BHP

Olympic Dam Smelter and Refinery Expansion Project

Environmental Impact Statement

Appendix C6 to Appendix C8

October 2026

BHP

Olympic Dam Smelter and Refinery Expansion Project

Environmental Impact Statement

Appendix C6 to Appendix C8

October 2026

Appendices

Appendix A Regulatory framework

Appendix A1. Impact Assessed Development declaration
Appendix A2. Assessment Requirements
Appendix A3. Assessment Requirements checklist
Appendix A4. Contributions and project team
Appendix A5. Stakeholder Communication and Engagement Strategy and Plan

Appendix B Proposed operation (source)

Appendix B1. Indicative engineering site layout drawings and sections

Appendix C Environmental assessments (pathway)

Appendix C1. Soil and groundwater
Appendix C2. Noise and vibration
Appendix C3. Air quality
Appendix C4. Radiation
Appendix C5. Greenhouse gas
Appendix C6. Surface water
Appendix C7. Land use and planning
Appendix C8. Traffic

Appendix D Impact assessments (receptor)

Appendix D1. Ecology
Appendix D2. Social
Appendix D3. Economic
Appendix D4. Historic heritage (non-indigenous)
Appendix D5. Visual amenity

Appendix E Consolidated impact assessment and risk register

Appendix E1. Environmental impact assessment framework
Appendix E2. Environmental impact assessment tables
Appendix E3. Risk register

Appendix F Other legislative requirements

Appendix F1. EPBC Act Notice of Referral Decision

BHP

OD SRE EIS

Appendix C (continued) Environmental assessments (pathway)



BHP

OLYMPIC DAM SMELTER AND
REFINERY EXPANSION PROJECT
ENVIRONMENTAL IMPACT STATEMENT

Appendix C6.
Surface water

Surface Water Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

Prepared for BHP Olympic Dam Corporation Pty Ltd

October 2026

Surface Water Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

BHP Olympic Dam Corporation Pty Ltd

October 2026

Approved by

Jarrah Muller
Associate Civil and Environment Engineer
2 October 2026

Level 4 74 Pirie Street
Adelaide SA 5000
ABN: 28 141 736 558

This report has been prepared in accordance with the brief provided by BHP Olympic Dam Corporation Pty Ltd and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purposed for which it has been provided. Except as permitted by the *Copyright Act 1968* (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to BHP Olympic Dam Corporation Pty Ltd (and subject to the terms of EMM's agreement with BHP Olympic Dam Corporation Pty Ltd).

© EMM Consulting Pty Ltd, Level 10, 201 Pacific Highway, St Leonards NSW 2065. 2026.
ABN: 28 141 736 558

Executive summary

ES1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the far north of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd (EMM) and Lathwida Environmental Pty Ltd (Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM was commissioned by BHP to undertake a Surface Water Impact Assessment of the proposed SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline surface water environment (see baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to baseline surface water conditions as a result of the SRE Project (see assessment of effects in Chapter 3 of this report)
- quantify the likely impacts resulting from the predicted change to baseline surface water conditions on identified receptors (see impact assessment in Chapter 4 of this report).

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

ES2 Baseline conditions

The SRE Project is located within the Olympic Dam Special Mining Lease (SML), with majority of project infrastructure proposed to be constructed in the vicinity of existing Olympic Dam smelter, refinery and processing plant infrastructure.

The immediate surrounds consist of a dune field system of small catchments that cause stormwater to pool in dune swales. The resulting rainfall runoff flow regime for undeveloped areas is low velocity runoff that moves a short distance before pooling.

All stormwater within the developed portions of the Olympic Dam mine and processing plant areas will be managed and diverted to stormwater ponds to prevent discharge of contact water from the SML to the environment.

There are no rivers, creeks or floodplains within the vicinity of the SRE Project.

ES3 Assessment of effects

ES3.1 Flooding

The proposed SRE Project is not at risk from regional flooding. There are no rivers, creeks or floodplains in the vicinity of the SRE Project.

Stormwater which collects in dune swales will be excluded from the site by bunding and the building up of pads above the stormwater pooling level.

Rainfall runoff collected from proposed infrastructure will be directed to the proposed stormwater management system. Additional storage capacity will be constructed to allow for collection of water from the project area.

Larger water level changes may occur along some of the bunds and access roads; however, this is expected to be ameliorated through the addition of culverts and detailed drainage design on the southern infrastructure pads.

Flood modelling indicated that 27 dune swales may have altered flood hydrology following SRE Project development, with negligible differences in wet and dry areas in these swales. At the interface of the proposed infrastructure and the natural environment, future dune swale stormwater water levels may vary from current in the order of ±20 centimetres (cm) in a 1% Annual Exceedance Probability (AEP) storm with negligible change in pooling water levels during smaller runoff events. The total post-development swale area (from crest to crest) affected by the SRE Project development is approximately 196 hectares (ha) (Figure 3.2); however, the surface area of pooling following rain will be significantly smaller.

ES3.2 Water quality

If unmanaged, there is potential for the SRE Project to affect surface water quality, through spills of contaminants which may subsequently be transported by rainfall runoff into swales, or through erosion of disturbed areas.

Management/mitigation methods are proposed such that the SRE Project is expected to have low or no impact on surface water quality, as:

- SRE Project smelter and refinery plants will be enclosed within buildings, such that rainfall is excluded
- the Electro Refinery and Temporary Works Area will be bunded to prevent uncontrolled discharge from the lease boundary
- no stormwater discharge points will be created by the SRE Project
- stormwater runoff velocities in the natural environment will remain unchanged; thus, there will be no change to erosion potential
- contaminant sources such as fuel storage and stockpiles would be bunded and located away from stormwater flow paths, preventing interaction with stormwater the dunal catchment system means that any contaminant, if one were to be released, would not be transported through a waterway network but would be captured locally, facilitating cleanup.

ES4 Impact assessment

Based on the assessment of effects, a total of 3 impact events were identified for SRE Project (Table ES1). The severity of each event was rated Level 1 (not significant).

Table ES1 Confirmed impact events

Pathway	Impact ID	Impact event description	Impact severity discussion
Surface water	SW05	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting flora and vegetation.	Erosion and sediment control measures will be developed as a part of detailed design and implemented during construction. Potential impacts to surface water quality are expected to be minor and manageable with standard controls in place.
Surface water	SW06	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting fauna and habitat.	
Surface water	SW07	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting State and Commonwealth threatened species.	

TABLE OF CONTENTS

Executive summary **ES.1**

1 Introduction **1**

1.1 Project area definitions 1

1.2 Regulatory context 2

1.3 Project description 4

2 Baseline condition assessment **12**

2.1 Study area 12

2.2 Environmental aspects 14

2.3 Sensitive receptors (baseline environment) 16

2.4 Surface water environment 16

3 Assessment of effects **20**

3.1 Potential impact events 20

3.2 Assessment of effects 24

3.3 Conclusion 29

4 Impact assessment **34**

4.1 Confirmed impact events 34

4.2 Impact assessment 34

4.3 Mitigation and management 36

References **37**

Abbreviations and acronyms **38**

Units of measure **39**

Annexures

Annexure A Hydraulic modelling technical report A.1

Annexure B Assessment requirements B.1

Tables

Table ES1 Confirmed impact events 2

Table 1.1 Project stages and timing 5

Table 1.2 Key characteristics of the SRE Project 6

Table 2.1 Annual rainfall statistics 14

Table 2.2 Climate change projections for Woomera (DEW 2022) 15

Table 2.3	Olympic dam water balance (BHP 2024b)	19
Table 3.1	Preliminary SPR assessment – potential impact events	21
Table 3.2	Indicative SRE Project water demand (Hatch JV 2025)	28
Table 3.3	Final SPR assessment – confirmed impact events	30
Table 4.1	Confirmed impact events	34
Table 4.2	Consequence definitions and significance determination	35
Table 4.3	Surface water impact assessment	35
Table 4.4	Indicative surface water mitigation and management measures	36
Table B.1	Assessment requirements	B.2

Figures

Figure 1.1	SRE Project Area - regional locality	9
Figure 1.2	SRE Project Area - SML Area	10
Figure 1.3	SRE Project Area - EIGR Areas	11
Figure 2.1	SRE Project - conceptual site plan	13
Figure 2.2	Monthly rainfall statistics – SRE Project SILO data (-30.45, 136.85) & Olympic Dam Aerodrome (-30.49, 136.87)	15
Figure 2.3	Peak baseline flood depths Pre-development 1% AEP storm	18
Figure 3.1	Peak design flood depth Post-development Current Climate 1% AEP storm	25
Figure 3.2	Affected catchments Current climate 1% AEP storm	26
Figure 3.3	Post-development flow paths	27

1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the far north of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd (EMM) and Lathwida Environmental Pty Ltd (Lathwida) have prepared an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM Consulting Pty Ltd (EMM) was commissioned by BHP to undertake an environmental assessment of the proposed surface water-related SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline surface water environment (see Baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to baseline surface water conditions as a result of the SRE Project (see assessment of effects in Chapter 3 of this report)
- quantify the likely impacts resulting from the predicted change to baseline surface water conditions on identified receptors (see impact assessment in Chapter 4 of this report).

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

1.1 Project area definitions

To maintain consistency throughout the EIS and supporting technical assessments, the following terminology related to project infrastructure have been defined for the SRE Project where the **SRE Project Area** is defined at the boundary around the SRE Project for which BHP is seeking approval, including:

- **Special Mining Lease (SML) Area**, located within the SML (Figure 1.2), which is further delineated by the following areas:
  - **SRE Area**: the extent of the proposed SRE Project infrastructure required for construction and operation of the SRE Project within the SML. Includes the existing brownfield plant area, proposed facility relocation(s), proposed plant and laydown areas.
  - **General Infrastructure Area**: the extent of the proposed ancillary infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed infrastructure laydown areas, proposed stormwater dam location, proposed topsoil and subsoil storage areas.
  - **Water Infrastructure Area**: the extent of the proposed water infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed water pipeline and water storage dam locations.
- **Electricity Infrastructure Ground Re-Profiling Area (EIGR Area)**: the extent of the isolated proposed vegetation disturbance required to maintain regulatory clearance distances between the 275 kilovolt (kV) transmission line and the ground surface within Clause 28 land. It is noted that the transmission line and infrastructure are already in place, but additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging and, therefore, changes to existing clearance distances to enable safe operation (Figure 1.3).

1.2 Regulatory context

The SRE Project was declared an Impact Assessed development pursuant to Section 108(1)(c) and 108(7) of the PDI Act on 29 August 2024. The declaration reflects the nature, scale and significance of the SRE Project to SA.

Impact Assessed Development is the most rigorous level of development assessment prescribed under the PDI Act.

Specifically, the Minister made the following declaration:

> Pursuant to Section 108(1)(c) and Section 108(7) of the Planning Development and Infrastructure Act 2016, having taken into account those principles prescribed under Regulation 27(2) of the Planning, Development and Infrastructure (General) Regulations 2017 (the Regulations) and having given consideration to the matters under Regulation 27(3) of the Regulations, I declare that all development of a kind specified in the Schedule to this Notice, to the extent that it is undertaken on land identified in Clause 28(1) of the Indenture as impact assessed development and that references to "development" include a project.

The majority of the SRE Project activities, with the exception of ground re-profiling within the Electricity Infrastructure Area, would be located wholly within the existing SML but does not include business-as-usual (BAU) operations (operations which enable existing approved production of up to approximately 200,000 tonnes per annum (tpa) total copper production) or activities associated with scheduled campaign maintenance 2027 (SCM27) works. These activities are subject to separate regulation (e.g. Environment Protection Authority (EPA) licensing) and approval. The SRE Project may also be supported by low impact development outside the SML, which could include, for example, minor road works and upgrades to accommodation infrastructure. It is proposed that any approvals required for these activities would be sought on an as-needs basis under applicable legislation and guidelines.

1.2.1 Planning Development and Infrastructure Act 2016 (SA)

Development approval is required for the Action under the PDI Act. The PDI Act established a new development assessment system in SA to streamline the assessment process. The PDI Act is supported by subordinate regulations, as well as practice directions and guidelines which are issued by the State Planning Commission, the state's independent principal planning body.

A key feature of the new planning system is the Planning and Design Code (the Code) which contains a single set of planning policy, rules and classifications for SA, which is applied spatially via mapping. The Code establishes a performance-based approach to planning and development assessment by including policies that address the scale, form and design of built structures and the contextual setting of the development.

The planning system established by the PDI Act includes five assessment pathways; accepted development, code assessed development (deemed-to-satisfy or performance assessed) and impact assessed development (restricted and impact assessed). As previously stated, impact assessed development is the most rigorous level of development assessment prescribed under the PDI Act.

i Ministerial declaration – impact assessed development

The declaration subjects the SRE Project to an EIS process requiring detailed environmental, social and economic assessment.

A Scoping Application was prepared by BHP to inform the development of EIS Assessment Requirements by the State Planning Commission (SPC). The EIS Assessment Requirements issued by the SPC summarise all potential issues needing to be addressed by BHP and highlight any further information required by the Minister to enable a proper assessment of the proposed SRE Project.

Due to the operation of the *Roxby Downs (Indenture Ratification) Act 1982*, the Minister for Energy and Mining is the relevant Minister for the SRE Project.

Specific Assessment Requirements for surface water (Appendix B) are as follows:

- Describe existing surface water environmental conditions upstream and downstream of the site (including seasonal variations and variations with flow) of waterbodies, watercourses and drainage channels. Water quality, including any existing site contamination and potential sources of surface water pollution should be addressed.

- Describe potential alteration to surface water flows as a result of the development (including to waterbodies, watercourses, wetlands, floodplains, beds and banks) and include details of the nature of the works. Discuss the implications of these changes for downstream water uses and describe how these impacts will be minimised.

- Describe surface water/groundwaters that are of cultural significance to Traditional Owners and the proposed mitigation measures to protect environmental and cultural values for surface water quality during construction and operation.

- Provide details of proposed wastewater and stormwater management, as well as details of any sensitive design features as part of the development.

- Describe all the options for supplying water to the development (including potable water (if relevant), the proposed Northern Water pipeline, Great Artesian Basin (GAB) water, dewatering bores, TSF mound water and reuse water) and temporary demands during the construction period.

- Identify the risks of contamination of land from chemical or acid spills (or fuel) or from waste generated by the proposed expansion. Describe measures for the prevention and containment of spills (including bunding) and describe the contingency plans to be implemented in the event of spills or leaching (including their expected effectiveness).

- Provide details of stormwater detention proposed for the site, ideally catering for a 1% Annual Exceedance Probability (AEP) rain event.

- Identify the potential impacts on people, property, infrastructure and the environment from potential flood risk (where relevant).

1.2.2 Surface water impact assessment

Legislation relevant to the protection of the environment and approval/regulation of a mine in South Australia are listed below, inclusive of any relevant federal legislation:

- *Environment Protection and Biodiversity Conservation Act 1999* – Commonwealth

- *National Parks and Wildlife Act 1972* – SA

- *Environmental Protection Act 2003* – SA

- *Landscape South Australia Act 2019* – SA.

1.2.3 Guidelines

Relevant water quality guidelines for the SRE Project include both national and state government guidelines, which provide default guideline values (DGVs) for water quality objectives relevant to the receiving environment:

- *Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality* (2018), using DGVs for the benchmark of protection of 95% of aquatic species
- South Australian Environment Protection (Water Quality) Policy (2015), using DGVs assigned to aquatic freshwater receiving environments. Where this document provides guidance, it supersedes the national guidance.

The guidelines recommend that site-specific water quality thresholds should be developed where possible with regard to the existing environment and receptors.

1.3 Project description

The objective of the SRE Project is to expand BHP's smelter and refinery capacity, enabling the Copper SA growth plan by:

- increasing copper production capacity up to 650,000 tpa of total copper plus associated products from the current average production of approximately 200,000 tpa
- delivering a sustainable, highly productive, and more resilient smelting and refining flowsheet
- ensuring the Cu:S ratio is resolved at Olympic Dam for copper concentrate production
- delivering reliable and predictable production outcomes following the 2023 acquisition of OZ Minerals' Carrapateena and Prominent Hill mining operations to realise Copper SA province opportunities.

Key elements of the SRE Project are:

- expansion of, and additions to, the existing smelter and refinery to enable total production of up to 650,000 tpa copper plus associated products
- introduction of a two-stage smelting involving the installation of a new primary flash-smelting furnace (FSF) to produce copper matte, adding material smelting capacity
- conversion of the existing direct-to-blister flash furnace (DBF) to a flash-converting furnace (FCF), which would process the matte into blister
- addition of an acid plant of similar nature and scale to the existing acid plant and subsequent upgrade of the existing acid plant
- expansion of the electrorefinery and precious metals recovery facilities to produce cathode copper, gold, and silver.

Associated with these key elements, the SRE Project would require new supporting facilities, infrastructure and services and the upgrade, removal and/or relocation of existing facilities and services within the SML Area (Figure 1.2).

External to the SML Area, electricity would be supplied to the SRE Project through the existing 275 kV line from Davenport substation (near Port Augusta) to Olympic Dam mine, located within Clause 28 land[1] (EIGR Areas). Whilst the transmission line and infrastructure are already in place, additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging, reducing the existing electrical clearances that are required to enable safe operation. The maintenance of the required electrical clearances between the 275 kV line and the ground surface would necessitate isolated areas of land disturbance and associated vegetation clearance (Figure 1.3).

The SRE Project would be constructed and operated in a staged manner to enable production capacity up to 650,000 tpa of total copper and associated products, with stages detailed in Table 1.1.

This technical assessment has been prepared based upon the maximum potential impacts associated with Stage 2 (i.e. the greatest impact scenario) to ensure that the full extent of all potential impacts is identified and assessed.

The indicative location of key infrastructure is shown in Figure 1.2 and Figure 1.3, while the key project characteristics are outlined in Table 1.2.

Table 1.1 Project stages and timing

Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
Stage 1a	1,100,000	Stage 1a includes: • an increase of smelter throughput to approximately 1,100,000 tpa of concentrate producing an output of approximately 390,000 tpa of total copper • a new regional concentrate receiving, handling and blending facility • upgrade and expansion of the existing smelter feed preparation, including additional concentrate storage, blending and a new steam dryer • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to an FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure and decommissioning of the existing electric slag reduction furnace (EF) if required • expansion of the brownfield slag concentrator supported by FSF slag cooling pits, a new interim slag stockpile and associated environmental management infrastructure • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant, additional acid storage, and an associated acid loading station to allow the export of acid • a new electrorefinery and associated anode preparation infrastructure • a new slimes treatment plant • expansion of the precious-metals refinery (PMR) facility.	2028 to 2032
Stage 1b	1,400,000	Stage 1b includes: • an increase in smelter throughput to approximately 1,400,000 tpa of concentrate producing an output of approximately 500,000 tpa of total copper • installation of additional concentrate leach thickening and filtration infrastructure	2032 to 2036

1 Clause 28 land as defined under the Roxby Downs (Indenture Ratification) Act 1982 (SA)

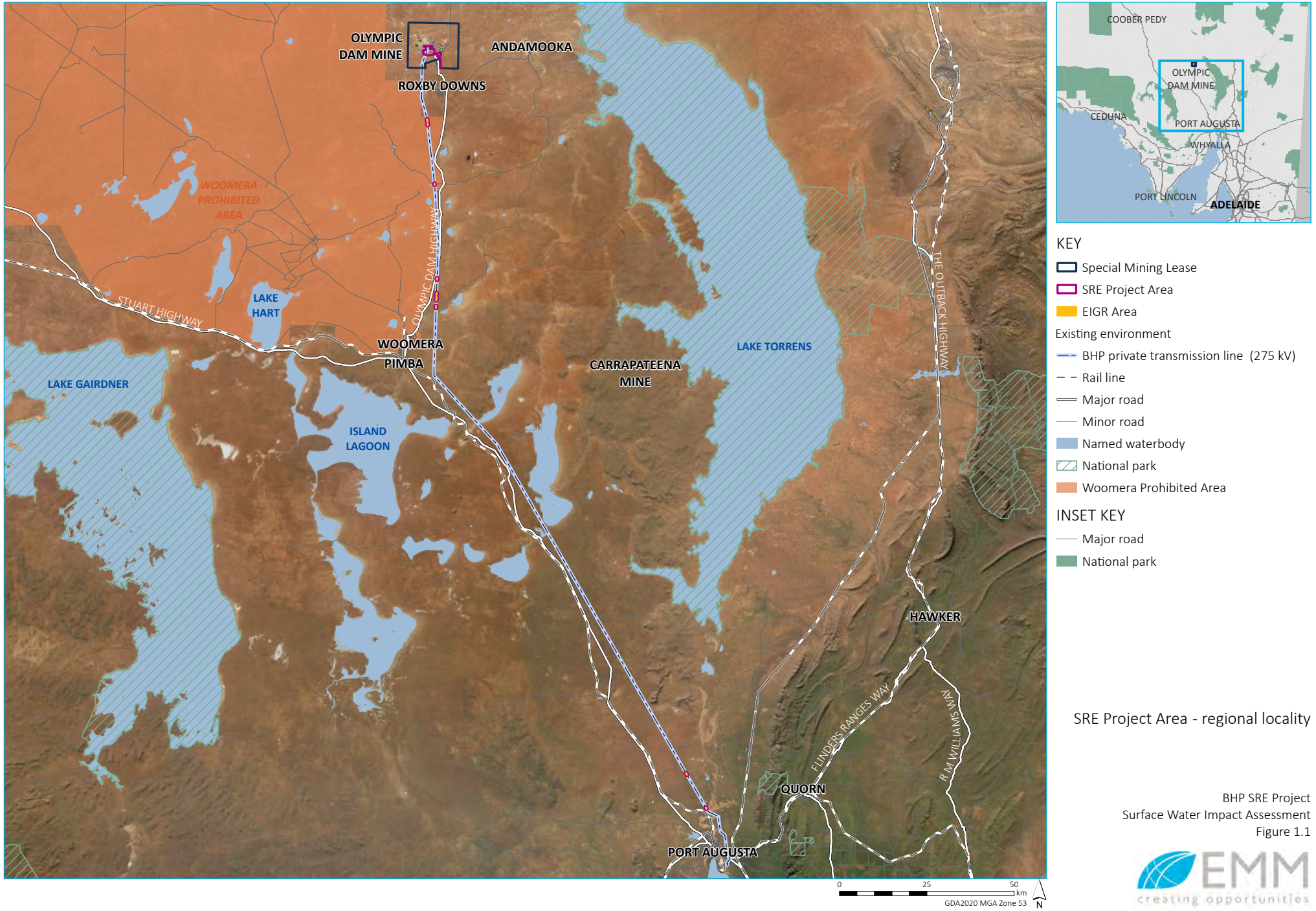
Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
		• development of greenfield slag concentrator and associated stockpile, and decommissioning of brownfield slag concentrator • incremental expansion of Stage 1a infrastructure and services, including: – the installation of additional electrorefinery modules – expansion of feed preparation, FCF feed system (including lime addition), off-gas management, acid plant, slimes treatment and PMR capacities.	
Stage 2	2,000,000	Stage 2 includes: • an increase in smelter throughput to approximately 2,000,000 tpa of concentrate producing an output of approximately 650,000 tpa of total copper • installation of new concentrate leach circuit for treatment of imported concentrate • incremental expansion of Stage 1b infrastructure and services, including: – the installation of additional electrorefinery modules – the installation of an additional anode furnace and associated off-gas management infrastructure – expansion of feed preparation, FSF and FCF feed systems, off-gas and slag management, acid plant, slimes treatment and PMR capacities.	2038 to closure

Table 1.2 Key characteristics of the SRE Project

Project element	Summary
Smelter and refinery expansion and additions	Expansion of, and additions to, the existing smelter and refinery to enable production of up to 650,000 tpa copper plus associated products (gold, silver, and acid). This would include: • a new concentrate handling and blending facility • additional concentrate leach capacity • upgrade and expansion of the existing smelter feed preparation • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to a FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure • upgrade of the existing slag concentrator circuit and subsequent development of a new slag concentrator circuit • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant and upgrade of the existing acid plants • a new electrorefinery and associated infrastructure • a new slimes treatment plant • expansion of PMR facility • slag stockpile and treatment.
Electricity demand, supply and distribution	An electricity demand of up to 68 mega volt-amperes (MVA) net load increase would be required for the SRE Project. The additional electrical demand due to the SRE Project would be met by capacity from the national grid via the existing 275 kV transmission line (noting potential for below line land disturbance and associated vegetation clearance outside of the SML). Minor augmentation of existing onsite electricity supply infrastructure at Olympic Dam within the SML would be to ensure the additional capacity could be achieved and maintained. New high voltage and low voltage power supply and reticulation infrastructure would be required to all smelter infrastructure.

<table>
<tr><th>Project element</th><th>Summary</th></tr>
<tr><td>Water demand</td><td>Water demand of between 2 and 16 megalitres per day (ML/day) required for the SRE Project in addition to the existing supply for current operations.</td></tr>
<tr><td>Water supply and distribution</td><td>The SRE Project proposes no additional water abstraction from the GAB above daily average BAU volumes. Water supply for the SRE Project would nominally be provided from the Department for Infrastructure and Transport (DIT) Northern Water Project (NWP) infrastructure, following commissioning of the initial 90 ML/d capacity of the NWP. This would require new water storage and distribution infrastructure to connect the SRE Project to the NWP connection point at the SML boundary.
The NWP water supply may be supplemented or offset by the provision of local groundwater supply (subject to further approvals). This water supply would occur via existing process storage dams, the desalination plant at the Olympic Dam site, and/or through the distribution of the existing water supply within daily average BAU volumes.
The additional water supplies are likely to require augmentation of the existing desalination water treatment plant and water distribution network, and a demineralised water plant will be required to support the SRE Project operations.</td></tr>
<tr><td>Supporting infrastructure</td><td>Supporting infrastructure includes:
civil infrastructure works, such as roads and stormwater infrastructure
new offices and crib rooms
new workshops
new laydown areas
process control system upgrades
concrete batching
other supporting infrastructure as required to facilitate the implementation and operation of the SRE Project.</td></tr>
<tr><td>Waste management</td><td>Development of the SRE Project may require decommissioning of the existing processing plant components including dryers, the electric furnace and the existing concentrate storage and transfer system. Some of the decommissioned infrastructure would be retained in-situ to preserve operational flexibility or for future management under the site Closure Management and Rehabilitation Plan; however, some elements may require disposal as a component of the SRE Project.
Waste generated during construction would be managed as follows:
where practicable, demolition materials would be removed from site and recycled
materials not suitable for removal from site would be managed on the SML via existing waste management facilities.
All waste generated from construction of the SRE Project would be managed in accordance with existing site procedures and approved management plans.
Operational wastes associated with the SRE Project consist of processing and non-processing wastes where:
processing wastes are limited to low-copper slags generated from the smelting and slag concentrator operations that are not suitable for reprocessing and effluent streams from various process operations that are directed to tailings, including from the PMR and smelter off-gas systems
non-processing wastes including reagent packaging wastes and operational consumables.</td></tr>
<tr><td>Workforce</td><td>100% fly-in/fly-out (FIFO) workforce is assumed for construction and the SRE operational workforce. Estimated peak construction workforce numbers (in full time equivalents (FTE)) are summarised below.<table><tr><th>Construction stage</th><th>Average FTE</th><th>Peak FTE</th></tr><tr><td>Stage 1a</td><td>~708</td><td>~1,313</td></tr><tr><td>Stage 1b</td><td>~260</td><td>~515</td></tr><tr><td>Stage 2</td><td>~519</td><td>~978</td></tr></table></td></tr>
</table>

<table>
<tr><th>Project element</th><th>Summary</th></tr>
<tr><td></td><td>Following construction, the SRE Project would require the permanent operational workforce summarised below.
<table>
<tr><th>Operational stage</th><th>Additional SRE Project operational workforce</th><th>Total Olympic Dam Smelter and Refinery workforce</th></tr>
<tr><td>Stage 1a</td><td>~207</td><td>766</td></tr>
<tr><td>Stage 1b</td><td>~57 (additional to Stage 1a)</td><td>823</td></tr>
<tr><td>Stage 2</td><td>~244 (additional to Stage 1b)</td><td>1,067</td></tr>
</table>
SRE Project construction and operational workforce is proposed to utilise existing and new accommodation to be established by BHP for the scheduled campaign maintenance 2027 (SCM27) shutdown, Olympic Dam future campaign maintenance accommodation, and/or greenfield accommodation (subject to separate approvals).</td></tr>
<tr><td>Concentrate import</td><td>Import of copper concentrate from Prominent Hill and Carrapateena mining operations, as well as possible future mining operations (e.g. Oak Dam), and maintain the ability to receive copper concentrate from other third-party suppliers.
Prominent Hill concentrate may be passed through concentrate leach to remove fluorides prior to smelter feed preparation. Carrapateena concentrate to pass directly to smelter feed preparation. Other, third-party concentrates may be passed through concentrate leach to remove deleterious elements (e.g. fluorides) prior to smelter feed preparation as required.</td></tr>
<tr><td>Production and export</td><td>Total production volumes of up to:
~650,000 tpa of cathode copper
~893,000 ounces per annum of gold
~3,950,000 ounces per annum of silver
~4,900 tpa of uranium oxide concentrate; note that the SRE Project does not materially change existing uranium production, with an increase of approximately 1% expected as a result of the leaching of Prominent Hill concentrate to remove fluoride. No upgrade or modification of uranium production facilities is proposed as a part of the SRE Project)
~1,700,000–1,900,000 tpa of 98% sulphuric acid (H_2SO_4), of which up to approximately 810,000 tpa may be exported from Olympic Dam (i.e. operations become ‘net’ sulphuric acid producer).</td></tr>
</table>



KEY

- Special Mining Lease
- SRE Project Area
- EIGR Area

Existing environment

- BHP private transmission line (275 kV)
- Rail line
- Major road
- Minor road
- Named waterbody
- National park
- Woomera Prohibited Area

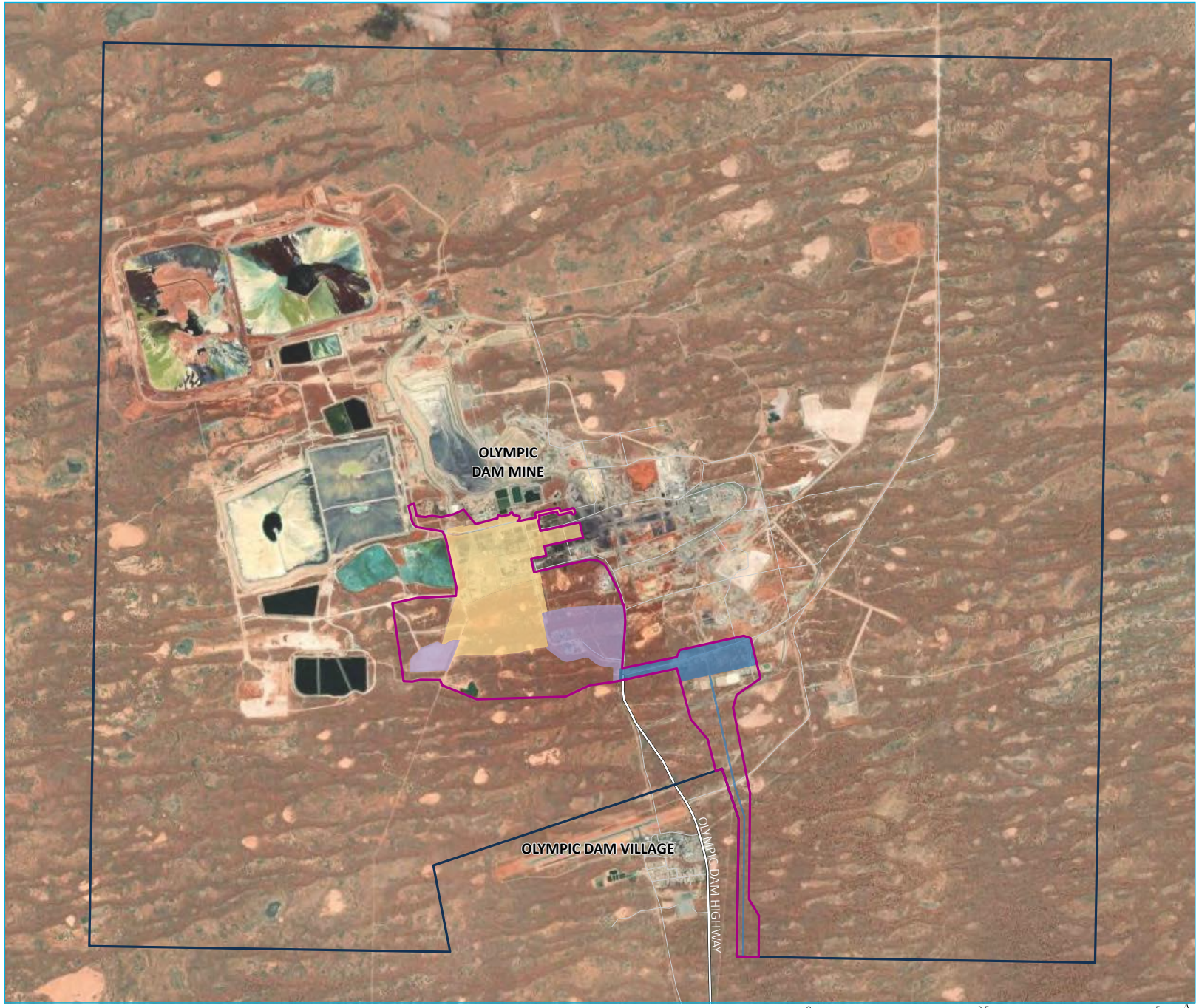
INSET KEY

- Major road
- National park

SRE Project Area - regional locality

BHP SRE Project
Surface Water Impact Assessment
Figure 1.1

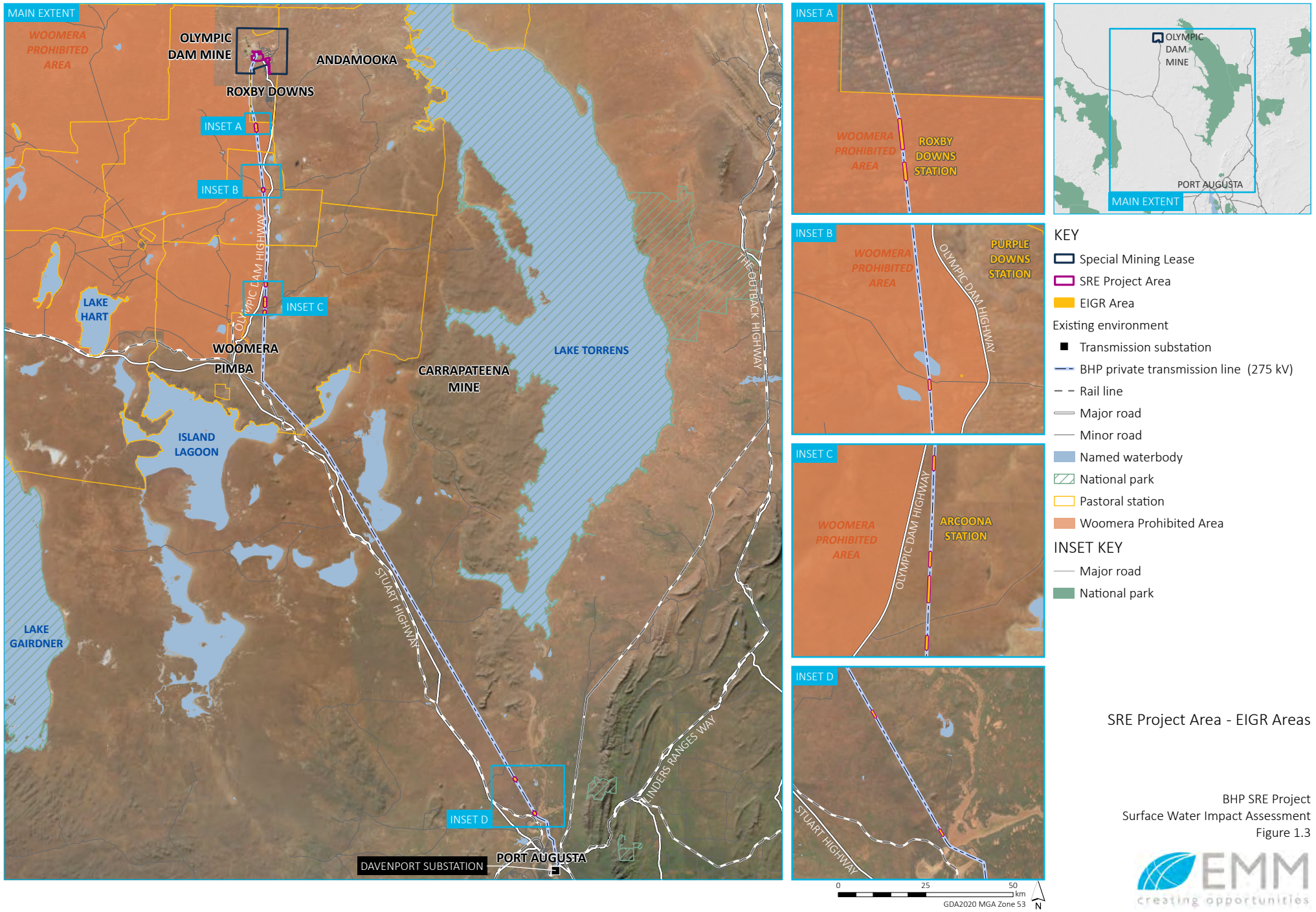
EMM
creating opportunities



SRE Project Area - SML Area

BHP SRE Project
Surface Water Impact Assessment
Figure 1.2

EMM
creating opportunities



SRE Project Area - EIGR Areas

BHP SRE Project
Surface Water Impact Assessment
Figure 1.3

EMM
creating opportunities

2 Baseline condition assessment

In order to quantify the potential effects of the SRE Project on the surface water environment, it is necessary to understand the existing baseline environment, and specifically:

- to classify and describe the existing surface water environment prior to the development of the SRE Project
- to provide a basis for project activities aimed at describing the likely change in the baseline environment as a result of the development of the SRE Project and quantifying the significance of resultant impacts to receptors.

