on this species overall conservation status is anticipated given limited area of likely impact.
Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	VU	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Possibly Occurs.	Known to occur in general area. Modification/loss of small areas of low-quality foraging habitat, however, no significant impact on this species overall conservation status is anticipated given limited area of likely impact.
Masked Owl *Tyto novaehollandiae novaehollandiae*	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes/Marginal	Unlikely to Occur.	Only occasionally recorded in this part of the southwest. No suitable nest/roost hollows. No significant impact on this species anticipated.
Fork-tailed Swift *Apus pacificus*	MI	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur	May occur very occasionally for brief periods. Entirely aerial. No impact on this species will occur.
Grey Wagtail *Motacilla cinerea*	MI	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.

Species	Conservation status		Habitat preferences	Habitat present	Likelihood of occurrence	Comments/possible impacts
	BC Act	EPBC Act				
Chuditch *Dasyurus geoffroii*	VU	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	No	Would Not Occur.	Regionally extinct. Very occasional transient individuals only. No impact on this species will occur.
Quenda *Isoodon fusciventer*	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes	Known to Occur	Diggings attributed to this species recorded. Loss/modification of a small area of habitat. Potential for individuals to be killed or injured during clearing. However, no significant impact on this species overall conservation status is anticipated given limited area of likely impact.
South-west Brush-tailed Phascogale *Phascogale tapoatafa wambenger*	CD	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes/Marginal	Unlikely to Occur	Known to occur in general area but project area lacks hollow bearing trees. No significant impact on this species overall conservation status is anticipated given limited area of likely impact.
Numbat *Myrmecobius fasciatus*	EN	EN	Open Woodlands generally dominated by eucalypts that provide hollow logs and branches for shelter and termites for food.	No/Marginal	Would Not Occur.	Regionally extinct. This species has not been recorded on the coastal plain for over 50 years. No impact on this species will occur.
Western Ringtail Possum *Pseudocheirus occidentalis*	CR	CE	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Unlikely to Occur	Not known to occur north of the Mandurah Estuary. No impact on this species anticipated.
Woylie *Bettongia penicillata ogilbyi*	CR	EN	Open sclerophyll forest and woodland with a low, dense, understorey of tussock grasses or woody scrub.	No/Marginal	Would Not Occur.	Regionally extinct. This species has not been recorded on the coastal plain for over 50 years. No impact on this species will occur.
Western Brush Wallaby *Notamacropus irma*	P4	-	Prefers areas of forest and woodland supporting a dense shrub layer adjacent to small open areas.	Yes	Would Not Occur.	Locally extinct. This species could not persist in the fragmented habitat within and around the survey area. No impact on this species will occur.
Tammar Wallaby *Notamacropus eugenii derbianus*	P4	-	Dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland	No	Would Not Occur.	Regionally extinct. This species has not been recorded on the coastal plain for over 50 years. No impact on this species will occur.
Water Rat *Hydromys chrysogaster*	P4	-	Permanent water, fresh, brackish or marine.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Western False Pipistrelle *Falsistrellus mackenziei*	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes/Marginal	Unlikely to Occur.	Only occasionally recorded in his part of the southwest. No suitable nest/roost hollows. No significant impact on this species anticipated.

One vertebrate fauna species of conservation significance (listed as State or Federal threatened/migratory species or as DBCA priority species) was positively identified as utilising the Development Envelope during the field survey:

- Quenda *Isoodon fusciventer* - P4 (*BC Act* Priority Species). Foraging evidence (diggings) attributed to this species were found during the survey and there are numerous records from nearby areas. It is possible they are present in dense groundcover within the Development Envelope.

Additional species of conservation significance may periodically use the Development Envelope; however, no sightings or evidence of use were observed during field surveys. These include:

- Peregrine Falcon *Falco peregrinus* - OS (*BC Act*). This species potentially utilises some sections of the Development Envelope as part of a much larger home range, though it is only likely to occur infrequently. All areas represent potential foraging habitat for this species. No potential nest sites present. This species is considered to potentially occur within the Development Envelope, based on available information.
- Carnaby's Cockatoo *Zanda latirostris* - Endangered (*BC Act & EPBC Act*). No evidence of this species was observed. The Development Envelope contains areas of potential black cockatoo breeding habitat (trees with a DBH >30 cm) but no suitable hollows are present. Most of the native vegetation within the Development Envelope represents negligible to low quality foraging habitat for this species. No evidence of roosting observed. Listed as a potentially occurring species based on available information.
- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* -Vulnerable (*BC Act* & *EPBC Act*). No evidence of this species was observed. The Development Envelope contains areas of potential black cockatoo breeding habitat (trees with a DBH >30 cm) but no suitable hollows are present. Most of the native vegetation within the Development Envelope represents negligible to low quality foraging habitat for this species. No evidence of roosting observed. Listed as a potentially occurring species based on available information.

Several other species of conservation significance (as listed in Table 8-2) may be present in large remnant vegetation in the local area (e.g. Marlee Reserve, Paganoni Swamp, Yalgorup National Park). However, the Development Envelope does not contain any suitable habitat and, therefore, these species are not listed as potentially occurring. Others are known to be regionally extinct and are also not listed as potentially occurring.

8.4.2.3 Black cockatoo habitat

Breeding habitat

Tuart (*Eucalyptus gomphocephala*) is the only tree species present within the Development Envelope that could potentially provide suitable breeding habitat for black cockatoos (subject to a suitable hollow being present). The black cockatoo breeding habitat assessment (Harewood 2025; Appendix E) identified 82 Tuart trees within the Development Envelope with a DBH of greater than 30 cm(Figure 8-1). These trees are concentrated within the Open Tuart Woodland habitat type along the eastern (Patterson Road) boundary, south-eastern corner and along the effluent pipeline route. Only one of these trees contained a hollow; however, it was not considered suitable or potentially suitable for black cockatoos (too small). Eighty-one habitat trees did not contain evident hollows of any size. No trees were assessed as containing hollows suitable for black cockatoos to use for nesting purposes (Harewood, 2025).

Additionally, JBS&G undertook a site inspection in April 2026 which identified one Tuart tree in the north-western corner of the Development Envelope with a DBH greater than 30 cm, though no hollows were identified. Several Tuart trees were also identified on road verge of the north-west corridor for the planned KWRP connection, none of which contained suitable hollows for Black Cockatoos. s will also apply to the Tuart trees identified on north-western corridor for the planned KWRP connection.

Foraging habitat

No evidence of black cockatoos foraging within the survey area was found during field surveys (Harewood, 2025). The preferred foraging species include marri, jarrah, banksia and sheoak; however, the birds will, on occasion, feed on species that are present in the Development Envelope. Native vegetation within the Development Envelope that could potentially be used as a direct food source (e.g. seeds, flowers, nectar, bark or grubs) by one or more species of black cockatoo include:

- Tuart – *Eucalyptus gomphocephala*;
- Peppermint – *Agonis flexuosa*;
- Summer-scented Wattle – *Acacia rostellifera*;
- Western Australian Golden Wattle – *Acacia saligna*; and
- Grass Tree - *Xanthorrhoea preissii*.

For the purposes of the assessment, NeoSmelt has used two methodologies to calculate foraging value. Using Bamford's foraging value scoring methodology (BCE 2020), the Development Envelope has a foraging value of zero (no value) to 2 (low foraging value) for the identified habitat types (Table 8-3). It should be noted that the method of calculating the site condition scores can produce artificially high scores to sites which present negligible foraging value for black cockatoos. Therefore, the total scores were moderated by re-assigning a score of 0 to both the site context and density to better reflect the actual foraging value of the vegetation noting the low site condition with minimal foraging value (Harewood 2025).

Table 8-3: Foraging values of vegetation for black cockatoos

Habitat description	Vegetation characteristics		Site context		Species density		Total score	
	CC*	FRTBC**	CC	FRTBC	CC	FRTBC	CC	FRTBC
Open Woodland of tuart over peppermint, basket bush, summer-scented wattle, WA golden wattle over grass trees over annual weeds in calcareous sand.	2	2	0	0	1	1	**2**	**2**
Open Low Heath of grass trees with some scattered small shrubs over annual weeds (grassland) in calcareous sand.	2	0	0	0	1	0	**2**	**0**
Tall open Scrub/Tall Open Shrubland of Chenille honey-myrtle and WA golden wattle over annual weeds in calcareous sand.	1	0	0	0	0	0	**1**	**0**
Existing cleared areas	0	0	0	0	0	0	**0**	**0**

*Carnaby's Cockatoo **Forest Red-tailed Black Cockatoo

DCCEEW's Foraging Quality Scoring Tool results in a foraging value of 8 out of 10 for all three black cockatoo species for the whole site (it does not differentiate the habitat types). This is higher than the score using the Bamford method as DCCEEW's tool starts with a score of 10 for a site if it includes native eucalypt woodlands and forests within the range of the species. Attributes that reduce the foraging functionality are then subtracted from the starting score. In this case, only "foraging potential", i.e. evidence of feeding on site, has been subtracted from the starting value (Harewood, 2025; Appendix E).

Night roosting habitat

No existing roosting trees or evidence of black cockatoos roosting within the Development Envelope was observed during the survey (Harewood, 2025). The closest documented and recently active cockatoo roost sites are located approximately 4 km east of the Development Envelope (recorded by the 2022 Great Cocky Count) (Pryor *et al.,* 2023).

Based on available vegetation mapping (DPIRD, 2025), it is estimated that there is approximately 19,300 ha of native vegetation within 20 km of the Proposal and, therefore, there is significant potential for roosting habitat to be present in the wider area (assuming the presence of suitable trees).

8.4.2.4 Quenda

Quenda (*Isoodon fusciventer*) is not listed as Threatened under state or federal legislation but is listed as Priority 4 by the DBCA as it is a species considered potentially at risk. Quendas are endemic to the southwest of WA but has experienced a contraction in range and a decline in abundance due to factors such as habitat loss and predation by introduced species. The animals occur mainly where there is dense, low vegetation to provide shelter and foraging habitat, largely irrespective of the overstorey stratum. For example, they can occur where there are dense, tall weeds, in dense heath and in dense understorey vegetation. Quenda are often associated with dense, low vegetation around wetlands and watercourses, but also occur in upland areas where there is dense, low vegetation. The Quenda's modern distribution is somewhat patchy, which reflects the similar distribution of suitable vegetation to provide habitat, particularly on the Swan Coastal Plain.

The Development Envelope supports very little suitable dense, low vegetation due to history of disturbance.

382600 382800 383000 383200 383400 383600 383800 384000 384200 384400 384600

6431400 6431200 6431000 6430800 6430600 6430400 6430200 6430000

ROCKINGHAM BEACH RD
KWINANA BEACH RD
CLAYMORE ST
CHARLES ST
OCEAN ST
OFFICE RD
JOHN BLACKBURN DR
PATTERSON RD
ALLOY AV
WARD RD
ALUMINA RD
ZIRCONIA DR

Legend

- Development Envelope
- Eco-cultural Buffer Zone (ECBZ)
- Cadastral boundary (LGATE-002)
- Highway
- Minor road
- Habitat Tree (DBH >30cm) [Harewood 2025]
- Habitat Tree (DBH >30cm) [JBS&G 2026]

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 29-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:6,000 at A3

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

BLACK COCKATOO HABITAT TREES (DBH >30CM)

FIGURE 8-1

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_08_01_BC habitat trees

8.5 Proposed mitigation

8.5.1 Avoid

Field surveys identified numerous Tuart trees which exist in a patch of TEC within the Development Envelope. This vegetation type provides the greatest habitat value to conservation significant fauna, including species of black cockatoo (section 8.4.2.3). To avoid impacting environmental values within this area, NeoSmelt has designated a 30 m buffer around the TEC patch (Figure 7-2) in the ECBZ, which will not be cleared. As a result, impacts to approximately 6 ha of land, including native vegetation/fauna habitat within the Development Envelope, will be avoided, which represents approximately 20% of the total area.

One potentially significant black cockatoo habitat tree located in the Infrastructure corridor in the northwest part of the Development Envelope (Figure 8-1) will also be retained under the Proposal, with implementation of an appropriate buffer that ensures the root system is not impacted by its potential use for temporary construction laydown and carparking activities.

Tuart trees identified on north-western corridor for the planned KWRP connection (Claymore Street) will also be avoided. GPS coordinates of the trees identified will be provided to construction personnel to ensure works are undertaken in existing cleared areas, ensuring any Tuart trees are avoided.

Additionally, potential habitat exists in the south-eastern pipeline corridor, where Tuart TEC has been inferred based on the known presence of Tuart trees in the surrounding bushland. However, all vegetation in this location will be avoided, as works will only occur within the existing cleared access track.

8.5.2 Minimise

To protect the habitat value of the TEC/ECBZ for fauna, NeoSmelt has developed the ECBZ MP, which includes fauna management measures, weed and hygiene measures and monitoring commitments (Appendix H).

NeoSmelt has also committed to the development of a CEMP to manage potential impacts to terrestrial fauna from the proposed clearing in other areas of the Development Envelope (Appendix G). The CEMP includes measures such as engaging an accredited fauna specialist to inspect clearing zones prior to clearing and relocate ground-dwelling species such as Quenda to the ECBZ or adjacent native vegetation. If fauna is found during clearing, ground disturbing activities will cease until animals are relocated or allowed time to move to adjacent native vegetation.

Additionally, NeoSmelt will undertake clearing in a slow and progressive manner aimed towards adjacent native vegetation in the ECBZ, allowing fauna to escape into the ECBZ ahead of clearing.

8.5.3 Rehabilitate

The ECBZ MP includes measures such as weed management with the objective of reducing the spread or introduction of weed species. As discussed in section 7.4, the presence of significant weed species listed under the BAM Act is a major factor in the poor and likely declining quality of the surrounding vegetation. Consequently, proposed weed management may result in improved vegetation condition and subsequent fauna habitat within the ECBZ.

8.6 Potential environmental impacts

8.6.1 Identified and predicted environmental impacts

Potential direct and indirect environmental impacts associated with the Proposal on terrestrial fauna are described in Table 8-4.

Table 8-4: Potential direct and indirect impacts to terrestrial fauna

Identified potential impact to terrestrial fauna	Direct or indirect	Relevance to Proposal	Predicted impact of Proposal
Clearing of native vegetation that represents fauna habitat	Direct and cumulative	The Proposal will result in the ground disturbance of up to 21.4 ha, which represents cleared areas and several habitat types in predominately degraded condition. The Development Envelope of 30.5 ha also comprises patch of Tuart TEC which provides higher value fauna habitat. Within the Development Envelope, vegetation may provide suitable foraging habitat for conservation significant species. For example, Tuart woodlands can provide food resources for foraging Carnaby's and Forrest red-tailed black cockatoos. Clearing of foraging habitat is a known threat to all three species of black cockatoos, and the Swan Coastal Plain is considered critical foraging habitat for Carnaby's black cockatoos (DAWE, 2022).	No suitable habitat trees for black cockatoos were identified in the black cockatoo habitat assessment (Appendix E). The area within the Development Envelope that is most likely to provide black cockatoo foraging (Tuart woodland) will be retained and managed within the ECBZ. While the remaining native vegetation within the Development Envelope may provide habitat for terrestrial fauna if present, it is degraded and of limited value and better-quality habitat exists nearby.
Injury or mortality of ground-based fauna from clearing activities	Direct	Clearing activities and construction may impact ground-dwelling fauna individuals if they are present, through direct injury or death. Priority 4 Quenda is a ground-based species that seeks daytime refuge in low vegetation. While Quenda have lost around 40% of their former range in southwest WA, they are commonly seen in urban and suburban areas and may occur within the Development Envelope (section 8.4.2.2). The species is sensitive to habitat clearing, requiring dense groundcover to survive, reproduce and forage effectively (DBCA, 2017b).	Implementation of mitigation measures such as engaging a fauna specialist to inspect clearing zones prior to clearing and relocate ground-dwelling species such as Quenda to the ECBZ or adjacent native vegetation across the road, will minimise the risk of impact.
Habitat fragmentation	Indirect	Clearing of existing native vegetation may reduce movement and dispersal opportunities, and create "edge effects", introducing predators and weeds that degrade habitat quality.	Retention and management of Tuart woodland within the ECBZ will limit the impacts of habitat fragmentation on fauna.