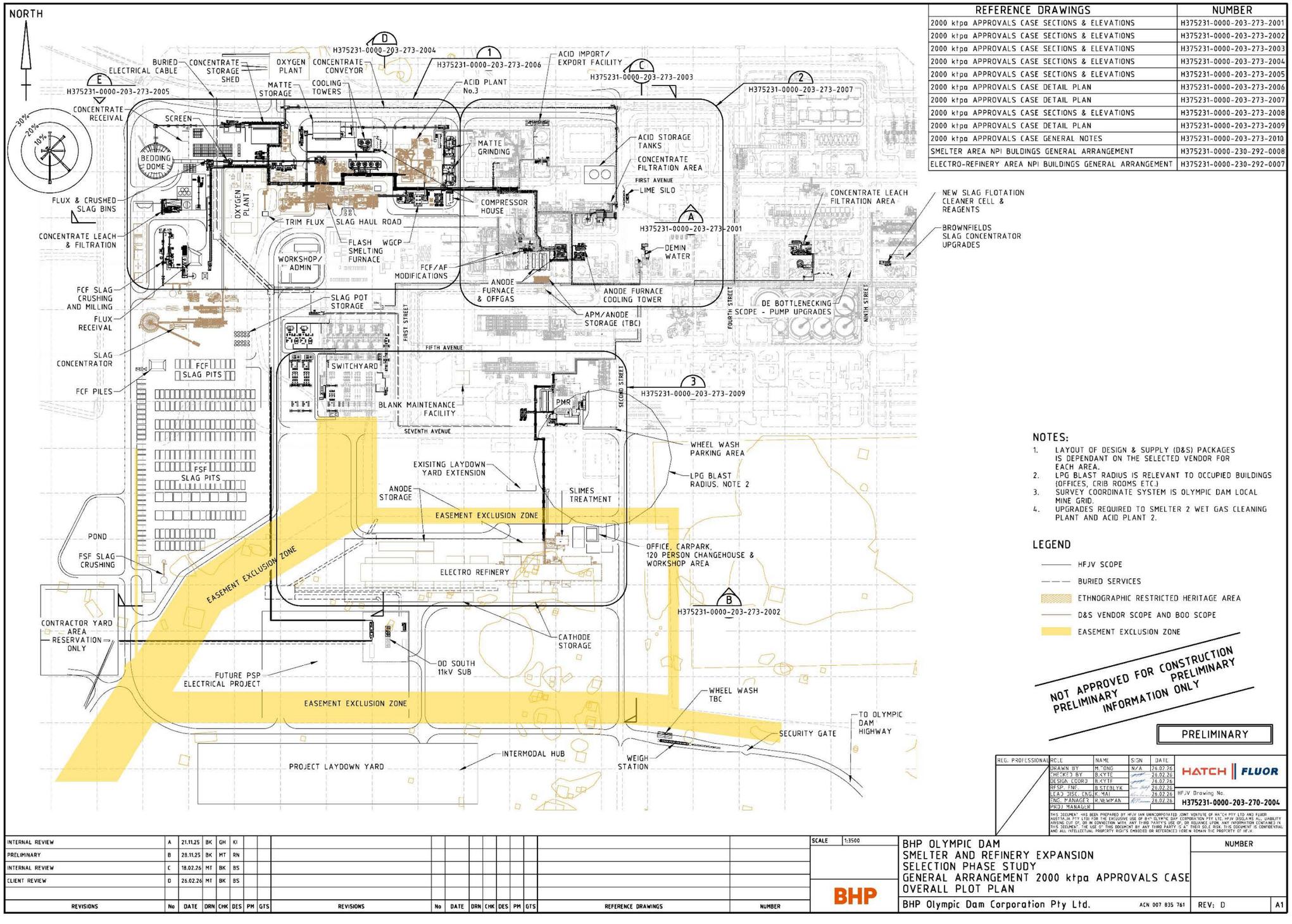
2.1 Study area

The SRE Project is located within the Olympic Dam SML, with the majority of project infrastructure proposed to be constructed in the vicinity of existing Olympic Dam smelter, refinery and processing plant infrastructure (Figure 2.1).

The immediate surrounds consist of a dune field system of small catchments that cause stormwater to pool in dune swales. The resulting flow regime for undeveloped areas is low velocity flow that moves a short distance before pooling (BHP 2024a). All stormwater within the Olympic Dam mine and processing plant is managed and diverted to stormwater ponds to prevent discharge of contact water from the SML (BHP 2024a).

There are no waterways within the vicinity of the SRE Project.

Due to the site topography, modelled changes to flow regimes and changes in stormwater discharge will be localised and any impacts approaching the SML boundary clearly identifiable. As a result, the study area was limited to the Olympic Dam SML.



REFERENCE DRAWINGS	NUMBER
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2001
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2002
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2003
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2004
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2005
2000 ktpa APPROVALS CASE DETAIL PLAN	H375231-0000-203-273-2006
2000 ktpa APPROVALS CASE DETAIL PLAN	H375231-0000-203-273-2007
2000 ktpa APPROVALS CASE SECTIONS & ELEVATIONS	H375231-0000-203-273-2008
2000 ktpa APPROVALS CASE DETAIL PLAN	H375231-0000-203-273-2009
2000 ktpa APPROVALS CASE GENERAL NOTES	H375231-0000-203-273-2010
SMELTER AREA NPI BULDINGS GENERAL ARRANGEMENT	H375231-0000-230-292-0008
ELECTRO-REFINERY AREA NPI BUILDINGS GENERAL ARRANGEMENT	H375231-0000-230-292-0007

NOTES:

1. LAYOUT OF DESIGN & SUPPLY (D&S) PACKAGES IS DEPENDANT ON THE SELECTED VENDOR FOR EACH AREA.
2. LPG BLAST RADIUS IS RELEVANT TO OCCUPIED BUILDINGS (OFFICES, CRIB ROOMS ETC.)
3. SURVEY COORDINATE SYSTEM IS OLYMPIC DAM LOCAL MINE GRID.
4. UPGRADES REQUIRED TO SMELTER 2 WET GAS CLEANING PLANT AND ACID PLANT 2.

LEGEND

- HFJV SCOPE
- BURIED SERVICES
- ETHNOGRAPHIC RESTRICTED HERITAGE AREA
- D&S VENDOR SCOPE AND BOO SCOPE
- EASEMENT EXCLUSION ZONE

NOT APPROVED FOR CONSTRUCTION
PRELIMINARY
INFORMATION ONLY

PRELIMINARY

REVISIONS	No	DATE	DRN	CHK	DES	PM	GTS
INTERNAL REVIEW	A	21.11.25	BK	GH	KI		
PRELIMINARY	B	28.11.25	BK	MT	RN		
INTERNAL REVIEW	C	18.02.26	MT	BK	BS		
CLIENT REVIEW	D	26.02.26	MT	BK	BS		

REG. PROFESSIONAL	RCE	NAME	SIGN	DATE
	DRAWN BY	M.TONG	N/A	26.02.26
	CHECKED BY	B.KYTE		26.02.26
	DESIGN COORD	B.KYTE		26.02.26
	RESP. ENG	B.STERLYK		26.02.26
	LEAD DISC. ENG	K.MAI		26.02.26
	ENG. MANAGER	R.NEWMAN		26.02.26
	PROJ MANAGER			

HATCH | FLUOR

HFJV Drawing No.
H375231-0000-203-270-2004

THIS DOCUMENT HAS BEEN PREPARED BY HFJV (AN UNINCORPORATED JOINT VENTURE OF HATCH PTY LTD AND FLUOR AUSTRALIA PTY LTD) FOR THE EXCLUSIVE USE OF BHP OLYMPIC DAM CORPORATION PTY LTD. HFJV DISCLAIMS ALL LIABILITY ARISING OUT OF, OR IN CONNECTION WITH, ANY THIRD PARTY'S USE OF, OR RELIANCE UPON, ANY INFORMATION CONTAINED IN THIS DOCUMENT. THE USE OF THIS DOCUMENT BY ANY THIRD PARTY IS AT THEIR SOLE RISK. THIS DOCUMENT IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS EMBODIED OR REFERENCED HEREIN REMAIN THE PROPERTY OF HFJV.

REFERENCE DRAWINGS	NUMBER

SCALE 1:3500

BHP

BHP OLYMPIC DAM
SMELTER AND REFINERY EXPANSION
SELECTION PHASE STUDY
GENERAL ARRANGEMENT 2000 ktpa APPROVALS CASE
OVERALL PLOT PLAN

NUMBER

BHP Olympic Dam Corporation Pty Ltd. ACN 007 835 761

REV: D

A1

Figure 2.1 SRE Project - conceptual site plan

2.2 Environmental aspects

2.2.1 Topography and surface water features

Topography in the SML is characterised by many small catchments bound by dunes up to 8 metres(m) high. Generally, catchments have a swale and a lower depression, typically a claypan.

There are no waterways present in the vicinity of the SRE Project. After rain, runoff from the dunes creates ephemeral pools in the dune swales. Clays within the dune swales can inhibit infiltration, causing water to remain pooled for several weeks until it is evaporated/infiltrated after intense rainfall events.

Vegetation in the SRE Project area is generally characterised as open shrubland or tall shrubland over mixed shrubs/grasses.

2.2.2 Climate

The nearest Bureau of Meteorology (BoM) operated rainfall gauge in the direct vicinity of the site is the Roxby Downs (16096) gauge 5 km to the south. Rainfall measured at the Roxby Downs (16035) gauge is generally lower than at the Woomera (16001) and Andamooka (16065) gauges (Table 2.1).

There are few stations in the area measuring evaporation, with Woomera Aerodrome (16001) being the closest, and the next closest being the Lake Torrens station which is approximately 180 km south-east.

Table 2.1 Annual rainfall statistics

Statistic	Units	Andamooka (16065)	Roxby Downs (Parakylia Station) (16035)	Roxby Downs (Olympic Dam Aerodrome) (16096)	Woomera Aerodrome (16001)
Rainfall record	-	1965–Present	1936–2022	1997–Present	1949–Present
Distance from site	km	29 km east	45 km west	5 km south	78 km south
Average rainfall	(mm/year)	190.3	160.4	149.2	182.2
Lowest rainfall	(mm/year)	33.4	26.6	35.2	53.6
10th percentile rainfall	(mm/year)	99.6	70.0	57.6	96.6
Median rainfall	(mm/year)	163.2	145.9	143.4	167.6
90th percentile rainfall	(mm/year)	352.0	271.6	237.8	277.9
Highest rainfall	(mm/year)	436.1	416.0	320.2	493

Source: BoM website (climate data online)

Annual rainfall and evaporation statistics from Scientific Information for Land Owners (SILO) gridded point data for the SRE Project is presented alongside data from the Olympic Dam Aerodrome gauge in Figure 2.2. It can be seen that rainfall at the site is low throughout the year, and evaporation significantly exceeds rainfall each month.

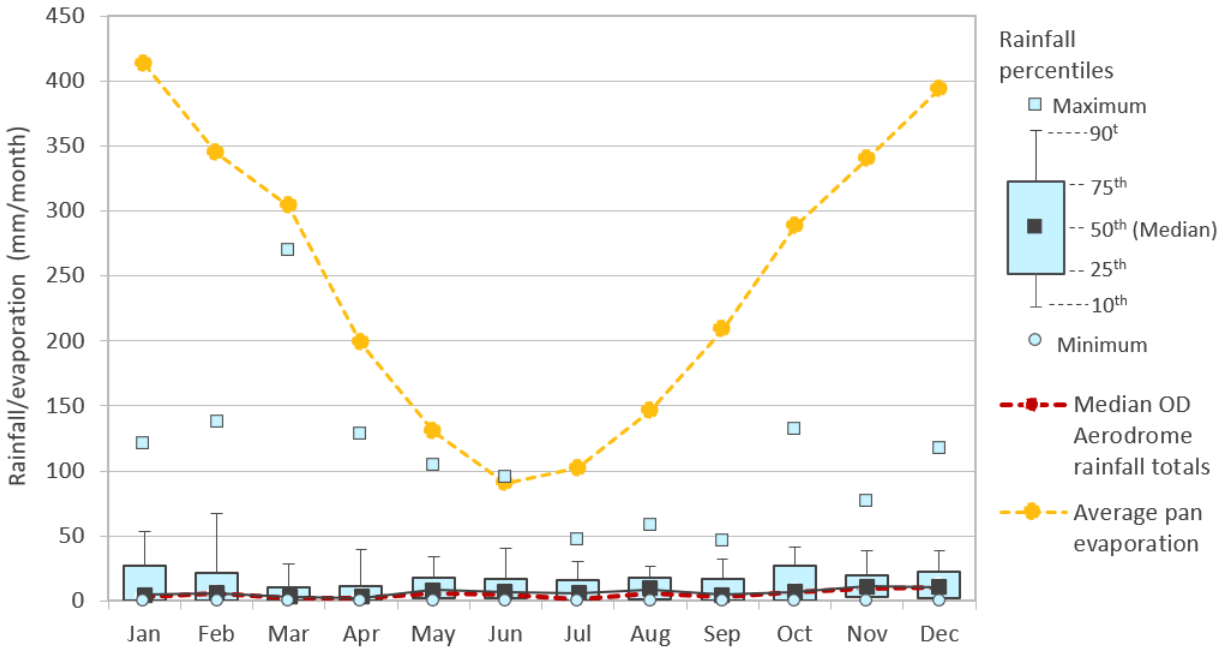


Figure 2.2 **Monthly rainfall statistics – SRE Project SILO data (-30.45, 136.85) & Olympic Dam Aerodrome (-30.49, 136.87)**

The Olympic Dam mine experiences no strong wet and dry season, although heavier rainfall, when it occurs, is observed more frequently in summer.

2.2.3 Climate change projections

Significant changes to the climate of northern South Australia are projected in the coming decades, including warmer temperatures, reductions in total annual rainfall, and increased intensity during large storms.

DEW (2022) outlines the projected changes in climate for the nearby township of Woomera, as shown in Table 2.2 below.

Table 2.2 **Climate change projections for Woomera (DEW 2022)**

Climate variable	Aspect	1981–2010 baseline	Mean estimate of change	
			2030	2050
Mean annual temperature (°C)	Mean daily max	26.0	+1.3	+2.1
	Mean daily min	13.0	+1.1	+1.8
Summer temperature (°C)	Mean daily max	33.8	+1.2	+2.0
	Mean daily min	19.2	+1.2	+2.0
Autumn temperature (°C)	Mean daily max	25.8	+1.3	+2.1
	Mean daily min	13.4	+1.1	+2.0
Winter temperature (°C)	Mean daily max	17.9	+1.2	+1.9
	Mean daily min	6.6	+0.8	+1.4
Spring temperature (°C)	Mean daily max	16.6	+1.4	+2.4
	Mean daily min	12.8	+1.2	+2.0

Climate variable	Aspect	1981–2010 baseline	Mean estimate of change	
			2030	2050
Mean annual rainfall (mm)		166	-5.2%	-10.6%
Summer rainfall (mm)		44	+2.3%	-3.1%
Autumn rainfall (mm)		38	-12.0%	-8.1%
Winter rainfall (mm)		42	-3.1%	-11.8%
Spring rainfall (mm)		42	-8.0%	-18.4%
Mean number of very hot days (over 40 °C) per year		15.1	22.9	30.8
Mean number of very cold night (less than 2 °C) per year		2.53	1.37	0.69
Heavy rainfall (means days per year above 99.9th percentile)		0.34	0.49	0.41

2.3 Sensitive receptors (baseline environment)

There are no permanent surface water features in the SML or SRE study area; however, claypans and ephemeral lakes can fill after intense rainfall, with water remaining for several weeks before infiltrating or evaporating.

Terrestrial flora and fauna communities of the dune systems may opportunistically utilise surface water when it is available. These communities are described further in the Ecology Impact Assessment to the EIS.

2.4 Surface water environment

2.4.1 Flood behaviour

Flood behaviour in the SML was investigated by WSP (2023) utilising a flood model. BHP provided the flood model to EMM for the purpose of assessing the potential effects of the proposed SRE Project. Flood simulations were undertaken by EMM (described in Appendix A) considering:

- the current environment (baseline conditions)
- the proposed infrastructure
- current (2025) climate
- future climate[2] with +2.5 °C warming, representing approximately:
    - 2070, if following the IPCC AR 6 SSP3-7.0 trajectory
    - 2075 if following draft IPCC AR7 High trajectory, which assumes roll back of current climate policy
    - 2090 if following draft IPCC AR7 Medium trajectory, which assumes continuation of current climate policy

[2] The Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) recommends that planning and development decisions should consider a high emissions climate warming scenario, naming the IPCC AR6 SSP3-7.0 scenario as appropriate for this purpose (DCCEEW 2026). DCCEEW describe SSP5-8.5 as unrealistic based on subsequent data and does not recommend its use in assessments

- storm magnitudes of:
    - 0.2% AEP (1 in 500-year storm)
    - 1% AEP (1 in 100-year storm)
    - 2% AEP (1 in 50-year storm)
    - 5% AEP (1 in 20-year storm)
- short and long duration storms.

The flood modelling indicated the following (Figure 2.3):

- Ponds form in dune swales and clay pans during large storms, with deeper depths occurring during longer storms due to the larger volume of rain that falls during large storms. The dune system creates numerous internally draining catchments. Along the base of the dunes, low saddles separate the individual swale catchments. In very large storms, these saddles can become inundated, allowing pools from separate catchments to link up into larger pools.
- Stormwater is not expected to flow into the SRE Project development site from external catchments.
- Stormwater runoff from the developed portions of the SRE Project would be captured in a stormwater collection system. In very large storms exceeding the design capacity of this system, excess stormwater will pool within the developed portion of the site and would not discharge to a downstream environment.



Peak design flood depth
Pre-development
Current climate
1% AEP storm

BHP SRE Project
Surface Water Impact Assessment
Figure 2.3

EMM
creating opportunities

2.4.2 Surface water quality

i General comments

Within dune environments in northern South Australia, salinity and turbidity of stormwater runoff is typically highly variable. Dust and salt can build up on the surface over time and be transported to ponds in the dune swales when rainfall runoff occurs. It is also common within northern South Australia for dust and soil to contain metals, such that metals concentrations in pooled water following rain will often exceed ANZG freshwater guideline values. This is typically not a concern, as pooled stormwater runoff does not support aquatic species, and downstream environments (where they exist) are typically salt lakes, not freshwater ecosystems.

ii SRE Project location

There is no regular water quality monitoring program for stormwater runoff within the dune swale environment surrounding Olympic Dam.

2.4.3 Site water balance

BHP maintains a water balance model for the Olympic Dam site (BHP 2024b). By documenting and forecasting water supply and demands for each component of the site, future demands can be forecast and the reliability of the water supply assessed.

The most recent five years of the water balance are summarised in Table 2.3 below. The most recent summer demand and an average of the last five years of data was calculated to establish approximate BAU operational values, with the summer demand serving as a more conservative, peak estimate.

Under existing operation conditions, the Olympic Dam site maintains a surplus of available supply. Currently, water is supplied via extraction from the GAB with no opportunistic use of stormwater collected in storage ponds.

Table 2.3 Olympic dam water balance (BHP 2024b)

Component	Volume (ML/d)						
	FY19	FY20	FY21	FY22	FY23	FY23 – Summer[1]	Average
Available supply (GAB borefield capacity)	39	39	37	37	41.9	41.9	38.8
Demand	28.4	33.3	32.2	25.6	31.8	39.4	30.3

Note: 1. FY23 Summer demand was determined in the *Approvals Water Balance Report* (Hatch Fluor JV 2025).

3 Assessment of effects

An assessment of effects was undertaken to determine the potential for change in the surface water pathway as a result of the proposed SRE Project activities. The assessment of effects included the following steps:

- review of baseline environment data
- review of the SRE Project activities
- consider potential events and pathways by which SRE activities to affect identified surface water receptors
- simulate the alteration of flood behaviour with a flood model (Appendix A)
- utilise the assembled information to undertake an effects assessment.

3.1 Potential impact events

BHP has identified potential impact events associated with likely changes to the baseline surface water environment as a result of the implementation of the SRE Project. These events represent scenarios for which there may be a linkage between SRE Project activities (sources), stormwater runoff (pathways) and the identified ecological baseline environment (receptors).

To ensure a consistent approach to impact assessment for the SRE Project, sources, pathways, and receptors (SPR) are defined and applied in this assessment as follows:

- Source – the SRE Project activities (i.e. potential impact event) which, alone or in combination, has the potential to impact a receptor.
- Pathway – the pathway, means or route (with consideration of any natural barriers) by which the receptor can be exposed to, or may reasonably be expected to be impacted by, the source.
- Receptor – the receptor that may be impacted by the source via the pathway.

The detailed list of potential impact events is provided in the Environmental Impact Assessment tables appendix to the EIS and are summarised for the surface water pathways in Table 3.1. The potential for these events to cause effects to identified receptors is investigated in this chapter, with conclusions presented in Section 3.3.

Table 3.1 Preliminary SPR assessment – potential impact events

Impact ID	Potential impact event	Source	Pathway	Receptor	Linkage
Project phase: Construction					
SW1	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting flora and vegetation.	Surface water	Quantity	Ecology (flora and vegetation)	Unconfirmed
SW2	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting fauna and habitat.	Surface water	Quantity	Ecology (fauna and habitat)	Unconfirmed
SW3	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting State and Commonwealth threatened species.	Surface water	Quantity	Ecology (State and Commonwealth threatened species)	Unconfirmed
SW4	During construction. placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting aquatic ecology.	Surface water	Quantity	Ecology (Aquatic ecology)	Unconfirmed
SW5	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting flora and vegetation.	Surface water	Quality	Ecology (flora and vegetation)	Unconfirmed
SW6	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting fauna and habitat.	Surface water	Quality	Ecology (fauna and habitat)	Unconfirmed
SW7	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting State and Commonwealth threatened species.	Surface water	Quality	Ecology (State and Commonwealth threatened species)	Unconfirmed
SW8	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting flora and vegetation.	Surface water	Quality	Ecology (flora and vegetation)	Unconfirmed
SW9	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting fauna and habitat.	Surface water	Quality	Ecology (fauna and habitat)	Unconfirmed
SW10	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting State and Commonwealth threatened species.	Surface water	Quality	Ecology (State and Commonwealth threatened species)	Unconfirmed

Impact ID	Potential impact event	Source	Pathway	Receptor	Linkage
SW11	During operations, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting the health and safety of the local community.	Surface water	Quality	Local community (health and safety)	Unconfirmed
SW12	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting flora and vegetation.	Surface water	Quality	Ecology (flora and vegetation)	Unconfirmed
SW13	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting fauna and habitat.	Surface water	Quality	Ecology (fauna and habitat)	Unconfirmed
SW14	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting State and Commonwealth threatened species.	Surface water	Quality	Ecology (State and Commonwealth threatened species)	Unconfirmed
Project phase: Operations					
SW15	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting the health and safety of the local community.	Surface water	Quality	Local community (health and safety)	Unconfirmed
SW16	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting flora and vegetation.	Surface water	Quality	Ecology (flora and vegetation)	Unconfirmed
SW17	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting fauna and habitat.	Surface water	Quality	Ecology (fauna and habitat)	Unconfirmed
SW18	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting State and Commonwealth threatened species.	Surface water	Quality	Ecology (State and Commonwealth threatened species)	Unconfirmed
SW19	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting flora and vegetation.	Surface water	Quality	Ecology (flora and vegetation)	Unconfirmed
SW20	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting fauna and habitat.	Surface water	Quality	Ecology (fauna and habitat)	Unconfirmed
SW21	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting State and Commonwealth threatened species.	Surface water	Quality	Ecology (State and Commonwealth threatened species)	Unconfirmed

Impact ID	Potential impact event	Source	Pathway	Receptor	Linkage
SW22	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting flora and vegetation.	Surface water	Quantity	Ecology (flora and vegetation)	Unconfirmed
SW23	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting fauna and habitat.	Surface water	Quantity	Ecology (fauna and habitat)	Unconfirmed
SW24	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting State and Commonwealth threatened species.	Surface water	Quantity	Ecology (State and Commonwealth threatened species)	Unconfirmed
SW25	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting aquatic ecology.	Surface water	Quantity	Ecology (Aquatic ecology)	Unconfirmed

3.2 Assessment of effects

3.2.1 Potential changes to flood behaviour

i SRE Project stormwater infrastructure

The flood model (Appendix A) indicated that the proposed SRE Project drainage scheme (Hatch Fluor JV 2025) will perform as intended for storms up to and including 1% AEP. Flood depths on the graded surfaces are expected to generally be <0.1 m although some pooling occurred around the drainage channels. It is expected that the flood immunity on the SRE Project infrastructure pad will be improved during the detailed design of pad surfaces and drainage channels.

In a conservative 'no pumping' scenario, the storage pond did not spill in the 1% AEP storm, although the 500 millimetre (mm) minimum freeboard was breached in the 1% AEP events and the 2.5 °C warming scenario 2% AEP storm. Once at capacity, the pond backwatered into the drainage channels, causing pooling on the SRE Project infrastructure pad surface, as outlined in the water management strategy (Hatch Fluor JV 2025).

The flood modelling illustrated that no stormwater would discharge to the environment (Figure 3.3).

ii Soil stockpile storage facility

The placement of the soil stockpile storage facility within the General Infrastructure Area and Water Infrastructure Area (Figure 1.2) may cause a localised change in water depth during and immediately following rainfall events, with temporary ponding adjacent to the proposed SRE Project infrastructure pad location ranging from 0.3 m deep for the 5% AEP event to 1 m for the 0.2% AEP event.

iii Dune swales

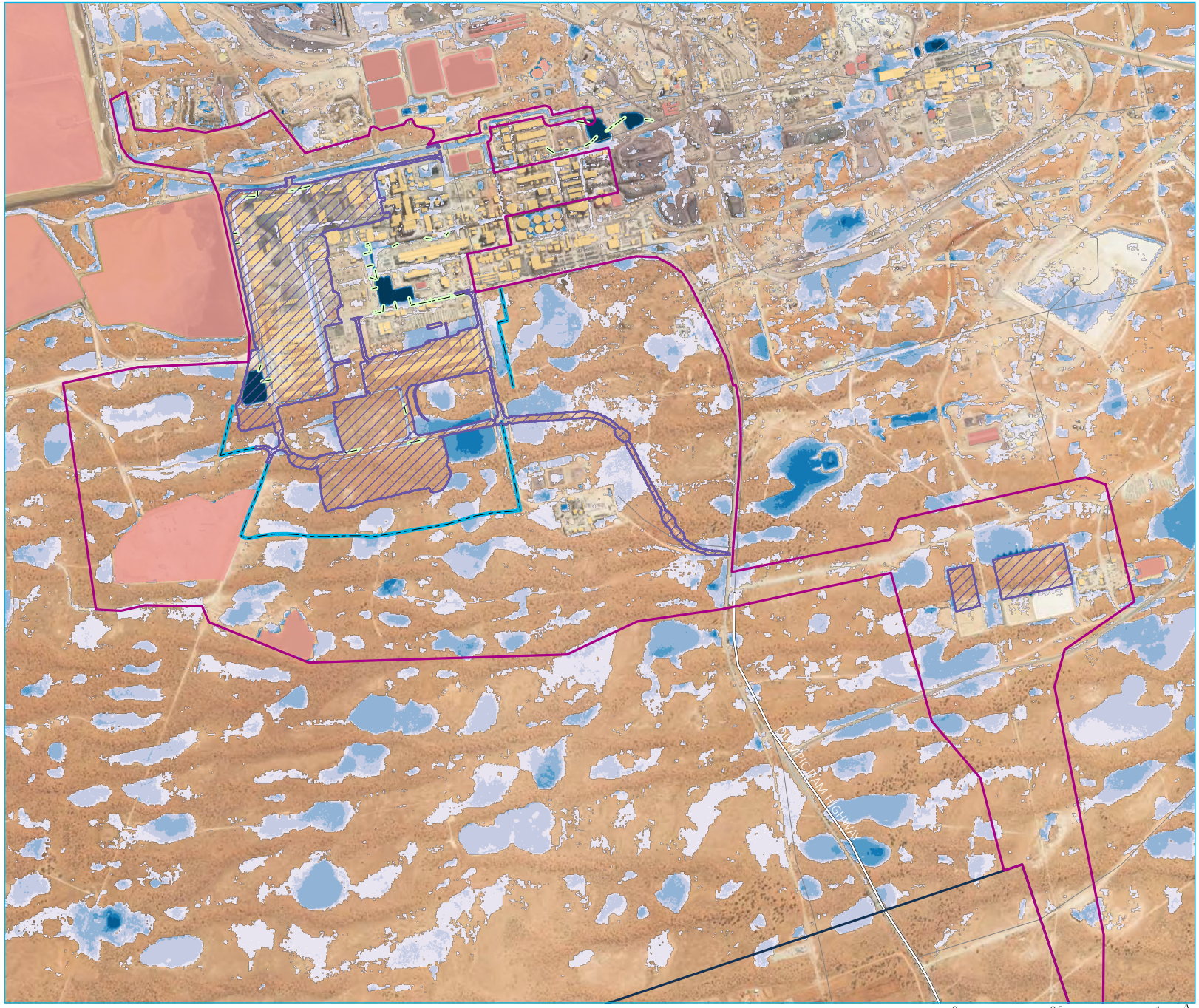
Dune swales intersected by the proposed development footprint may receive less stormwater runoff, due to this water being redirected by the SRE Project stormwater drainage system. For example, the flood model indicated flood depths reducing by 0–10 cm within a swale immediately west from the proposed development.

Other dune swales were intersected by the SRE Project infrastructure such that bunds, roads or pad surfaces acted as barriers to flow with a minor reduction in swale catchment area. For example, the flood model indicated that flood depths would increase by 0–10 cm in two swales directly east of the proposed development.

iv Summary

Construction of the SRE Project infrastructure will result in collection of stormwater from some areas which currently exist as natural swales, and banking up of water against the edge of proposed bunds, roads and raised pads (Figure 3.1). Flood modelling indicated that 27 dune swales may have altered flood hydrology for a 1% AEP event following SRE Project development (Figure 3.2). There was a negligible difference in wet and dry areas in each modelled scenario.

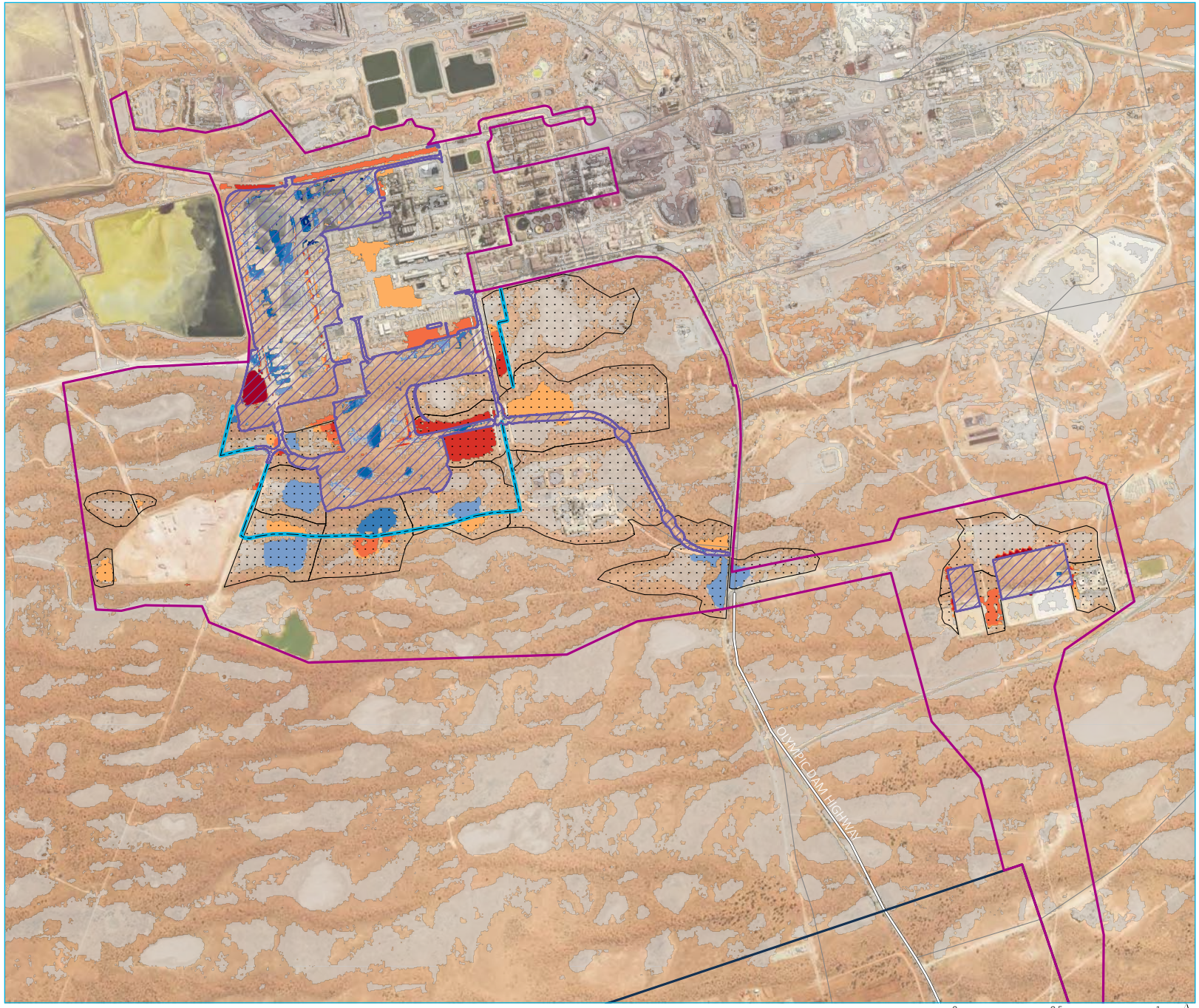
These are predominantly located south of the existing Olympic Dam mine process plant infrastructure pad, and are largely increases and decreases to water levels either side of a bund or access road. The addition of culverts to the access road in detailed design is predicted to return many of these to near-baseline conditions. Pooling and depth increases also occurred next to the southern pad surface; however, detailed design of the drainage system in this area will be able to at least partially ameliorate this. In each case, the change in water level is not expected to result in an impact to identified receptors (baseline environment).



Peak design flood depth
Post-development
Current climate
1% AEP storm

BHP SRE Project
Surface Water Impact Assessment
Figure 3.1

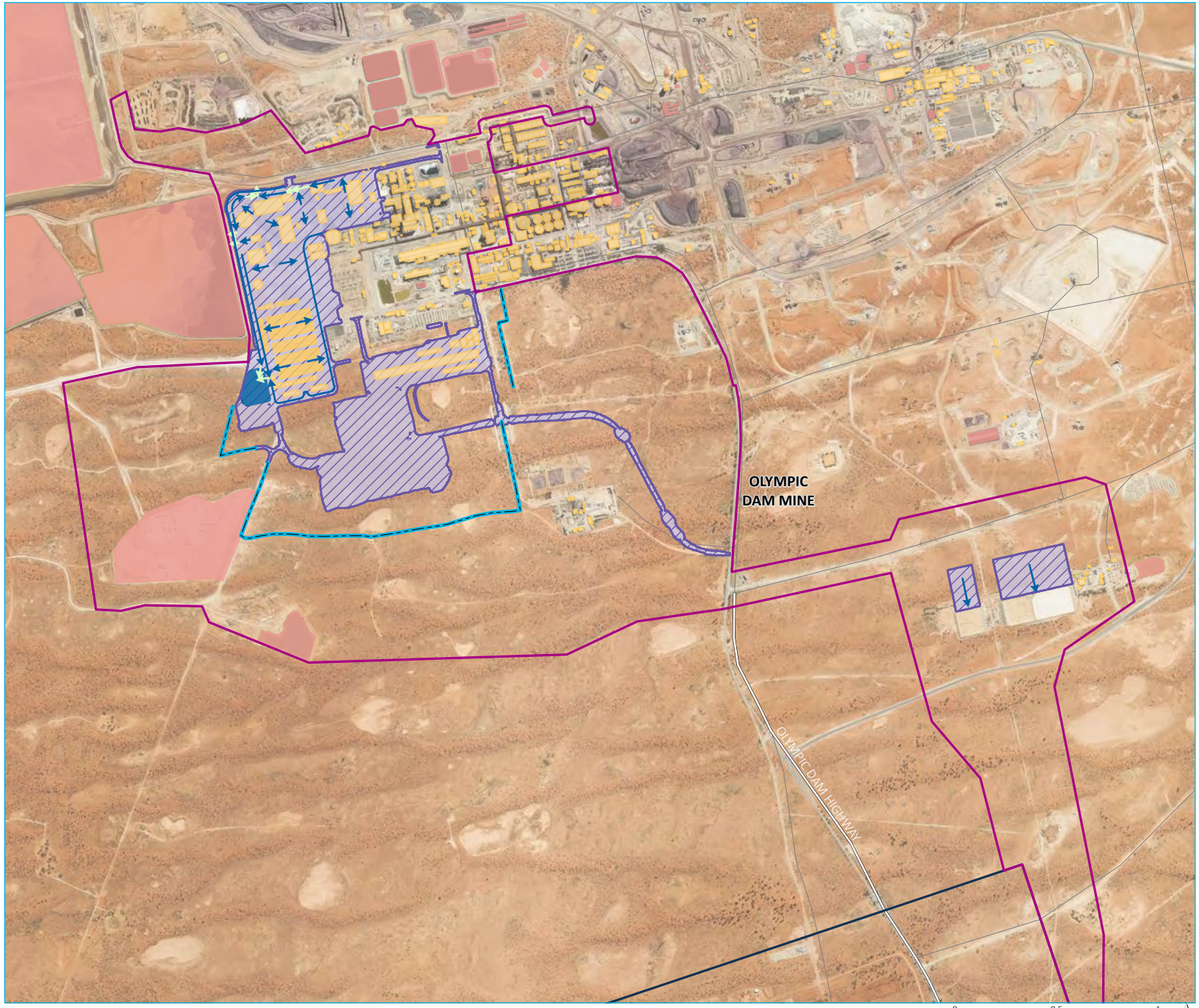
EMM
creating opportunities



Affected catchments
Current climate
1% AEP storm

BHP SRE Project
Surface Water Impact Assessment
Figure 3.2

EMM
creating opportunities



Post-development flow paths

BHP SRE Project
Surface Water Impact Assessment
Figure 3.3

EMM
creating opportunities

3.2.2 Surface water quality

If surface runoff is unmanaged, there is potential for the Project to affect surface water quality, for example, through spills of contaminants (i.e. fuels, lubricants, other chemicals) which may subsequently be transported by rainfall runoff into swales, saline water runoff into surrounding environments from dust suppression activities, or through erosion of disturbed areas. Additionally, it is anticipated that runoff from SRE pads may contain contaminants including dust and radionuclides which would need to be managed accordingly (Hatch Fluor JV 2025).

Management/mitigation methods are proposed such that the proposed development is expected to have low or no impact on surface water quality, including:

- contaminant sources such as fuel storage and stockpiles would be bunded and located away from stormwater flow paths, preventing interaction with stormwater
- SRE Project smelter and refinery plants will be enclosed within buildings, such that rainfall is excluded
- no stormwater discharge points will be created by the SRE Project
- stormwater runoff velocities in the natural environment will remain unchanged; thus, there will be no change to erosion potential
- the dunal catchment system means that any contaminant, if one were to be released, would not be transported through a waterway network but would be captured locally, facilitating cleanup
- any excess saline water runoff from dust suppression would be captured within a stormwater containment system which would not discharge to the environment.

3.2.3 Site water balance

As per the Approvals Water Balance Report (Hatch 2025) an additional water demand of up to 16 ML/d would be required for the SRE Project, including the reuse of 8.0 ML/d of water in various processes on site.

The SRE Project proposes no additional water abstraction from the GAB. Current smelter and electrorefinery (ER) water demand volumes are presented in Table 3.2 with additional volumes of water required to meet the proposed SRE Project demand to be provided from the Department for Infrastructure and Transport's (DIT) Northern Water Project (NWP) infrastructure (BHP 2024a), following commissioning of the initial 90 ML/d capacity of the NWP.

The proposed water demand is provided in Table 3.2.

Table 3.2 Indicative SRE Project water demand (Hatch JV 2025)

Water quality	Current Smelter and ER water demand (ML/D	Smelter and ER water demand following implementation of the SRE Project (ML/d)		
		Stage 1a	Stage 1b	Stage 2
Process water	7.4	5.1	6.2	12.7
Potable water	2.8	7.7	9.1	12.7
RO (desalinated) water	1.9	0.6	0.5	0.4
Demineralised water	0.7	1.5	1.8	2.7
Total	**12.8**	**14.9**	**17.7**	**28.5**
Incremental SRE Project increase	-	+2.1	+4.9	+15.6

BHP may opportunistically utilise collected stormwater runoff to reduce the take of water from the GAB bores and NWP. However, given the low annual rainfall and unpredictable nature of rain, such use would constitute only a minor component of the site water balance. Analysis of historical climate records and developed catchment area indicates that an average of 0.05 ML/d might be harvestable(i.e. insufficient to alter the typical annual water balance).

The NWP water supply may be supplemented or offset by the provision of local groundwater supply (subject to further approvals). This water supply would occur via existing process storage dams, the desalination plant at the Olympic Dam site, and/or through the distribution of the existing water supply within daily average BAU volumes.

The additional water supplies are likely to require augmentation of the existing desalination water treatment plant and water distribution network, and a demineralised water plant would be required to support the SRE Project operations.

3.3 Conclusion

Source-Pathway-Receptor linkages have been confirmed for 3 (SW5, SW6, SW7) of the 25 potential impact events identified in the preliminary SPR assessment (Table 3.3), being events related to management of sediment during construction.

These potential impact events for which a linkage has been demonstrated have been carried into the impact assessment.

Table 3.3 Final SPR assessment – confirmed impact events

SPR ID No.	Potential impact event	Receptor	Linkage	Justification
Project phase: Construction				
SW1	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting flora and vegetation.	Ecology (flora and vegetation)	Yes	Surface water flows in newly developed areas of the SRE Project will flow back to existing operational areas. There may be a loss or reduction of surface water flow volume from the newly developed areas which may reduce the abundance and diversity of native vegetation, which represents potential habitat for common and threatened species. Simulation of flooding effects indicates that areas which would have been wet or dry without the project (e.g. dune swales) will remain so following construction. This result is expected to apply to the construction phase also. Refer Ecological Impact Assessment
SW2	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting fauna and habitat.	Ecology (fauna and habitat)	Yes	
SW3	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	Yes	
SW4	During construction. placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting aquatic ecology.	Ecology (Aquatic ecology)	No	There are no streams or waterways in the project area with aquatic ecology assets. Refer Ecological Impact Assessment
SW5	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting flora and vegetation.	Ecology (flora and vegetation)	Yes	Surface water flows in newly developed areas of the SRE Area will flow back to existing operational areas. Clean flows will be maintained to adjacent undisturbed areas. Ground disturbance during earthworks and other site activities may lead to exposure of soils and potential erosion and mobilisation of sediment into the (local swale) downstream environment. There may also be a loss or reduction of surface water flow volume from the newly developed areas which may reduce the abundance and diversity of native vegetation, which represents potential habitat for common and threatened species. Refer Ecological Impact Assessment for additional flora and fauna impact assessment.
SW6	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting fauna and habitat.	Ecology (fauna and habitat)	Yes	
SW7	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	Yes	

SPR ID No.	Potential impact event	Receptor	Linkage	Justification
SW8	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting flora and vegetation.	Ecology (flora and vegetation)	No	Excess saline water runoff from dust suppression would be captured within a stormwater containment system which would not discharge to the environment.
SW9	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting fauna and habitat.	Ecology (fauna and habitat)	No	
SW10	During construction, the use of water for dust suppression activities results in saline water run-off into surrounding environments, causing salinisation which impacts the downstream environment, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	No	
SW11	During operations, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting the health and safety of the local community.	Local community (health and safety)	No	Contaminant sources will be bunded to appropriate guidelines and stored away from stormwater flow paths. Runoff will be captured within a stormwater containment system which will not discharge to the environment.
SW12	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting flora and vegetation.	Ecology (flora and vegetation)	Yes	Contaminant sources will be bunded to appropriate guidelines and stored away from stormwater flow paths. Runoff will be captured within a stormwater containment system which will not discharge to the environment. Whilst not planned, spillage or leakage of material storage vessels may occur, and although the volumes are likely to be sufficiently low, there is the potential that these spilled materials may be transported to surface water drainages during subsequent rainfall events, the impacts of which could be a reduction in native vegetation and habitat condition and, therefore, subsequently to the abundance (and potentially local diversity) of flora and fauna species. Refer Ecological Impact Assessment
SW13	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting fauna and habitat.	Ecology (fauna and habitat)	Yes	
SW14	During construction, the release of chemicals or hydrocarbons used in SRE Project operations, results in impacts to the downstream environment, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	Yes	

SPR ID No.	Potential impact event	Receptor	Linkage	Justification
Project Phase: Operations				
SW15	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting the health and safety of the local community.	Local community (health and safety)	No	Contaminant sources will be bunded to appropriate guidelines and stored away from stormwater flow paths. Runoff will be captured within a stormwater containment system which will not discharge to the environment.
SW16	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting flora and vegetation.	Ecology (flora and vegetation)	Yes	Contaminant sources will be bunded to appropriate guidelines and stored away from stormwater flow paths. Runoff will be captured within a stormwater containment system which will not discharge to the environment. Whilst not planned, spillage or leakage of material storage vessels may occur, and although the volumes are likely to be sufficiently low, there is the potential that these spilled materials may be transported to surface water drainages during subsequent rainfall events, the impacts of which could be a reduction in native vegetation and habitat condition and, therefore, subsequently to the abundance (and potentially local diversity) of flora and fauna species. Refer Ecological Impact Assessment
SW17	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting fauna and habitat.	Ecology (fauna and habitat)	Yes	
SW18	The release of chemicals or hydrocarbons used in SRE Project operations, including metals mobilised via acid rock drainage from stockpiles and/or the TSF or effluent released from WWTPs, results in impacts to the downstream environment, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	Yes	
SW22	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting flora and vegetation.	Surface water	No	Simulation of flooding effects indicates that areas which would have been wet or dry without the project will remain so following construction. Changes to pool water depth within individual swales following rain could have minor variance in the order of centimetres for a short period prior to evaporation and infiltration; however, this is not expected to be meaningful flora, fauna or fauna and will not alter the frequency of water availability.
SW23	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting fauna and habitat.	Surface water	No	
SW24	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting State and Commonwealth threatened species.	Surface water	No	

SPR ID No.	Potential impact event	Receptor	Linkage	Justification
SW25	During operation, placement of SRE Project infrastructure and associated surface water management infrastructure disrupts, reduces or increases surface water flows, impacting aquatic ecology.	Surface water	No	There are no streams or waterways in the project area with aquatic ecology assets.
Project phase: Closure				
SW19	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting flora and vegetation.	Ecology (flora and vegetation)	Yes	Runoff velocities are low, and the landscape segmented into small swales. As parts of the site are closed and rehabilitated, these characteristics will mean that any potential landform erosion risk will be negligible. While not planned, sediment-laden run-off from areas where structures have been removed and cleared land rehabilitated may occur as a result of SRE Project activities, which may impact adjacent vegetation, and habitat for common flora and fauna species, as well as for threatened species which have been determined to be potentially present. Refer Ecological Impact Assessment
SW20	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting fauna and habitat.	Ecology (fauna and habitat)	Yes	
SW21	Erosion of closed structures and rehabilitated areas results in the sedimentation of the downstream environment, impacting State and Commonwealth threatened species.	Ecology (State and Commonwealth threatened species)	Yes	

4 Impact assessment

The impact significance of confirmed impact events associated with the proposed SRE Project activities is described in this section.

4.1 Confirmed impact events

Based on the assessment of effects, the impact events presented in Table 4.1 have been confirmed.

Table 4.1 Confirmed impact events

Pathway	Impact ID	Impact event
Surface water	SW5	During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting: • SW5: flora and vegetation. • SW6: fauna and habitat. • SW7: State and Commonwealth threatened species.
Surface water	SW6	
Surface water	SW7	

4.2 Impact assessment

4.2.1 Impact significance criteria

The impact significance criteria are presented in the Environmental Impact Assessment Framework (EIAF) appendix to the EIS. Criteria relevant to the assessment of the surface water-related impact significance are repeated in Table 4.2.

4.2.2 SW5, SW6, SW7: Sedimentation of the downstream environment, impacting abundance and diversity during construction

During project construction, land clearing and earth works will temporarily expose soils and increase the risk of erosion if rain occurs prior to completion.

A construction phase erosion and sediment control plan will be in place during project construction. Potential impacts to surface water quality are expected to be minor and manageable with standard erosion and sediment controls in place.

Utilising the descriptors contained in Table 4.2, this magnitude of change in water quality to the local swale flora and fauna community has been rated Level 1 (not significant). If controls were to fail, the severity level would increase to Level 2 (not significant).

Further discussion of potential effects on terrestrial and aquatic ecology is provided in the Ecological Impact Assessment.

Table 4.2 Consequence definitions and significance determination

Severity level	1	2	3	4	5
Environmental value	**Not significant**		**Significant**		
Surface water quantity	No or negligible reduction or change in quantity available to current and potential receptors.	Local reduction or change in water quantity that can be immediately (within one year) remediated or will attenuate naturally (within one year).	Local major or regional minor reduction or change in water quantity that can be remediated or is reasonably expected to attenuate in the long term.	Regional major reduction or change in water quantity available to current and potential receptors that can be remediated or is reasonably expected to attenuate in the long term.	Regional major reduction or change in quantity available to current and potential receptors that cannot be remediated and/or is not expected to attenuate.
Surface water quality	No or minimal reduction in water quality, where water quality objectives are maintained.	Local reduction in water quality (exceeding water quality objectives) that can be remediated or will attenuate naturally within one year.	Local major or regional minor reduction in water quality (exceeding water quality objectives) that can be remediated or is reasonably expected to attenuate in the long term.	Regional major reduction in water quality (exceeding water quality objectives) at location of current or potential receptors that can be remediated or is expected to attenuate naturally in the long term.	Regional major reduction in water quality at location of current or potential receptors that cannot be remediated during exploration and is not expected to attenuate naturally.

Table 4.3 Surface water impact assessment

Confirmed impact event	Impact ID	Impact significance*	Significance justification	Uncertainty
During construction, placement of SRE Project infrastructure and associated surface water management infrastructure results in the sedimentation of the downstream environment, impacting: • SW5: flora and vegetation. • SW6: fauna and habitat. • SW7: State and Commonwealth threatened species.	SW-05	Level 2 – not significant	In the event of unmanaged runoff during construction, sediment from the construction area may be mobilised in the order of 100 m. Singular dune swales may be affected, with limited geographical extent. Rainfall runoff in arid South Australia is typically turbid, with flora and fauna adapted to such. Standard erosion and sediment controls are expected to be effective, and are recommended. Refer Ecological Impact Assessment.	Low Management measures are standard Runoff velocity and thus erosion risk will be low due to small catchment sizes and low rainfall rates (relative to other parts of Australia).
	SW-06	Level 2 – not significant		
	SW-07	Level 2 – not significant		

4.3 Mitigation and management

Potential impact events were investigated (Table 3.1), of which many were assessed as not having SPR linkage due to details of the proposed design such as stormwater runoff containment, bunding, and roofing.

Events with confirmed SPR linkage related to the potential for erosion and sediment transport during construction, to be mitigated via the development and application a construction phase erosion and sediment control plan.

To reduce impact significance to as low as reasonably achievable (ALARA), a list of potential mitigation and management measures that may be applied is presented in Table 4.4.

Table 4.4 Indicative surface water mitigation and management measures

Mitigation and management measure
Design phase: Update the site stormwater management plan to include the proposed SRE Project infrastructure
Design phase: Design of stormwater assets in accordance with relevant design guidelines
Design phase: Design of fuel and chemical storage bunding in accordance with current design guidelines
Construction phase: Prepare and implement a construction phase erosion and sediment control plan
Operations phase: Regular maintenance of on-site stormwater management systems

References

ANZG. 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra: Australian and New Zealand Governments and Australian state and territory governments.

Ball, J, M Babister, R Nathan, W Weeks, E Weinmann, M Retallick, and I Testoni. 2019. "Australian Rainfall and Runoff: A Guide to Flood Estimation." Commonwealth of Australia (Geoscience Australia).

BHP. 2024a. *Smelter and Refinery Expansion Project - Olympic Dam: Impact Assessed Development - Scoping Application.* BHP.

BHP. 2018. *Standard Engineering Specification for Civil and Structural Design Guideline for Olympic Dam.* BHP.

—. 2024b. "Water Demand Forecast – LoA25 TP with OkD and Freo Doc'." BHP. Receieved 6/1/2025 EMMC-RFI-000019.

BMT. 2025. "TUFLOW Classic/HPC User Manual 2025.0." https://docs.tuflow.com/classic-hpc/manual/2025.0/.

CSIRO and BoM. 2021. *South Australia's Changing Climate.* CSIRO, BOM and Department of Agriculture, Water and the Environment, Australian Government. Accessed 02 7, 2025. https://www.climatechangeinaustralia.gov.au/en/changing-climate/state-climate-statements/south-australia/.

DCCEEW. 2026. *National Climate Scenario Guidance.* Canberra: Department of Climate Change, Energy, the Environment and Water. https://www.dcceew.gov.au/sites/default/files/documents/national-climate-scenarios-guidance.pdf.

DEW. 2022. *Guide to climate projections for risk assessment and planning in SA 2022.* Adelaide: Department for Environment and Water, Government of South Australia.

Hatch. 2025. "Approvals Water Balance Repor."

Hatch Fluor JV. 2025. *Approvals Water Balance Report.* Hatch Fluor JV.

SILO. 2025. *Get Point Data.* Queensland Department of Environment and Science. https://www.longpaddock.qld.gov.au/silo/point-data/.

SRK. 2023. *Oak Dam Geochemical Assessment.* SRK Consulting.

Worley. 2024b. "CuSA Smelter & Refinery Expansion Project (SRE): Accomodation, Resource Profile, and NPI Assessement Report."

Worley. 2024a. *SRE Early SPS - Concept Drainage Scheme Assessment.* Worley.

—. 2024a. "SRE Early SPS - Concept Drainage Scheme Assessment." *311000-00102-CI-MEM-0002_C.* 27 September.

WSP. 2023. *Olympic Dam Surface Flow Model.* Brisbane: WSP.

Abbreviations and acronyms

Acronym	Expansion
AEP	Annual exceedance probability
ALARA	As Low As Reasonably Achievable
BAU	Business-as-usual
BHP	BHP Olympic Dam Corporation Pty Ltd
BoM	Bureau of Meteorology
Copper SA	Copper South Australia
DBF	Direct-to-blister flash furnace
DEW	Department for Environment and Water
DIT	Department for Infrastructure and Transport
EIAF	Environmental Impact Assessment Framework
EIS	Environment Impact Statement
EPA	Environment Protection Authority
FCF	Flash converting furnace
FIFO	Fly-in/fly-out
FSF	Flash smelting furnace
GAB	Great Artesian Basin
NA	Not applicable
NO2	Nitrogen dioxide
NOx	Oxides of nitrogen
NWP	Northern Water Project
PDI Act	Planning, Development and Infrastructure Act 2016 (South Australia)
PMR	Precious Metal Refinery
SA	South Australia
SML	Special Mining Lease
SPC	State Planning Commission
SPR	Source-pathway-receptor
SRE	Smelter and Refinery Expansion

Units of measure

Unit	Description
oC	degrees Celsius
%	percent
cm	centimetre
Cu	copper
d	day
ha	hectare
km	kilometre
kV	kilovolt
L	litre
m	metre
min	minute
ML	megalitre
mm	millimetre

Appendix A

Hydraulic modelling technical report

EMM
creating opportunities

Hydraulic Modelling Technical Report

Olympic Dam Smelter and Refinery Expansion Project

Prepared for BHP Olympic Dam Corporation Pty Ltd

October 2026

Hydraulic Modelling Technical Report

Olympic Dam Smelter and Refinery Expansion Project

BHP Olympic Dam Corporation Pty Ltd

E240021 Appendix A of Surface Water Assessment

October 2026

Approved by

Jarrah Muller
Associate Civil and Environmental Engineer
2 October 2026

Level 4 74 Pirie Street
Adelaide SA 5000
ABN: 28 141 736 558

This report has been prepared in accordance with the brief provided by BHP Olympic Dam Corporation Pty Ltd and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purpose for which it has been provided. Except as permitted by the *Copyright Act 1968* (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to BHP Olympic Dam Corporation Pty Ltd (and subject to the terms of EMM's agreement with BHP Olympic Dam Corporation Pty Ltd).

© EMM Consulting Pty Ltd, Level 10, 201 Pacific Highway, St Leonards NSW 2065. 2026.
ABN: 28 141 736 558

TABLE OF CONTENTS

1 Introduction 1

1.1 Purpose 1

1.2 SRE Project landscape changes 1

1.3 Modelling approach 2

1.4 Model review 2

2 Rainfall data 5

2.1 Annual exceedance probability 5

2.2 Storm durations 5

2.3 Design storm data 5

2.4 Climate warming effects 6

3 Model construction 8

3.1 Grid sizes 8

3.2 Model extent 9

3.3 Model timesteps 9

3.4 Catchment roughness 9

3.5 Application of rainfall losses 9

3.6 Site infrastructure 9

3.7 Buildings 10

3.8 Drainage network 10

3.9 SRE Project infrastructure 11

4 Calibration and validation 13

5 Flood model results 14

5.1 Results presented 14

5.2 Result processing 14

5.3 Discussion 14

5.4 Summary 15

6 Sensitivity 18

6.1 Overall model uncertainty and sensitivity 18

References 20

Attachments

Attachment A	Pre-development peak flood depths	A.1
Attachment B	Post-development peak flood depths	B.1
Attachment C	Changes in peak flood depths due to SRE Project infrastructure	C.1
Attachment D	Pre-development flood hazard ratings	D.1
Attachment E	Post-development flood hazard rating	E.1

Tables

Table 2.1	Simulated storm durations	5
Table 2.2	Global warming effects on rainfall intensity compared to the 1960–1990 baseline period (based on ARR v4.2)	6
Table 6.1	Standardised model sensitivity descriptors	18
Table 6.2	Hydraulic model (TUFLOW) uncertainty and sensitivity for this study	19

Figures

Figure 1.1	SRE Project infrastructure	4
Figure 2.1	IPCC AR6 climate warming scenarios relative to 1961–1990 baseline (2.5 °C warming marked)	7
Figure 2.2	Draft IPCC AR7 climate warming scenarios relative to 1961–1990 baseline (2.5 °C warming marked)	7
Figure 3.1	Illustration of quadtree mesh (BMT 2025)	8
Figure 5.1	Affected catchments – Current climate – 1% AEP storm	16
Figure 5.2	Peak design flood velocity – Post-development – Current climate – 1% AEP storm	17
Figure A.1	Peak design flood depth – Pre-development – Current climate – 0.2% AEP storm	A.3
Figure A.2	Peak design flood depth – Pre-development – Current climate – 1% AEP storm	A.4
Figure A.3	Peak design flood depth – Pre-development – Current climate – 2% AEP storm	A.5
Figure A.4	Peak design flood depth – Pre-development – Current climate – 5% AEP storm	A.6
Figure A.5	Peak design flood depth – Pre-development – 2.5 °C warming – 0.2% AEP storm	A.8
Figure A.6	Peak design flood depth – Pre-development – 2.5 °C warming – 1% AEP storm	A.9
Figure A.7	Peak design flood depth – Pre-development – 2.5 °C warming – 2% AEP storm	A.10
Figure A.8	Peak design flood depth – Pre-development – 2.5 °C warming – 5% AEP storm	A.11
Figure B.1	Peak design flood depth – Post-development – Current climate – 0.2% AEP storm	B.3
Figure B.2	Peak design flood depth – Post-development – Current climate – 1% AEP storm	B.4
Figure B.3	Peak design flood depth – Post-development – Current climate – 2% AEP storm	B.5
Figure B.4	Peak design flood depth – Post-development – Current climate – 5% AEP storm	B.6
Figure B.5	Peak design flood depth – Post-development – 2.5 °C warming – 0.2% AEP storm	B.8
Figure B.6	Peak design flood depth – Post-development – 2.5 °C warming – 1% AEP storm	B.9
Figure B.7	Peak design flood depth – Post-development – 2.5 °C warming – 2% AEP storm	B.10
Figure B.8	Peak design flood depth – Post-development – 2.5 °C warming – 5% AEP storm	B.11

Figure C.1	Change in peak flood depth – Current climate – 0.2% AEP storm	C.3
Figure C.2	Change in peak flood depth – Current climate – 1% AEP storm	C.4
Figure C.3	Change in peak flood depth – Current climate – 2% AEP storm	C.5
Figure C.4	Change in peak flood depth – Current climate – 5% AEP storm	C.6
Figure C.5	Change in peak flood depth – 2.5 °C warming – 0.2% AEP storm	C.8
Figure C.6	Change in peak flood depth – 2.5 °C warming – 1% AEP storm	C.9
Figure C.7	Change in peak flood depth – 2.5 °C warming – 2% AEP storm	C.10
Figure C.8	Change in peak flood depth – 2.5 °C warming – 5% AEP storm	C.11
Figure D.1	Peak design flood hazard – Pre-development – Current climate – 0.2% AEP storm	D.3
Figure D.2	Peak design flood hazard – Pre-development – Current climate – 1% AEP storm	D.4
Figure D.3	Peak design flood hazard – Pre-development – Current climate – 2% AEP storm	D.5
Figure D.4	Peak design flood hazard – Pre-development – Current climate – 5% AEP storm	D.6
Figure D.5	Peak design flood hazard – Pre-development – 2.5 °C warming – 0.2% AEP storm	D.8
Figure D.6	Peak design flood hazard – Pre-development – 2.5 °C warming – 1% AEP storm	D.9
Figure D.7	Peak design flood hazard – Pre-development – 2.5 °C warming – 2% AEP storm	D.10
Figure D.8	Peak design flood hazard – Pre-development – 2.5 °C warming – 5% AEP storm	D.11
Figure E.1	Peak design flood hazard – Post-development – Current climate – 0.2% AEP storm	E.3
Figure E.2	Peak design flood hazard – Post-development – Current climate – 1% AEP storm	E.4
Figure E.3	Peak design flood hazard – Post-development – Current climate – 2% AEP storm	E.5
Figure E.4	Peak design flood hazard – Post-development – Current climate – 5% AEP storm	E.6
Figure E.5	Peak design flood hazard – Post-development – 2.5 °C warming – 0.2% AEP storm	E.8
Figure E.6	Peak design flood hazard – Post-development – 2.5 °C warming – 1% AEP storm	E.9
Figure E.7	Peak design flood hazard – Post-development – 2.5 °C warming – 2% AEP storm	E.10
Figure E.8	Peak design flood hazard – Post-development – 2.5 °C warming – 5% AEP storm	E.11

1 Introduction

1.1 Purpose

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the far north of South Australia.

EMM Consulting Pty Ltd (EMM) and Lathwida Environmental Pty Ltd (Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (South Australia).

EMM was commissioned by BHP to undertake an environmental assessment of the proposed surface water-related SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline surface water environment
- determine the likely magnitude of the change to baseline surface water conditions as a result of the SRE Project
- quantify the likely impacts resulting from the predicted change to baseline surface water conditions on identified receptors.

This report is a technical attachment to the EIS' surface water assessment appendix and describes the baseline flood behaviour and likely magnitude of changes to flooding as a result of the SRE Project.

1.2 SRE Project landscape changes

The SRE Project will alter the landscape (potentially affecting flood behaviour) due to the following:

- Construction of new access roads:
  - Roads are often constructed as low linear embankments, which may redirect shallow runoff.
- Construction of infrastructure pads for new infrastructure:
  - Pads are typically raised above the natural terrain, such that floodwaters in the natural landscape are diverted around the new infrastructure.
  - Runoff from the pads is typically diverted to stormwater drainage, which will be stored or discharged at a different location than if the area was not developed.
- Construction of stormwater management infrastructure:
  - The stormwater management basin and channels will alter the flow of stormwater around the developed site.

Infrastructure changes are illustrated in Figure 1.1.

1.3 Modelling approach

Prior to the development of the EIS, WSP (2023) prepared a flood model of the Olympic Dam site. This existing model was used as a starting point for assessing the potential effects of the SRE Project on flooding.

Information utilised from the previous work included:

- model software version (TUFLOW release 2023-AB)
- model geometry, including:
  - Lidar data describing the topography and existing built areas
  - stormwater infrastructure details such as culverts and channels.

The new work undertaken for the EIS referred to the current release of Australian Rainfall and Runoff (ARR) (Ball, et al. 2019), version 4.2. This version was released in late 2024 and contained an update to the climate change guidance describing that the rainfall intensity-frequency-duration curves contained on the Bureau of Meteorology website were developed from rainfall data collected across Australia from 1900–2016 and as such represent pre-climate change conditions. Approximately 1 °C of warming has occurred since the baseline period of 1960–1990, and so all flood studies in Australia now need to apply warming factors to rainfall inputs to obtain design information suitable for describing the climate in 2025.

The modelling undertaken by EMM for the EIS contained the following changes from the WSP (2023) flood study:

- updated climate data (warming factors suitable for 2025, and a 2.5 °C warming climate scenario)
- addition of the SRE infrastructure (when considering project effects scenarios).

1.4 Model review

EMM's review of the WSP (2023) flood model noted the following:

- The geometry of the model appeared to be a reasonable representation of the SRE Project; however, no field visit was undertaken by EMM to confirm any details.
- The model was produced prior to the release of version 4.2 of ARR, and so updated rainfall intensity information was required, described further in Section 2.4.
- The model was a larger domain than required for assessment of the proposed SRE infrastructure; therefore:
  - no new lidar or model extent needed to be added
  - for assessment efficiency, the model domain was reduced, resulting in faster simulation.
- The model represented buildings using areas of high roughness, allowing water in the model to enter and flow slowly through those locations:
  - EMM considers the representation of buildings utilised by WSP a valid method commonly used in flood modelling.
  - EMM would typically choose the block-out method to represent buildings, and updated to model to use this approach, described further in Section 3.7.

- The initial and continuing loss rates appeared low. In particular, the choice of zero initial loss does not accord with values provided in ARR. Low loss rates would result in modelled estimates of flood effects that are greater than would occur in reality.