8.7 Assessment of significance of residual impacts

8.7.1 Proposal

The Proposal will result in the ground disturbance of up to 21.4 ha within the Disturbance Footprint, which lies inside a 30.5 ha Development Envelope, this will include both existing cleared areas and areas of native

vegetation with the potential to provide fauna habitat. The impact area represents a minor portion of the RIZ, for which clearing of the Development Envelope has already been assessed and approved under Derived Proposal 5. In accordance with MS 863, the RIZ SEA included a Conservation Area to offset perceived impacts of the RIZ. NeoSmelt has prepared a CEMP, specific to the Proposal, with additional efforts for the retention of vegetation where practicable. Clearing of vegetation to facilitate the proposal will be regulated by DWER under Part V of the EP Act via a Native Vegetation Clearing Permit.

Within the Development Envelope is a designated retention area (ECBZ) of 6 ha, comprising a Tuart TEC (Figure 7-2), which represents the highest value fauna habitat as a potential foraging resource for threatened black cockatoo species (although no evidence of feeding was recorded). This native vegetation is excluded from the Disturbance Footprint and will not be cleared, rather it will be protected within a designated ECBZ.

Ground-dwelling fauna may be impacted by the clearing and/or construction. The most likely species to occur is the Priority 4 Quenda. Quenda's preferred habitat is dense scrubby and swampy vegetation of which there is very limited amounts within the Development Envelope. Nonetheless, to minimise the potential impacts to terrestrial fauna individuals if they are present during clearing or construction, the Proponent will implement a CEMP and ECBZ MP.

The loss of potential fauna habitat associated with clearing for the Proposal is highly unlikely to be significant as few species are likely to use the vegetation (section 8.4.2.2), and clearing of the highest quality foraging habitat for black cockatoos within the Development Envelope will be avoided (section 8.5.1).

8.7.2 Cumulative impacts

The existing and reasonably foreseeable activities considered in the assessment of cumulative impacts to fauna habitat are those that will cumulatively impact on current known extents of fauna and for which quantitative impact data is available (EPA, 2026). Cumulative impacts associated with the industrial use of the Development Envelope were previously assessed under the RIZ SEA, with mitigation provided through the establishment of the Conservation Area, located approximately 900 m south of the Development Envelope.

Cumulative impacts specific to the Proposal consider the clearing of up to 21.4 ha of potential fauna habitat that may be utilised by conservation significant species, including black cockatoos and Quenda. Based on available vegetation mapping (DPIRD 2025), there is approximately 19,300 ha of native vegetation located within 20 km of the Development Envelope that may provide suitable fauna habitat. Accordingly, the extent of clearing associated with the Proposal is estimated to contribute to a less than 0.11% reduction in fauna habitat at a local scale.

The Development Envelope is also close to several existing conservation areas (refer to section 2.12.6), which support habitat connectivity and mitigate potential long term fragmentation effects. In addition, as outlined in section 8.5, the highest value fauna habitat within the Development Envelope will be retained within the ECBZ.

When considered in combination with existing disturbance and reasonably foreseeable or approved activities, the total extent of fauna habitat clearing is not expected to result in a significant cumulative impact in terms of habitat loss or degradation, given the substantial extent of remaining habitat in the local area. Furthermore, the implementation of management measures within the CEMP and ECBZ MP is expected to minimise indirect impacts such as dust deposition, altered fire regimes, introduction or spread of weeds, pathogens and pests, waste accumulation and vehicle strike that could otherwise reduce habitat quality or result in fauna mortality.

Given the relatively minor reduction in potential fauna habitat, the retention of high-value habitat within the ECBZ, the presence of surrounding habitat including that within conservation areas, and the implementation of management measures, the cumulative impacts to terrestrial fauna are not considered significant.

8.8 Environmental outcomes

In accordance with the mitigation hierarchy, the Proposal has been designed to avoid and minimise disturbance to terrestrial fauna where practicable, with a focus on the retention and protection of habitat within the ECBZ.

The Proposal will result in the loss of up to 21.4 ha of native vegetation within the Disturbance Footprint, noting this area also includes pre-existing disturbed/ cleared areas.

The environmental outcomes for terrestrial fauna are:

- Avoidance of direct impacts to habitat through establishment and maintenance of the ECBZ (i.e., no loss of high value black cockatoo foraging, breeding or roosting habitat);
- Improvement of the quality of retained habitat through implementation of an ECBZ MP; and
- Avoidance and minimisation of indirect impacts to fauna through implementation of the CEMP (i.e., minimisation of injury or mortality of ground-dwelling terrestrial fauna from clearing or construction).

Overall, the Proposal has been strategically designed to retain the most significant habitat values (Tuart TEC) and to ensure that the direct and potential indirect impacts to terrestrial fauna are appropriately managed through the ECBZ MP and CEMP.

Construction and operation of the Proposal is not expected to result in any significant environmental impacts to terrestrial fauna and the EPA's objective can be met.

9. Social surroundings

This section provides a detailed assessment of potential noise impacts associated with the Proposal in the context of the EPA's objective for social surroundings. The assessment describes the receiving environment, including sensitive receptors, and evaluates potential noise impacts. The effectiveness of embedded design features and proposed mitigation measures is considered, including compliance with relevant standards and guidance. The significance of residual impacts is then assessed to determine whether the Proposal can be implemented in a manner that protects human health, amenity and social values in accordance with the EPA's objective.

Other potential impacts associated with the Proposal relevant to social surroundings are considered as part of other aspects of the environmental impact assessment, including fugitive dust (air quality), and heritage, traffic and visual impact (other environmental factors).

9.1 Summary

The social surroundings assessment demonstrates that potential impacts to amenity and community values can be effectively managed such that residual impacts are not significant and the EPA's objective to protect social surroundings is expected to be met.

The Proposal is located within an established industrial area of the WTC, where surrounding land uses are predominantly industrial, and separation distances to sensitive receptors are maintained.

A detailed assessment, including noise modelling, has been undertaken to evaluate potential impacts to nearby sensitive receptors. The assessment has considered both construction and operational phases, as well as cumulative impacts within the industrial area.

Mitigation measures have been incorporated into the design and operation of the Proposal, including engineered controls to minimise noise emissions, operational management procedures and implementation of management plans, where required. These measures are consistent with the mitigation hierarchy and relevant regulatory requirements.

With the implementation of these controls, residual impacts to social surroundings are considered to be low and within acceptable levels. The Proposal is not expected to result in significant adverse impacts to human health or amenity.

Accordingly, it is concluded that the Proposal will meet the EPA's objective for social surroundings, and that potential impacts can be adequately managed through other statutory processes, including Part V approvals under the EP Act.

9.2 EPA environmental factor and objective

The EPA's objective for the social surroundings environmental factor is "*To protect social surroundings from significant harm"* (EPA, 2023*).*

9.3 Relevant policy and guidance

Legislation, policy and guidance relevant to the assessment of social surroundings (noise emissions) is described in Table 9-1.

Table 9-1: Relevant legislation, policy and guidance

Policy or guidance	How the policy or guidance has been considered
State	
Environmental Factor Guideline: Social Surroundings	The social surroundings guideline identifies that "*Noise, odour and dust all have the potential to unreasonably interfere with the health, welfare, convenience and comfort of people.*" Amenity and sensitive receptors can be adversely affected by emissions from the Proposal, including noise. Note that potential dust and odour impacts are considered through the air quality environmental factor.
Environmental Protection (Noise) Regulations 1997 (Noise Regulations).	The Noise Regulations prescribe standards under the EP Act setting the maximum allowable noise limits at receiving premises (assigned levels). For noise-sensitive premises (defined in Schedule 1 part C of the Noise Regulations), the allowable noise levels include an influencing factor calculated from the land use within 100 m and 450 m radius from the noise emitting premises. Industrial and utility premises in the KIA are also subject to specific assigned levels in recognition of the unique factors of the area.
DWER Draft Guideline Assessment of environmental noise emissions, May 2021	Will be used to guide the noise assessment to ensure that work completed is adequate to support a works approval application.

9.4 Receiving environment

9.4.1 Studies and surveys

The assessment of potential noise impacts has been informed by an environmental noise assessment (Talis, 2026). The following sections outline the details of the noise assessment undertaken for the Proposal, including the methodology, assessment criteria, noise modelling inputs, results, assessment and proposed mitigation for the purposes of determining the significance and potential impact of the Proposal.

9.4.2 Existing environment

The Proposal is within the RIZ, which is designated for heavy industrial use and is within the City of Rockingham and City of Kwinana local government area (LGA) boundaries. The Kwinana and Rockingham townships are located to the east and southwest of the Proposal, respectively. Both Kwinana and Rockingham townships are urban areas that provide access to major services and facilities for the residential population such as educational, healthcare, emergency services and recreational areas and facilities. In 2024, the Rockingham LGA had a total estimated population of 154,132 persons and the Kwinana LGA had a total estimated population of 54,672 persons (Australian Bureau of Statistics, 2024).

The KIA is located to the immediate north of the RIZ, extending north of the Proposal. The nearest residential suburbs to the Proposal are:

- North Rockingham – approximately 1.3 km southwest;
- Hillman – approximately 2.6 km south;
- Leda – approximately 3.5 km east;
- Calista – approximately 3.6 km east-northeast; and
- Medina – approximately 3.8 km northeast.

The Proposal is on the coastal flats at approximately 5 mAHD with the ocean to the west (Figure 2-1) and a line of dunes with elevations of up to approximately 60 mAHD approximately 4 km to the east. The topography of the area is not expected to influence noise dispersion at nearby sensitive receptors.

The Kwinana Industrial Area (KIA), within which the Proposal is located, comprises a highly diverse range of industrial operations. These include smaller service-based industries such as fabrication and construction facilities, as well as large-scale heavy process industries, including alumina refineries, nickel processing facilities, and oil refineries. Consequently, the area represents a complex acoustic environment, making it challenging to isolate and quantify the noise contributions from individual facilities and to measure compliance with the requirements of the Environmental Protection (Noise) Regulations 1997 (Noise Regulations).

In addition, noise levels received within the surrounding residential communities are cumulative in nature and result from multiple contributing sources, including industrial operations, transport activities and community noise. Due to the similarity in acoustic characteristics of these sources, particularly industrial and transport noise, it is not practicable to fully distinguish or separate the individual contributions of each noise source within the measured environmental noise levels.

In recognition of this complexity, the KIC established a cumulative environmental noise model in 2005 to assist in the management of cumulative industrial noise levels within the KIA. The model is updated on a five-yearly cycle and requires industries operating within the area to provide modelled noise contours in digital format. These datasets are then incorporated into the cumulative noise model maintained by the KIC, enabling the assessment of the combined noise emissions from industrial operations across the precinct.

9.4.2.1 Sensitive receptors

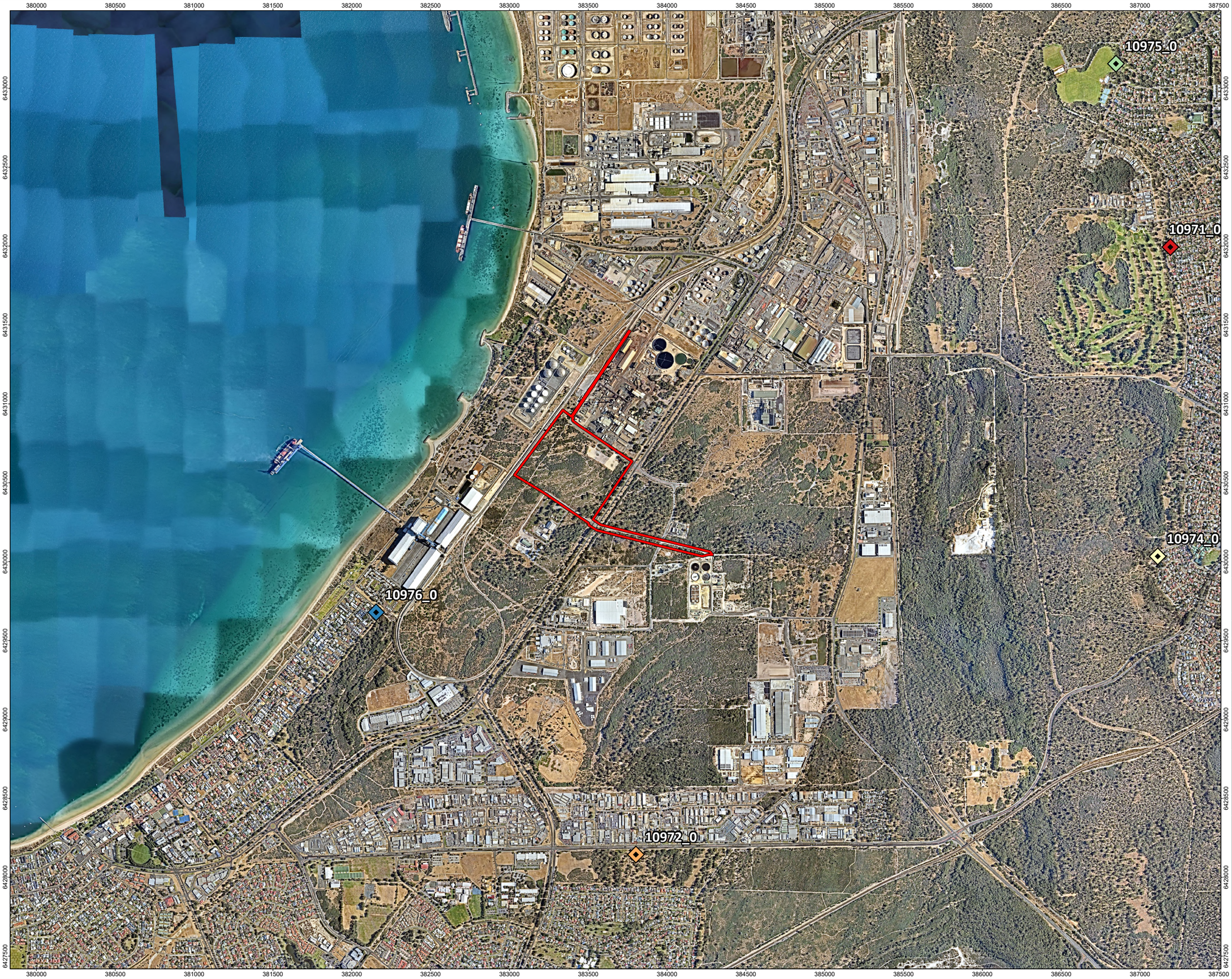
Recreational areas in the vicinity of the Proposal include Wells Park, and the coastline to the southwest of the Proposal is frequented by residents and tourists and used for swimming, snorkelling, fishing and boating.

The nearest sensitive communities to the Proposal include North Rockingham (southwest), Hillman (south), Leda (east), Calista (northeast) and Medina (northeast). Each of these closest receiving communities is represented using a key noise sensitive receiver in the noise model, which aligns with the receivers used in previous noise assessments in the area.

The discrete model receptors used in the environmental noise assessment are described in Table 9-2 and shown on Figure 9.1.

Table 9-2: Sensitive receptors

ID	Description	Distance and direction from Proposal
1	North Rockingham	1.5 km, southwest
2	Hillman	2.5 km, south
3	Leda	3.8 km, east
4	Calista	4 km, northeast
5	Medina	4.3 km north-northeast



Legend

- Development Envelope

Receiver locations

- Calista
- Hillman
- Leda
- Medina
- North Rockingham

JBS&G

Job No: 6892903	
Client: BlueScope Future Industries Pty Ltd	
Version: A	Date: 30-Apr-2026
Drawn By: droberts	
Checked By: JBailes	

Scale 1:22,000 at A3

0 200 400
metres

Coord. Sys. GDA2020 MGA Zone 50

Project NeoSmelt, East Rockingham WA 6168

ENVIRONMENTAL NOISE ASSESSMENT

FIGURE 9-1

File Name: C:\Users\droberts\JBS&G Australia\DCS - Internal - V2\Projects\Bluescope\68929 Neosmelt\GIS\02_MapProjects\6892903_ProjectNeosmelt_s38_R02.aprx
Image Reference: www.nearmap.com© - Imagery Date: 21. January 2025.
Layout: 6892903_A3L_09_01_Environmental_N_A

9.5 Proposed mitigation

Potential construction-related noise emissions will be managed in accordance with Regulation 13 of the Noise Regulations.

Operations-related noise emissions will be minimised by applying noise control measures to equipment within the Proposal. The proposed noise controls are designed to ensure that received noise levels attributable to the Proposal are less than or equal to a level 5 dB below the applicable assigned level at the noise-sensitive premises. This approach will minimise the Proposal's contribution to cumulative environmental noise levels and will comply with the requirements of the Noise Regulations.

Based on the current plant design, the following mitigation measures will be used to mitigate noise emissions from the Proposal:

- Avoidance by substitution of a very noisy method of breaking up ingots with a quieter method using a granulator (refer to section 2.11.5);
- Silencers or low noise valves or noise walls will be applied to flares, vents and stacks that require silencing;
- As far as reasonably practicable, flares, vents and stacks that require silencing will be directed towards the west (i.e., away from sensitive receivers);
- Silencers, acoustic louvres or noise walls will be applied to fans that require silencing;
- Pumps that require silencing will either be enclosed, or noise barriers will be used to attenuate noise;
- Acoustic enclosures will be used for large compressors; and
- Where required, mobile equipment operations will be limited to certain time periods.

The detailed design of the noise control solutions will be undertaken once vendor selection has been finalised.

9.6 Potential environmental impacts

9.6.1 Identified environmental impacts

The Proposal includes construction and operations noise emissions that have the potential to impact social surroundings by affecting the amenity of nearby sensitive receptors.

9.6.1.1 Assessment Criteria

The Proposal is subject to the Noise Regulations, which regulate noise emissions from premises based on the surrounding receivers noise sensitivity and surrounding land uses. The Noise Regulations define maximum allowable noise levels, termed 'assigned level', which apply to noise received at noise sensitive premises, such as residential areas. These are determined by a combination of a base noise level plus an influencing factor (IF).

The assigned noise levels include L_{A1}, L_{A10} and L_{AMAX} noise parameters, defined as:

- L_{ASMAX} means the maximum noise level which is not to be exceeded at any time;
- L_{AS1} means the noise level which is not to be exceeded for more than 1% of time; and
- L_{AS10} means the noise level which is not to be exceeded for more than 10% of time.

For noise sensitive premises, the time of day also affects the assigned noise levels. As the Proposal will operate 24 hours a day, seven days a week, the night-time L_{A10} noise emissions have been assessed against the most stringent night-time assigned levels (Table 9-3).

Table 9-3: Assigned outdoor noise levels

Type of premises receiving noise	Time of day	Assigned level (dB)[1]		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Monday to Saturday	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises other than those in the Kwinana Industrial Area	All hours	65	80	90
Industrial and utility premises in the Kwinana Industrial Area	All hours	75	85	90

(2) The LAx is the noise level that is exceeded for x% of the time, i.e., LA10 is the noise level exceeded for 10% of the time. The LA_{MAX} is the maximum noise level recorded.

In addition to the assigned levels, it is a requirement under the Noise Regulations (Regulation 9) that noise should be free of annoying characteristics (i.e., tonality, impulsiveness and modulation). Should these characteristics be present, then adjustments are made to the measured or predicted level at the receiving premises for the purposes of assessment. These adjustments are cumulative to a maximum of 15 dB (Table 9-4).

Table 9-4: Adjustments for annoying characteristics where noise emission is not music

Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB	+5 dB	+10 dB

Under the Noise Regulations much of the land between the KIA and surrounding residential areas is treated as Type B (commercial) for the purpose of determining the influencing factor.

For the residential receptors surrounding the KIA, the existing background noise from the premises within the KIA means the provisions of Regulations 7(1)(a) and 7(2) of the Noise Regulations ('significantly contributing') apply. This means the recommended maximum design noise emission level for compliance of the Proposal with the Noise Regulations is 5 dB less than the night-time L_{A10} 'assigned level'.

The assigned noise levels for each sensitive receptor, including the relevant influencing factor based on the proximity to industrial and commercial zoned areas and major and secondary roads, are shown in Table 9-5.

Table 9-5: Assigned noise level

Receptor ID	Receptor description	Influencing factor[1]	Night-time L_{A10} assigned level (dB)[2]
1	North Rockingham	3	33
2	Hillman	3	33
3	Leda	2	32
4	Calista	5	30
5	Medina	5	30

(3) Influencing factors are determined by the level of commercial and industrial zoning at the receptor locality. The Influencing factor takes into account zoning and road traffic around the sensitive receptor, within a 100 m and 450 m radius.

(4) Note the most stringent criteria for night-time is shown to account for continuous operations. Less stringent criteria also exist for evening (+5 dBA) and day (+10 dBA) times. Compliance with the night-time criteria demonstrates compliance with the evening and day criteria.

9.6.2 Predicted environmental impacts

Talis (2026) has undertaken an environmental noise assessment for the Proposal. The scope of the environmental noise assessment included:

- Determination of noise emissions associated with operations equipment;
- Develop a noise model for the Proposal;
- Predict noise levels at the nearest key receptor locations.
- Determine mitigations required to achieve compliance.

9.6.2.1 Noise model

A desktop environmental noise model was developed for the Proposal using the SoundPLAN v9.1 software package. This software package calculates sound pressure levels at nominated receiver locations and produces noise contours over a defined area of interest.

The inputs required by the SoundPLAN modelling software are noise sources, ground topographical and absorption data, meteorological data and sensitive receiver point locations. SoundPLAN has been set up for the study to utilise ISO9613 for calculating the attenuation of sound during outside propagation and the CONCAWE[18,19] prediction algorithm. The CONCAWE algorithm is accepted by the Department of Water and Environmental Regulation (DWER).

The model has been used to predict received noise levels at noise sensitive receiver locations and to generate noise contour maps for the wider area.

9.6.2.2 Noise sources

The noise sources modelled were identified based on documentation received from NeoSmelt. The documentation included site drawings, 3D models of the Proposal and process flow diagrams. Noise sources identified in the documentation include the following:

- Pumps;
- Fans;

[18] CONCAWE (Conservation of Clean Air and Water in Europe) was established in 1963 by a group of oil companies to carry out research on environmental issues relevant to the oil industry.

[19] The propagation of noise from petroleum and petrochemical complexes to neighbouring communities, CONCAWE Report 4/81, 1981.

- Motors;
- Agitators;
- Conveyors;
- Belt feeders;
- Screens;
- Granulator;
- Compressors;
- Dust extraction equipment;
- Flares;
- Vents; and
- Mobile equipment.

Noise Sound Power Levels (SWLs) applied to each item of equipment were calculated based on the data provided, the 3D model, and noise measurements of similar representative equipment types at other plants.

The Proposal design continues to be reviewed and optimised as the project progresses, and the noise model will continue to be updated to support secondary approval processes as the design matures and additional detail becomes available.

The current unmitigated equipment noise source SWLs modelled are presented in Table 9-6.

Table 9-6: Noise source sound power levels

Proposal noise sources	Sound Power Level dB(A), per item
Venting and flaring activities	113-120
Compressor CG 436-J	106.2
Compressor CG 438-J	106.2
Material Transfer Loader 1	105.1
13100-FAN-0098 Material Handling Feed Prep Baghouse Fan	103.4
Baghouse fan and stack at feed hoppers	103.4
ESF Water Cooling Fan 1	103.4
ESF Water Cooling Fan 2	103.4
Furnace Baghouse Fan 13400-FAN-0019A/B	103.4
Thermal Oxidiser Burner Fan 13400-FAN-0006	103.4
Thermal Oxidiser Combustion Fan 13400-FAN-0008	103.4
Screen	103.2
Belt Feeder RH 204-V	102.3
RH 133-V12 Belt Feeder	102.3
RH 133-V13 Belt Feeder	102.3
FD Fan PG 310-J	100.7
ID Fan PG 309-J	100.7
Baghouse Fan and Stack 2	100.4
Agitator C61WTR	99.6
Agitator RH 205-J	99.6

Proposal noise sources	Sound Power Level dB(A), per item
G29WMX KW Mixer (Agitator)	99.6
13700-PMP-0006A Cooling water circulation pump	99.3
13700-PMP-0006B Cooling water circulation pump	99.3
BFW Pump CO 337-J11	99.3
Cooling Water Pump 13700-PMP-0002A	99.3
Depressurising Scrubber Pump UT 703-J11	99.3
ESF Pump 1 Large	99.3
Gas Washing Water Pump CO 331-J11	99.3
Lean Solution Circulating Pump CO 322-J11	99.3
Oxygen Scavenger Agitator	99.3
Oxygen Scavenger Pump CO 336-U	99.3
Phosphates Agitator	99.3
Phosphates Pump CO 339-U	99.3
Pump 13700-PMP-0002A	99.3
Pump A71WPU 02	99.3
Pump C73WPU 02	99.3
Pump G17WPU 01	99.3
Pump G71WPU 02	99.3
Reboiler Condensate Pump CO 356-J11	99.3
Reflux Pump CO 325-J11	99.3
Solution Charging Pump CO 343-J	99.3
Solution Feeding Pump CO 329-J	99.3
CDRI Loader 1	99.0
CDRI Loader 2	99.0
Front End Loader - Feed	99.0
Vibrating Screen RH 100-G	96.9
Furnace Baghouse Stack 13400-STA-0020	96.5
Material Handling Baghouse Stack 13100-STA-0114	96.5
Rotary Valve RE 276-L	96.0
Granulator	95.0
Baghouse fan and stack 3 at Surge Silo Tower	93.4
Fan A01WCT 01	93.4
Fan A01WCT 02	93.4
13400-FAN-0012A/B Furnace Lower Wall Cooling Fan	92.3
13400-FAN-0013A/B Furnace Hearth Cooling Fan	92.3
CO 329-J Solution Prep Pump	92.3
Effluent Pump 1	92.3
Effluent Pump 2	92.3
ESF Pump 2 Small	92.3
F52WPU Pit Pump 1	92.3

Proposal noise sources	Sound Power Level dB(A), per item
N2 Pump 1	92.3
N2 Pump 2	92.3
O2 Pump 1	92.3
O2 Pump 2	92.3
Storage Tank Pump CO 328-J	92.3
UT 233-H Grease Pump 1	92.3
UT 932-J11 Operator Pump 1	92.3
UT 933-J11 Recirculation Pump 1	92.3
WS 367-J11 CWR Pump 1	92.3
HPU UT 930-L	90.0
CDRI Conveyor	75.0
CDRI Conveyor 2	75.0
CV 13100-BCR-0005 Batch Plant Conveyor	75.0
CV 13100-BCR-0027 Feed System Conveyor	75.0
CV 13100-BCR-0028 Furnace Feed Conveyor	75.0
IO Belt Conveyor 3	75.0
Material Transfer Conveyor 1	75.0
Material Transfer Conveyor 2	75.0
Material Transfer Conveyor 3	75.0
RH-126-V Flexowell Conveyor	75.0
RH-128-V IO Belt Conveyor 1	75.0
RH-131-V IO Belt Conveyor 2	75.0

9.6.2.3 Model scenarios

Various noise model scenarios, including scenarios with and without noise-controlled equipment, have been undertaken to represent the Proposal under expected operating conditions. All scenarios have been run applying worst case meteorological conditions as defined by DWER guidance documentation.

9.7 Assessment of significance of residual impacts

9.7.1 Proposal

An environmental noise assessment has been carried out for the Proposal (Talis, 2026). Noise levels were predicted using the acoustic software SoundPLAN v9.1 for worst-case wind conditions. The night-time L_{A10} assigned level (as shown in Table 9-7) is the most critical assessment criteria at the receiver locations.

The predicted noise emissions from the Proposal presented in Table 9-7 are all below 33 dB at sensitive receivers and, therefore, comply with the assigned night-time L_{A10} level prescribed by the Noise Regulations and will not result in significant impacts at these locations.

Table 9-7: Predicted noise emissions at residential receptors

Receiver ID	Receiver description	Proposal predicted noise level L_{A10} (dB)	Night-time L_{A10} assigned level (dB)	Compliance status at night-time
1	North Rockingham	31	33	Complies
2	Hillman	33	33	Complies
3	Leda	28	32	Complies
4	Calista	26	30	Complies
5	Medina	25	30	Complies

9.7.2 Cumulative impacts

The Noise Regulations address cumulative noise impacts in industrial areas by requiring proponents to design and operate facilities such that the received noise level from each facility does not exceed a level 5 dB below the applicable assigned level at a noise-sensitive premises. This requirement is intended to ensure that any individual facility does not significantly contribute to cumulative environmental noise levels at the point of reception, as outlined in Regulation 7(2).

Accordingly, the noise mitigation measures identified for the Proposal have been designed to ensure that received noise levels attributable to the Proposal are less than or equal to a level 5 dB below the applicable assigned level at the noise-sensitive premises. This approach is intended to minimise the Proposal's contribution to cumulative environmental noise levels and to support compliance with the requirements of the Noise Regulations.

Within the KIA, the growth of cumulative industrial noise levels is monitored and tracked through the cumulative environmental noise model maintained by the KIC. The primary purpose of this model is to provide government planners, regulators and the community with an understanding of existing cumulative industrial noise levels across the industrial precinct and surrounding residential areas.

9.8 Environmental outcomes

Based on the results of the environmental noise assessment, noise emissions from the Proposal will comply with the assigned levels in the Noise Regulations and will not result in significant impacts on social surroundings. Therefore, it is considered that the EPA's objective for social surroundings will be met.

10. Matters of National Environmental Significance

10.1 Introduction

The Proposal is located within the RIZ, which was referred to the Commonwealth under the EPBC Act in 2010 due to potential impacts to MNES. The establishment of the RIZ was determined to be a 'Controlled Action' (EPBC 2010/5337) and received conditional approval in November 2011.

The controlling provisions related to listed threatened species and communities, specifically the *Sedgelands in Holocene dune swales of the southern Swan Coastal Plain Threatened Ecological Community* (TEC), which does not occur within the Development Envelope, and black cockatoo habitat. DevelopmentWA is the approval holder under the EPBC Act. The Proposal is a separate action and will not be undertaken pursuant to the controlled action but will be undertaken in a manner consistent with the conditions of EPBC 2010/5337.

While some environmental factors were identified that may be relevant to the MNES trigger of 'nationally threatened animal and plant species and ecological communities', a significance assessment was undertaken for the Proposal, which concluded that it is unlikely to result in significant impacts to MNES. Therefore, the Proposal is not expected to constitute a 'controlled action' under the EPBC Act. Accordingly, NeoSmelt does not intend to refer the Proposal to the Commonwealth (DCCEEW).

10.2 Listed species

NeoSmelt has undertaken an assessment of the likelihood of occurrence of EPBC listed species (including migratory species) and other MNES. Only Forest Red-tailed Black Cockatoo (Vulnerable) and Carnaby's Black Cockatoo (Endangered) have a 'moderate' likelihood of occurrence (all other species are 'low' likelihood). In addition, the *Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community* (Tuart TEC), which was uplisted in 2019, is present within the Development Envelope.

Forest Red-tailed Black Cockatoo primarily inhabits the jarrah forest of the northern Darling Range, from Collie to Mundaring, with some presence in the lower southwest and isolated eastern populations (Garnett et al., 2011; CALM 2006). Though previously rare on the Swan Coastal Plain, the birds are now found year-round in search of food. The species prefers dense jarrah, karri, and marri forests that typically receive over 600 mm of annual rainfall, and they can be found to forage in nearby reserves approximately 5.3 km from the Development Envelope.

Carnaby's cockatoo, endemic to southwest WA, has a widespread range and migrates to higher rainfall coastal regions, such as the mid-west coast, Swan Coastal Plain, and south coast during the non-breeding season (January to July). This species inhabits uncleared or remnant native eucalypt woodlands, particularly those containing salmon gum and wandoo, as well as shrublands or kwongan heathlands dominated by hakea, dryandra, banksia, and grevillea species. The birds also use remnant native vegetation patches within agricultural areas. Additionally, Carnaby's cockatoo forage seasonally in high rainfall pine plantations, notably on the Swan Coastal Plain, suggesting potential for black cockatoo presence in the region.

Potential habitat for Carnaby's cockatoos (Tuart trees) is present along the eastern boundary and in the southeastern corner of the Development Envelope. Suitability of this vegetation as Black cockatoo habitat is discussed further in section 8.4.2.3. However, surveys undertaken to identify environmental values within the Development Envelope recorded low-quality foraging habitat for black cockatoos, largely due to historical vegetation disturbance associated with surrounding industrial land use.

No evidence of foraging was observed during surveys, and the vegetation present within the Development Envelope represents only a minor proportion of any one bird's diet, relative to preferred foraging species (i.e., Marri [*Corymbia calophylla]*, Jarrah [*Eucalyptus marginata*], banksia [*Banksia* spp.] and sheoak [*Allocasuarina* and *Casuarina* spp.]), which do not occur within the Development Envelope. In addition, no

evidence of roosting was observed, nor were any potential breeding trees with suitable hollows recorded within the Development Envelope.