- WSP (2023) describe that these rates were chosen in consultation with BHP:

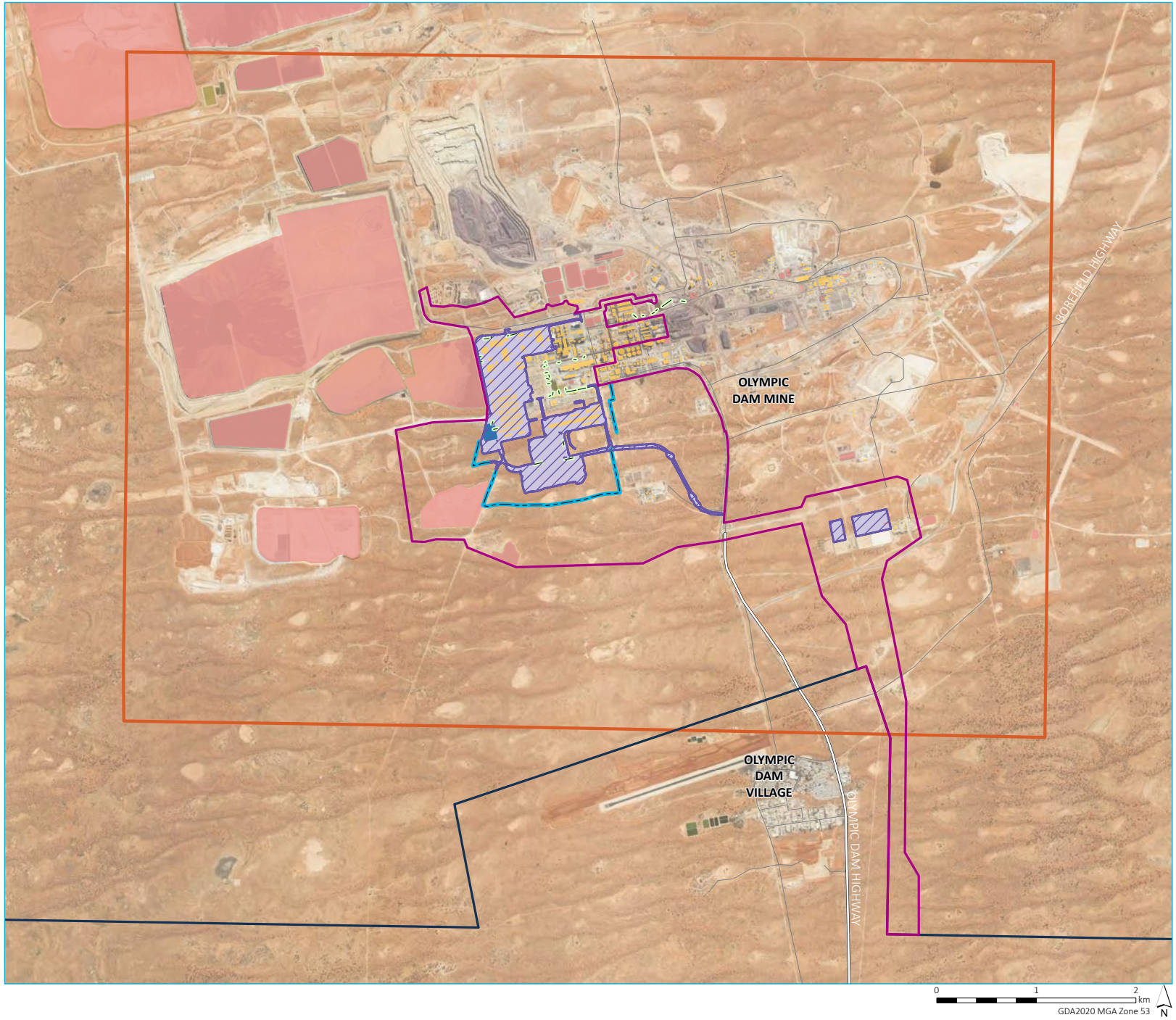
    - EMM considers the logic described in WSP (2023) for choosing low loss rates has merit, and the parameters used are not unreasonable.

    - EMM would typically choose different parameters, but maintained the previously used loss rates for consistency with previous modelling.

- WSP (2023) focussed on reporting a short duration storm burst and a long duration storm several days long. The short events illustrate flood risk posed from intense rainfall which may overwhelm stormwater drainage systems, while the longer events illustrate volumetric effects such as water storages and depressions filling:

    - Testing by EMM confirmed that these are appropriate and relevant storms at this site.

Changes made to the model for the SRE Project surface water assessment are outlined in Chapter 3.



Post-development infrastructure

BHP SRE Project
Hydraulic Modelling Technical Report
Figure 1.1

EMM
creating opportunities

2 Rainfall data

2.1 Annual exceedance probability

For assessment of the SRE Project, storms with the following annual exceedance probabilities (AEPs) were simulated:

- 0.2% (1 in 500 year event)
- 1% (1 in 100 year event)
- 2% (1 in 50 year event)
- 5% (1 in 20 year event).

2.2 Storm durations

Simulated storm durations were maintained as per WSP (2023) (Table 2.1).

Sensitivity testing by EMM (not reported) confirmed that these durations were appropriate for assessing both short duration flash flooding effects and long duration volumetric effects.

Table 2.1 Simulated storm durations

AEP	Short duration storm	Long duration storm
0.2%	1 hour	72 hour
1%	0.25 hour	72 hour
2%	1 hour	72 hour
5%	0.25 hour	72 hour

2.3 Design storm data

ARR describes that different storms which have the same total rainfall may have different temporal characteristics. Some storms may have more rainfall at the start or end of the event, while others may have rain distributed more evenly through the duration. ARR supplies 10 temporal patterns for each storm duration, allowing the effect of temporal variability to be explored.

When simulating short duration storms, all 10 supplied temporal patterns were used, and the average result reported as recommended by ARR.

Peak flooding in the 72-hour events is a factor of total rainfall volume rather than temporal pattern. All 10 temporal patterns were simulated for the 1% AEP storm over the existing infrastructure, with analysis indicating that the same peak flood depths could be obtained by running a reduced set of storms. For efficiency of analysis, three temporal patterns (TP1, 6 and 10) were then used for all other long duration scenarios.

2.4 Climate warming effects

ARR version 4.2 (Ball, et al. 2019) recommends projected rainfall intensities, I_P, be calculated using the formula:

Equation 2-1

$$I_P = I \times \left(1 + \frac{\alpha}{100}\right)^{\Delta T}$$

Where:

- I is the design rainfall intensity described in the IFD data developed using historical rainfall records.
- α is the rate of change (% change in rainfall intensity per degree of warming), which has an associated uncertainty, and varies depending on storm duration, with:
  - short duration storms: α = 15% increase/degree of warming.
  - long duration storms: α = 8% increase/degree of warming.
- ΔT is the most up-to-date estimate of global warming relative to the 1961–1990 IFD data baseline period (currently IPCC AR6, though AR7 warming scenarios have been released in in draft status).

The previous flood study (WSP 2023) was undertaken before the release of ARR v4.2, and utilised a similar relationship described in *BHP Guideline for Climate Change Adaptation in Mine Water Planning and Hydrologic Assessments* (BHP 2020) when considering climate change scenarios. This relationship had the same form as Equation 2-1; however, α was held constant at 5%. WSP (2023) considered a range of warmer global temperatures enveloping the warming range simulated by this SRE effects assessment.

The Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) recommends that planning and development decisions should consider a high emissions climate warming scenario, naming the IPCC AR6 SSP3-7.0 scenario as appropriate for this purpose (DCCEEW 2026). DCCEEW describe SSP5-8.5 as unrealistic based on subsequent data and does not recommend its use in assessments.

Two climate change scenarios were considered for this study:

- a present day climate scenario, with +1.2 °C warming from the 1960–1990 baseline.
- a 2.5 °C warming scenario, representing approximately:
  - 2070, if following the IPCC AR 6 SSP3-7.0 trajectory (Figure 2.1)
  - 2075 if following draft IPCC AR7 High trajectory, which assumes roll back of current climate policy (Figure 2.2)
  - 2090 if following draft IPCC AR7 Medium trajectory, which assumes continuation of current climate policy (Figure 2.2)

2070–2075 is a reasonable assessment horizon given the proposed life of the project.

Table 2.2 Global warming effects on rainfall intensity compared to the 1960–1990 baseline period (based on ARR v4.2)

Event	+1.2 °C (2025–2030)	+2.5 °C (Design horizon)
Short duration storm	+18%	+42%
Long duration storm	+10%	+21%

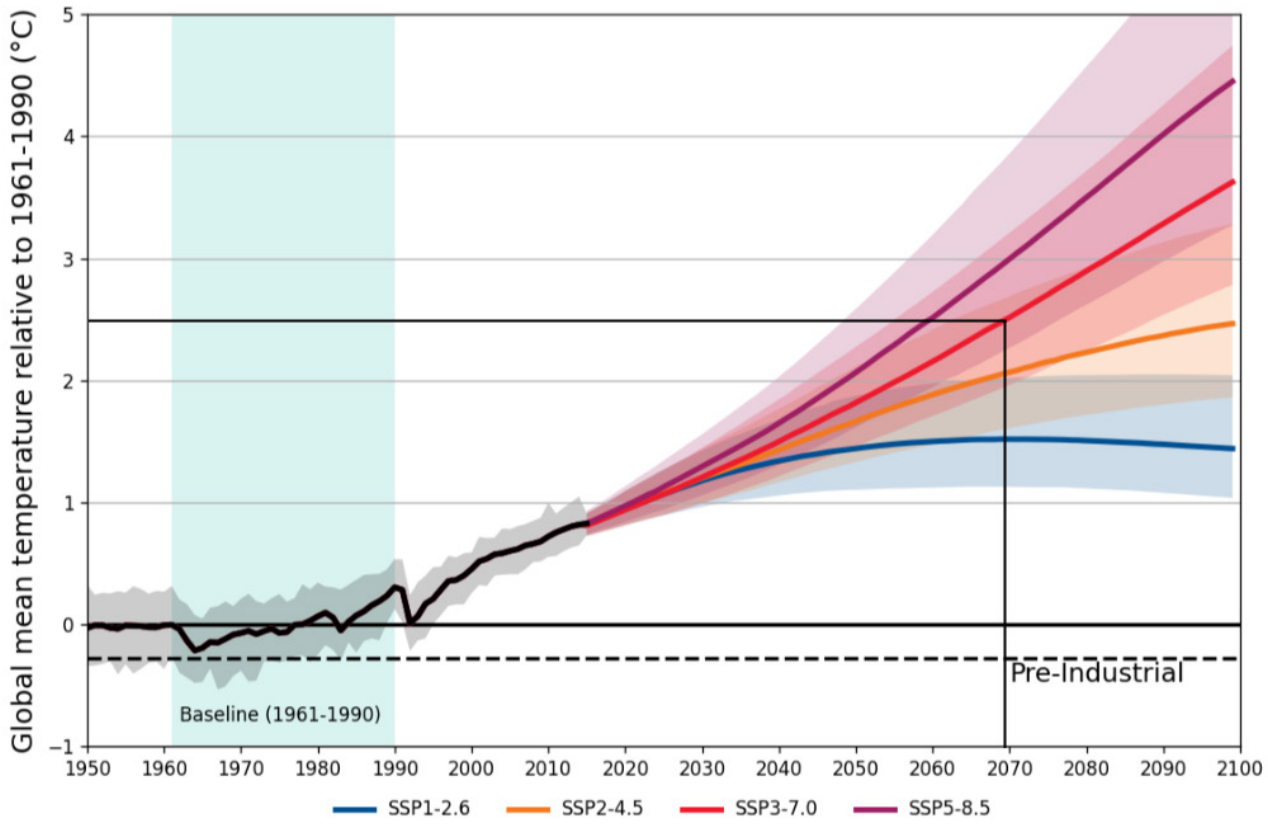


Figure 2.1 **IPCC AR6 climate warming scenarios relative to 1961–1990 baseline (2.5 °C warming marked)**

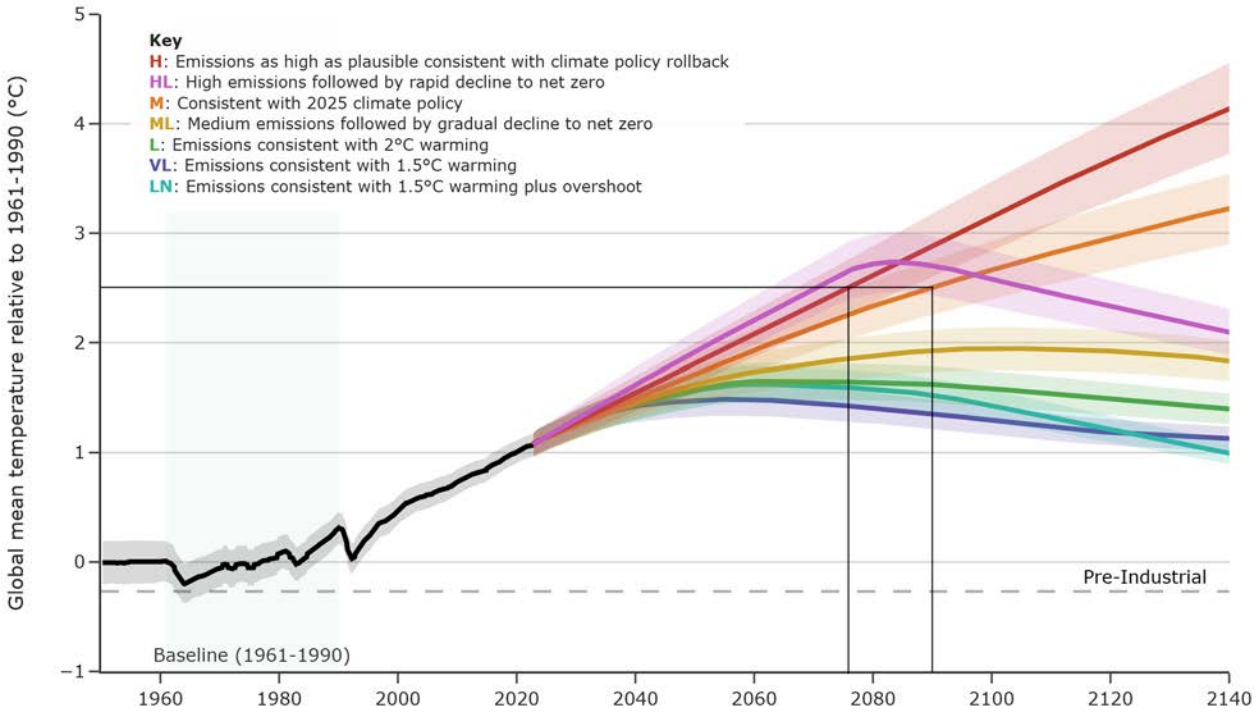


Figure 2.2 **Draft IPCC AR7 climate warming scenarios relative to 1961–1990 baseline (2.5 °C warming marked)**

3 Model construction

TUFLOW hydraulic models were developed for the SRE Project under existing (baseline) and post-development conditions.

The purpose of these models was to:

- establish the peak design flood inundation extent, flood flow paths and peak design depth in the project area for each development scenario
- determine afflux (change in peak design depth), and changes in peak flood inundation extent relative to baseline conditions due to the development of the mine site.

3.1 Grid sizes

The LiDAR DEM of the SRE Project area described in Section 1.3 was used to represent the terrain across the model domain, which is represented entirely in 2D. Quadtree mesh and Sub-Grid Sampling (SGS) were used in this model. A quadtree mesh is constructed by dividing standard grid cells (level 1) in defined areas of the model domain into four smaller square cells (level 2), which can be further subdivided into four (level 3), and so on. This enables the use of variable grid sizes across the TUFLOW model domain. By increasing the cell size in locations away from the area of interest, model run times can be reduced without compromising hydraulic accuracy in areas of interest. Figure 3.1 illustrates the development of quadtree mesh to three levels.

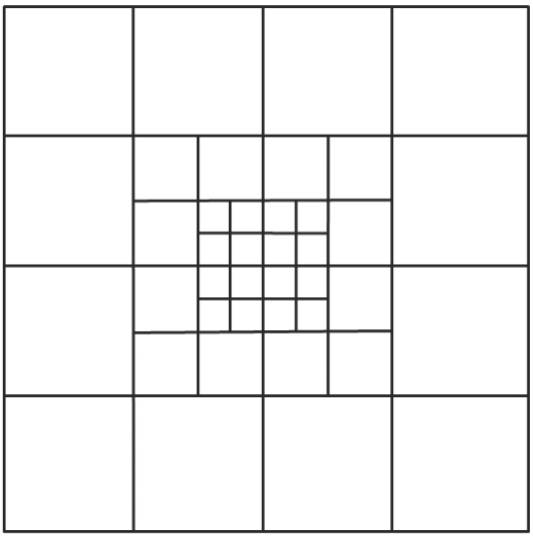


Figure 3.1 Illustration of quadtree mesh (BMT 2025)

The LiDAR DEM was obtained at a 0.5 metres (m) resolution which, when used unaltered, would result in excessively high model run times. Prior modelling by WSP (2023) used a grid cell size of 32 m and decreased the cell size to 2 m in areas of interest using a level 5 quadtree mesh. It was found that model run times could be significantly improved with little loss in result clarity by increasing the smallest cell size to 4 m (quadtree level 4). The mesh was refined to 4 m (quadtree level 4) in the existing process plant area, and the area covered increased with each level. The new roads, refinery complex and surrounding infrastructure are covered by the 4 m cell size regions (quadtree levels 4 and 3).

Sub-grid sampling (SGS) was used to increase the resolution of the model by sampling the underlying DEMs and enable sub-grid scale features to be adequately represented in the model. This allowed fuller utilisation of the fine resolution client supplied DEM dataset in the model without excessively high model run times.

3.2 Model extent

The WSP (2023) model was developed to assess flood risk across the entire Olympic Dam Special Mining Lease (SML), requiring a 192 km^2 model domain. As this study is assessing the impact of SRE Project infrastructure on the surface water environment, the model domain was reduced to areas where development is proposed.

3.3 Model timesteps

TUFLOW HPC uses an adaptive timestep approach to maintain unconditional stability during simulations. Timesteps are automatically adjusted during the simulation to maintain stability, based on a range of criterion (BMT 2025).

3.4 Catchment roughness

Manning's n values were unchanged from WSP (2023) modelling for open ground and impervious areas. Buildings were simulated using a high roughness in the WSP model; however, a 'block-out' methodology was adopted for this study (see Section 3.7). As a result, only two Manning's n values were used over the model domain:

- open ground: 0.035
- impervious areas: 0.02.

3.5 Application of rainfall losses

Rainfall losses applied to the domain were unchanged from prior modelling by WSP (2023). Rainfall losses were applied using initial loss/continuing loss (IL/CL) values, whereby the initial loss is the amount of rain required to saturate the soil surface before runoff is produced, and the continuing loss is a constant loss throughout the remainder of the storm. As per WSP (2023) modelling, the IL/CL used were:

- IL: 0 mm (i.e. ground is saturated/very low permeability)
- CL: 3 mm/hr (open ground), 0.1 mm/hr (impervious areas).

3.6 Site infrastructure

Site infrastructure was implemented in the model using TUFLOW topography modifications and inactive areas. Existing infrastructure in the baseline model was largely unchanged from the prior modelling by WSP (2023), with changes only made to how buildings were modelled.

For the post-development model, existing stormwater pond No. 4 was removed and its storage capacity provided through a wider drainage system to facilitate the required SRE Project process plant equipment. The *Water Management and Pond Sizing* from Hatch (2025a) outlines the surface water management philosophy and components.

Post-development infrastructure modelled includes the stormwater drainage infrastructure, pad surfaces for permanent infrastructure, newly developed roads, bunding, buildings and a topsoil storage. Modelled post-development infrastructure can be seen in Figure 1.1.

3.7 Buildings

There are several ways which buildings may be represented in flood models:

- **Block-out:**
  - Buildings may be digitised and the 2D grid cells blocked out or raised so that flood waters must go around buildings and not through.
  - This method is of particular relevance in dense urban areas when water should be forced to flow along streets and alleys and not through buildings, and sand bagging is expected to be effective at keeping water out of buildings.
  - This method can unintentionally reduce the total rainfall added to the model if used in a rain on grid model as no rain is added to blocked out cells. Roof runoff must be added into the model domain manually by the modelling practitioner.
  - This method can create problems with flood storage if water would realistically have entered buildings.
- **Three walls:**
  - Three walls of each building may be digitised as walls, and the third left open.
  - This allows water to enter buildings but not flow through them.
  - Rain landing on the building is added inside each building and can create artefacts in results if trapped by the three walls.
- **High roughness:**
  - Buildings may be digitised and a high roughness applied to the cells.
  - The high roughness will mean that water can go through the cells, but only slowly, and will preferentially flow around.

Prior modelling by WSP (2023) used the high roughness method which left some floodwaters 'stuck' in the buildings on-site.

The SRE Project surface water assessment instead used the block-out method so that the full storm volume would be redirected stormwater management system. Buildings and other infrastructure were modelled as inactive areas in TUFLOW, forcing the water to flow around. The reduction in total rainfall due to the inactive areas was compensated for by applying a rainfall multiplier in the areas directly surrounding infrastructure, ensuring the intended volume of rain for each storm event was produced. This is analogous to rain hitting the building roofs and being quickly converted to runoff and pouring down drainpipes.

3.8 Drainage network

The existing drainage network modelled was unchanged from prior modelled by WSP (2023). The network is represented by 29 culverts throughout the process plant area that convey stormwater to Stormwater Pond 1 and 2. Culverts were implemented as a 1D network within the model and storage ponds were modelled as represented in the LiDAR.

3.9 SRE Project infrastructure

SRE Project infrastructure includes new roads, bunding, infrastructure pads, a stormwater pond and drainage, as illustrated in Figure 1.1. The representation of each of these elements in the model is described below.

3.9.1 Infrastructure pad surfaces

The SRE Project includes infrastructure pads (i.e. engineering hardstand) on which buildings and other infrastructure will be constructed. BHP supplied the latest DEM of the SRE Project design surface which was modified to match design changes since its creation. The road layout was modified and the pad surface adjacent to the stormwater pond was extended. It was assumed that pad surface slopes and elevations were maintained from unmodified areas into the extended pad surface. Roads leading into the modified pad were typically around 0.4 m above the natural ground surface which was maintained for new roads around the extended pad surface. Drainage channels were assumed to extend onto the new pad surface from the unmodified areas, maintaining channel slope and geometry.

Manning's n roughness values across were maintained as per previous modelling (i.e. 0.02 for impervious areas, and all other areas 0.035).

3.9.2 Buildings, bunds and soil stockpile storage

Buildings and soil stockpile storage were modelled as inactive areas in the model, forcing water to be diverted around the infrastructure footprint rather than passing through. Inactive areas in TUFLOW do not receive rainfall, causing a reduction in overall rainfall across the catchment. To compensate, rainfall multipliers were used around inactive areas to ensure the correct volume of rain was applied for a given AEP event. This does result in more intense rain around buildings but is analogous to water hitting the roofs of infrastructure and quickly running off down drainpipes.

Bunded areas were defined in the *Water Management and Pond Sizing* report (Hatch Fluor JV 2025a), although there is currently no design information. Where bunds were placed along roads, it was assumed the road would act as the bunding. Roads that were included in the infrastructure design surface were modelled as is under the assumption that the road height would be sufficient to act as a bund. Other roads designated as bunds were often dirt tracks with little to no difference in elevation compared to the natural ground surface and, thus, were modelled as inactive areas to ensure a sufficient bund was in place and inform design.

3.9.3 Storage pond

A proposed stormwater pond was included in the design surface supplied by BHP (Figure 1.1). As outlined in the *Water Management and Pond Sizing* report (Hatch Fluor JV 2025a), the drainage system is designed such that runoff will be directed to the pond. When the pond reaches capacity, pooling will occur in the drainage channels upstream from the pond, and then on the pad surfaces. This increases the system storage capacity beyond that of the pond itself while preventing stormwater from reaching critical infrastructure. The pond, as modelled, has a design storage capacity of 72 ML with 0.5 m freeboard, or 81 ML with no freeboard, and a footprint area of 19,100 m^2.

In the *Water Management and Pond Sizing* report, Hatch (2025a) describes that water captured in the stormwater pond will be pumped to the existing 'Olympic Dam Stormwater Pond 1' for recovery and use on site. For the purposes of flood modelling, it was assumed that pump out would occur after rainfall was complete, and so all modelling assumed a 'no pumping' scenario where the pumps are offline for the entirety of the storm event.

The existing Stormwater Pond 4 will be removed to make space for the SRE Project infrastructure.

3.9.4 Drainage channels

Drainage channels were located around and between the SRE pad surfaces to convey stormwater to the storage ponds. Channels were built into the SRE Project design surface provided by BHP and were generally either:

- trapezoidal, with a bottom width of 1–2 m, a side slope of 1:3 and a height of 1–1.5 m
- triangular, with a height of 0.3 m and a top width of 3 m.

3.9.5 Roads

New and existing roads were explicitly represented in the SRE Project design surface DEM and LiDAR DEM, respectively. The quadtree mesh was refined to 4 m cells around all new roads to ensure they were represented in the model and interacted appropriately with the flow of water.

3.9.6 Culverts

At locations where the newly developed roads intersected a drainage channel, it was assumed a culvert would be placed underneath the road. In the model, all added culverts were simulated as singular circular barrels of 1 m diameter, which is oversized relative to the drainage channels to ensure adequate conveyance. Detailed design will be undertaken post-approval to optimise culvert sizes.

3.9.7 Northern Water Project and stormwater pipelines

Two pipelines are proposed for the SRE Project to connect:

- the new stormwater pond and the existing Olympic Dam Stormwater Pond 1
- the SRE Project to the Northern Water Project.

The pipeline between the stormwater ponds will link into an existing pipeline running east-west directly north of the SRE Project and existing plant areas. A connecting portion of the pipeline will need to be constructed in the roughly 10 m strip of land between the 6.4 m high embankment of the evaporation pond and the outer drainage channel of the SRE Project design surface. The pipeline will be an insignificant hydraulic barrier to the small amount of runoff produced on the embankment flowing towards the drainage channel, so the stormwater pipeline was not included in the model.

It was assumed that the Northern Water Project supply pipeline would be elevated on frames/'feet'. The water supply pipeline was not included in the model as prior modelling of similar elevated pipelines has found negligible impacts on floodwaters as flood levels each side of pipelines equalise via flow under and over the pipeline.

4 Calibration and validation

No model calibration to historical flood events was described by WSP (2023).

No calibration or validation of the model was undertaken by EMM.

There are no relevant stream gauges which could be used to calibrate runoff, due in part to the dunal landscape and lack of a stream network in the region. Few runoff studies have been undertaken in the arid north of South Australia.

Of the model inputs:

- Elevation data are expected to be accurate and does not require calibration.
- Design rainfall data are defined by the rainfall runoff methodology in ARR and does not require calibration.
- Manning's roughness values can affect velocity of runoff, which is of minor concern at this site, so calibration is not expected to yield any changes to results.
- Initial and continuing loss rates could change the volume of pooling water, and would be the focus of calibration if data were available. The values chosen are lower than typically used, and as a result the simulated flood levels may be higher than would occur in a real storm. This is considered (by EMM) to be an acceptable response to lack of calibration data.

5 Flood model results

5.1 Results presented

Catchments affected by the SRE Project are shown in Figure 5.1. Simulated flood depths with 2025 climate are presented in Attachment A, and with +2.5 °C warming in Attachment B.

Within the dune swales surrounding the proposed infrastructure stormwater runoff velocities were low in all cases, to the degree that there was little to be seen of interest to environmental assessment (Figure 5.2). As such, a full suite of velocity results has not been presented.

5.2 Result processing

Simulated peak flood depths from short and long duration storms were combined for reporting, with each pixel in result grids taking the higher water level from the simulated storms. In natural swales and depressions, the peak water levels were generated by long duration storms, while short duration storms were critical for some locations within the constructed stormwater management system.

5.3 Discussion

5.3.1 Main SRE Project infrastructure pad

The proposed SRE Project infrastructure pad will intercept a portion of rainfall which currently lands on dune swales. This rain will become stormwater and be directed to the new stormwater infrastructure within the SRE Project infrastructure pad. The proposed infrastructure may cause a minor increase or decrease in peak stormwater depths in swales immediately adjacent to the infrastructure:

- The proposed stormwater infrastructure will redirect storm water away from swales, which may result in lower pooled water levels during significant rainfall events.
- The proposed infrastructure pad will reduce the volume of swales it intersects, such that runoff into those swales from unaffected areas may pool to a greater depth.

These changes are illustrated in Afflux maps in Attachment A.

5.3.2 Stormwater network

The modelling indicated that the proposed water management strategy (Hatch Fluor JV 2025a) will perform as intended. The stormwater pond was not overtopped in the 1% AEP storm, although the freeboard was reduced in the 1% AEP events and the 2% AEP event under a 2.5 °C warming scenario.

Ponding occurred on the eastern side of the SRE Project infrastructure pad for all events even when the pond was not filled. For smaller storms, this is likely due to the conveyance and dimensions of the drainage channel simulated in the model. For larger storms, ponding occurred due to backwater effects from the storage pond reaching capacity. In both cases, it is expected that improvements could be made during the detailed design post approval.

An elevation of 102.4 metres Australian Height Datum (m AHD) was defined as the base of critical infrastructure on the SRE Project infrastructure pad in the *Stormwater Pond Sizing – Validation* (Hatch Fluor JV 2025b). Stormwater pooling reached this elevation only along the western side of the oxygen plant, due to (in the model) that area being disconnected from the nearest drainage channel. It is expected that the addition of on-pad drainage during detailed design will prevent this pooling from occurring.

Other than the pooling near the oxygen plant described above, pooling depth around structures was generally less than 0.2 m for the 1% AEP storm, creating no risk to occupants.

Overflows from the drainage scheme were directed to areas that would already receive runoff, that is, no change in flood behaviour (e.g. captured adjacent to the road embankment directly north of the process plant area). No discharges to undeveloped areas were seen in the model results.

5.3.3 Soil stockpile storage facility

The placement of the soil stockpile storage facility may cause a localised change in water depth, with ponding adjacent to the proposed pad location ranging from 0.3 m deep for the 5% AEP event to 1 m for the 0.2% AEP event.

5.3.4 Dune swales

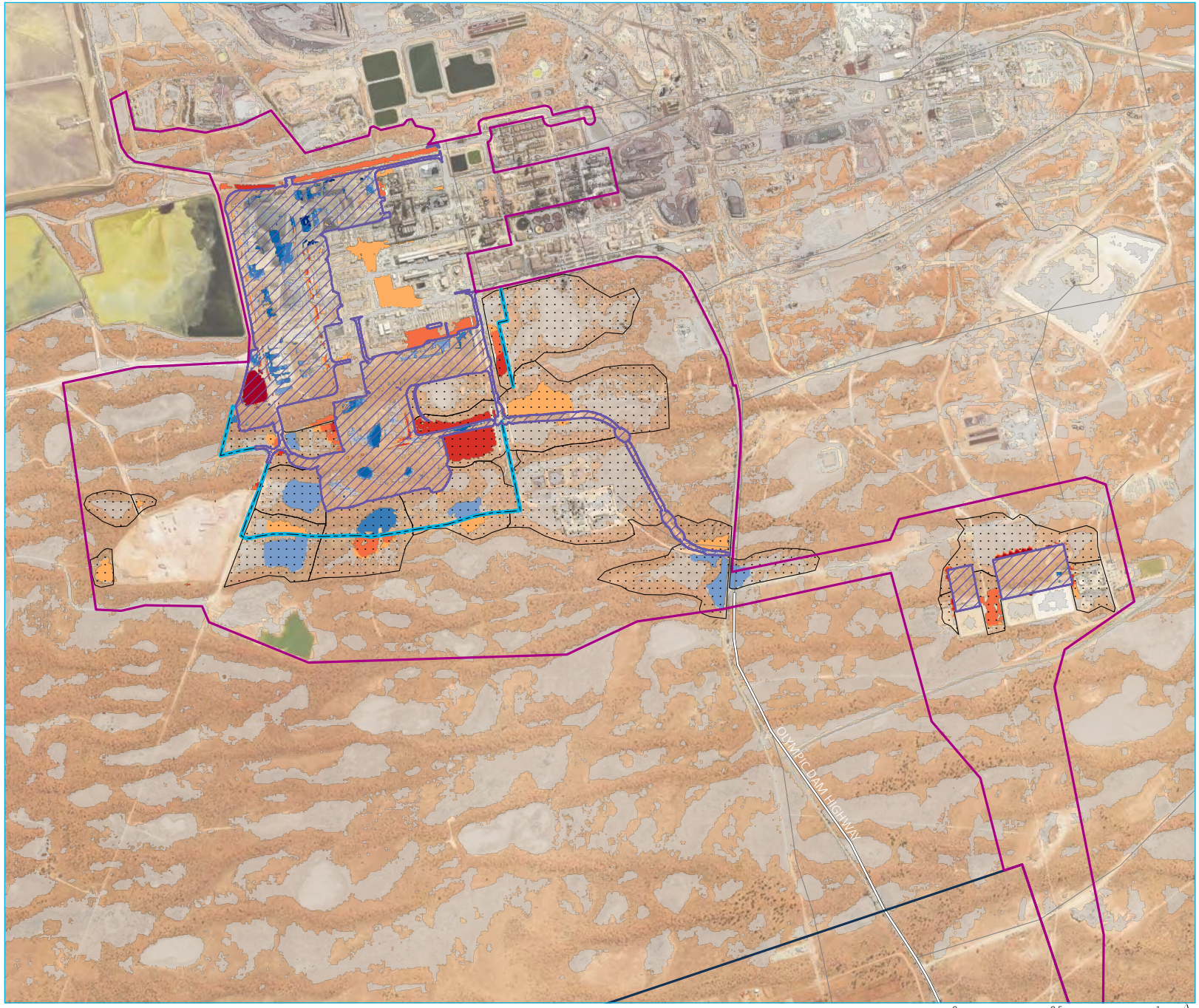
The clay pans in the identified claypan area are largely unaffected by the proposed SRE Project developments for all AEP events. Inundation extents surrounding the clay pans may increase slightly with the SRE Project infrastructure, with flood depths increasing by 10 cm for the 0.2% AEP event and ≤5 cm for all other events due to bunding of a portion of the local swale catchment.

5.4 Summary

The SRE Project may affect flood levels in 27 dune swales (locations illustrated in Figure 5.1). The total area of swales affected by the project (crest to crest) is 196 ha. The area of pooling in these swales will vary depending on storm event but will be significantly less than the total swale area.

The modelling indicates a negligible difference in wet/dry areas in each scenario; that is, areas that were previously wet will remain wet and areas that were previously dry will remain dry.