10.3 Listed migratory species

Of the migratory species listed under the EPBC Act, only the Fork-tailed Swift and Caspian Tern have a moderate likelihood of occurrence within the Development Envelope.

The Fork-tailed Swift may be present in the airspace above the Development Envelope. This species is highly migratory and spends most of its time in the air, following weather patterns and foraging on insects while in flight (Higgins, 1999). Their use of the area is likely to be transient only, linked to seasonal movements rather than permanent residency, and they do not rely on ground-based resources.

The Development Envelope represents limited suitable habitat for the Caspian Tern. The species is widespread across Australia and uses a variety of coastal and inland habitats, often moving seasonally and in response to weather conditions (Higgins & Davies, 1996). Their foraging and nesting preferences, such as shallow waters and sandy or rocky shores, are typical across their extensive range and not unique to the Development Envelope. Furthermore, their global distribution across diverse regions indicates their adaptability and resilience to different environmental conditions (Birdlife International, 2011). Therefore, the Proposal is not expected to lead to significant habitat disruption.

10.4 Environmental outcomes

Notwithstanding the limited black cockatoo habitat values identified, the mitigation hierarchy has been applied to effectively avoid, minimise and/or rehabilitate potential impacts to MNES. Key measures include the retention of all Tuart trees representing the TEC within an ECBZ, which encompasses the highest-value habitat for black cockatoos within the Development Envelope.

Additional measures include engaging an accredited fauna specialist to inspect clearing areas prior to disturbance, implementing weed and hygiene protocols to maintain and enhance retained vegetation and fauna habitat, and enforcing on-site speed restrictions to reduce the risk of vehicle strikes on fauna.

Detailed management measures are provided in section 7.5 and section 8.5, as well as in the CEMP (Appendix G) and ECBZ MP (Appendix H).

Overall, the Proposal is not expected to result in any significant impacts to MNES.

References

360 Environmental Pty Ltd 2023. *H2Perth Hydrogen Plant: Kwinana Landscape Visual Impact Assessment*. Prepared for Advisian, May 2023

Advisian, 2023. *Woodside H2Perth Water Management Report*. Prepared for Woodside. 24 April 2023

Bamford Consulting Ecologists (BCE) (2020). *Scoring system for the assessment of foraging value of vegetation for black-cockatoos*. Revised 5th June 2020.

Beard, J., 1976. Vegetation survey of Western Australia. Western Australia 1:1,000,000 vegetation series.

Bofinger, N.D., Best, P.R., Cliff. D.I., Stumer, L.J., 1986. The oxidation of nitric oxide to nitrogen dioxide in power station plumes. Proceedings of the Seventh World Clean Air Congress, Sydney.

Bureau of Meteorology, 2025, Climate statistics for Australian locations – Perth Airport (009021) Graphical climate statistics for Australian locations (Accessed 5 March 2026)

Coffey Environments, 2010. *Rockingham Industry Zone Assessment 1534 Strategic Environmental Assessment (SEA) Response to the Department of Environment and Conservation Submission.* Prepared for Landcorp. 10 December 2010.

Commander, D.P., 2003. Outline of the hydrogeology of the Perth Region. Australian Geomechanics 38 (3).

Commonwealth of Australia, 2025. *Australia's National Climate Risk Assessment: An Overview*, Australian Climate Service.

Davidson, W.A., 1995. Hydrogeology and groundwater resources of the Perth Region, Western Australia: Western Australia Geological Survey, Bulletin 142, 257p.

Department of Agriculture, Water and the Environment (DAWE), 2022. *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo.* Commonwealth of Australia, 2022.

Department of Biodiversity, Conservation and Attractions (DBCA), 2017a. Ramsar Sites (DBCA-010) – GIS dataset. Perth, Australia. Perth, Australia.

Department of Biodiversity, Conservation and Attractions (DBCA), 2017b. *Fauna Notes: Living with Quenda*. Retrieved from http://www.dbca.wa.gov.au/

Department of Biodiversity, Conservation and Attractions (DBCA), 2018. Directory of Important Wetlands in Australia – Western Australia (DBCA-045) – GIS dataset. Perth, Australia.

Department of Biodiversity, Conservation and Attractions (DBCA), 2019. 2018 State-wide Vegetation Statistics – Full Report. March 2019. Perth, Australia.

Department of Biodiversity, Conservation and Attractions (DBCA), 2019. 2018 South West Vegetation Complex Statistics. March 2019. Perth, Australia.

Department of Biodiversity, Conservation and Attractions (DBCA), 2026. Threatened Fauna Database. Accessed March 2026.

Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2021. *Climate Change in Australia - Western Australia's Changing Climate*. Commonwealth of Australia, Canberra, Australian Capital Territory, 14 March 2021. Retrieved from https://www.climatechangeinaustralia.gov.au/en/changing-climate/state-climate-statements/western-australia/

Department of Environment (DoE), 2006. Air Quality Modelling Guidance Notes. Government of Western Australia, March 2026.

Department of Environment and Energy (DoEE), 2019. '*Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community*'. Commonwealth of Australia, 2019.

Department of Environmental Regulation (DER), 2015. Guideline: Identification and investigation of acid sulfate soils and acidic landscapes. Perth: Department of Environment Regulation.

Department of Environmental Regulation (DER), 2015. Guideline: Treatment and management of soil and water in the acid sulfate soil landscapes. Perth: Department of Environment Regulation.

Department of Parks and Wildlife (DPaW), 2013. Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia.

Department of Primary Industries and Regional Development (DPIRD), 2018. Soil Landscape Mapping – Systems (DPIRD-064) – GIS dataset. Perth, Australia.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011a. Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the EPBC Act. Commonwealth of Australia. Available at https://www.awe.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2012. *EPBC Act referral guidelines for three threatened black cockatoo species*. Commonwealth of Australia, 2012.

Department of the Environment (DoE), 2013. Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Commonwealth of Australia, 2013.

Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010. *Survey guidelines for Australia's threatened birds*. Commonwealth of Australia, 2010.

Department of Water and Environmental Regulation (DWER), 2017. *Acid Sulfate Soil Risk Map – Swan Coastal Plain* (DWER-055). GIS dataset.

Department of Water and Environmental Regulation (DWER), 2019a. Water Register. Accessed March 2026. Available at https://maps.water.wa.gov.au/#/webmap/register

Department of Water and Environmental Regulation (DWER), 2019b. Guideline Air Emissions. Draft for External Consultation October 2019. Perth, Australia.

Department of Water and Environmental Regulation (DWER), 2020. Clearing Regulations – Environmentally Sensitive Areas (DWER-046). GIS dataset.

Department of Water and Environmental Regulation (DWER), 2021a. *Western Australian climate projections: Summary*. September 2021. Government of Western Australia

Department of Water and Environmental Regulation (DWER), 2021b. National Environment Protection (Ambient Air Quality) Measure. Perth, Australia, May 2021.

Environmental Protection Authority (2011) *Report and Recommendations of the EPA (Report 1390) Rockingham Industrial Zone Strategic Environmental Assessment*. Western Australia, April 2011.

Environmental Protection Authority (EPA), 2016a. Environmental Factor Guideline: Flora and Vegetation, EPA, Western Australia.

Environmental Protection Authority (EPA), 2016b. Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment, EPA, Western Australia.

Environmental Protection Authority (EPA), 2016c. Environmental Factor Guideline: Terrestrial Fauna, EPA, Western Australia.

Environmental Protection Authority (EPA), 2018. Statement of Environmental Principles, Factors and Objectives, EPA, Western Australia.

Environmental Protection Authority (EPA), 2020. Environmental Factor Guideline: Air Quality, EPA, Western Australia.

Environmental Protection Authority (EPA), 2023. Environmental Factor Guideline: Social Surroundings, EPA, Western Australia.

Environmental Protection Authority (EPA), 2024. Environmental Factor Guideline: Greenhouse Gas Emissions. EPA, Western Australia.

Environmental Protection Authority (EPA), 2025a. Environmental Impact Assessment Practice in WA, Assessment of Proposals under Part IV of the EP Act.

Environmental Protection Authority (EPA), 2025b. *Instructions: How to prepare an Environmental Review Document*, EPA, Western Australia.

Environmental Protection Authority (EPA), 2026. Guideline for Cumulative Impact Assessment, EPA, Western Australia.

Government of Western Australia (GoWA), 2024. The State Register and other heritage listings. Accessed August 2025. Available at https://www.wa.gov.au/government/document-collections/the-state-register-and-other-heritage-listings

GV Environmental 2013. *Rockingham Industry Zone Construction environmental management plan*. Prepared for LandCorp. November 2023

Harewood, G., 2025. *Fauna Assessment, Miscellaneous Lots, Patterson Road – East Rockingham*, Prepared for BlueScope Future Technologies Pty Ltd, October 2025 V1.

Heddle, E., Loneragan, O. and Havel, J., 1980. Vegetation of the Darling System. Perth. Australia.

Higgins, P.J. and Davies, S.J.J.F., 1996. Handbook of Australian, New Zealand and Antarctic Birds. Volume 3 Snipe to Pigeons. Oxford University Press. Melbourne.

Higgins, P.J., 1999. Handbook of Australian, New Zealand and Antarctic Birds. Volume Four – Parrots to Dollarbird. Melbourne: Oxford University Press.

Hyd2o, 2013. *Rockingham Industrial Zone Water Management Strategy*. Prepared for Development WA

JBS&G, 2025. *Project NeoSmelt – Ecology Site Inspection.* Memo to BlueScope. 27 August 2025

Pryor, M, Barrett, G and Williams M (2023). The 2021 and 2022 Great Cocky Count: a community-based survey for Carnaby's Black-Cockatoo (*Zanda latirostris*), Baudin's Black-Cockatoo (*Zanda baudinii*) and Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*). Birdlife Australia, Floreat, Western Australia.

Smith, A.J., Turner, J.V., Herne, D.E., Hick, W.P., 2003. Quantifying submarine groundwater discharge and nutrient discharge into Cockburn Sound, Western Australia. CSIRO Land and Water Technical Report No. 01/03. CSIRO.

Threatened Species Scientific Committee (TSSC), 2019. Approved Conservation Advice (incorporating listing advice) for the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community.

Worley Consulting, 2025. *Neosmelt DRI-ESF Pilot Plant: Baseline Contamination Assessment*. Prepared for Bluescope Future Technologies.

Appendices

Appendix A Legislative context

A.1. Legislative context

A1.1 Environmental impact assessment process

Environmental Impact Assessment (EIA) is the systematic process used by Commonwealth and State regulators to evaluate the potential environmental effects of proposed development.

A1.1.1 Commonwealth process

The primary Commonwealth legislation relevant to the Proposal is the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act). Under the EPBC Act, any 'proposed action' that is likely to have a significant impact on matters of national environmental significance (MNES) requires referral to the Australian Minister for the Environment for a decision on whether it requires approval under the EPBC Act. The EPBC Act is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The EPBC Act identifies MNES, which are:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance;
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mining); and
- A water resource related to coal seam gas development and large coal mining development.

Where a Proposed Action is likely to have a significant impact on MNES, it is considered a 'controlled action' and cannot proceed without assessment and approval under the EPBC Act.

The only relevant MNES that could apply to the Proposal is the category of '*Listed threatened species and ecological communities*'. However, since there are no predicted significant impacts on this or any other MNES, NeoSmelt does not intend to refer the Proposal to the Commonwealth under the EPBC Act.

The relevant MNES that apply to the Proposal are further addressed in section 10 in the context of existing approvals for the RIZ.

A1.1.2 Western Australian process

The *Environmental Protection Act 1986* (EP Act) is the primary legislation that governs environmental impact assessment (EIA) and environmental protection in WA. If a proposal is likely to have a significant effect on the environment, it is a 'significant' proposal, requiring referral to the Environmental Protection Authority (EPA) under section 38 of the EP Act.

The EPA provides advice and recommendations to the State Government (Minister for the Environment) on the environmental acceptability of significant proposals. Under Part IV of the EP Act, the EPA considers proposals that are referred to it and decides whether it requires formal EIA along with the level of assessment. The Department of Water and Environmental Regulation (DWER) supports the EPA in conducting environmental impact assessments and monitors compliance with the conditions of Ministerial approvals.

The terms 'significant impact' and 'significant effect' are not defined in the EP Act; however, when considering significant impact or effect, the EPA may have regard to various matters, including:

- Values, sensitivity, and quality of the environment which is likely to be impacted;
- Extent (intensity, duration, magnitude, and geographic footprint) of the likely impacts;
- Consequence of the likely impacts (or changes);
- Resilience of the environment to cope with the impacts or change;
- Cumulative impact with other existing or reasonably foreseeable activities, developments, and land uses;
- Connections and interactions between parts of the environment to inform a holistic view of impacts to the whole environment;
- Level of confidence in the prediction of impacts and the success of proposed mitigation; and
- Public interest about the likely effect of the proposal or scheme, if implemented, on the environment and public information that informs the EPA's assessment.

The EIA process follows the steps detailed below:

1. Referral of a proposal to the EPA;
2. EPA to decide whether to assess a referred proposal;
3. Assessment of proposals;
4. EPA report on the assessment of a proposal; and
5. Decision on proposal and implementation of proposals.

Any person can refer a significant proposal to the EPA (e.g., the proponent, decision-making authority, or community members), except in certain situations.

When a project is referred to the EPA, it may decide to assess or not assess the proposal. If the EPA decides to assess the proposal, then this may involve an assessment of referral information (ARI) with or without a notice requesting further information, or a Public Environmental Review (PER). In deciding to assess a proposal, the EPA will identify the preliminary key environmental factors that need to be addressed and what proposal-specific information is required.

The EPA's assessment is documented in a public report, which informs a Ministerial Statement of the decision and conditions for the implementation of the proposal.

This document has been prepared to provide supporting information for the referral of the Proposal to the EPA, including:

- The key characteristics of the Proposal and associated activities;
- The receiving environment;
- Stakeholder consultation; and
- Potential environmental impacts on environmental factors and associated management measures.

Based on the assessments undertaken to support the referral and the predicted outcome of each of the environmental factors considered, NeoSmelt has determined that there are no environmental factors that require assessment by the EPA.

The studies carried out to date as considered in this ERD demonstrate that the EPA’s objectives for each relevant environmental factor can be met through the mitigation hierarchy that will be applied. Further,

other statutory decision-making processes can adequately manage the potential environmental impacts associated with the Proposal to ensure that the objectives are met (refer to section 1.3).

A1.2 Other decision-making authority processes

The other approvals and statutory decision-making processes relevant to the Proposal are detailed in Table A1-1.

Table A1-1: Other statutory decision-making processes which can mitigate potential impacts on the environment

Environmental impacts	How is the impact regulated by other decision-making processes?	Limit(s) of the decision-making process(es) to regulate the impact e.g. time limits, excluded operations	Likely environmental outcome of decision-making process(es), and consistency with EPA objective	Conditions, enforcement, and review process required by decision-making process(es)	Stakeholder engagement in decision-making process(es)
Air quality, social surroundings, terrestrial environmental quality					
Emissions to air causing health and amenity impacts to nearby sensitive receptors. Noise emissions causing amenity impacts to nearby sensitive receptors. Discharges of potentially contaminated stormwater to the environment	The Proposal will be regulated by DWER under Part V of the EP Act as a Category 44 Metal Smelting or Refining prescribed premises, which includes all activities relevant to the Proposal. The prescribed premises boundary will be consistent with the Disturbance Footprint described in this ERD, and activities relevant to the Proposal contained within the same boundary. NeoSmelt will apply to DWER for a works approval for construction, commissioning and time limited operation of the Proposal. During time limited operations under the works approval, NeoSmelt will apply to DWER for a licence for the ongoing operation of the Proposal.	Works approvals are typically issued for a duration of 3-5 years to allow sufficient time for the construction, commissioning and time limited operation of the Proposal. DWER will determine the maximum appropriate licence term, up to 20 years, taking account of: • the duration of other statutory approvals, such as planning approvals • the risk of harm to public health and the environment posed by the Proposal • whether the Proposal has been subject to recent environmental assessment • matters relevant to the efficient operation of the licensing regime • any other matter DWER considers relevant.	DWER regulates to ensure that there is not an unacceptable risk of harm to public health or the environment, consistent with the objectives of the EPA factors. The DWER assessment and decision-making processes are governed by relevant legislation and DWER policies, guidelines and procedures. Consistent with the environmental impact assessment (EIA) process under Part IV of the EP Act, DWER's regulatory functions under Part V of the EP Act are guided by the statutory object and principles of the EP Act and the following principles of good regulatory practice: • Risk-based regulation. • Evidence-based decision-making. • Application of Environmental Standards. • Appropriate conditions It is expected that the works approval and licence process administered by DWER can mitigate the potential impacts of the Proposal and, therefore, the EPA's objectives for the environmental factors of air quality and social surroundings are expected to be met through this decision-making process.	DWER can apply conditions to works approvals and licences that are necessary or convenient for the prevention, control, abatement or mitigation of pollution or environmental harm. DWER will set conditions to give effect to determined controls in accordance with its regulatory framework. It is expected that the works approval will specify the infrastructure (works) that NeoSmelt can construct and will regulate emissions and discharges associated with construction and commissioning, including dust, noise, emissions to air and discharges of wastewater and potentially contaminated stormwater. The works approval can also include conditions to regulate time-limited-operation of the premises whilst DWER assess the application for a licence. The works approval may include conditions relating to compliance and commissioning reporting, atmospheric discharge points, air emission monitoring requirements, stack emission limits, emissions abatement equipment, water pollution (discharge) controls and secondary containment of environmentally hazardous liquids. It is expected that the licence will include conditions relating to the specification and operation of infrastructure and equipment, authorised emission points and parameters, emissions limits, emissions monitoring and reporting. DWER undertakes proactive compliance monitoring of activities regulated under Part V of the EP Act to ensure they do not pose unacceptable risks to water, the environment and public health. Compliance inspections of prescribed premises also focus on determining whether emissions and discharges are managed appropriately by the current instrument and assessing compliance with the instrument and relevant associated legislation.	The EP Act requires applications for works approvals and licences that meet DWER's requirements are advertised for public comment. DWER advertises applications, including publication of supporting documentation, on its website for a period of 21 days. DWER can also seek comments from any public authority or person who it considers has a direct interest in the subject matter of the application. Post-decision, appeals can be lodged against the specifications of granted works approvals and licences within 21 days of the applicant being notified of the decision.