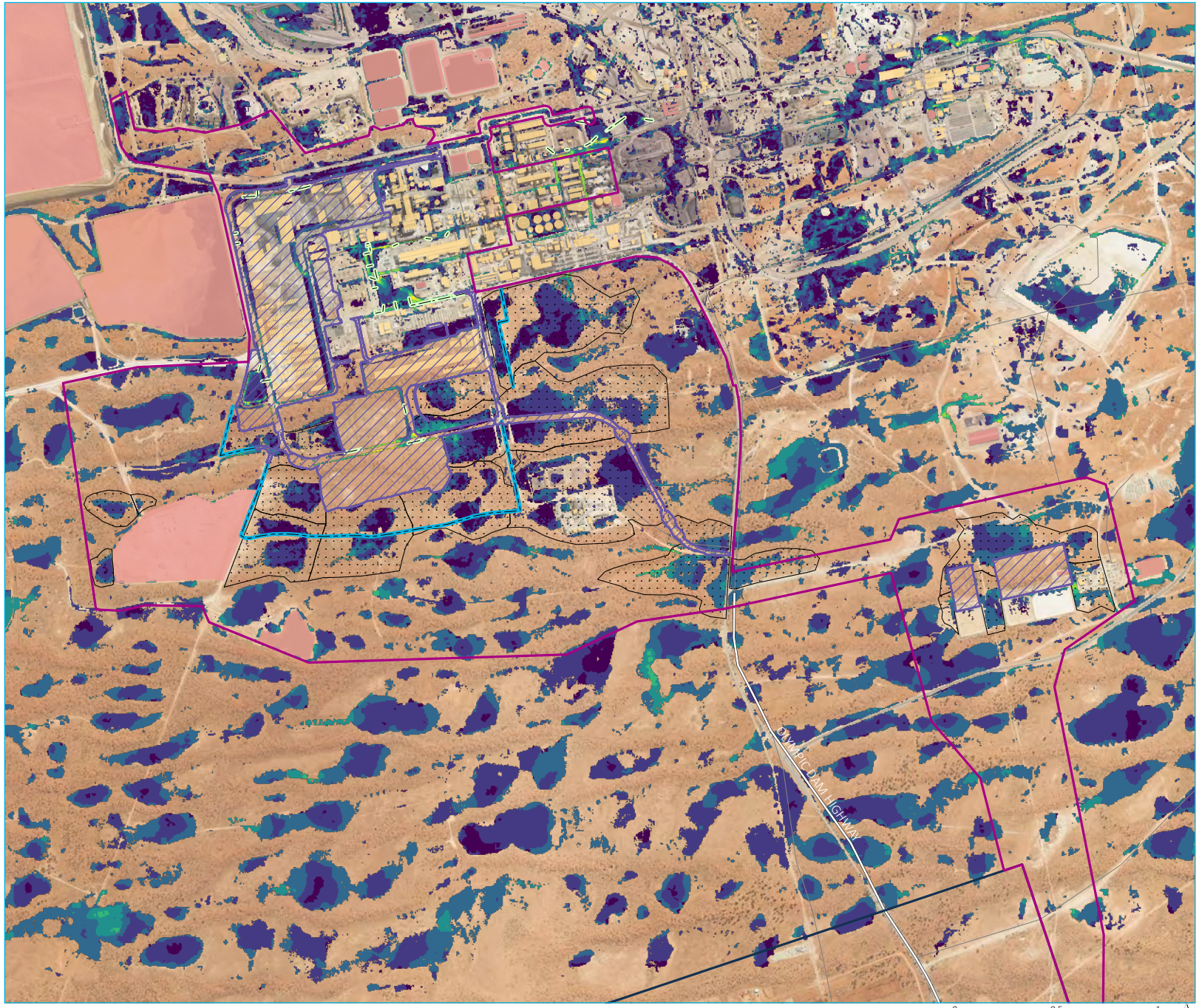
The model indicates an increase in water depth at the interface of the southern pad and the access road. Pooling and depth changes along the access road could be reduced during detailed design including additional culverts as needed.



Affected catchments
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure 5.1

EMM
creating opportunities



Peak design flood velocity
Post-development
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure 5.2

EMM
creating opportunities

6 Sensitivity

6.1 Overall model uncertainty and sensitivity

A standardised qualitative set of descriptors of model uncertainty and sensitivity, as summarised in Table 6.1, have been applied to the TUFLOW model to allow readers unfamiliar with the modelling software and methods to contextualise the statements made regarding data sources, methods, and reliability of outputs.

Table 6.1 Standardised model sensitivity descriptors

Ranking	Descriptor
Input uncertainty	
A	• Extensive data • Field verified • Limited use of assumptions
B	• Limited data • Use of industry recognised or benchmarked data • Some assumptions
C	• Numerous assumptions • Limited (if any) verification
Software/methodology uncertainty	
A	• Recognised method and application • Industry standard approach
B	• New method or new application of existing method • Not industry recognised
C	• *ad hoc* methodology • Informal approach
Results sensitivity	
A	• Predictions not sensitive to input variation
B	• Some sensitivity of input variations
C	• Predictions highly sensitive to input variations • Sensitivity not studied/unknown

The uncertainty and sensitivity of flood modelling inputs and results are described below and summarised in Table 6.2:

- Topographic data were assigned a ranking of 'A' as these data were collected at a high resolution across the project area.
- Rainfall IFD data were assigned 'B' as they are industry recognised, benchmarked data from the Bureau of Meteorology.
- Data from the ARR Data Hub were assigned a 'B' because they have a high level of inherent uncertainty and are based on numerous assumptions, with limited verification, and data within arid regions are limited.

- Initial and continuing losses was assigned a ‘C’ as it is based on typical values, several assumptions and there was no nearby gauged data for model calibration.
- The material roughness was assigned ‘C’ as it is based on typical values, several assumptions and there was no gauged data for model calibration.
- The TUFLOW modelling and results processing methodology follow an industry standard approach and is, therefore, rated ‘A’.
- ARR design storm methodology was ranked ‘A’ because the methodology is accepted as industry standard.

Prior modelling by WSP (2023) found that the model had low sensitivity to changes in material roughness and initial and continuing losses. Thus, for the intended purpose of describing flood characteristics, the model developed is considered adequate, with an ‘A’ sensitivity rating.

A higher degree of certainty in modelled results could be achieved in the future via on-site field infiltration testing to improve confidence in the rainfall loss inputs.

Table 6.2 Hydraulic model (TUFLOW) uncertainty and sensitivity for this study

Item	Ranking
Inputs	
Topographic information	A
Rainfall IFD data	B
ARR Data Hub	B
Initial and continuing losses	C
Material roughness	C
Method	
Model grid size and use of SGS	A
ARR design storm methodology	A
Results	
Mapped peak flood results	A

References

Babister, M, A Trim, I Testoni, and M Retallick. 2016. *The Australian Rainfall and Runoff.* 37th Hydrology and Water Resources Symposium. https://data.arr-software.org/.

Ball, J, M Babister, R Nathan, W Weeks, E Weinmann, M Retallick, and I Testoni. 2019. "Australian Rainfall and Runoff: A Guide to Flood Estimation." Commonwealth of Australia (Geoscience Australia).

BHP. 2020. *BHP Guideline for Climate Change Adaptation in Mine Water Planning and Hydrologic Assessments.* BHP.

BMT. 2025. "TUFLOW Classic/HPC User Manual 2025.0." https://docs.tuflow.com/classic-hpc/manual/2025.0/.

Bureau of Meterology. 2016. *Design Rainfall Data System.* Accessed 2 7, 2025. http://www.bom.gov.au/water/designRainfalls/revised-ifd/.

DCCEEW. 2026. *National Climate Scenario Guidance.* Canberra: Department of Climate Change, Energy, the Environment and Water. https://www.dcceew.gov.au/sites/default/files/documents/national-climate-scenarios-guidance.pdf.

Hatch Fluor JV. 2025b. "Stormwater Pond Sizing - Validation." Hatch Fluor.

Hatch Fluor JV. 2025a. *Water Management and Pond Sizing.* Hatch.

IPCC. 2023. *Climate Change 2023: Synthesis Report. Contributions of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva, Switzerland: IPCC, 35-115.

Worley. 2024b. "CuSA Smelter & Refinery Expansion Project (SRE): Accomodation, Resource Profile, and NPI Assessement Report."

—. 2024a. "SRE Early SPS - Concept Drainage Scheme Assessment." *311000-00102-CI-MEM-0002_C.* 27 September.

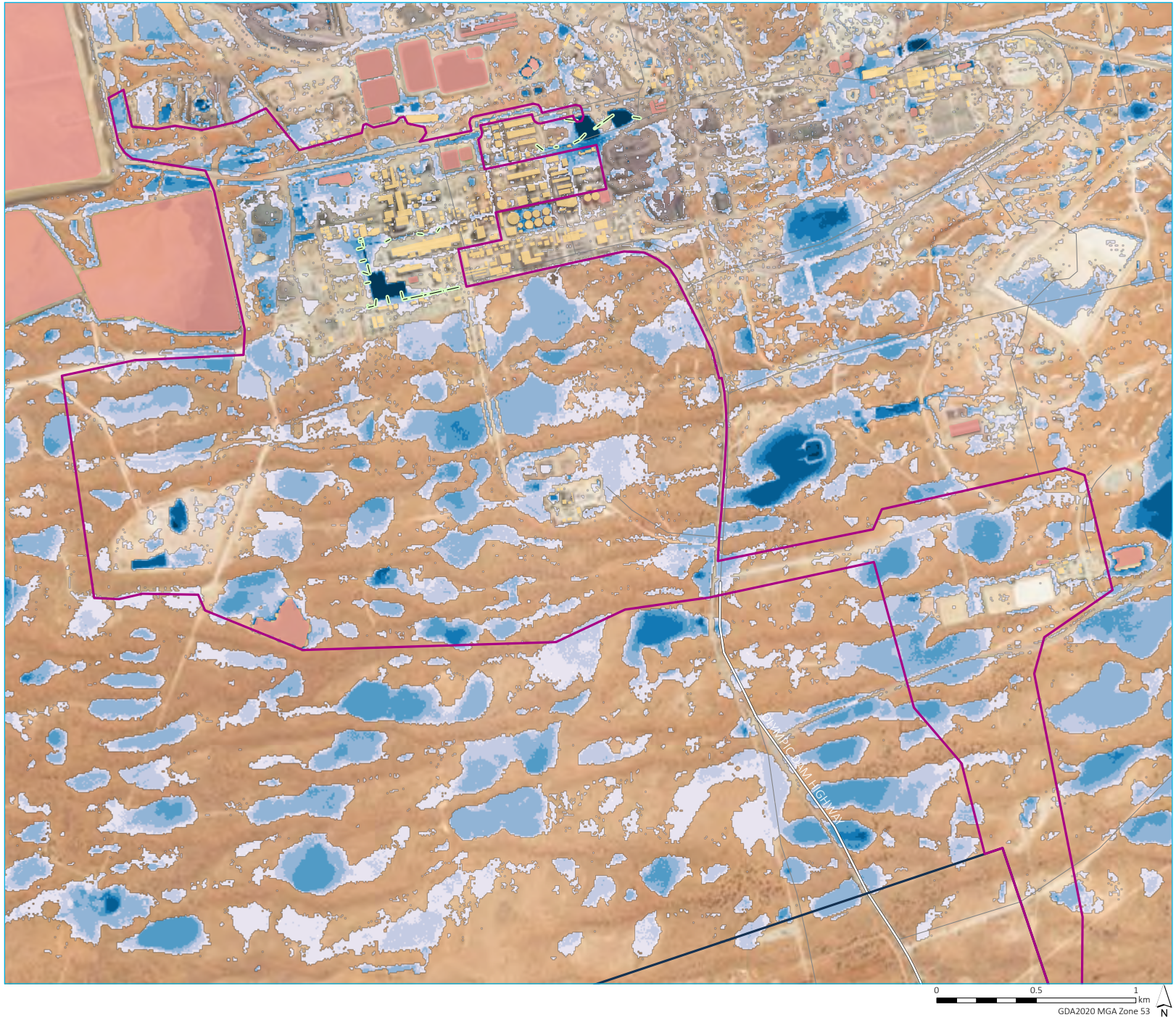
WSP. 2023. *Olympic Dam Surface Flow Model.* Brisbane: WSP.

Attachment A

Pre-development peak flood depths

EMM
creating opportunities

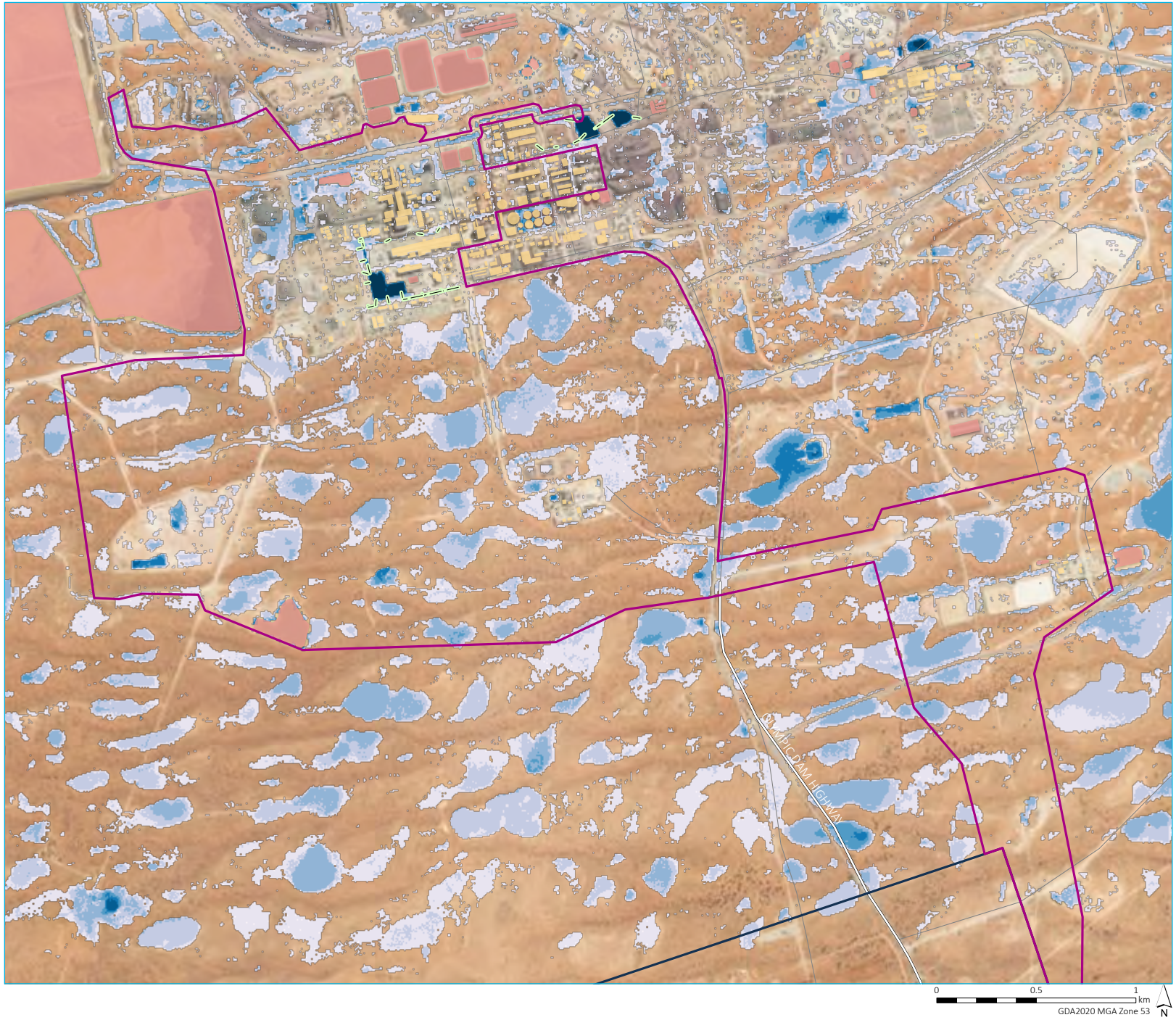
A.1 Existing climate



Peak design flood depth
Pre-development
Current climate
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.1

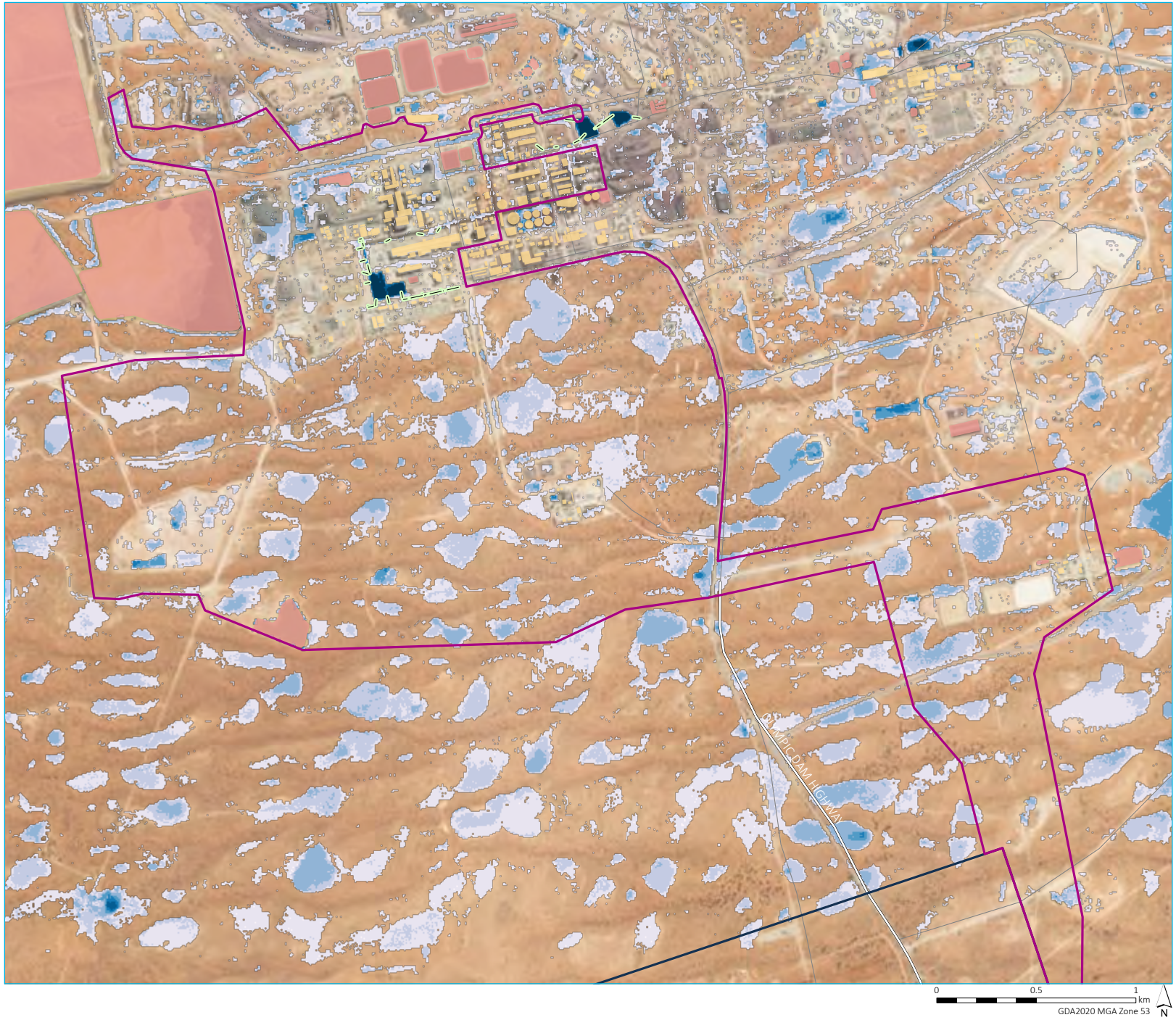
EMM
creating opportunities



Peak design flood depth
Pre-development
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.2

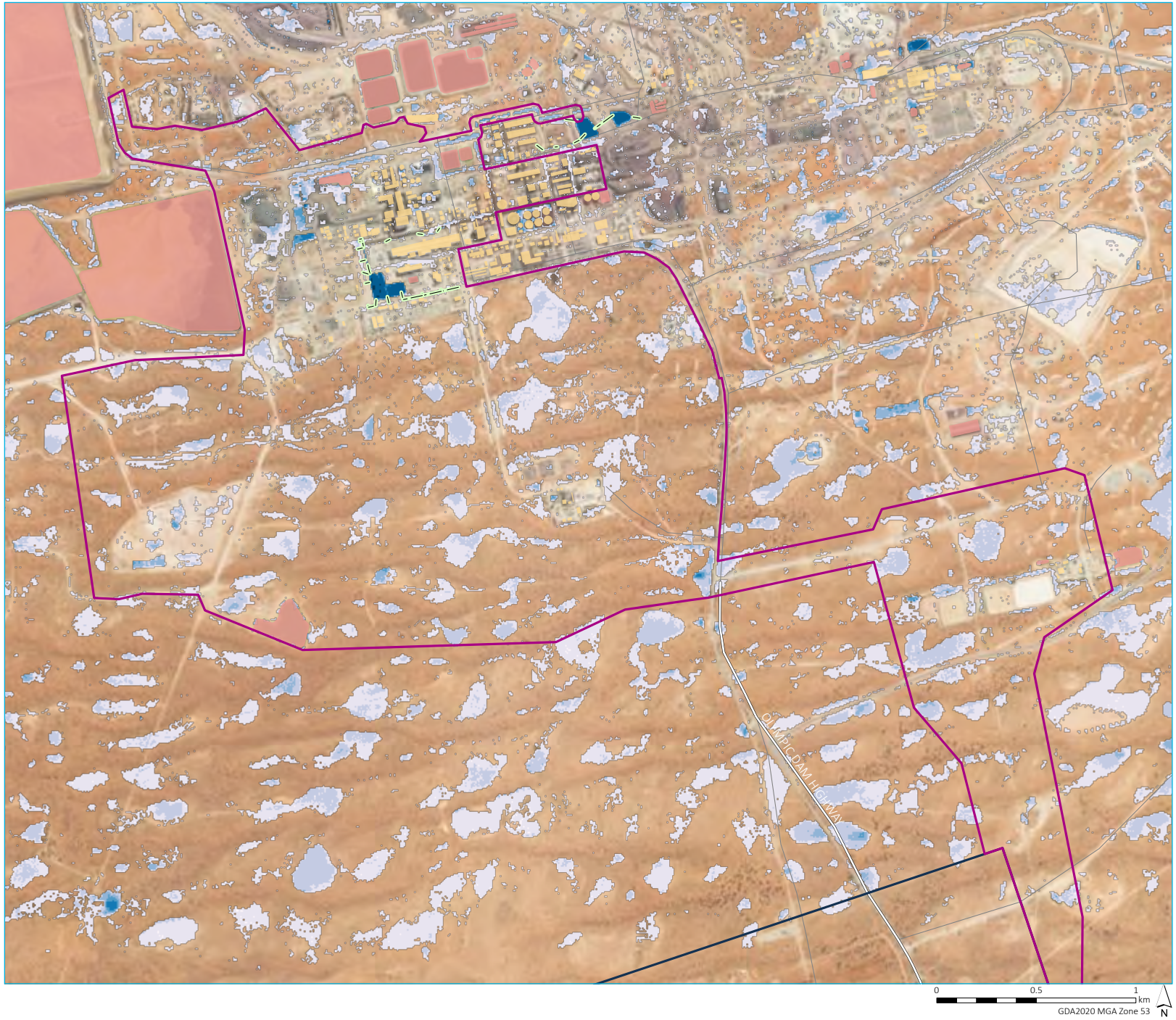
EMM
creating opportunities



Peak design flood depth
Pre-development
Current climate
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.3

EMM
creating opportunities

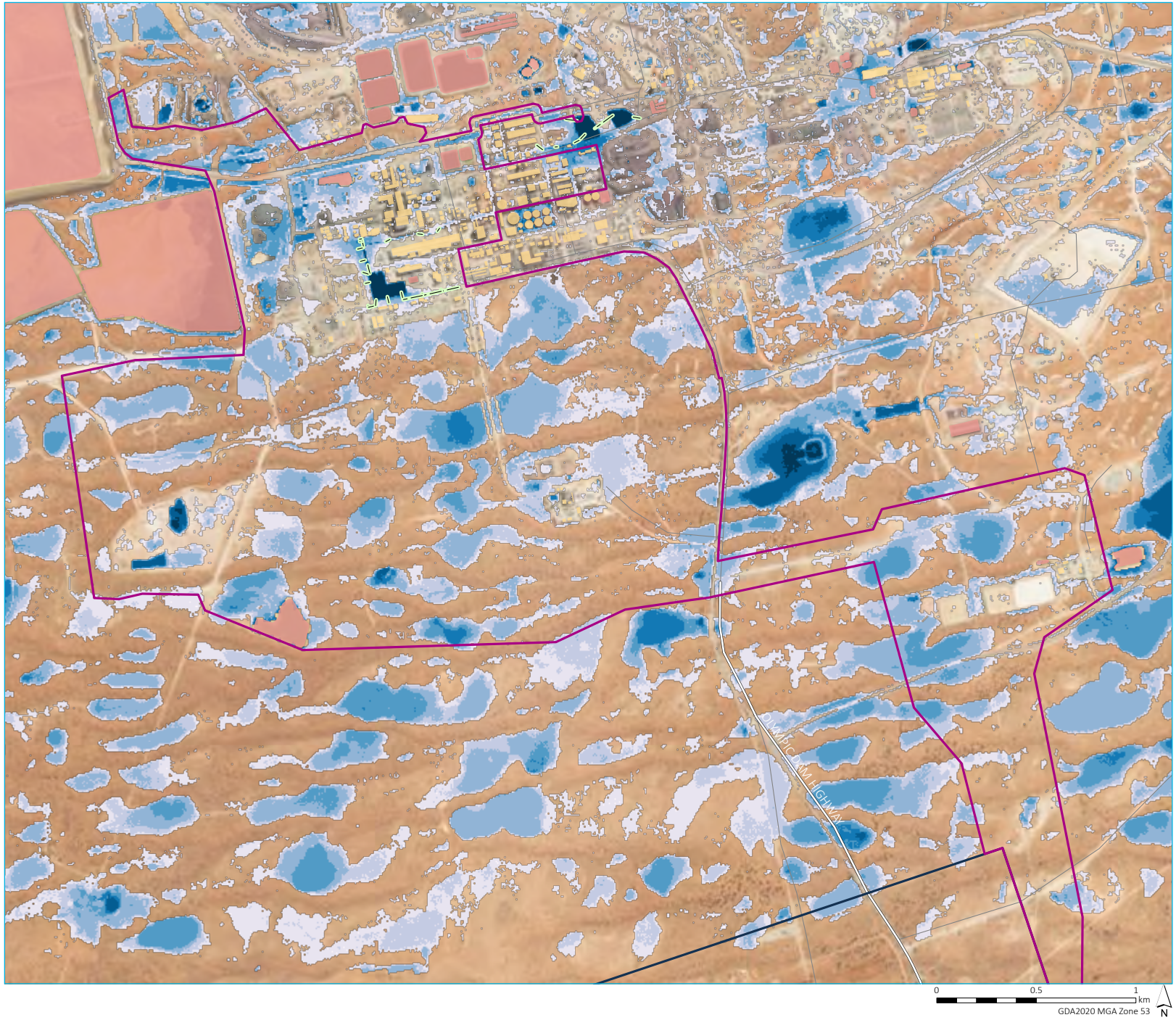


Peak design flood depth
Pre-development
Current climate
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.4

EMM
creating opportunities

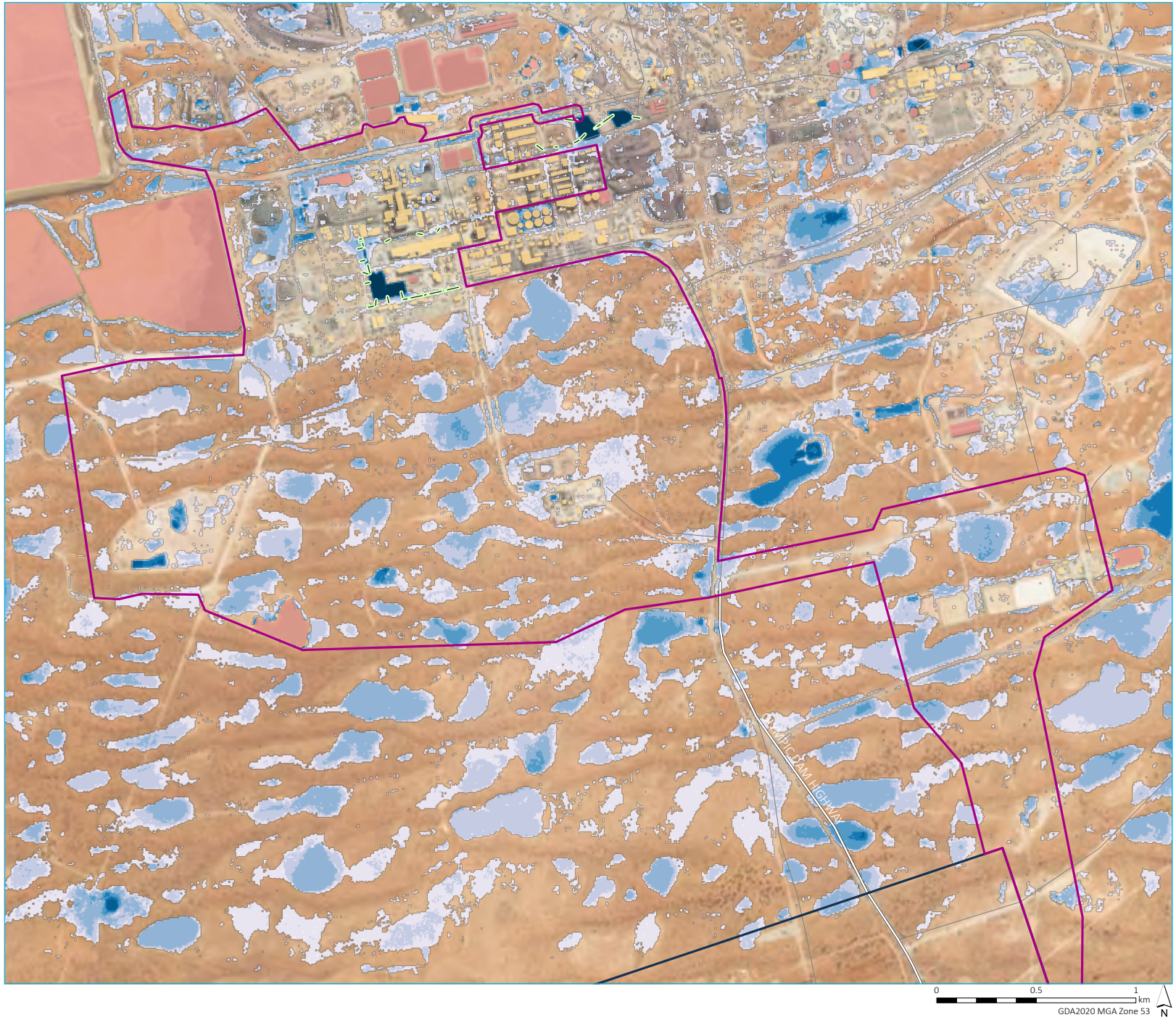
A.2 2.5 °C warming scenario



Peak design flood depth
Pre-development
2.5°C warming
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.5

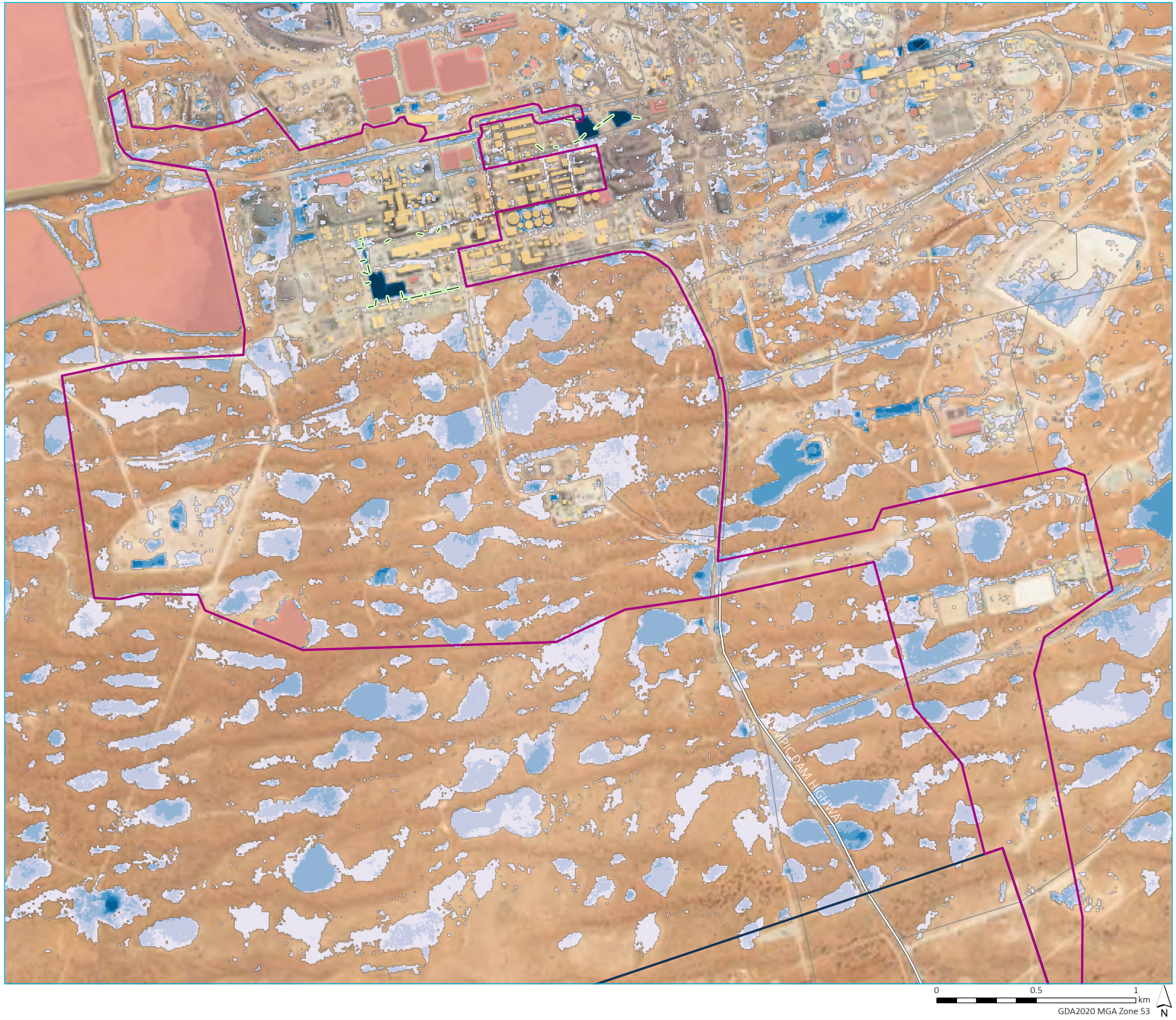
EMM
creating opportunities



Peak design flood depth
Pre-development
2.5°C warming
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.6

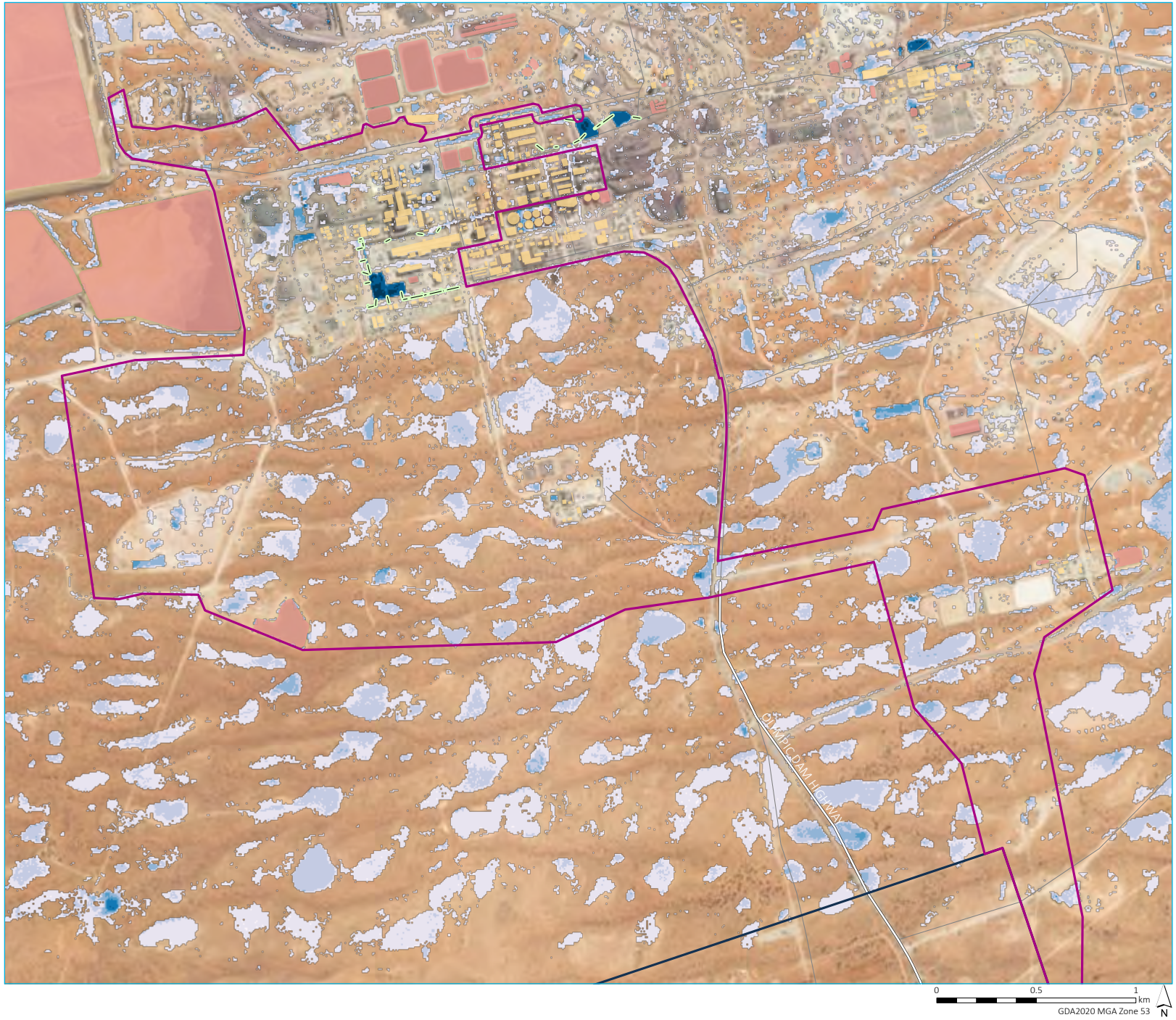
EMM
creating opportunities



Peak design flood depth
Pre-development
2.5°C warming
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.7

EMM
creating opportunities



Peak design flood depth
Pre-development
2.5°C warming
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure A.8

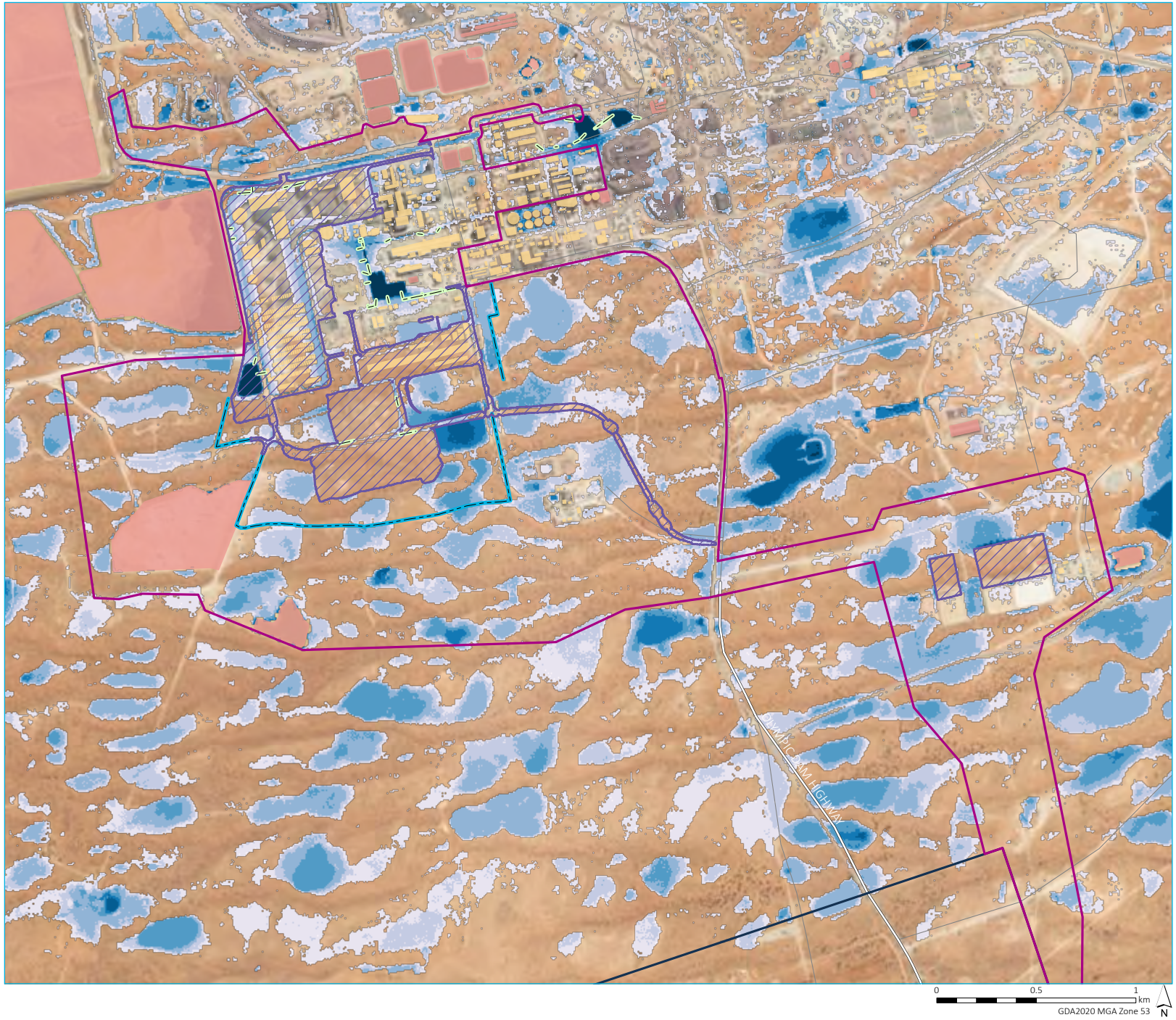
EMM
creating opportunities

Attachment B

Post-development peak flood depths

EMM
creating opportunities

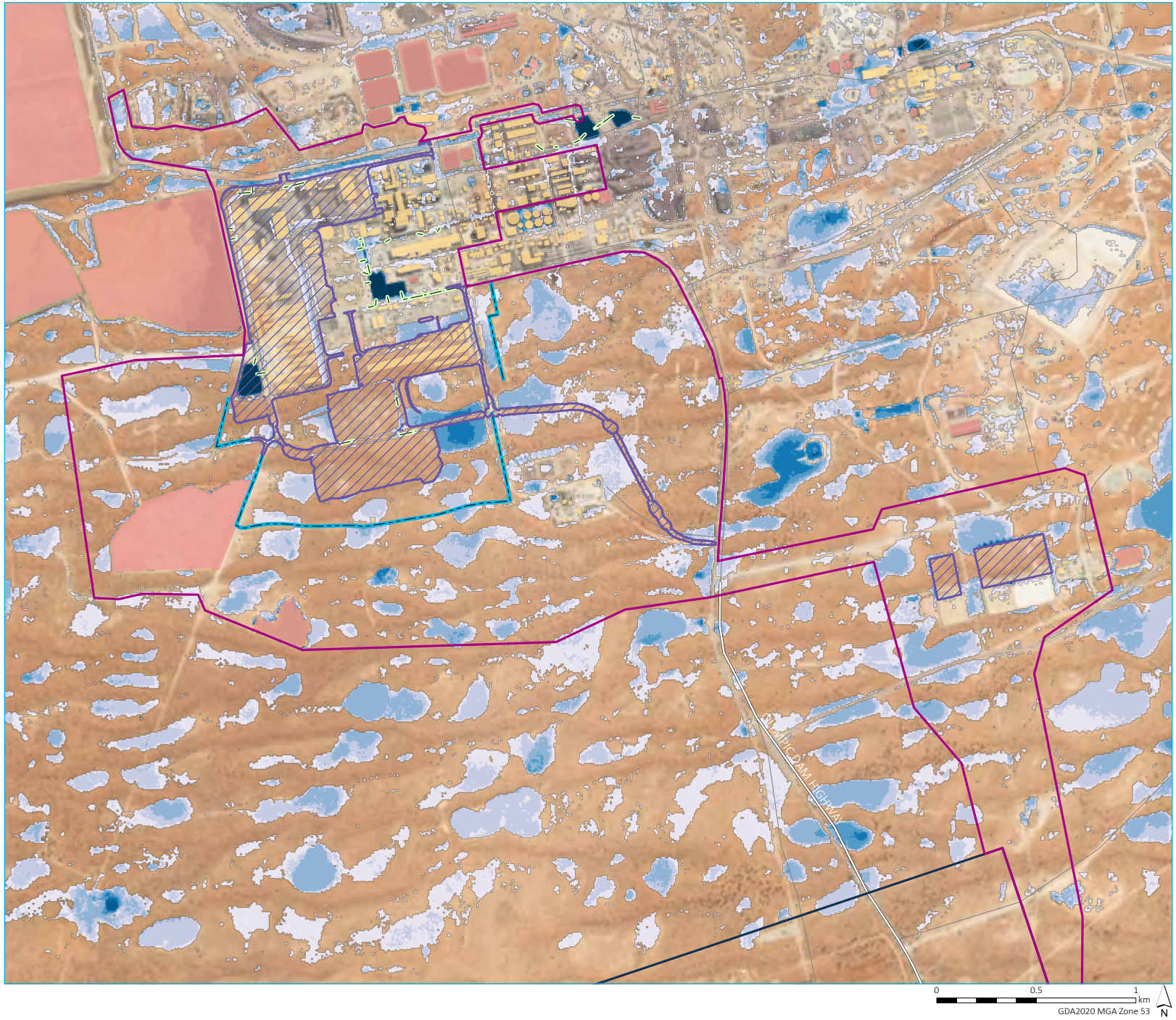
B.1 Existing climate



Peak design flood depth
Post-development
Current climate
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.1

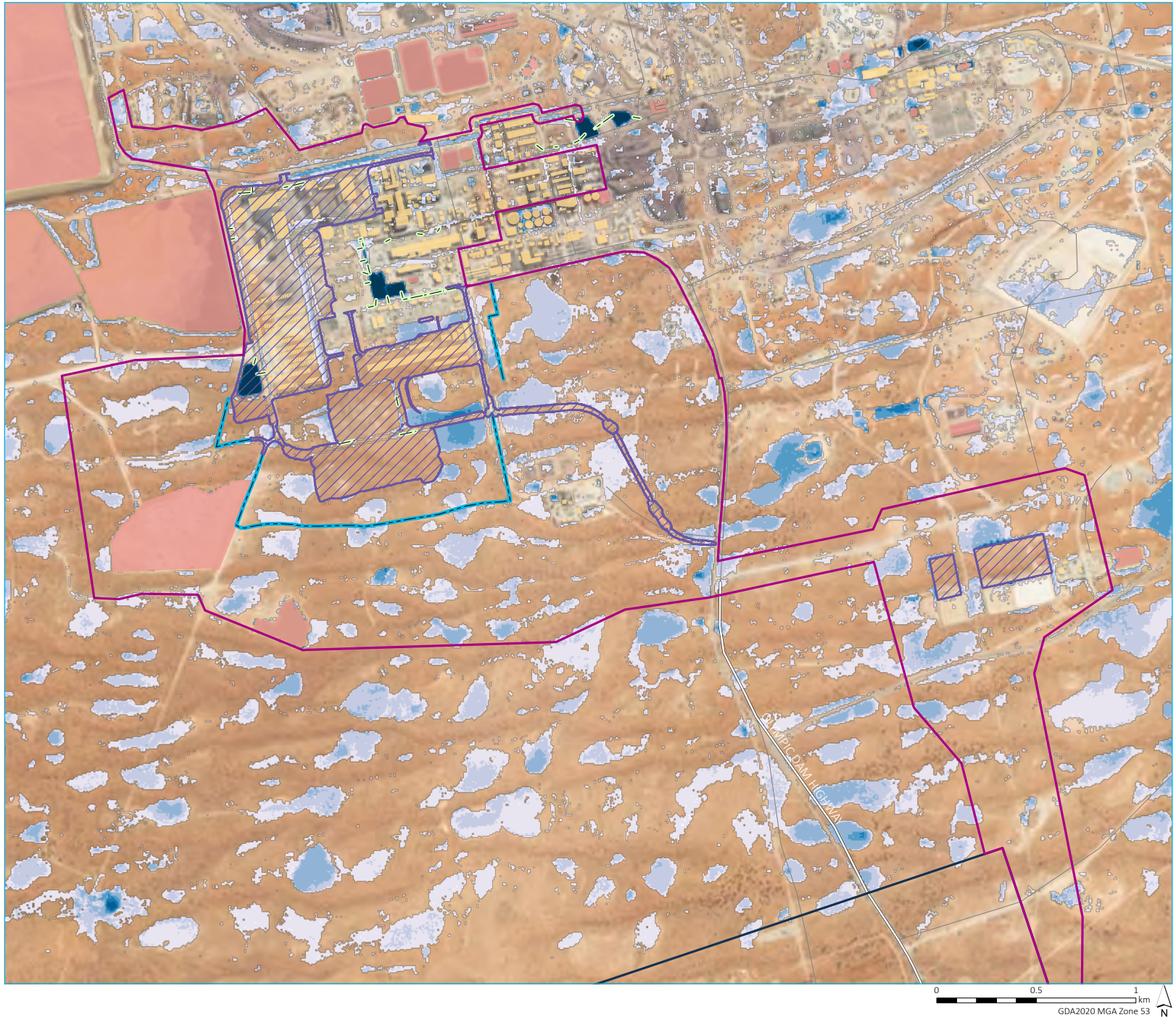
EMM
creating opportunities



Peak design flood depth
Post-development
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.2

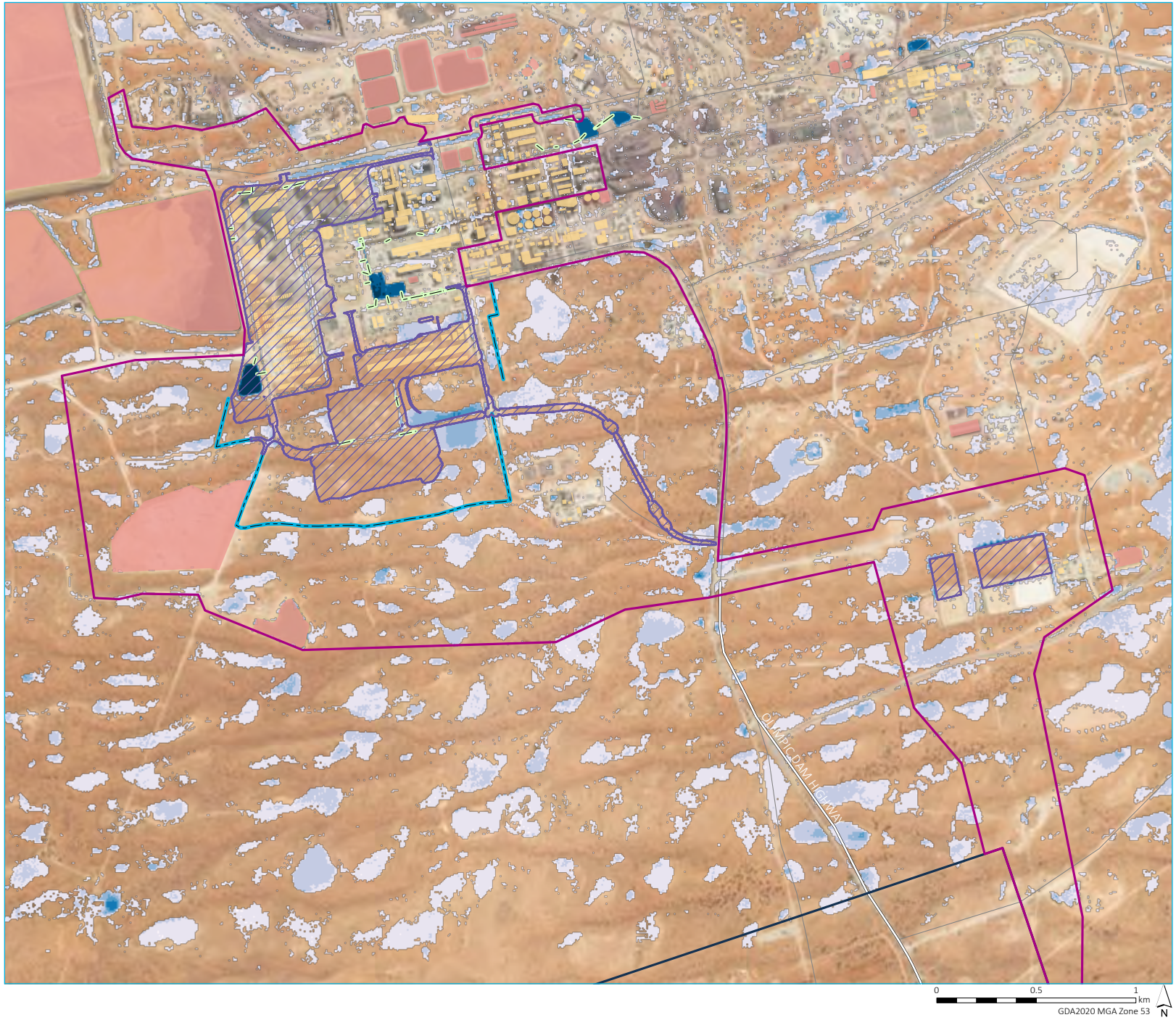
EMM
creating opportunities



Peak design flood depth
Post-development
Current climate
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.3

EMM
creating opportunities

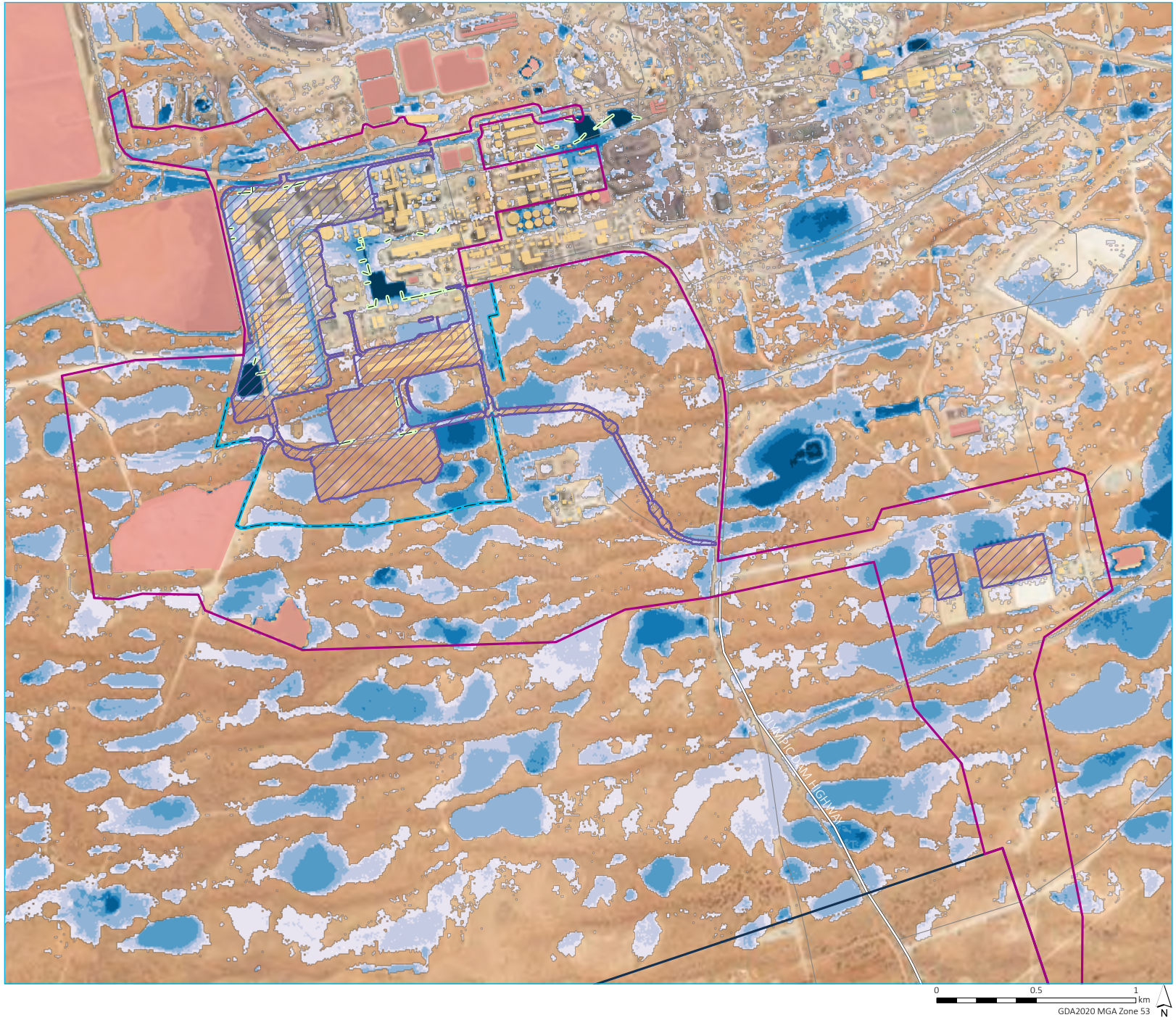


Peak design flood depth
Post-development
Current climate
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.4

EMM
creating opportunities

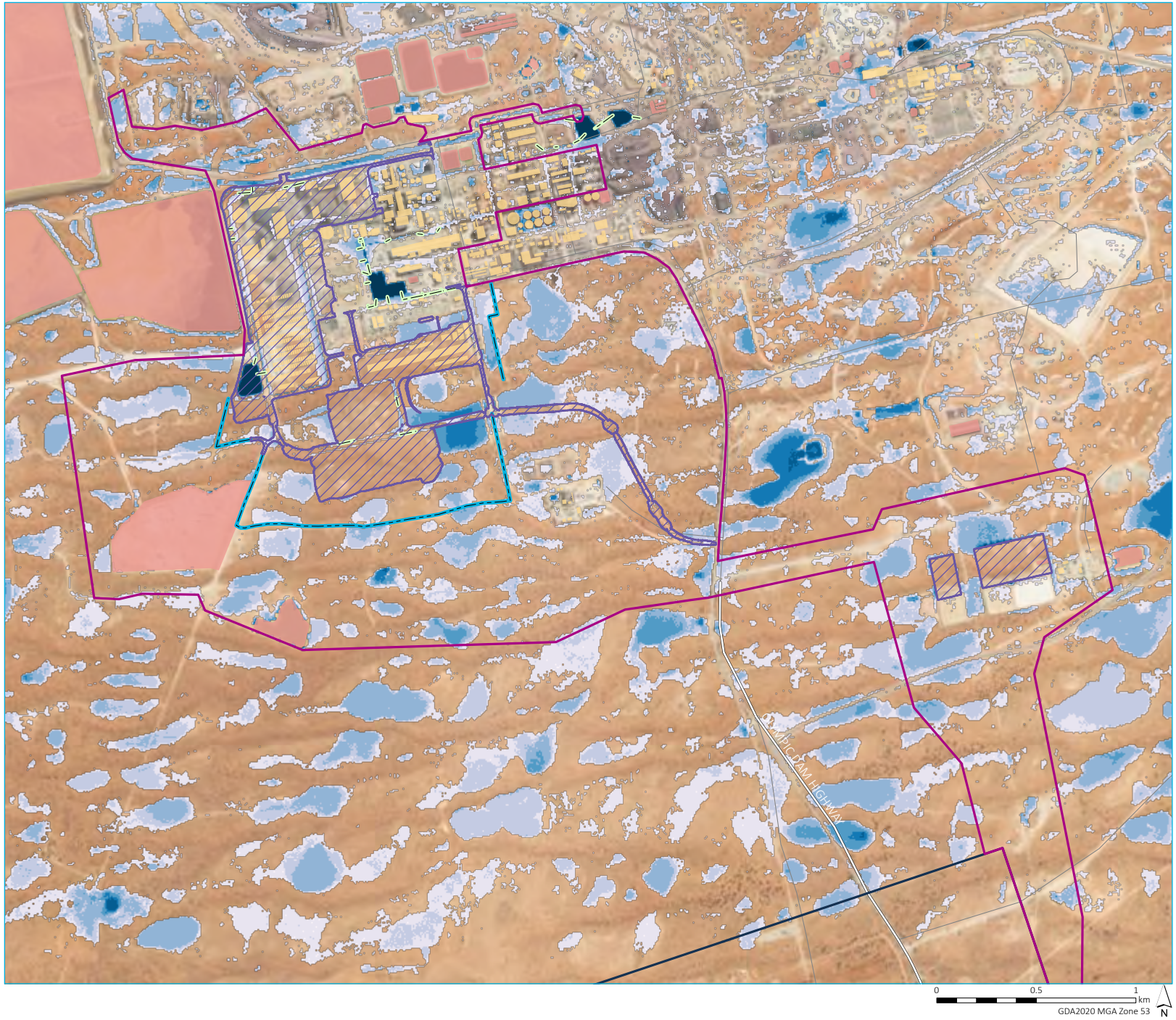
B.2 2.5 °C warming scenario



Peak design flood depth
Post-development
2.5°C warming
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.5

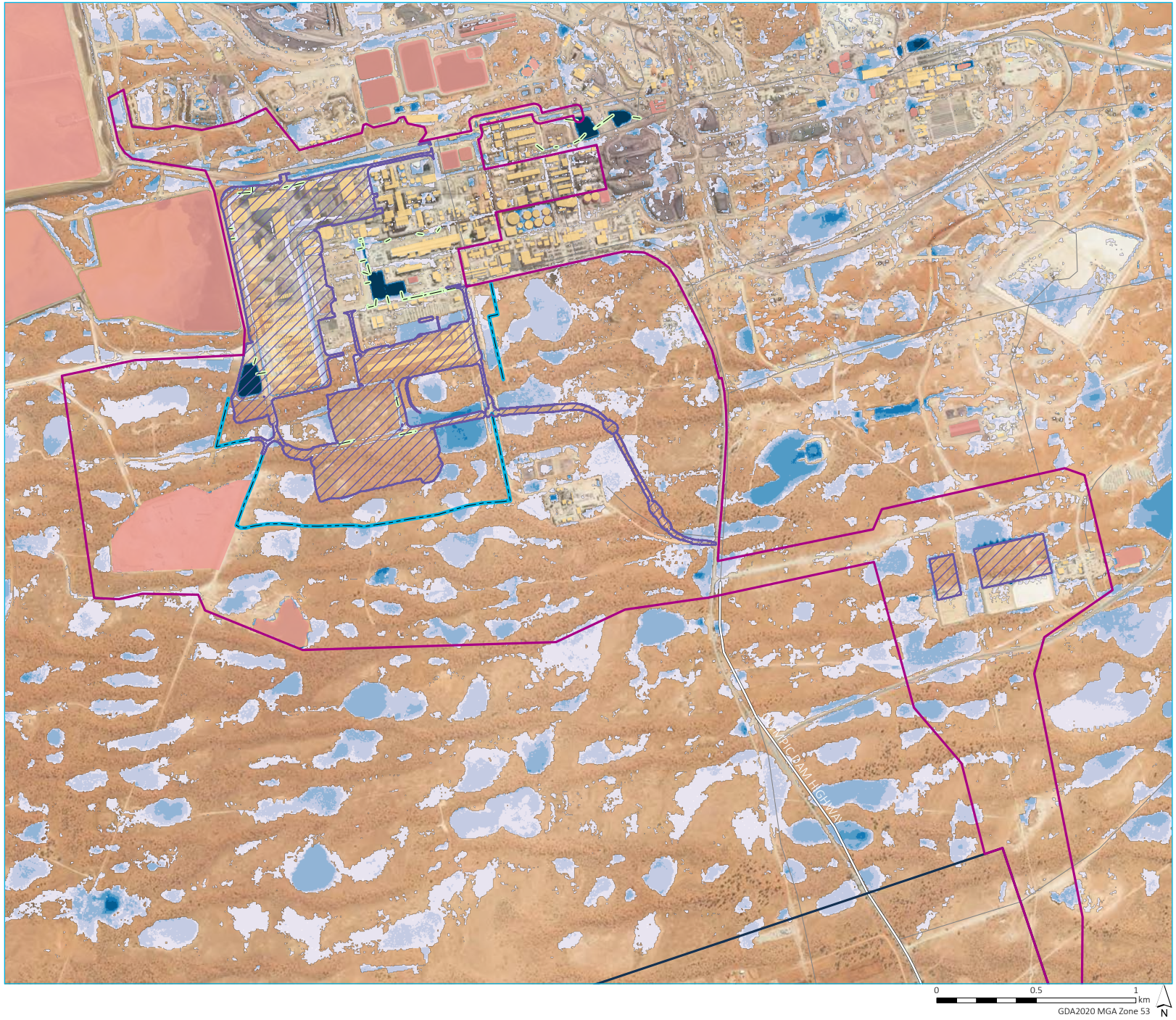
EMM
creating opportunities



Peak design flood depth
Post-development
2.5°C warming
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.6

EMM
creating opportunities



Peak design flood depth
Post-development
2.5°C warming
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.7

EMM
creating opportunities



KEY

- Special Mining Lease
- SRE Project Area - SML Area
- Building
- Inactive area
- Pad surface
- Bunding
- Culvert

Existing environment

- Major road
- Minor road

Maximum water depth (m)

- < 0.1
- 0.1- 0.25
- 0.25- 0.5
- 0.5- 1
- 1- 1.5
- 1.5- 2
- 2- 3
- > 3

0 0.5 1 km

GDA2020 MGA Zone 53

N

Peak design flood depth
Post-development
2.5°C warming
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure B.8