Environmental impacts	How is the impact regulated by other decision-making processes?	Limit(s) of the decision-making process(es) to regulate the impact e.g. time limits, excluded operations	Likely environmental outcome of decision-making process(es), and consistency with EPA objective	Conditions, enforcement, and review process required by decision-making process(es)	Stakeholder engagement in decision-making process(es)
				In addition to proactive compliance of activities carried out by DWER, licences typically include conditions for annual licence-holder compliance audits. These Annual Audit Compliance Reports (AACRs) are submitted to DWER and published on the department's website.	
Emissions to air causing health and amenity impacts to nearby sensitive receptors. Noise emissions causing amenity impacts to nearby sensitive receptors. Discharges of potentially contaminated stormwater to the environment. Visual impact of the Proposal causing amenity impacts to nearby sensitive receptors.	Development Approval under the *Planning and Development Act 2005* is required to ensure the Proposal is consistent with the zoning for the area and complies with the Local Planning Scheme and related Local Planning Policy requirements. The Development Approval application process and assessment of the Proposal against the relevant local planning schemes and policies can mitigate potential impacts, including nuisance aspects associated with air quality and noise. The Proposal will be assessed as a mandatory development application to be determined by the Metro Outer Development Assessment Panel (DAP) as it exceeds the project value threshold of $10 million or more. Operating under the Planning and Development (Development Assessment Panels) Regulations 2011, the Metro Outer DAP determines development applications as if it were the responsible planning authority, against the relevant local or region planning scheme and policies. However, the City of Rockingham will assess the application and prepare a report containing recommendations for the Metro Outer DAP to consider (Responsible Authority Report). The Development Approval application will be assessed against the Metropolitan Region Scheme and the City of Rockingham's Local Planning Scheme No. 2 and planning policies.	Development approvals are generally valid for a period of two years from the date of issue, within which the development must be "substantially commenced" to keep the approval valid. Given regulation of the Proposal by DWER under Part V of the EP Act, the process may delegate consideration of emissions and discharges to DWER.	The Development Approval process carried out by the City of Rockingham and Metro Outer DAP can mitigate the potential impacts of the Proposal. The EPA's objective for the factor social surroundings, air quality and terrestrial environmental quality are expected to be met through this decision-making process.	Most development approvals have conditions that form part of the development approval package and set out the circumstances in which the approved development may proceed. Often the purpose of conditions is to protect or reduce impacts on the environment and amenity. Standard planning conditions include those, amongst others, for the mitigation of emissions of wastewater, waste, noise, dust and odour.	Development Approval applications are advertised for public submissions and organisations and individuals can apply to present at DAP meetings. There are no third party appeal rights and only the applicant can request the State Administrative Tribunal (SAT) review a DAP decision.

A1.3. Object and principles of the EP Act

The object of the EP Act is to protect the environment of the State through establishing a series of principles for environmental protection. The principles for environmental protection have been considered with respect to the Proposal as summarised in Table A1-2.

Table A1-2: Consideration of the object and principles of the EP Act

Principle	Consideration
Object of the EP Act The object of the EP Act is "*…to protect the environment of the State, having regard to the following principles – …*"	The Proposal meets the object of the EP Act by: • Demonstrating a lower-emissions industrial technology; • Locating within an established industrial footprint; • Incorporating best-practice environmental controls; • Minimising waste and promoting resource recovery; and • Operating within a regulated approvals and compliance framework. The Proposal supports environmental protection while enabling industrial innovation, consistent with the principles of ecologically sustainable development embedded in the EP Act.
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decision should be guided by:* *a. careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* b. *an assessment of the risk-weighted consequences of various options.*	The Proposal is being developed through a detailed process of review to ensure impacts to the environment are minimised to the extent possible (as detailed in sections 5 to 9). Existing environmental data for the region and local area has been used in the EIA process, supplemented with additional site-specific scientific studies to ensure potential environmental impacts of the Proposal are understood. Specific studies have included GHG forecasting, flora and vegetation, fauna, Aboriginal cultural heritage, air quality, noise, water management and traffic assessments. These studies provide a detailed understanding of the existing environmental setting of the Proposal and demonstrate that the Proposal is not expected to cause significant impacts to the environment. The Proposal area has been designed to minimise environmental impacts as far as practicable. It is located within the RIZ, a SIA that has been subject to extensive historical industrial development and previous EPA assessment (refer to section 1.4) and separated from sensitive receptors. Areas of potentially significant flora and vegetation and terrestrial fauna have been avoided and will be retained, with management measures applied to enhance the environmental values of the area. NeoSmelt considers that the Proposal has been developed in accordance with the precautionary principle, and no risk of serious or irreversible damage to the environment is predicted.

Principle	Consideration
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	The Proposal meets the principle of intergenerational equity through its focus on developing and demonstrating lower-emission ironmaking technologies that can substantially reduce the carbon intensity of steel production, which is one of the world's largest industrial sources of GHG emissions. By replacing traditional coal-based methods with the DRI–ESF process powered by natural gas and, ultimately, renewable hydrogen and electricity, the Proposal will cut GHG emissions by up to 60 % in the short term and net-zero in the longer term. The Proposal also promotes responsible resource use by confirming that Western Australian Pilbara iron ores can be used in lower-emission steel manufacturing, ensuring the continued sustainable value of these resources. Circular-economy measures, including slag reuse, closed-loop water systems, and energy efficiency, further minimise waste and preserve natural resources. Knowledge generated from the Proposal will be shared across the iron and steel industry to accelerate decarbonisation and support long-term environmental stewardship. The Proposal will ensure that the benefits of present-day innovation do not compromise the environmental quality, resource availability or wellbeing of future generations. Accordingly, the Proposal is considered to meet the objectives of the principle of intergenerational equity.
3. The principle of conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	Any threat to biological diversity and ecological integrity has been avoided by locating the Proposal within the existing RIZ, a highly modified industrial landscape that contains minimal native vegetation or habitat of ecological value. No clearing of conservation-significant flora, fauna or habitat is expected, noting that Tuart trees and associated vegetation in the Development Envelope will be retained. The Proposal has been designed to prevent the discharge of untreated water, dust or contaminants to surrounding land or waterways, thereby protecting the ecological health of nearby environments. Discharge of wastewater to the marine environment will be controlled and monitored in accordance with an established management framework to ensure that current environmental values are maintained. In short, neither biological diversity nor ecological integrity will be adversely impacted, either directly because of clearance activity or indirectly via emissions and discharges, as a result of the development of the Proposal.

Principle	Consideration
4. Principles relating to improved valuation, pricing and incentive mechanisms *a. Environmental factors should be included in the valuation of assets and services.* *b. The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *c. The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* d. *Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.*	The Proposal reflects the principle of improved valuation, pricing and incentive mechanisms by incorporating economic and environmental efficiency into its design, operation and long-term objectives. By trialling a lower-emission ironmaking process, the Proposal supports the transition to markets where emissions intensity influences product value and investment decisions. The Proposal also encourages the use of circular resource management, including the reuse of intermediate products, which reduces waste disposal costs while conserving materials. Integration of the Proposal within an existing industrial complex enables environmental impacts associated with developing new industrial sites to be avoided or minimised. Integration with existing infrastructure such as ammonia storage tanks allows materials produced by the Proposal to be distributed to customers in a cost-effective and efficient manner, thus avoiding or minimising the environmental impacts associated with this aspect. Through collaboration among the NeoSmelt JV Participants, the Proposal aligns commercial incentives with environmental outcomes, ensuring that economic decision-making reflects the true cost of resource consumption and environmental protection. In doing so, the Proposal contributes to a market framework that rewards sustainability and innovation, consistent with the long-term goals of the State Government's sustainable development principles.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	All reasonable and practicable measures have been taken to minimise the generation of waste and its discharge into the environment through adopting the hierarchy of waste controls (avoid, minimise, reuse, recycle and safely dispose). No solid or liquid waste generated during operations will be discharged directly into the environment. Wastewater generated by the Proposal will be managed through existing wastewater infrastructure near the Proposal and intermediate products will be suitable for reuse in industrial applications, supporting circular-economy outcomes. Any residual waste streams will be collected and either recycled to the maximum extent practicable or disposed of in a controlled manner.

Appendix B Other environmental factors or matters

B1. Other environmental factors or matters

The identification of environmental factors (section 4) established several other environmental factors to be considered for the Proposal in addition to air quality, greenhouse gas emissions, flora and vegetation, terrestrial fauna and social surroundings (noise), being:

- Social surroundings (heritage, visual and traffic); and
- Benthic communities and habitats, marine environmental quality and marine fauna.

The Proposal is not expected to result in a significant environmental effect on the above environmental factors and, therefore, they have not been subject to detailed assessment in this ERD. Notwithstanding this, Table B.1-1 provides a summary assessment of how these other environmental factors have been considered for the Proposal.

Table B1-1: Other environmental factors or matters

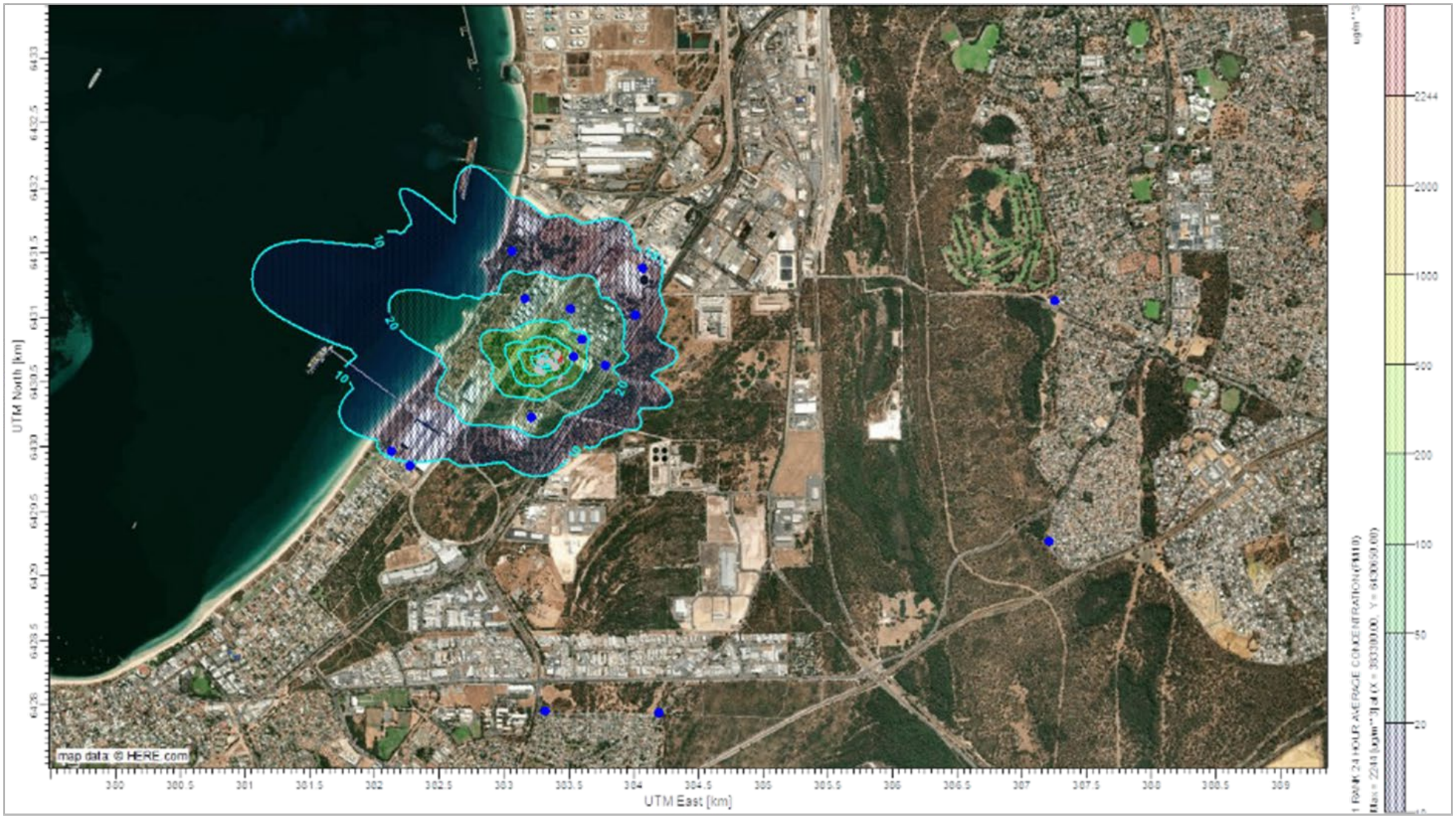
Environmental factor	EPA objective	Relevant surveys and investigations	Potential impacts	Application of mitigation hierarchy / management of impacts	Environmental Outcomes
Social surroundings (heritage)	To protect social surroundings from significant harm.	Archaeological and Ethnographic Site Identification Heritage Survey (Appendix F)	Disturbance of archaeological and ethnographic values	**Avoid:** • No registered sites or heritage places within the Development Envelope. • No isolated artefacts found during preliminary ground-disturbing activities (e.g., for geotechnical testing). • Retention and protection of Eco-cultural Buffer Zone. **Minimise:** • Cultural monitors to be present during ground disturbance work within the Development Envelope. • All employees and contractors working within the Development Envelope area will be made aware of the purpose of cultural monitors participating in the proposed works. • Implementation of CEMP, including Chance Finds Procedure. • Salvage of some *boorack*/balga trees that will be impacted by vegetation clearance works within the Development Envelope. • Provide opportunity for seed collection to be completed in collaboration with GKBAC prior to clearing. • Develop a robust and long-term employment and training strategy to ensure opportunities for Noongar people are provided in accordance with NeoSmelt's First Nations Engagement Framework.	Through implementing the mitigation hierarchy, the construction and operation of the Proposal are not expected to result in any significant environmental impacts to cultural heritage and the EPA's objective for social surroundings will be met.
Social surroundings (visual)		A visual impact assessment was conducted by Ecoscape, which identified four landscape character units (LCUs) relevant to the Proposal. The Proposal is located adjacent to the industrial LCU. Landscape values and key view locations are primarily associated with the Coastal Strip LCU.	**Direct impacts:** No direct impacts are expected. **Indirect impacts:** The Proposal will be visible above the vegetation canopy along Patterson Road resulting in an alteration of the view.	**Avoid:** The location of the development within an industrial area avoids significant visual impacts to sensitive visual receptors and key views. **Minimise:** The retention of existing vegetation along the Patterson Road boundary will minimise visual impacts for observers along this road.	The siting of the Proposal is located within an appropriate landscape character with existing roadside vegetation screening. Therefore, the existing landscape character within the study area will be retained. The key views and landscape values along the Coastal Strip LCU will not be impacted by the Proposal. Accordingly, the EPA's objective for social surroundings will be met.
Social surroundings (traffic)		A traffic impact assessment is currently being carried out to inform the application for Development Approval	The Proposal has the potential for traffic-related impacts associated with increased traffic generation and network capacity, road safety, amenity impacts (e.g., noise, exhaust emissions, vibration), heavy vehicle and logistics, and access and parking.	**Avoid:** • Locate site access via existing industrial road network (Charles Street/Patterson Road) to avoid sensitive receptors (e.g. residential areas); • Avoid direct access to Patterson Road (controlled access highway), reducing conflict with high-speed traffic; • Configure primary heavy vehicle movements to/from the north, avoiding unnecessary routing through local roads; • Separate light vehicle and heavy vehicle access points to avoid interaction risks; • Design internal road network to limit opposing heavy vehicle movements (e.g. one-way systems); and • Avoid reliance on Ward Road access except for emergency/contingency use. **Minimise:** • Stagger shift start/finish times where practicable to reduce peak congestion; • Schedule heavy vehicle movements to avoid peak commuter periods where feasible and distribute campaign traffic across 24 hours;	Traffic associated with the Proposal is not expected to result in a significant environmental impact, with preliminary modelling demonstrating that the surrounding road network will continue to operate at acceptable levels of service. Potential impacts are primarily limited to localised safety, minor amenity effects, and short-term construction traffic, all of which can be effectively managed through design, operational controls and a Construction Traffic Management Plan to be developed to the satisfaction of the Local Government Authority.

Environmental factor	EPA objective	Relevant surveys and investigations	Potential impacts	Application of mitigation hierarchy / management of impacts	Environmental Outcomes
				• Provide adequate on-site parking capacity to avoid overflow onto public roads; • Design site access and intersections to accommodate heavy vehicle turning movements and minimise queuing on Charles Street; • Implement speed controls and traffic calming within the site; and • Maintain clear sightlines at site access points (vegetation management, signage). **Management:** • Prepare and implement a Construction Traffic Management Plan; • Implement an Operational Traffic Management Plan; • Install and maintain appropriate signage and line marking at site access and internal roads; • Monitor traffic volumes and intersection performance post-commissioning and adapt operations if required. • Implement road safety procedures. • Maintain incident reporting and response procedures for traffic-related events. • Liaise with Main Roads WA and City of Rockingham regarding any emerging traffic issues. • Periodically review parking demand and traffic patterns and adjust site layout/operations if required.	
Marine environmental quality	To maintain the quality of water, sediment and biota so that environmental values are protected.	SDOOL discharge modelling	Marine environmental quality (and other associated environmental factors) could be indirectly impacted due to discharge of process wastewater from the Proposal to the marine environment via the SDOOL	**Avoid:** • The Proposal has been designed to prevent discharge of untreated water, dust or contaminants to surrounding land or waterways, thereby protecting the ecological health of nearby environments. • The Proposal has been designed to meet existing discharge conditions for the SDOOL to maintain ecosystem health in the receiving environment. **Minimise:** • A hydrodynamic model has been used to project potential for changes in marine quality from discharge during operations. The modelling confirms that the conditions in MS 665 and the requirements of the SDOOL Monitoring and Management Plan will continue to be met after commissioning. • Discharge of wastewater to the marine environment will be controlled and monitored in accordance with an established management framework to ensure that current environmental values are maintained. **Management:** Water Corporation will continue to meet the requirements of the SDOOL Monitoring and Management Plan and conditions of the EP Act licence regulating the discharge.	No additional or different risk of impacts to marine environmental quality because of the discharge have been identified. Therefore, it is considered that the EPA's objective for marine environmental quality will be met.
Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected	NeoSmelt Pilot Plant Stormwater Drainage Management Plan (Draft) (Hatch, 2025)	**Direct impacts:** • alteration of groundwater recharge and surface water regimes due to creation of impervious surfaces • impacts to groundwater quality from spills or leaks of hydrocarbons and hazardous materials **Indirect impacts:**	**Avoid:** • The Proposal is in an area with no existing surface water features or external catchments that drain into the Development Envelope, and no surface water users. The closest surface water features (within 700 m) are hydrologically upgradient of the Development Envelope. • The Development Envelope features sandy soils and shallow groundwater, conditions that favour local infiltration rather than stormwater runoff to waterways. **Minimise:** • There are no major, long-term dewatering activities anticipated. If short-term, localised dewatering is required during construction, a relevant dewater licence and associated management plan will be put in place.	No impacts to inland waters are expected because of the Proposal and the EPA's objective for inland waters will be met.

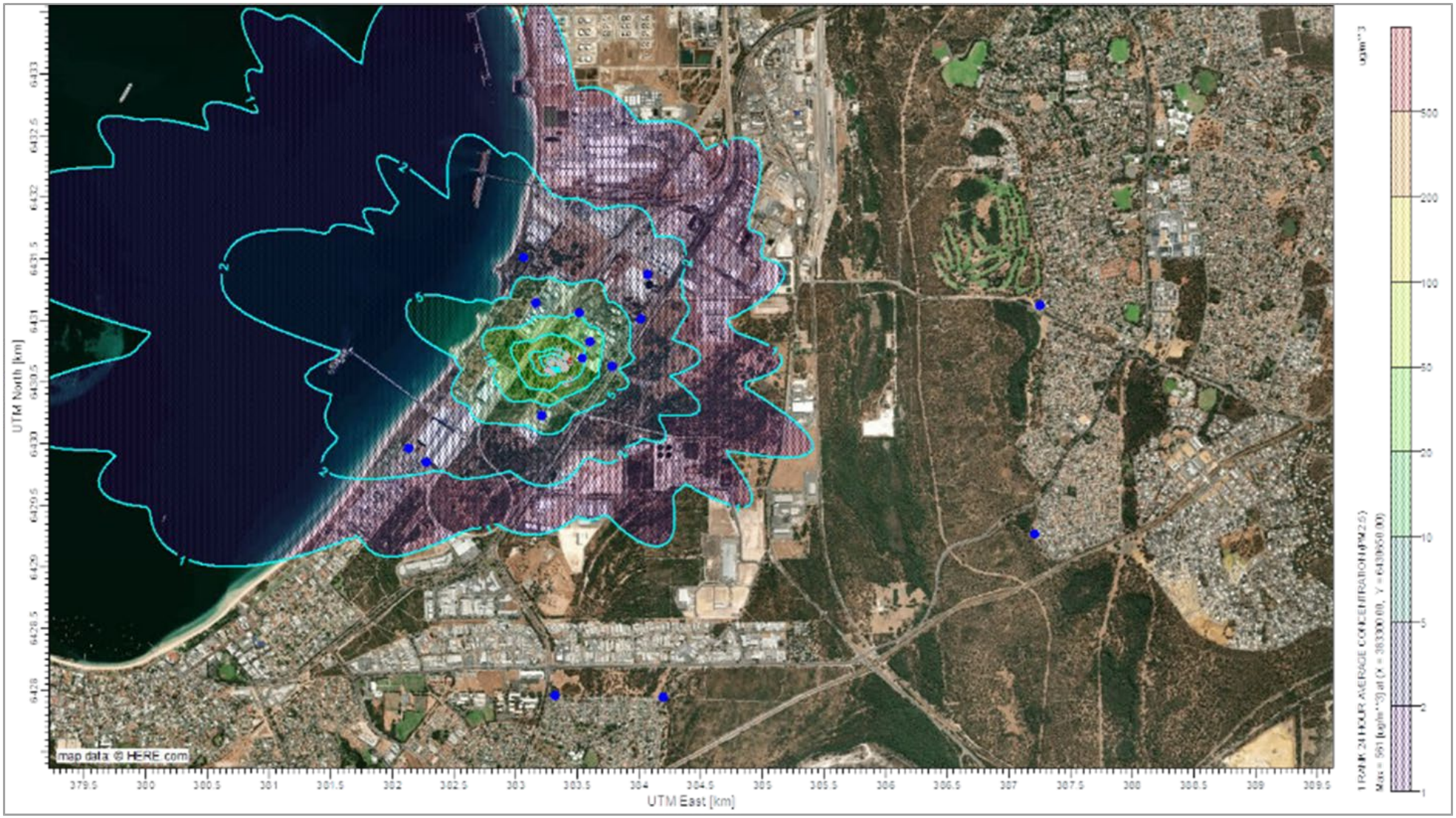
Environmental factor	EPA objective	Relevant surveys and investigations	Potential impacts	Application of mitigation hierarchy / management of impacts	Environmental Outcomes

			• Transport of groundwater contaminants via groundwater flows.
			• Alteration to hydrological regimes via dewatering.
			• Alteration to water quality as a result of waste discharge and/or stormwater runoff.
				• Water quality treatment systems and stormwater management structures will be designed in accordance with the relevant guidelines.
				• A draft stormwater management plan has been prepared which includes measures such as:
				  ○ The first 15 mm of runoff will be retained within the Development Envelope, where practicable;
				  ○ stormwater will be captured and infiltrated within the development Envelope;
				  ○ Pre-development peak flow rates and volume runoff will be maintained for ecological protection;
				  ○ Stormwater drainage will use a pipe and pit network within the sealed road network as the main conveyance method;
				  ○ Hard standing pad areas will be mostly unsealed and graded towards roads to capture and contain rainfall runoff from plant areas to a gully drainage pit and pipe network; and
				  ○ Runoff diversion bunds will be used to protect stockpile areas and the containment of known contamination-risk processes and sources.
				  ○ All bunded areas will have an impermeable perimeter to prevent the escape of contaminated runoff.	

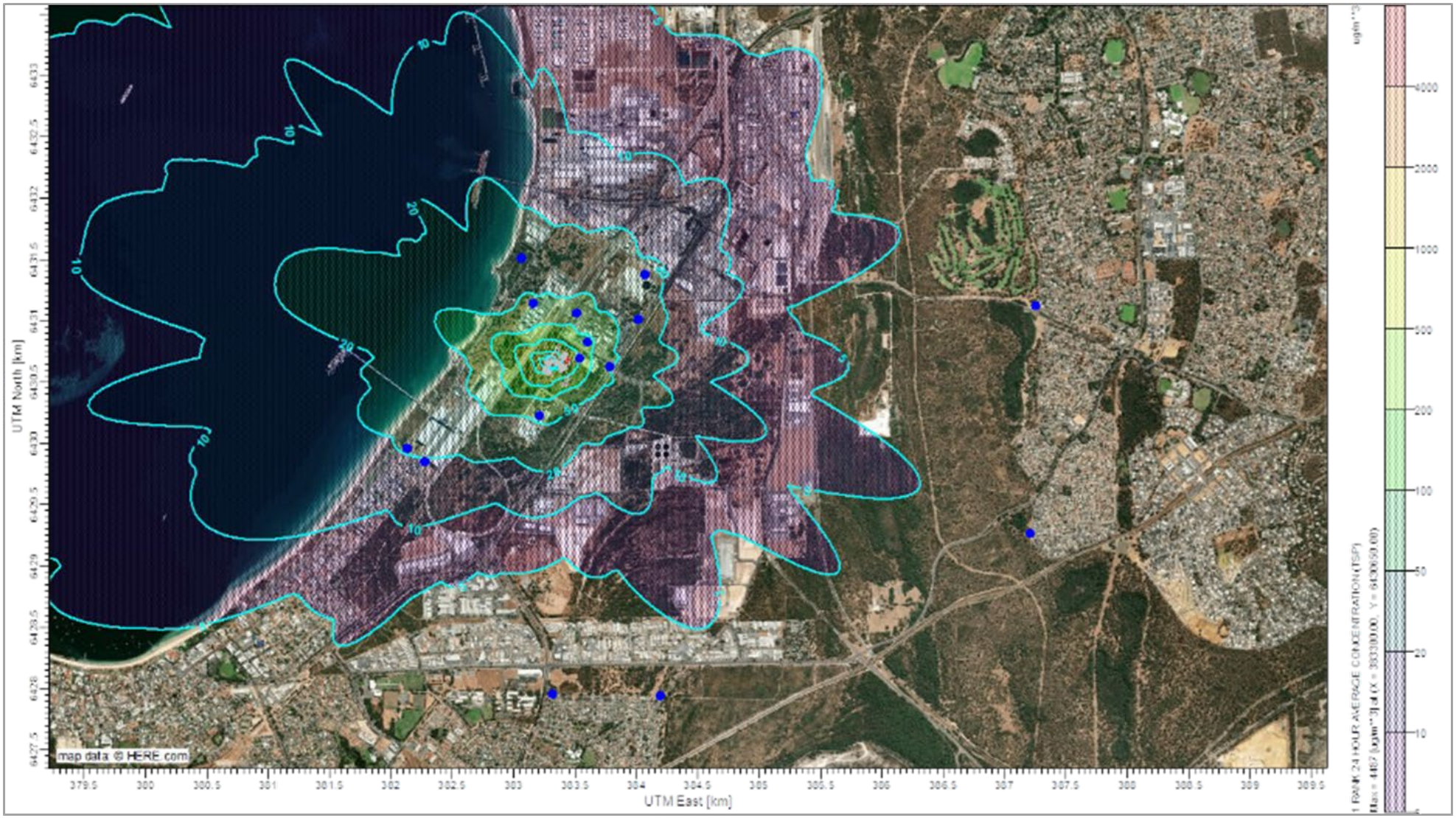
Appendix C Air Quality – Contours (isopleths)



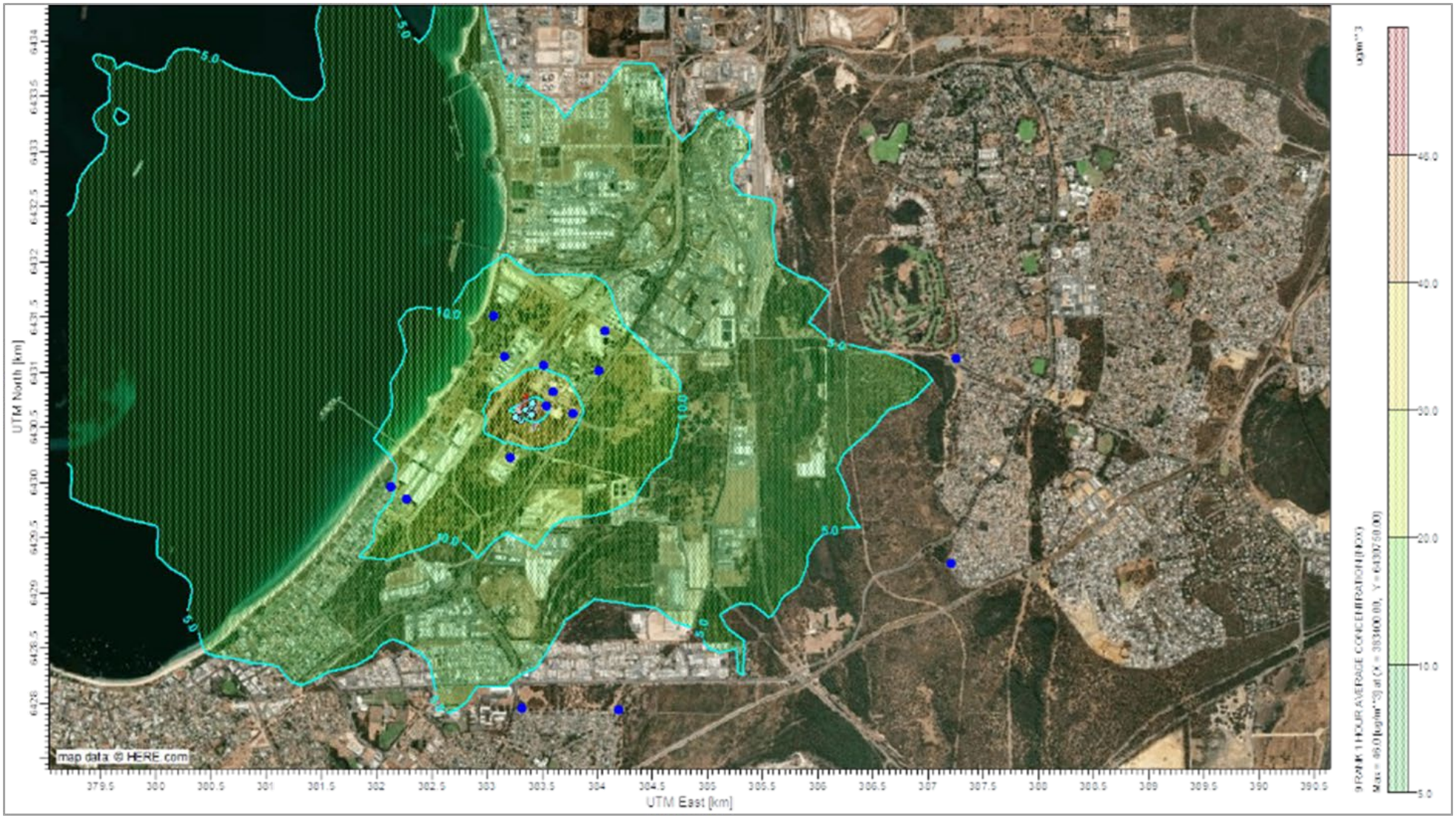
Proposal only – predicted maximum 24-hour average ground-level concentrations of PM_{10} (µg/m^3)