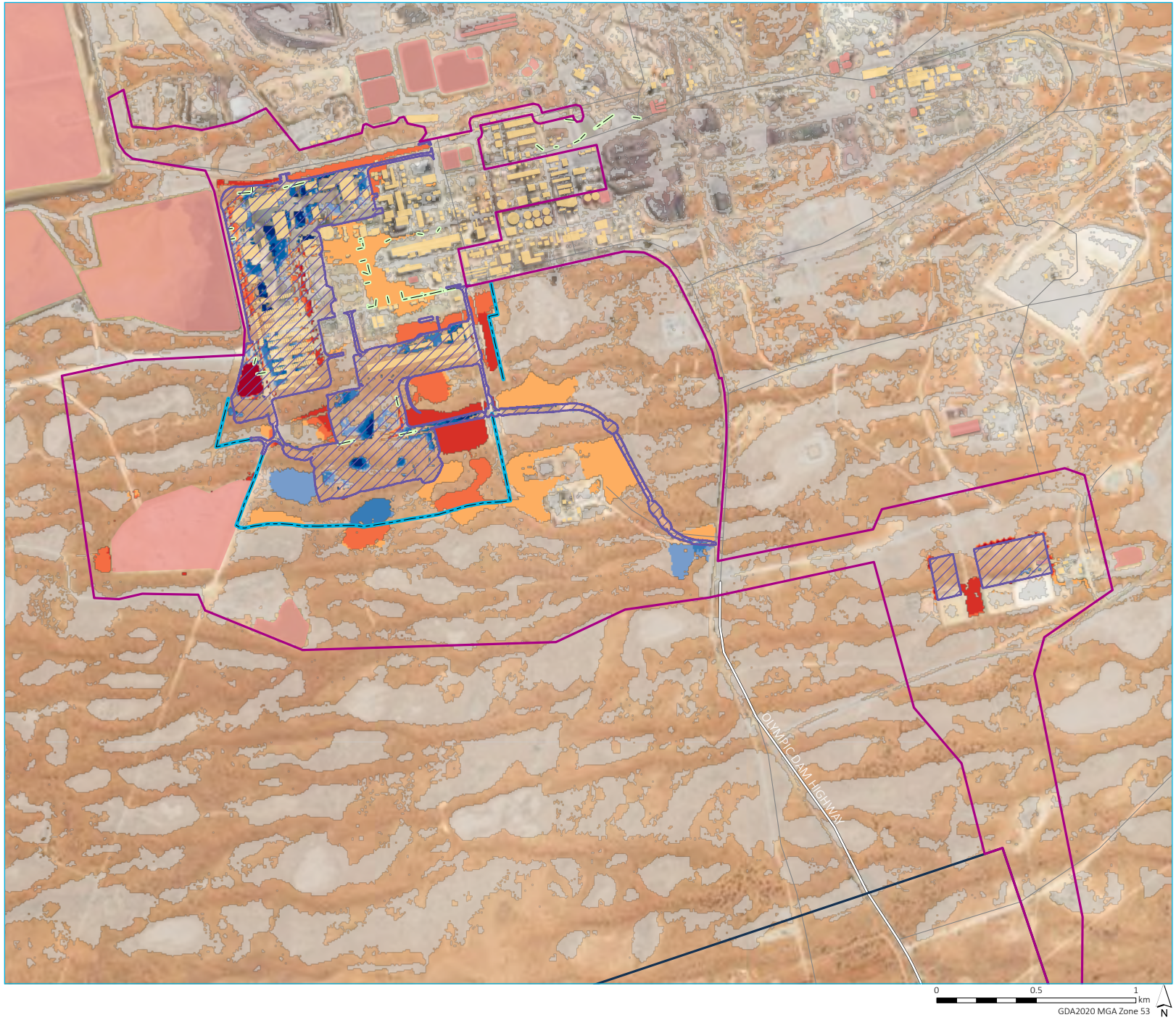
EMM
creating opportunities

Attachment C

Changes in peak flood depths due to SRE Project infrastructure

EMM
creating opportunities

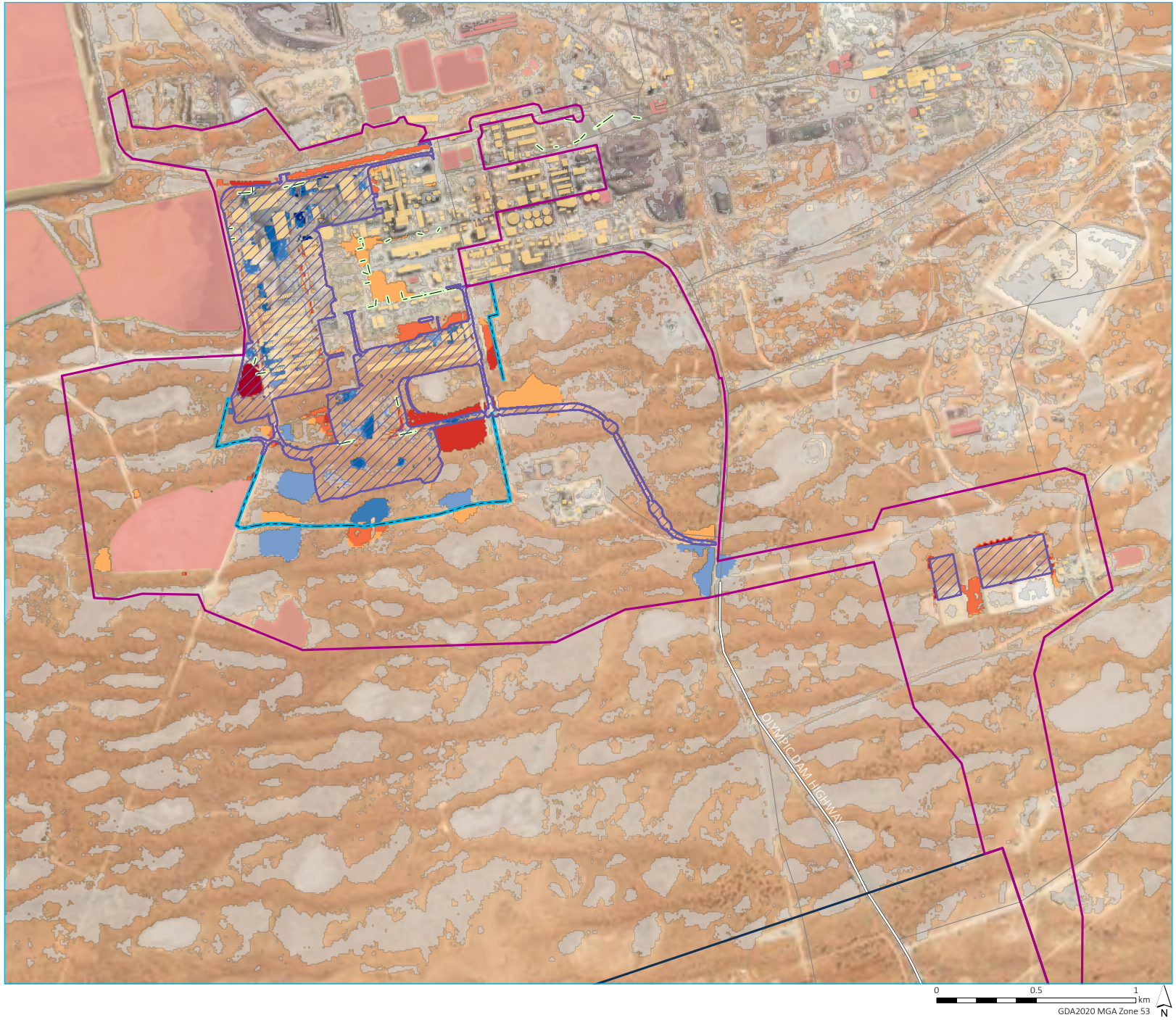
C.1 Existing climate



Change in peak flood depth
Current climate
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.1

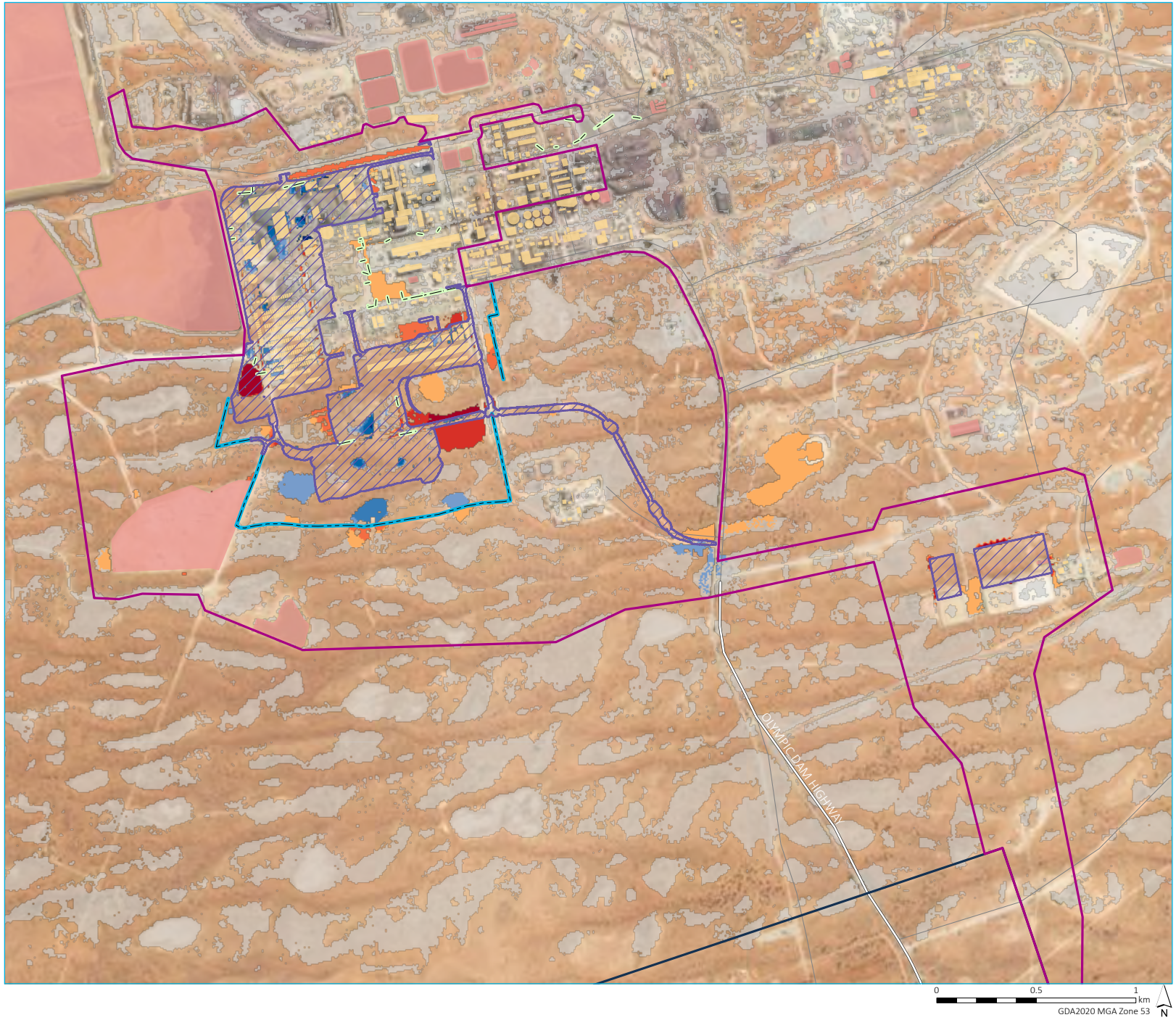
EMM
creating opportunities



Change in peak flood depth
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.2

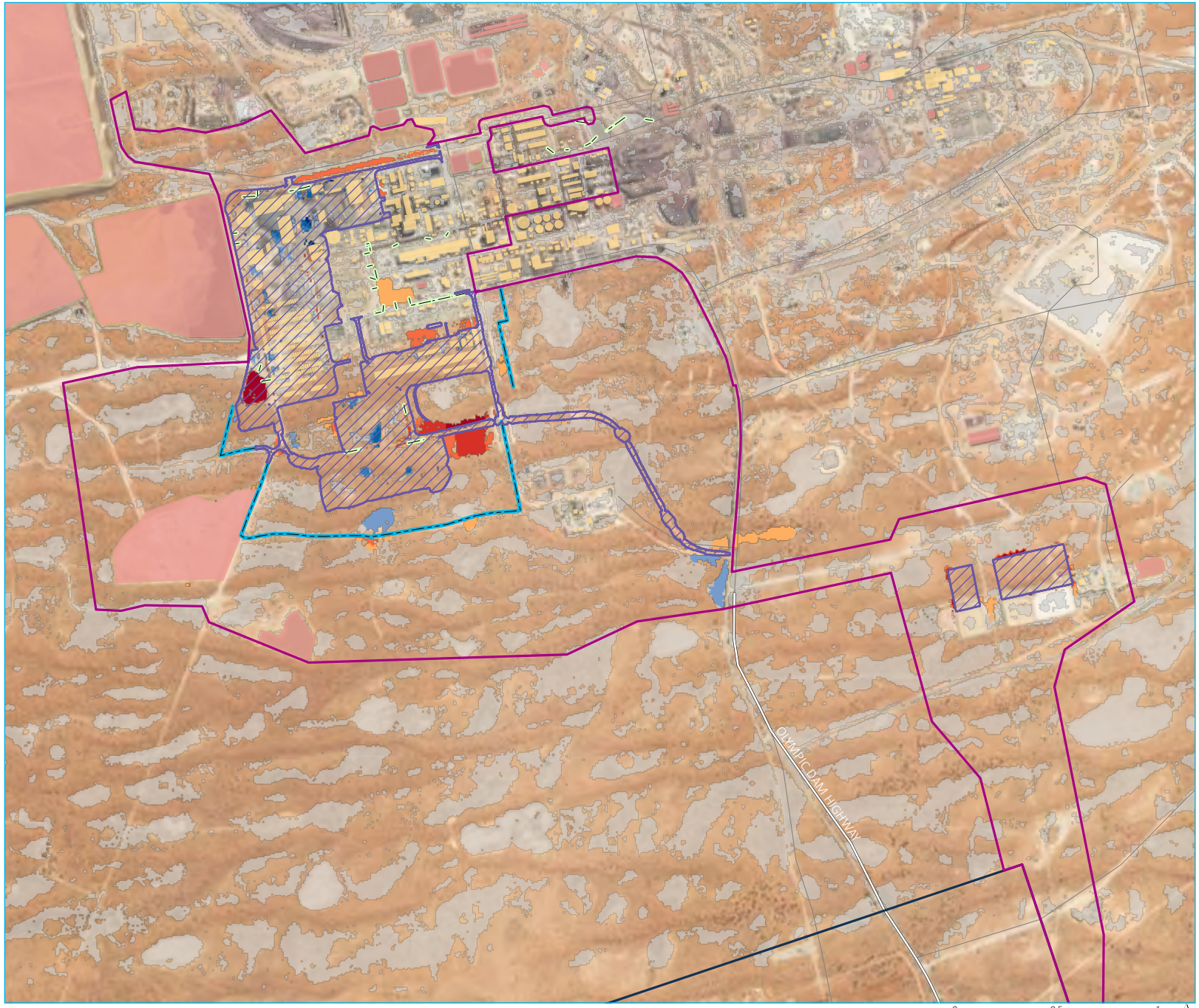
EMM
creating opportunities



Change in peak flood depth
Current climate
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.3

EMM
creating opportunities

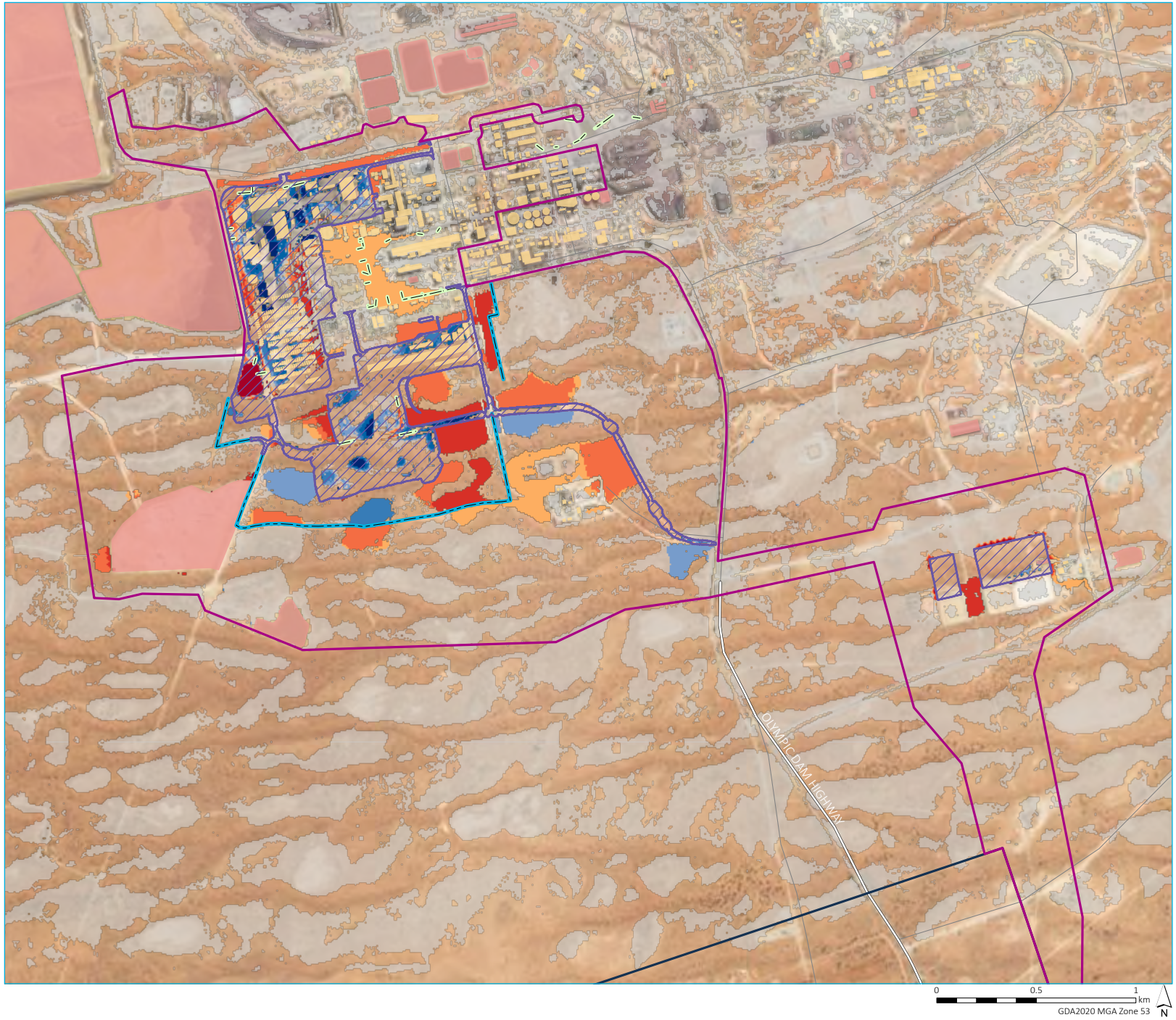


Change in peak flood depth
Current climate
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.4

EMM
creating opportunities

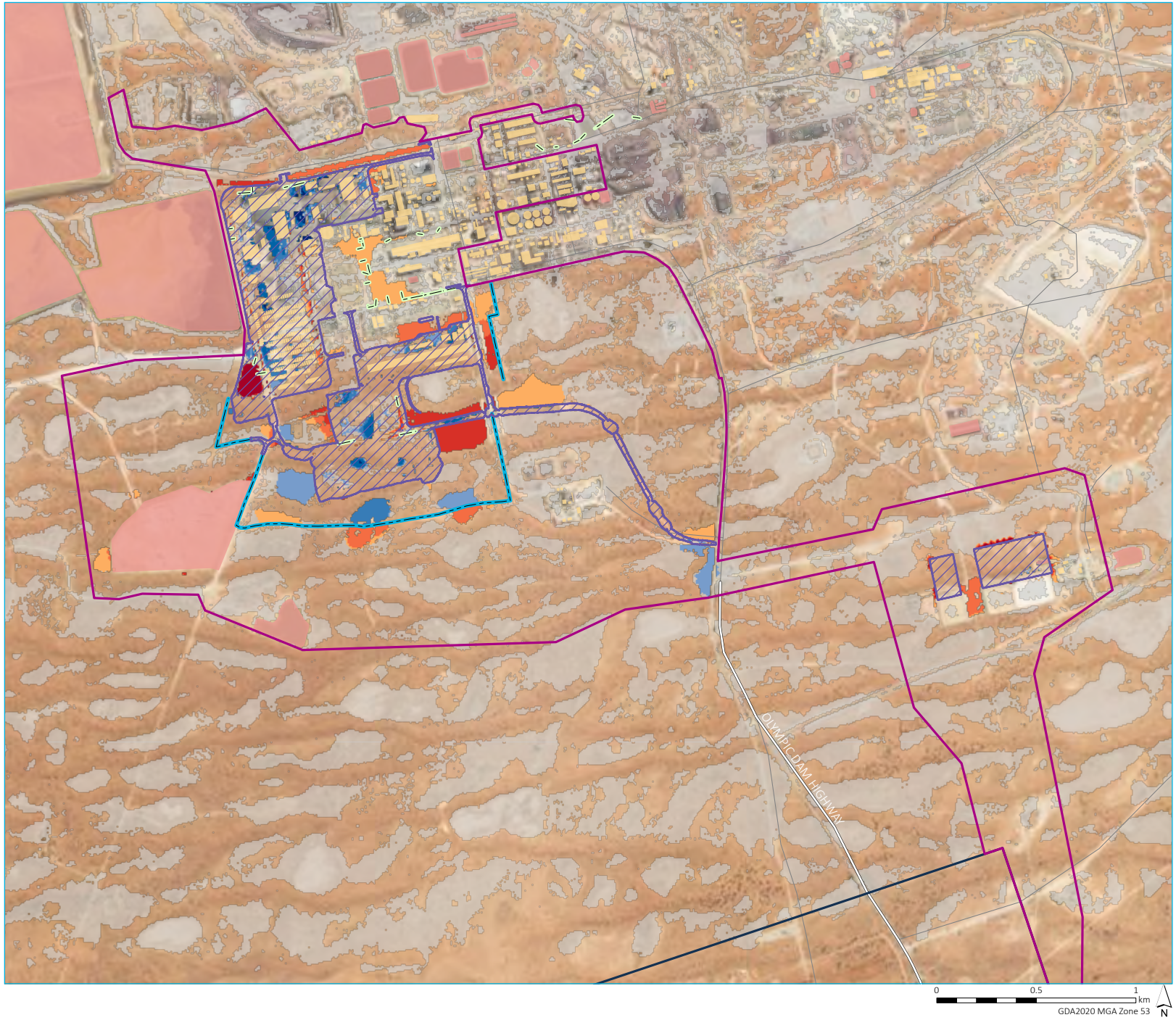
C.2 2.5 °C warming scenario



Change in peak flood depth
2.5°C warming
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.5

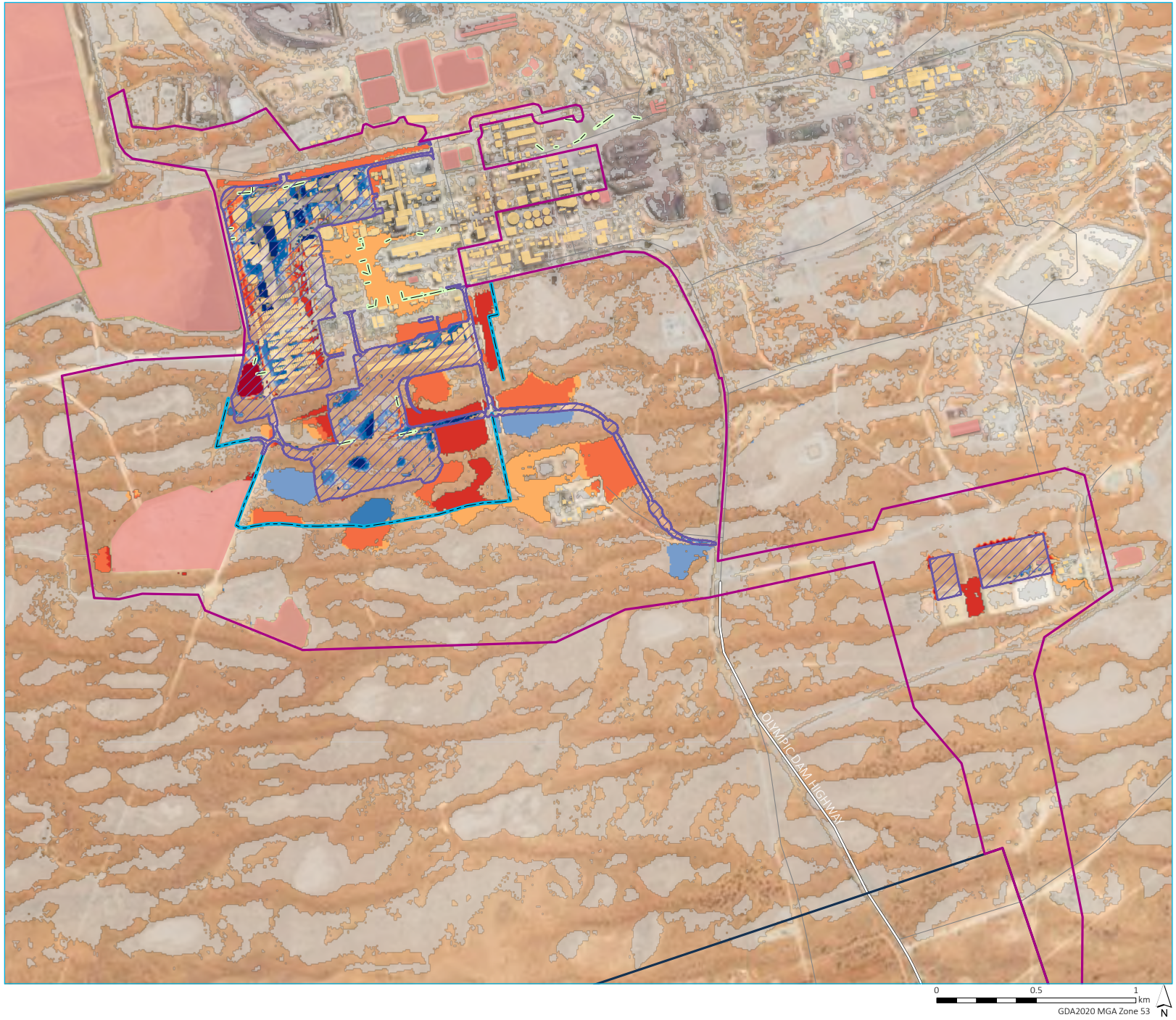
EMM
creating opportunities



Change in peak flood depth
2.5°C warming
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.6

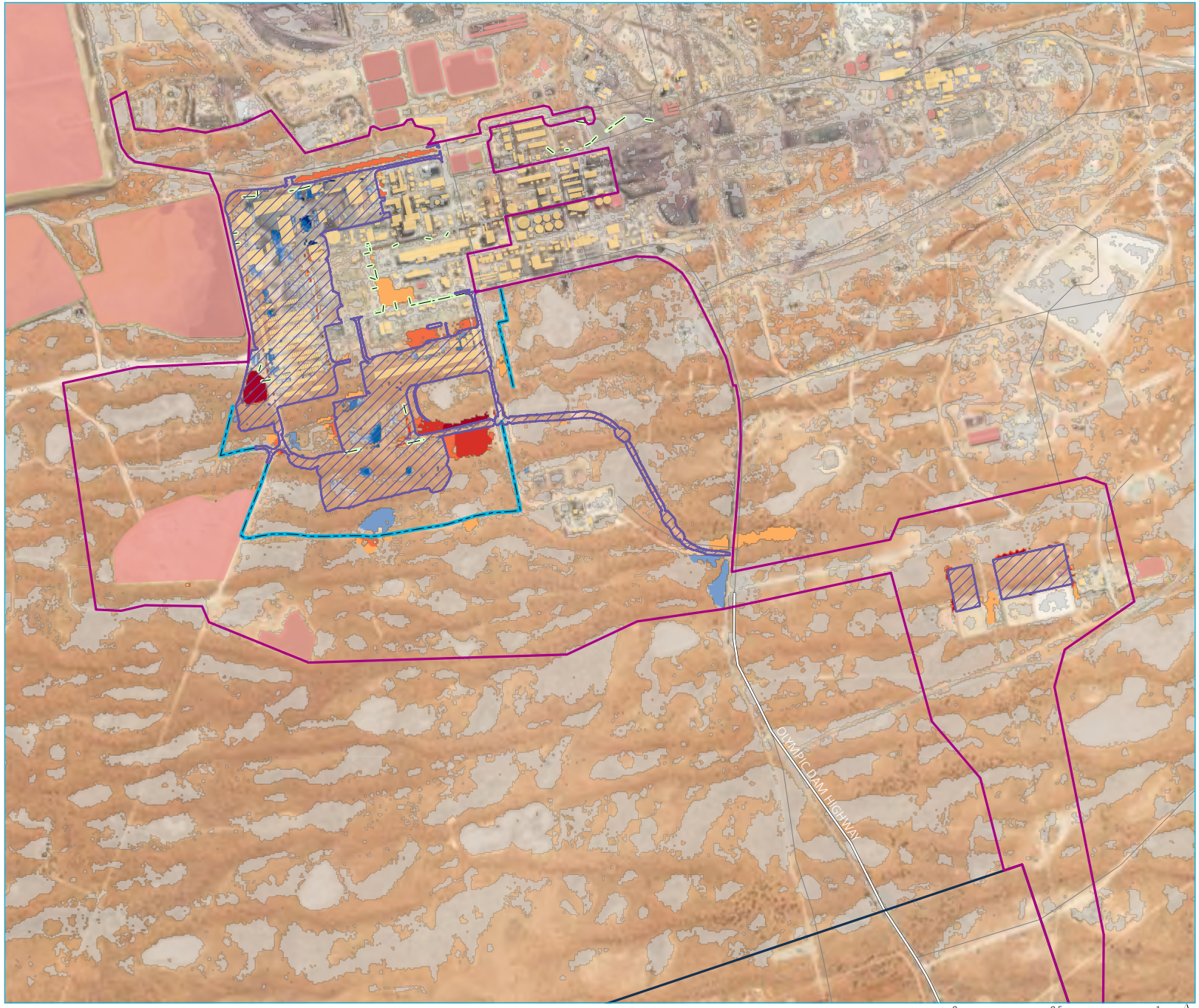
EMM
creating opportunities



Change in peak flood depth
2.5°C warming
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.7

EMM
creating opportunities



KEY

- Special Mining Lease
- SRE Project Area - SML Area
- Building
- Inactive area
- Pad surface
- Bunding
- Culvert

Existing environment

- Major road
- Minor road

Change in peak flood level (m)

- <-1
- -1--0.5
- -0.5--0.25
- -0.25--0.1
- -0.1- 0.1
- 0.1- 0.25
- 0.25- 0.5
- 0.5- 1
- >1

Change in peak flood depth
2.5°C warming
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure C.8

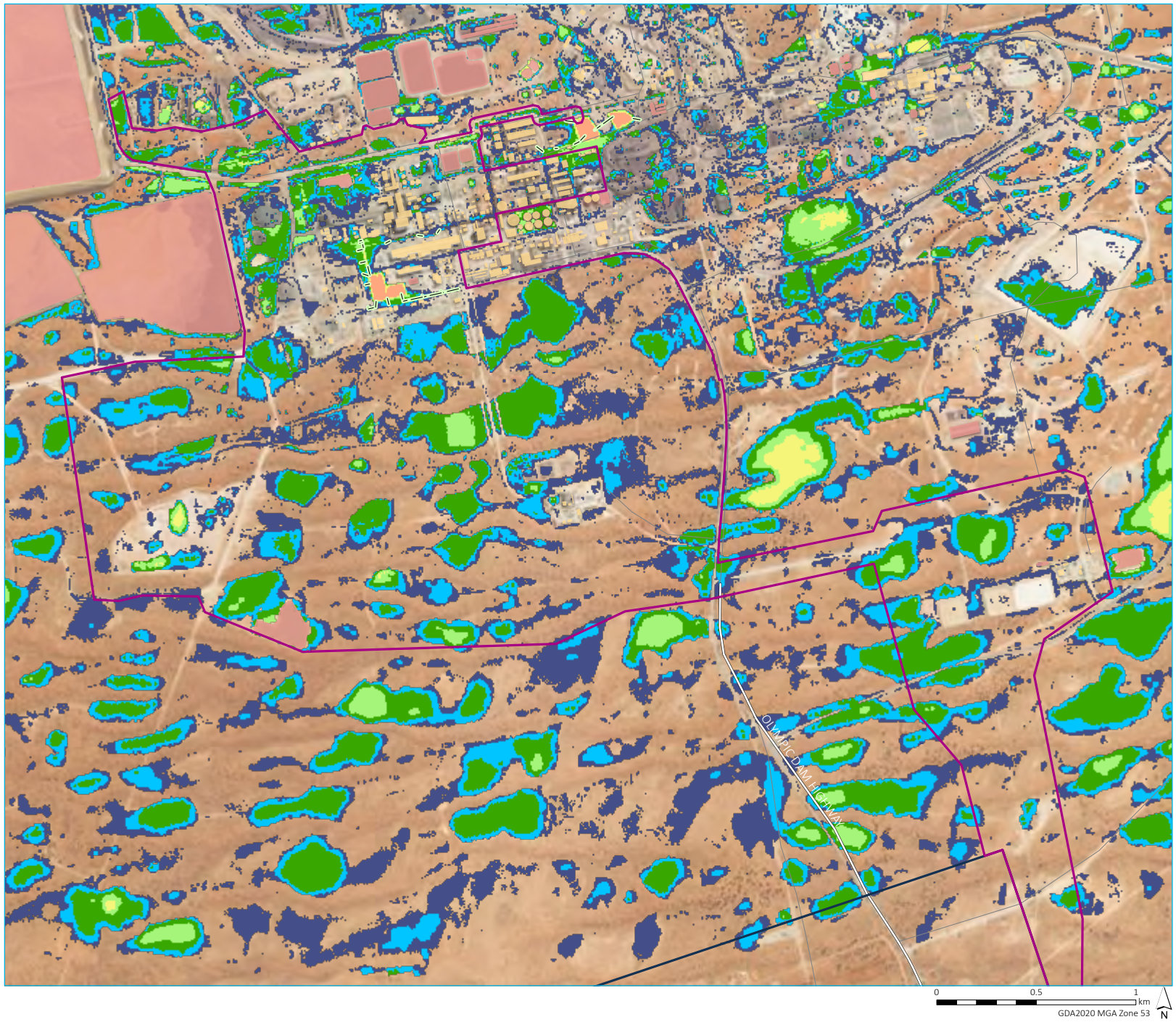
EMM
creating opportunities

Attachment D

Pre-development flood hazard ratings

EMM
creating opportunities

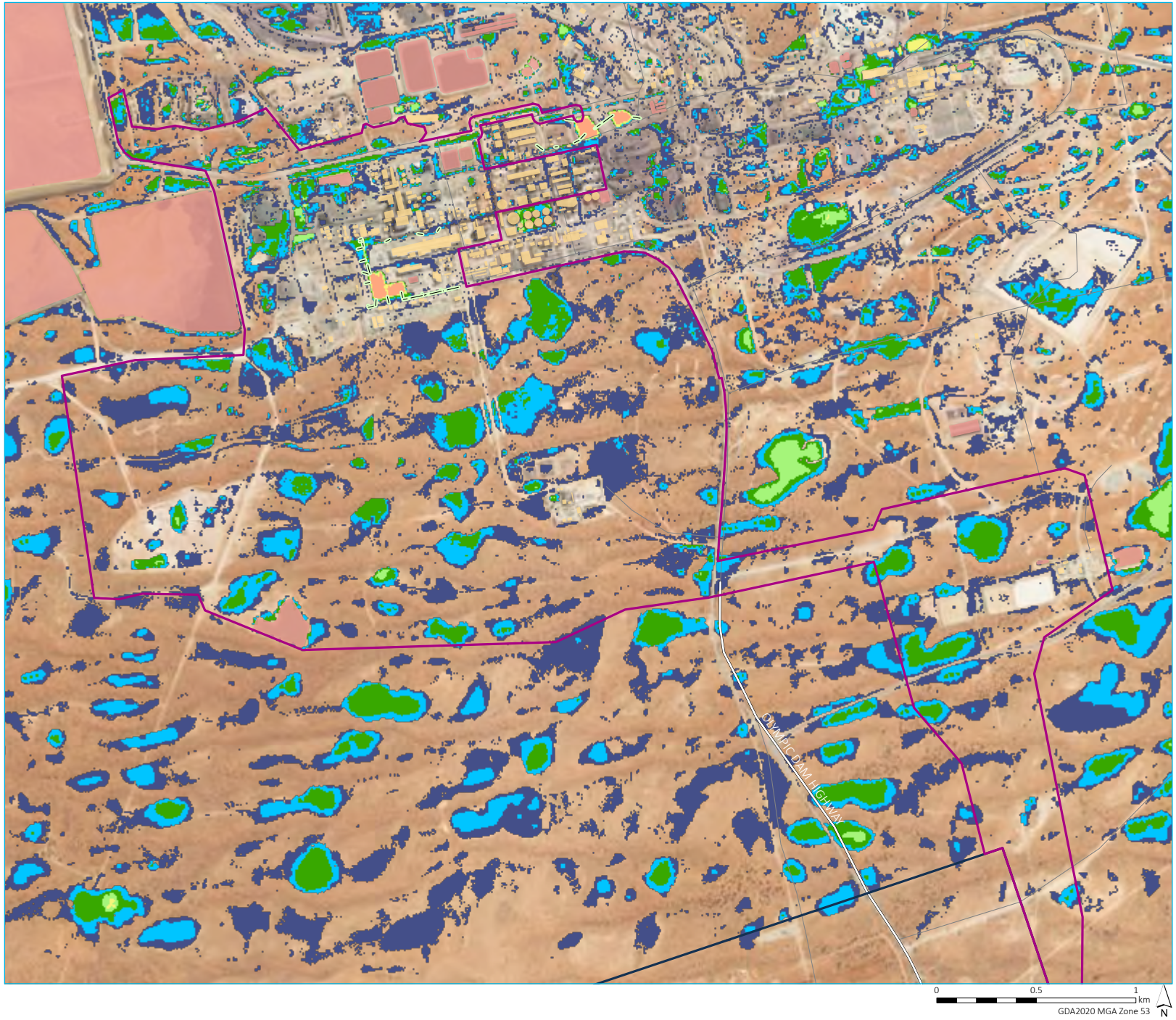
D.1 Existing climate



Peak design flood hazard
Pre-development
Current climate
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.1