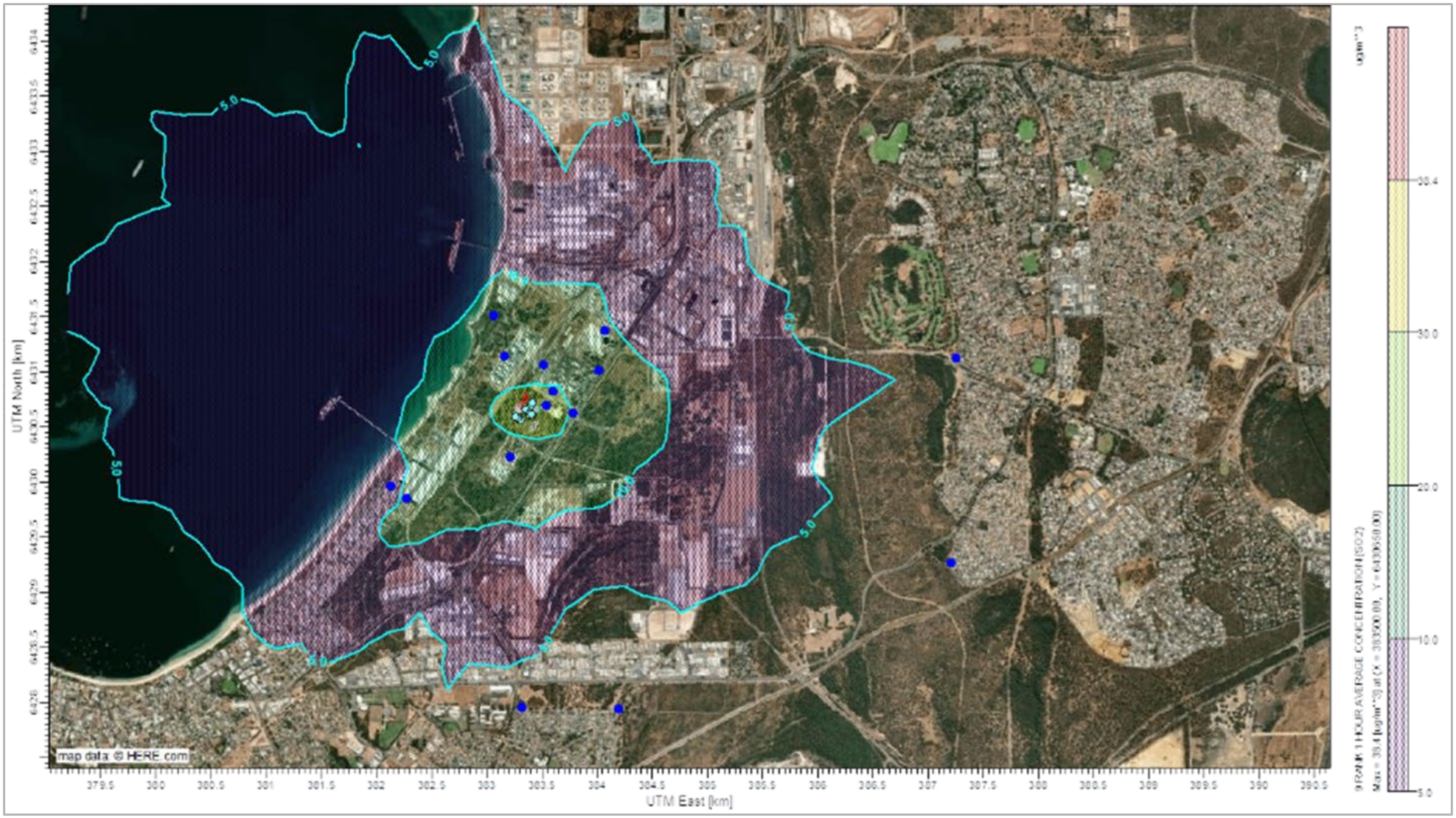
Proposal only - predicted maximum 24-hour average ground-level concentrations of $PM_{2.5}$ ($\mu g/m^3$)



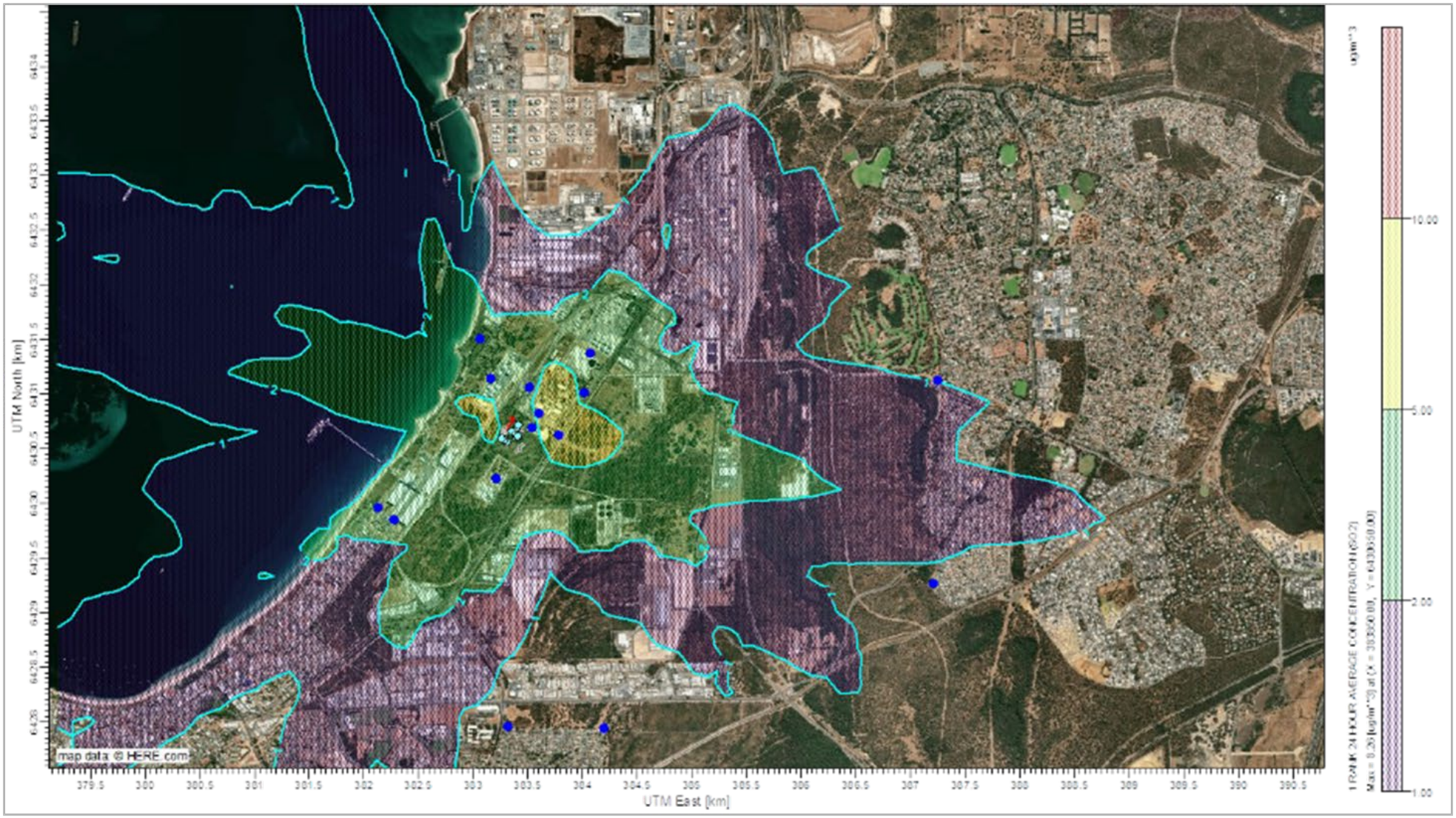
Proposal only - predicted maximum 24-hour average ground-level concentrations of TSP (µg/m^3)



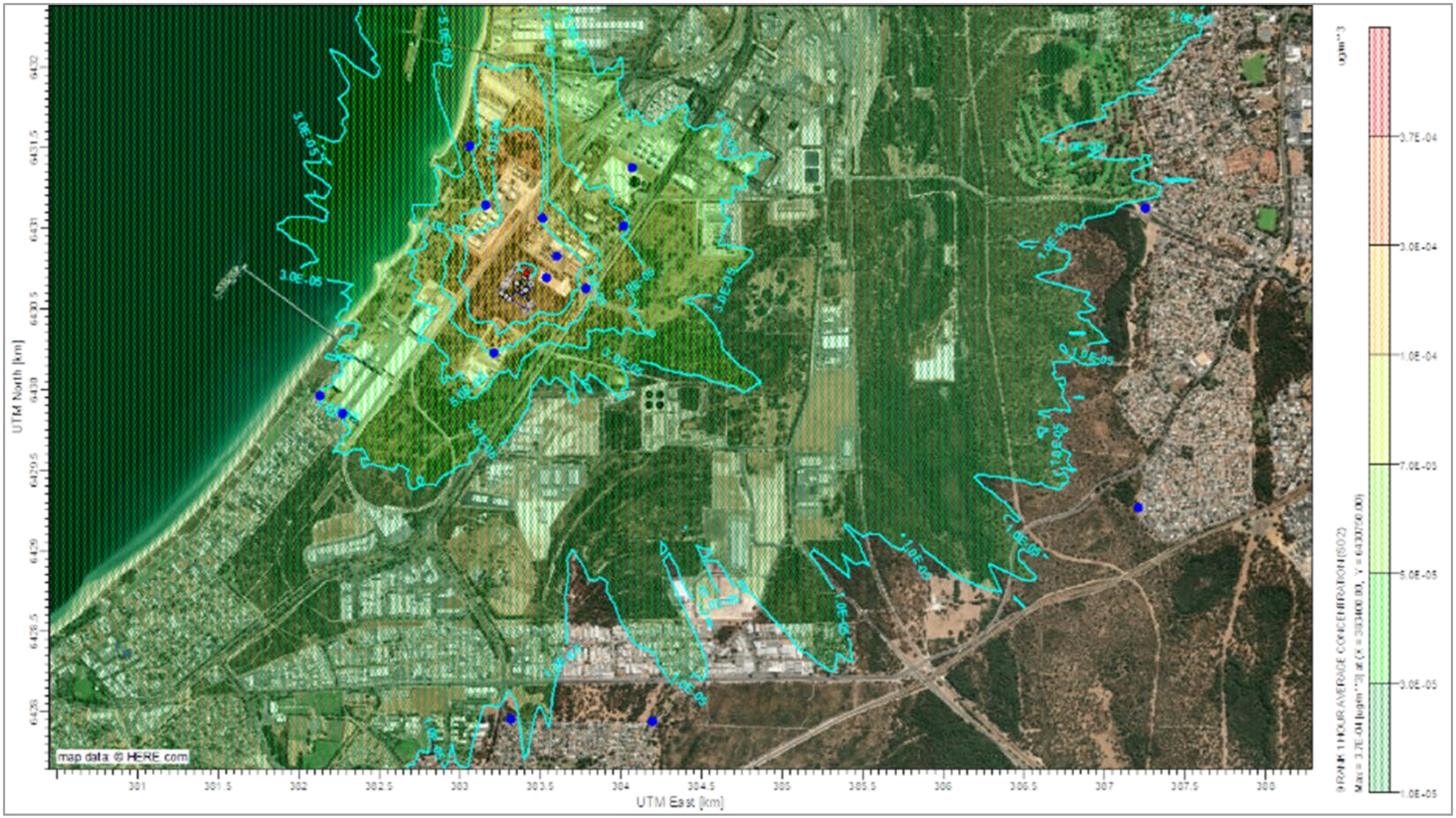
Proposal only - predicted maximum 1-hour average ground-level concentrations of NO_2 ($\mu g/m^3$)



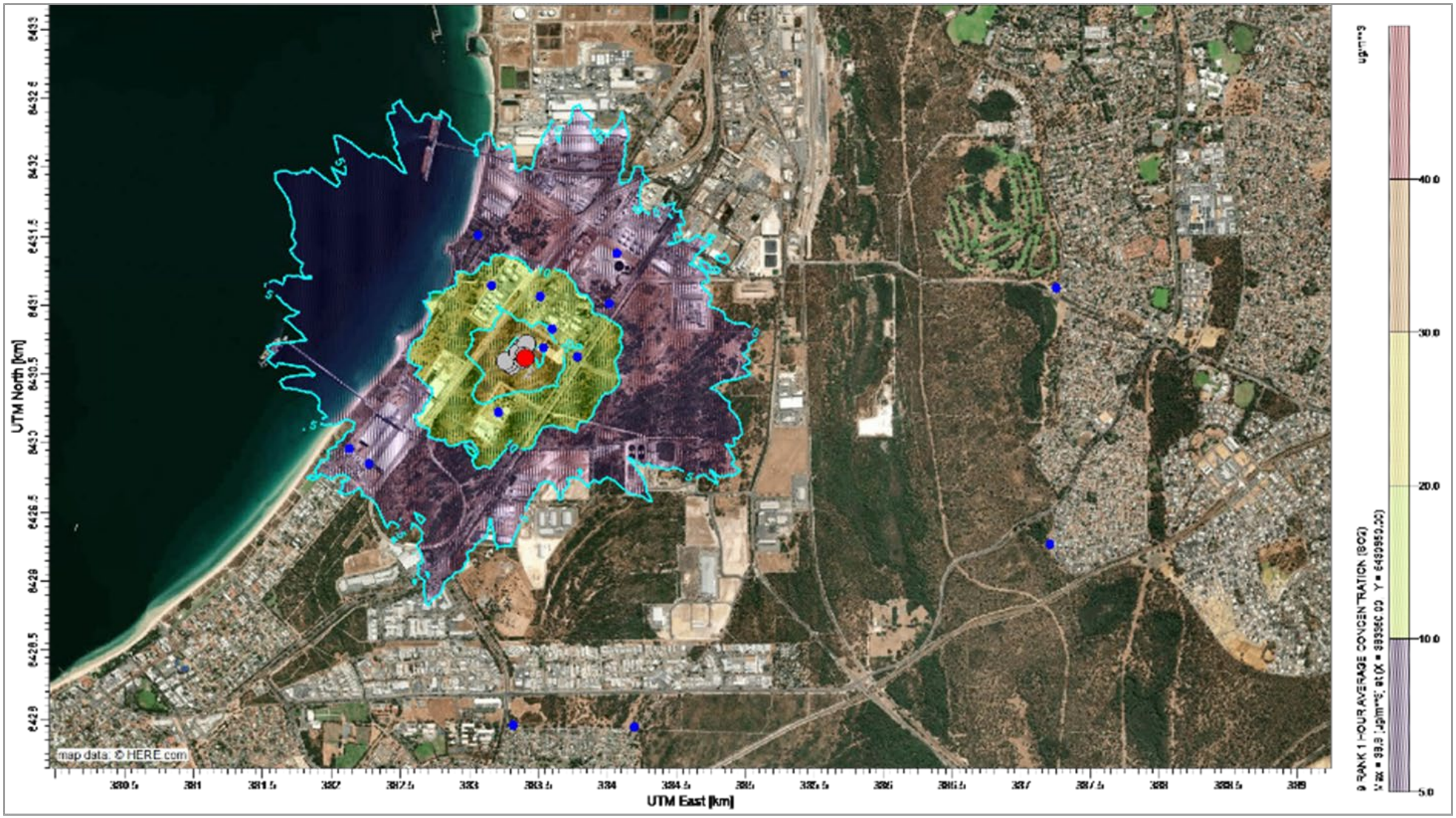
Proposal only - predicted maximum 1-hour average ground-level concentrations of SO_2 (µg/m^3)



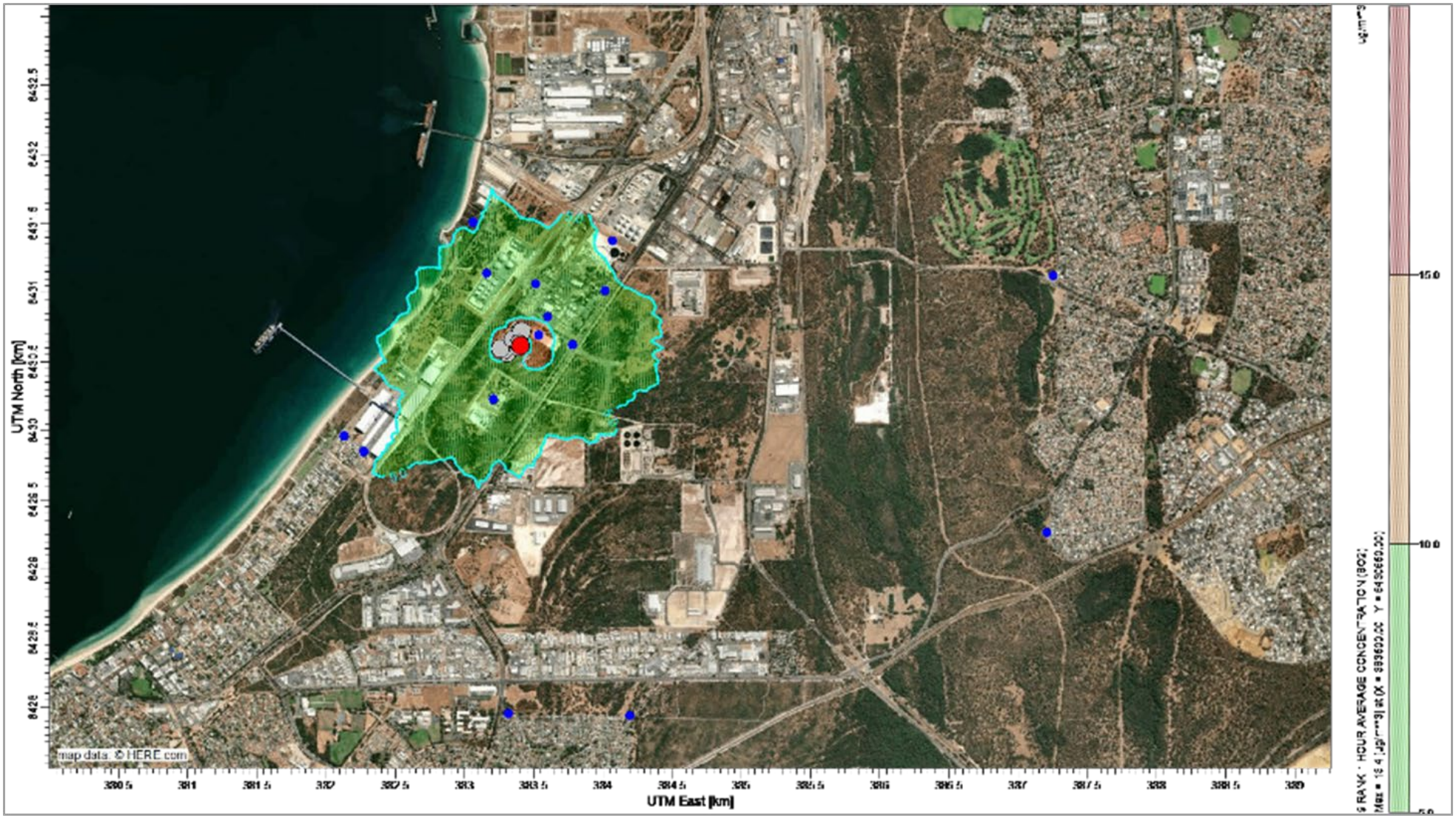
Proposal only - predicted maximum 24-hour average ground-level concentrations of SO_2 (µg/m^3)



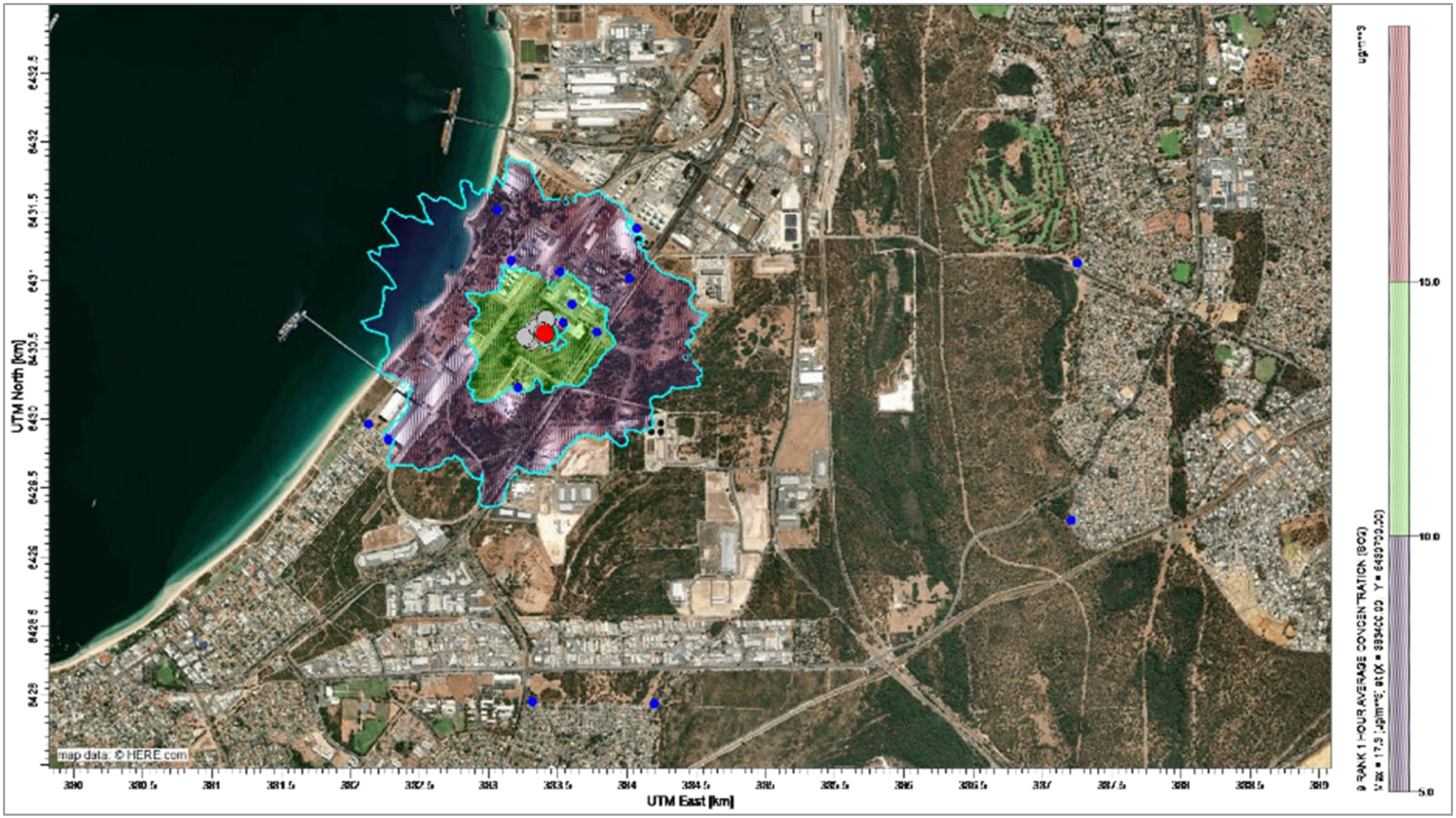
Proposal only - predicted **maximum 1-hour average ground-level concentrations of SO_2 – DRP Flare Event ($\mu g/m^3$)**



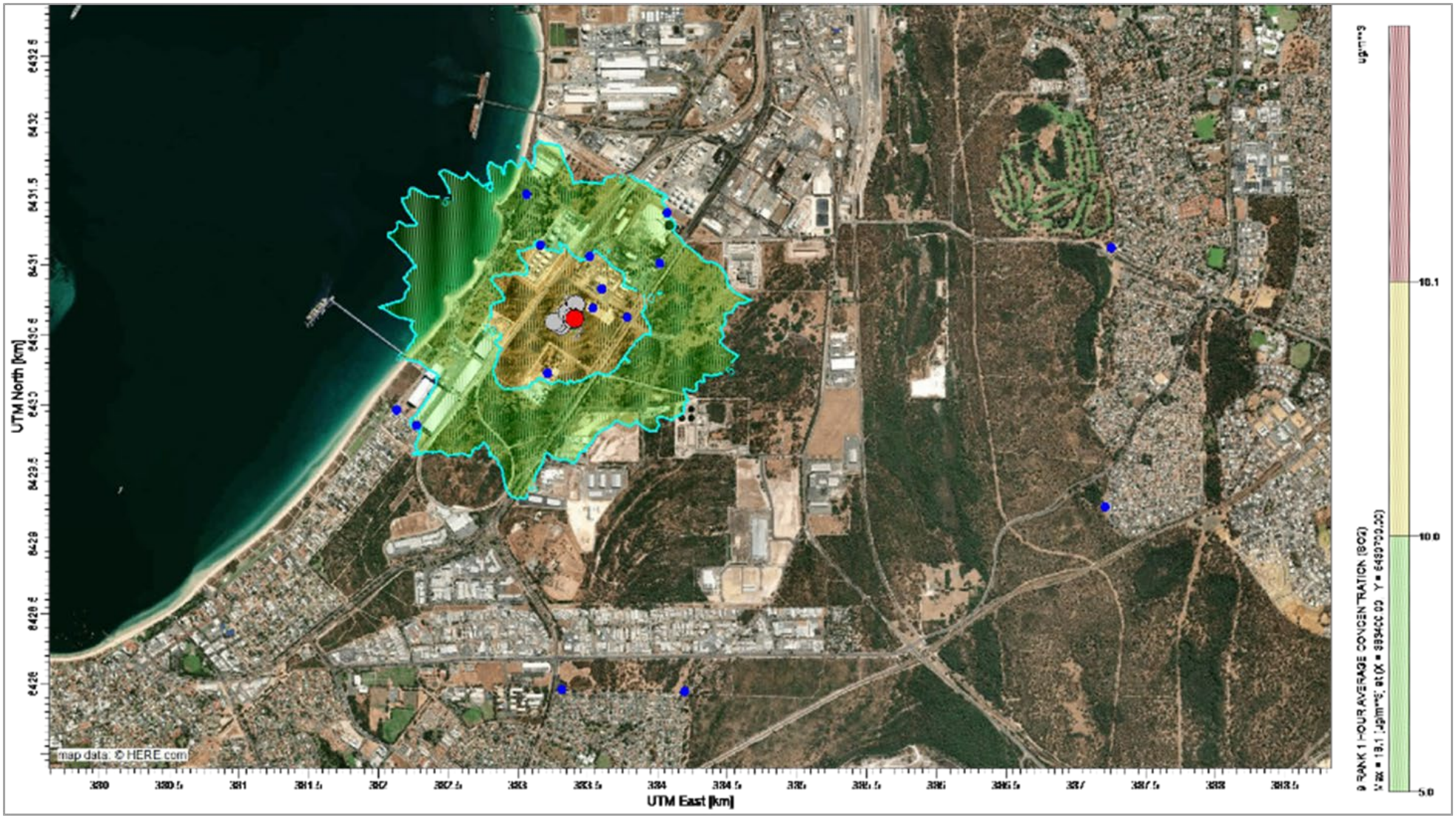
Proposal only - predicted maximum 1-hour average ground-level concentrations of SO_2 – Event Type 1 (µg/m^3)



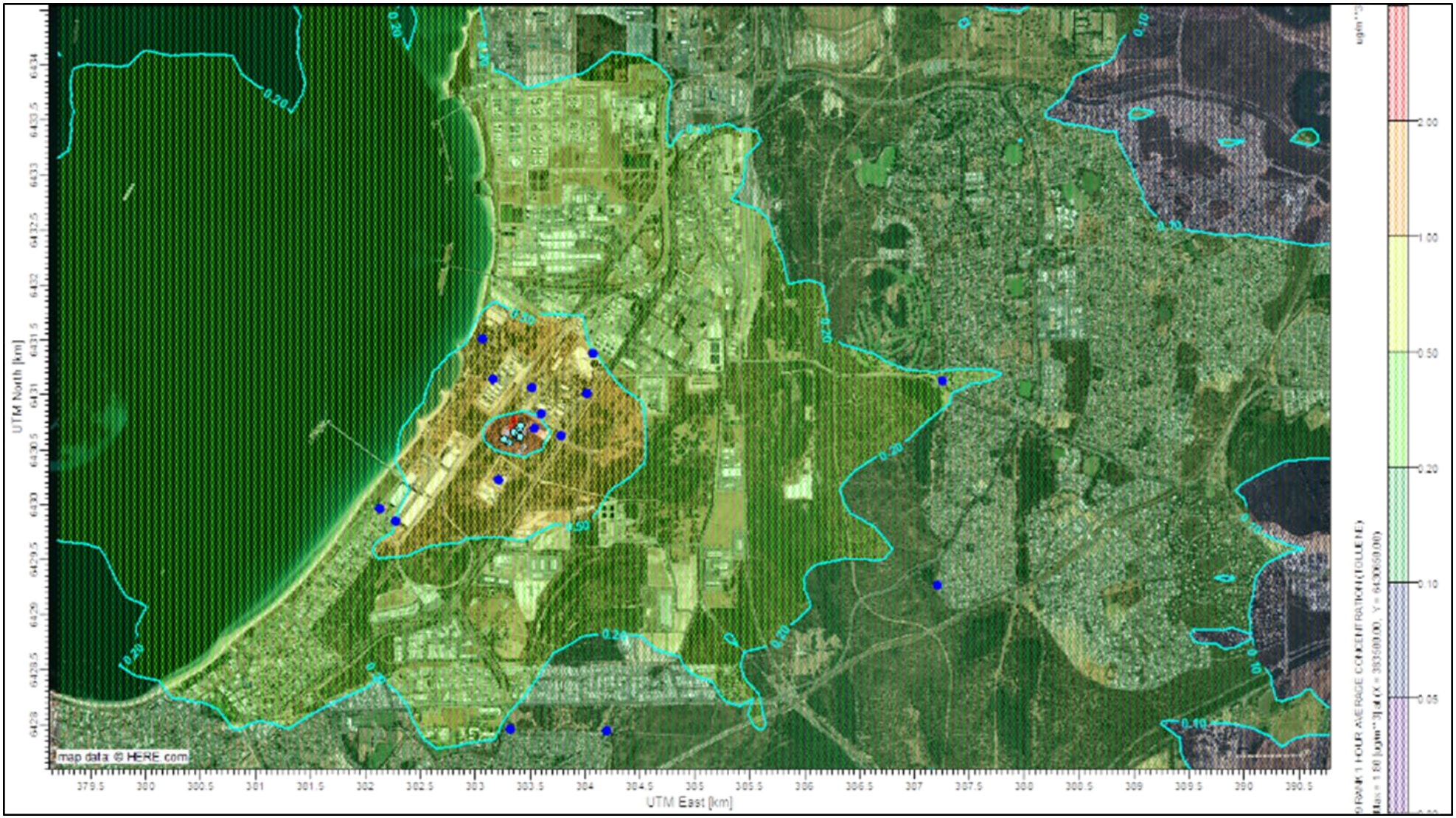
Proposal only - predicted maximum 1-hour average ground-level concentrations of SO_2 – Event Type 2 ($\mu g/m^3$)



Proposal only - predicted maximum 1-hour average ground-level concentrations of SO_2 – Event Type 3 ($\mu g/m^3$)



Proposal only - predicted maximum 1-hour average ground-level concentrations of SO_2 – Event Type 4 ($\mu g/m^3$)



Proposal only - predicted maximum 1-hour average ground-level concentrations of H_2S (µg/m^3)

Appendix D Ecology Site Inspection (JBS&G, 2025)

Appendix E Fauna Assessment (Greg Harewood, 2025)

Appendix F Heritage Survey Report

Appendix G Construction Environment Management Plan

Appendix H Eco-cultural Buffer Zone Management Plan