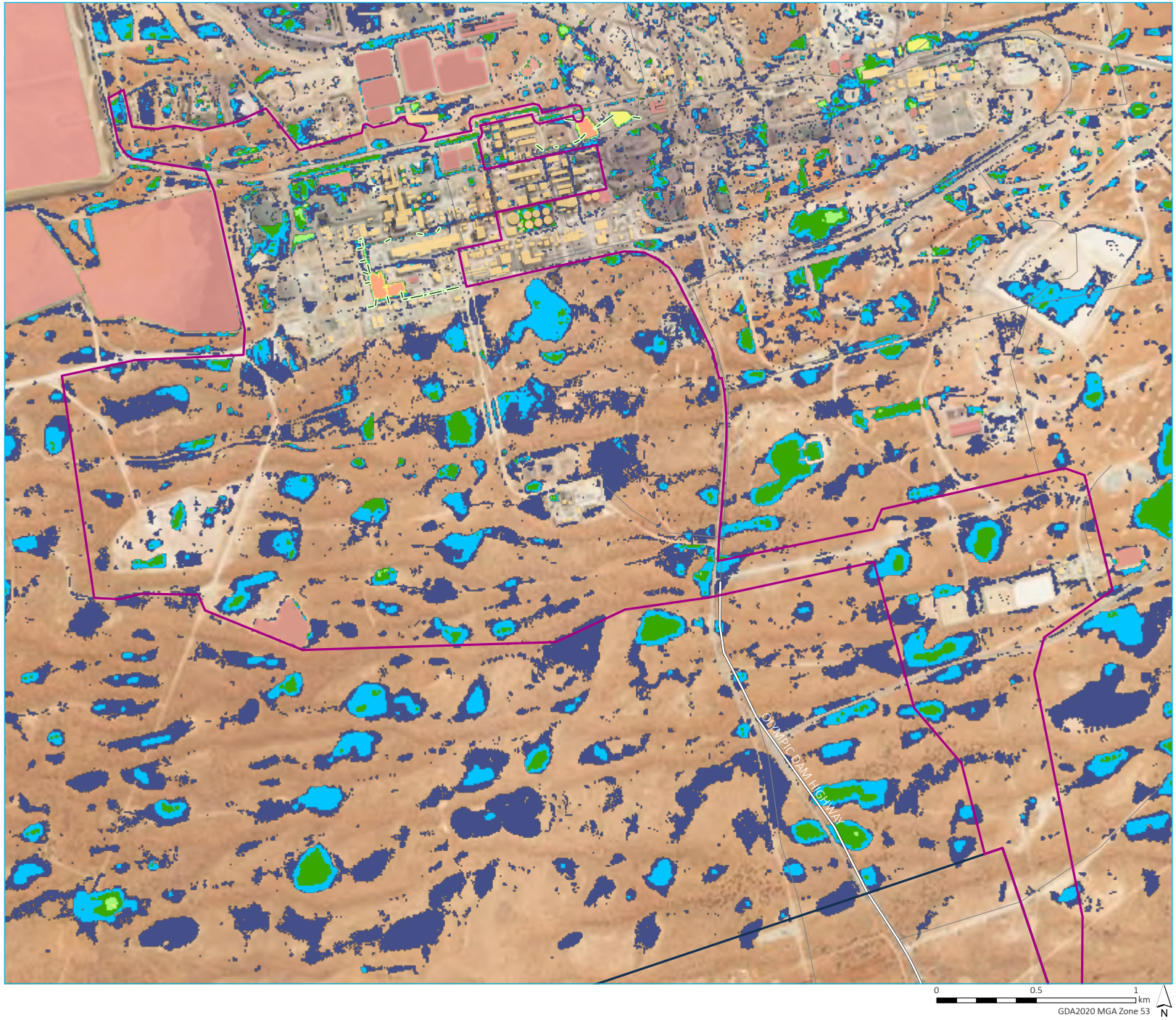
EMM
creating opportunities



Peak design flood hazard
Pre-development
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.2

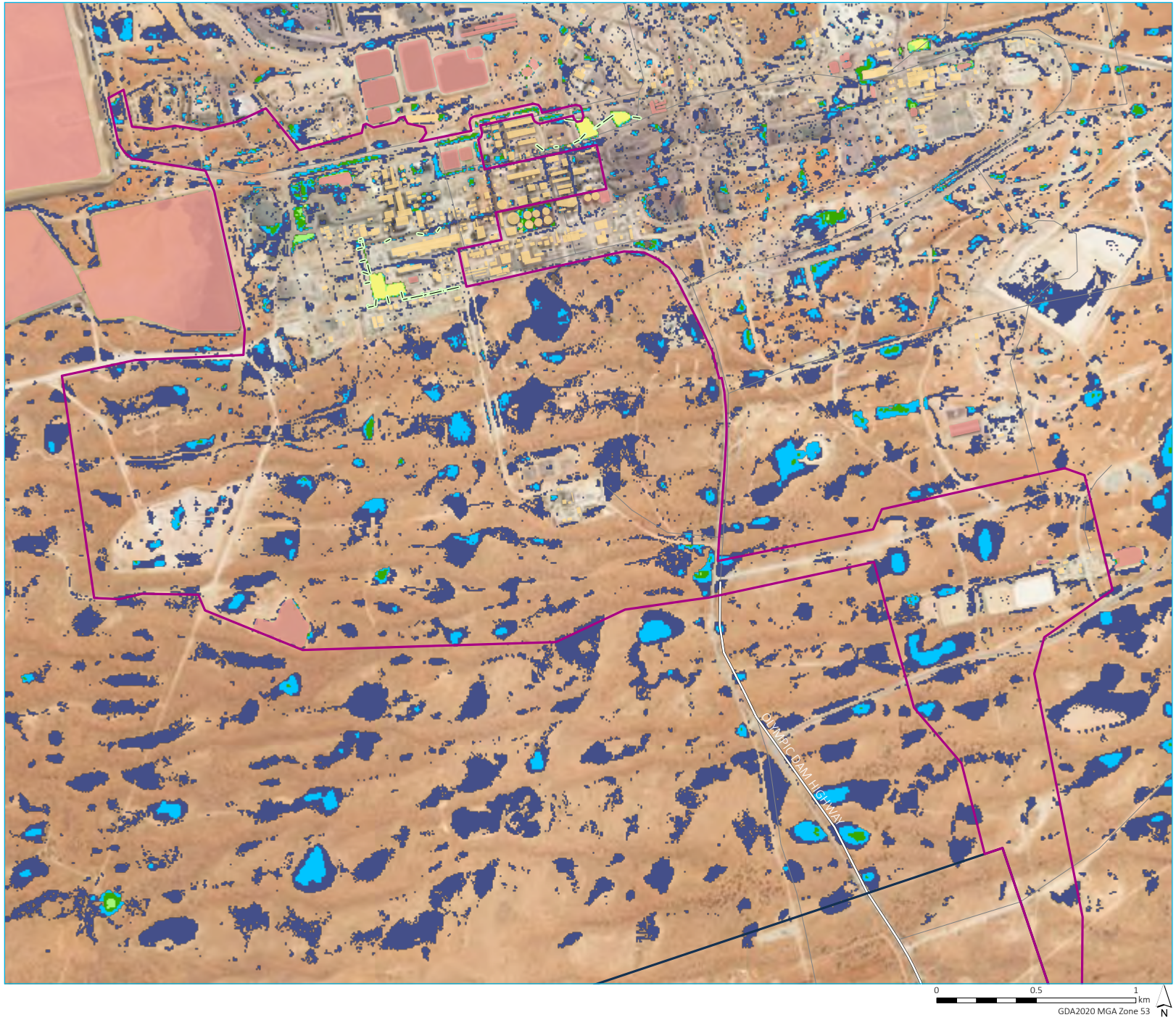
EMM
creating opportunities



Peak design flood hazard
Pre-development
Current climate
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.3

EMM
creating opportunities

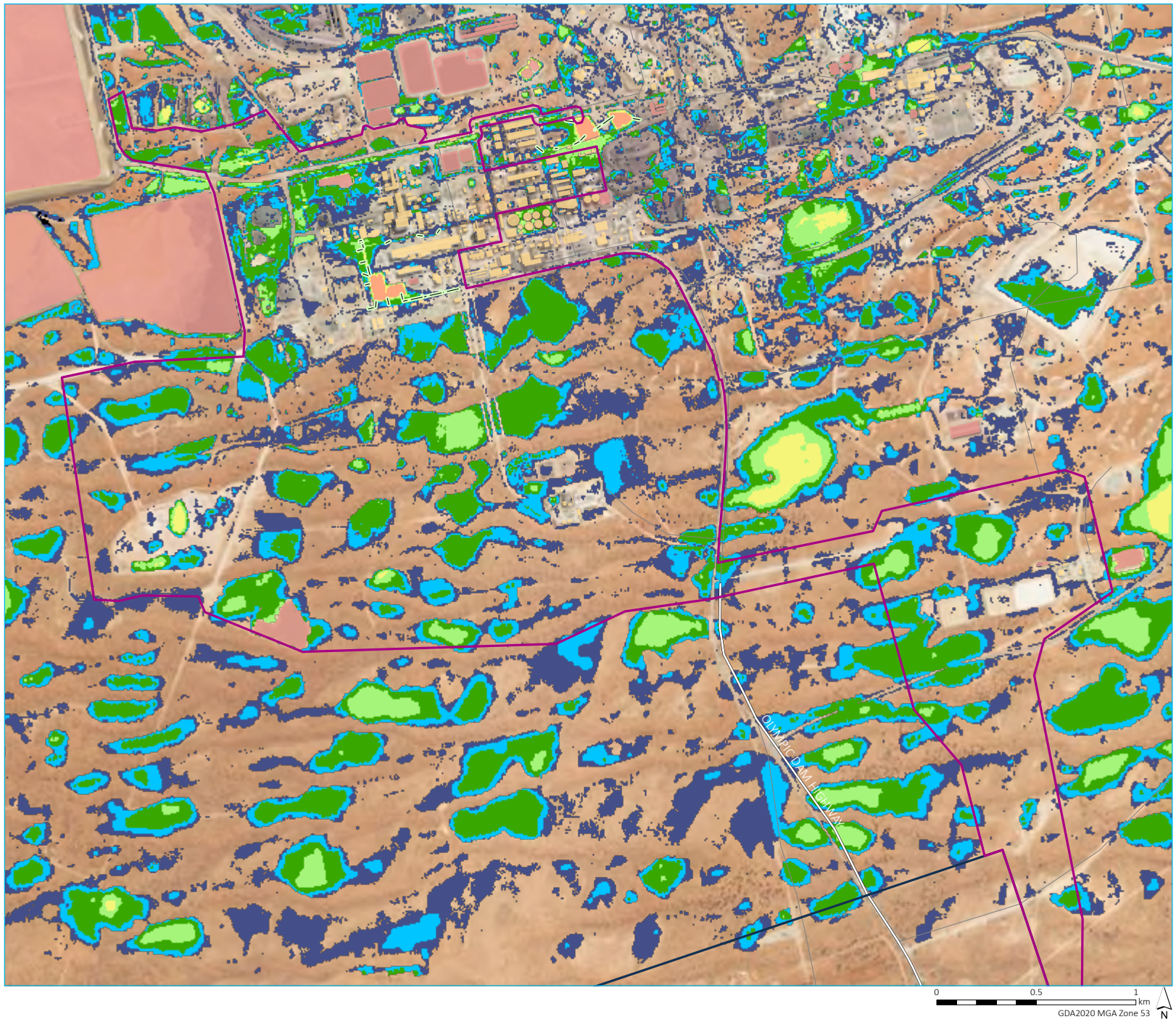


Peak design flood hazard
Pre-development
Current climate
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.4

EMM
creating opportunities

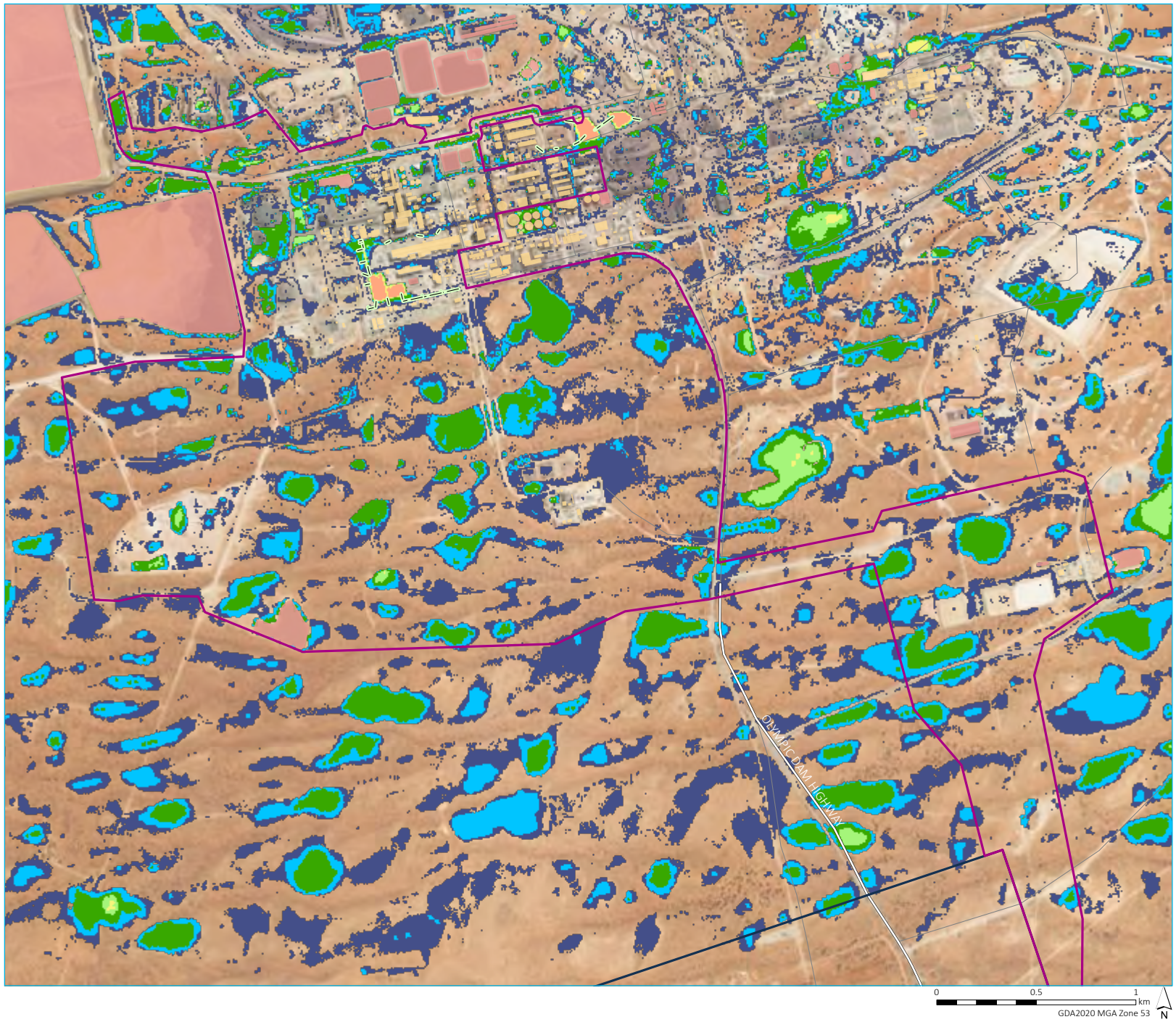
D.2 2.5 °C warming scenario



Peak design flood hazard
Pre-development
2.5°C warming
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.5

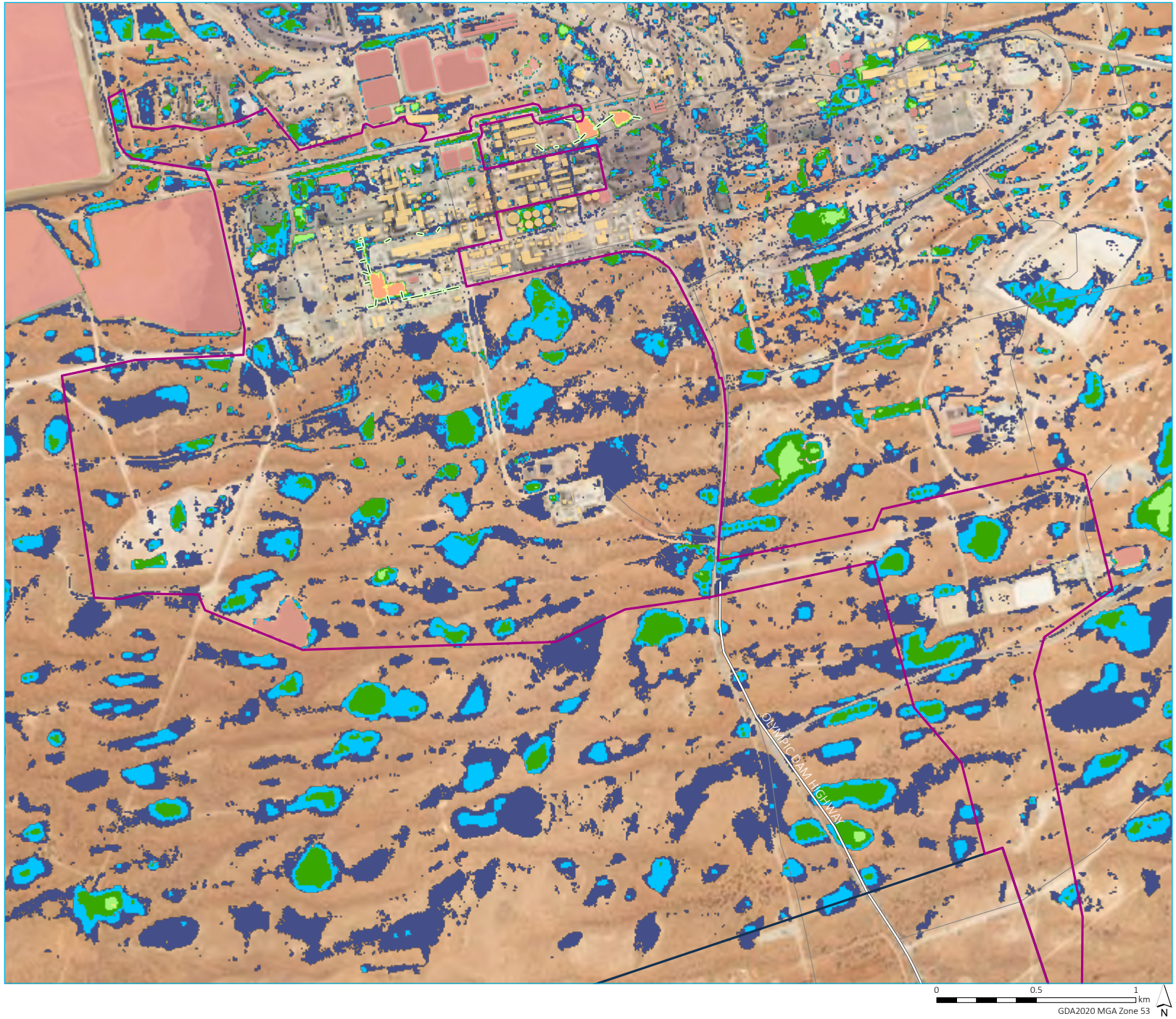
EMM
creating opportunities



Peak design flood hazard
Pre-development
2.5°C warming
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.6

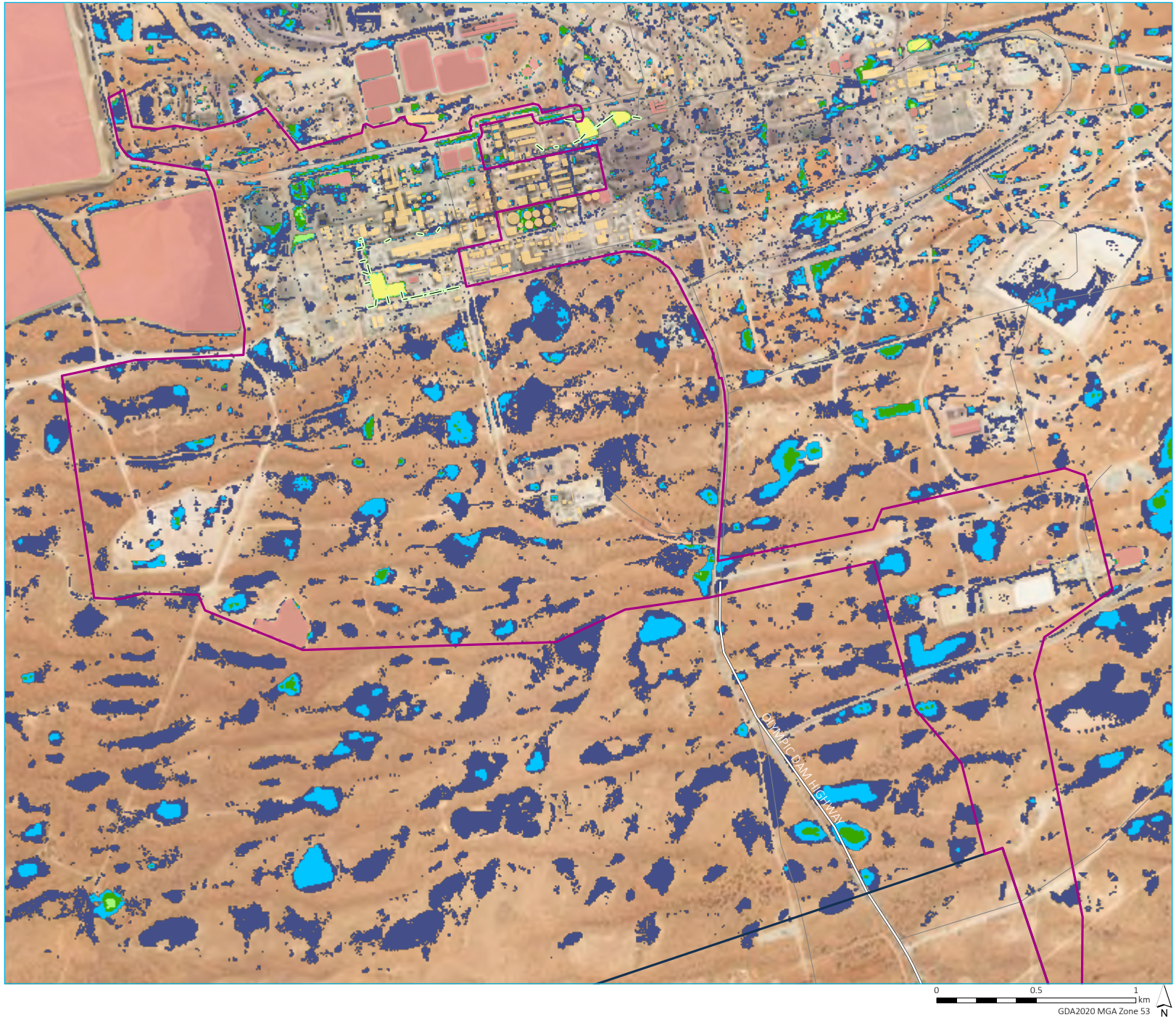
EMM
creating opportunities



Peak design flood hazard
Pre-development
2.5°C warming
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.7

EMM
creating opportunities



Peak design flood hazard
Pre-development
2.5°C warming
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure D.8

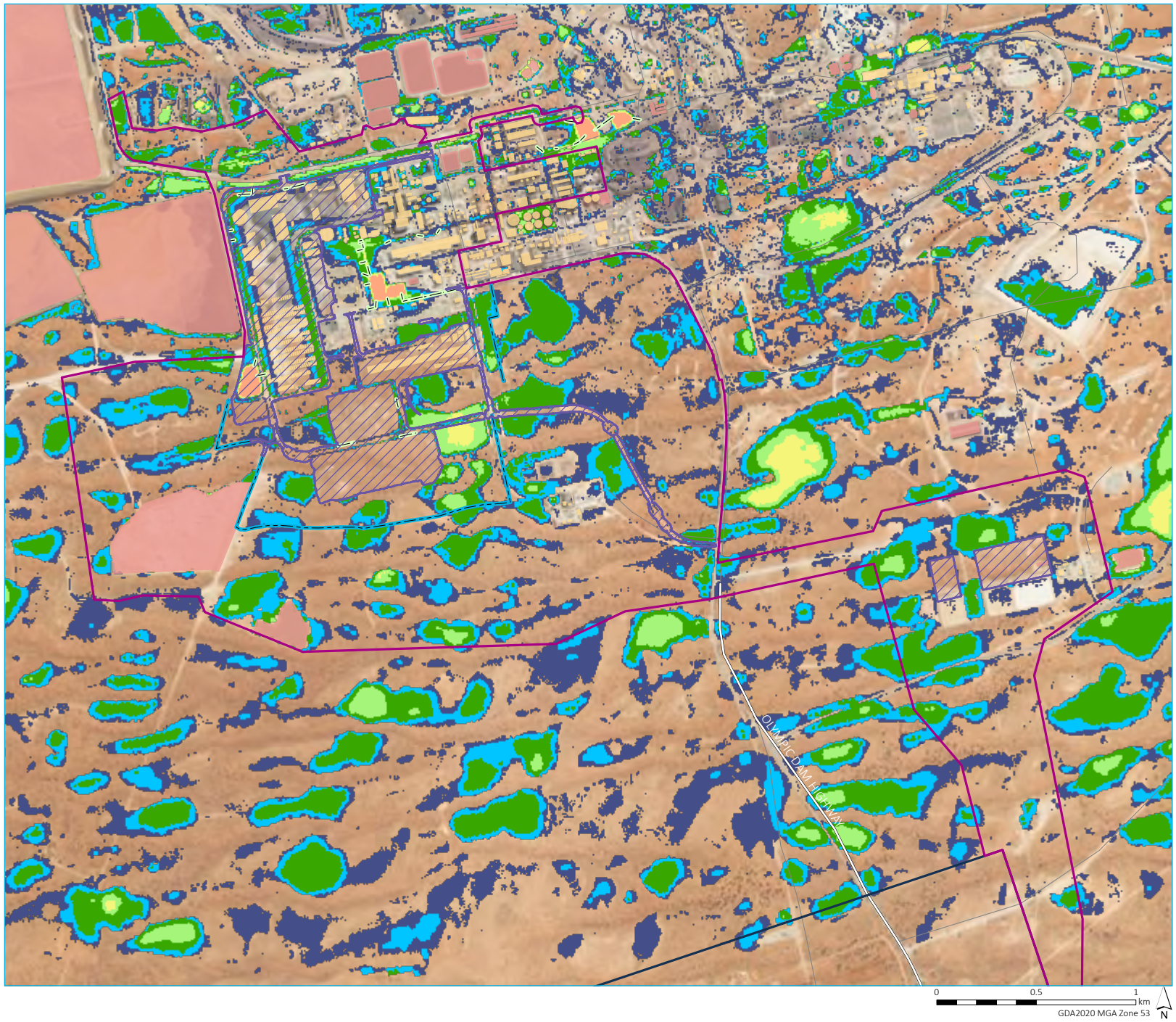
EMM
creating opportunities

Attachment E

Post-development flood hazard rating

EMM
creating opportunities

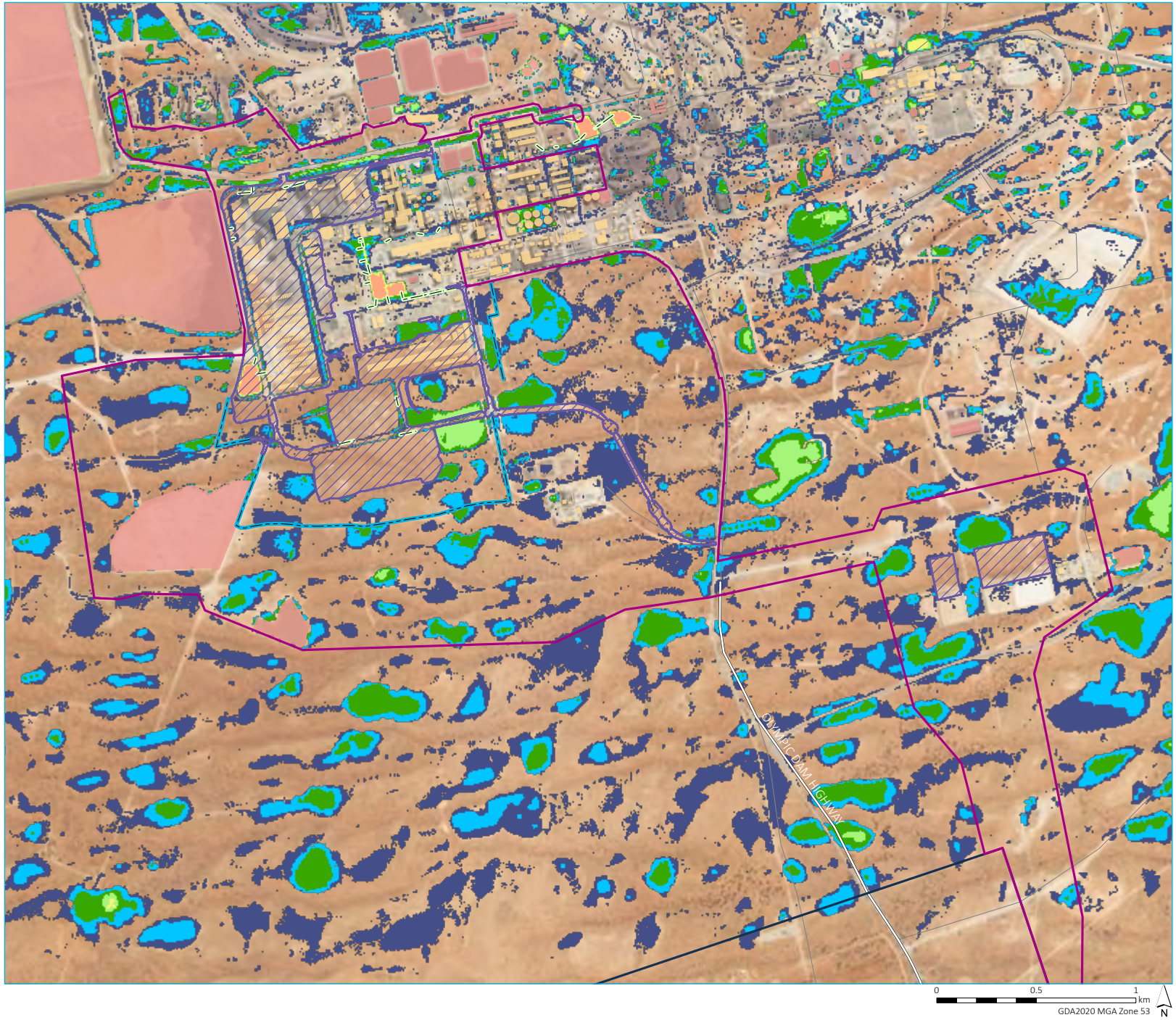
E.1 Existing climate



Peak design flood hazard
Post-development
Current climate
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.1

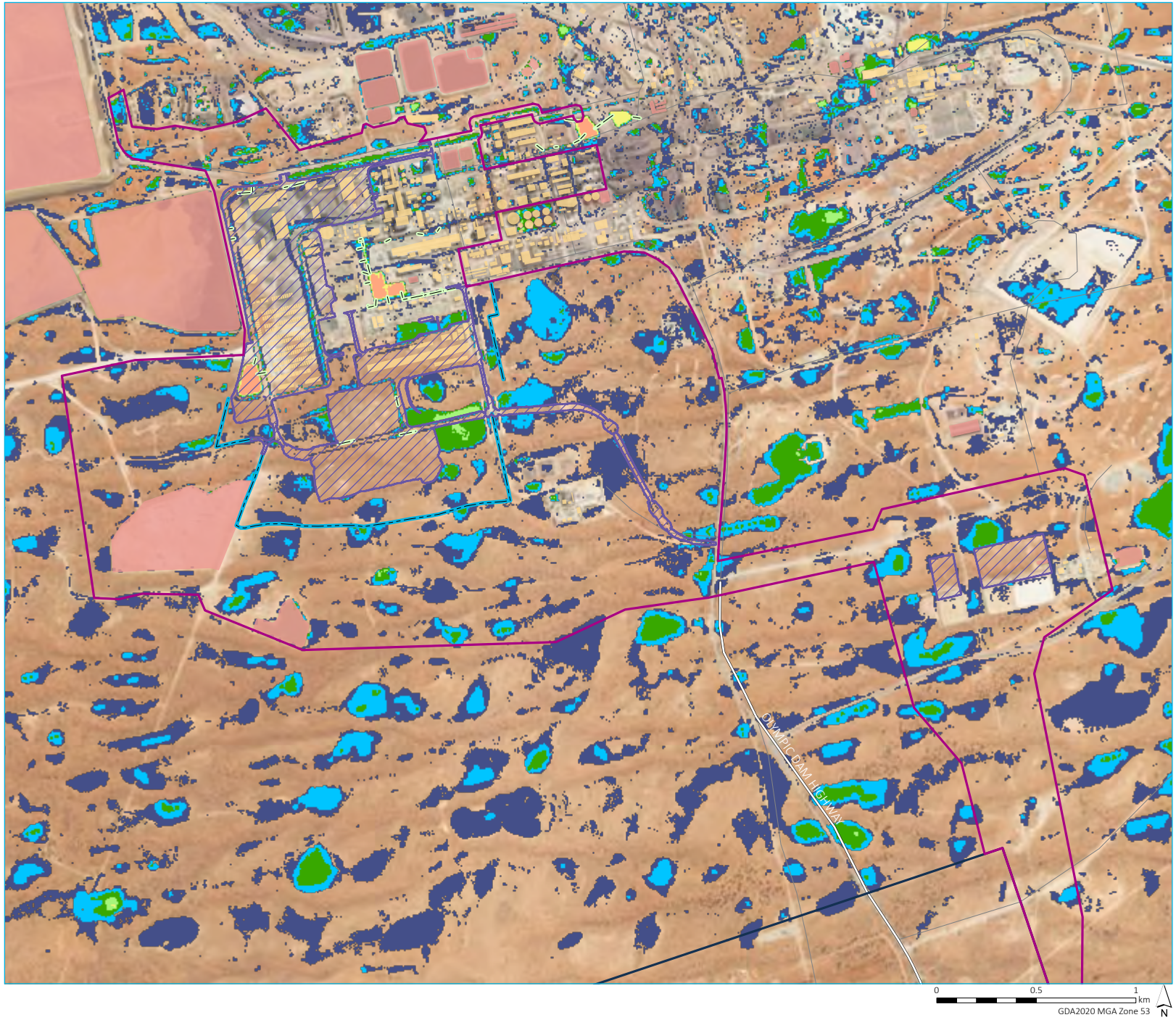
EMM
creating opportunities



Peak design flood hazard
Post-development
Current climate
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.2

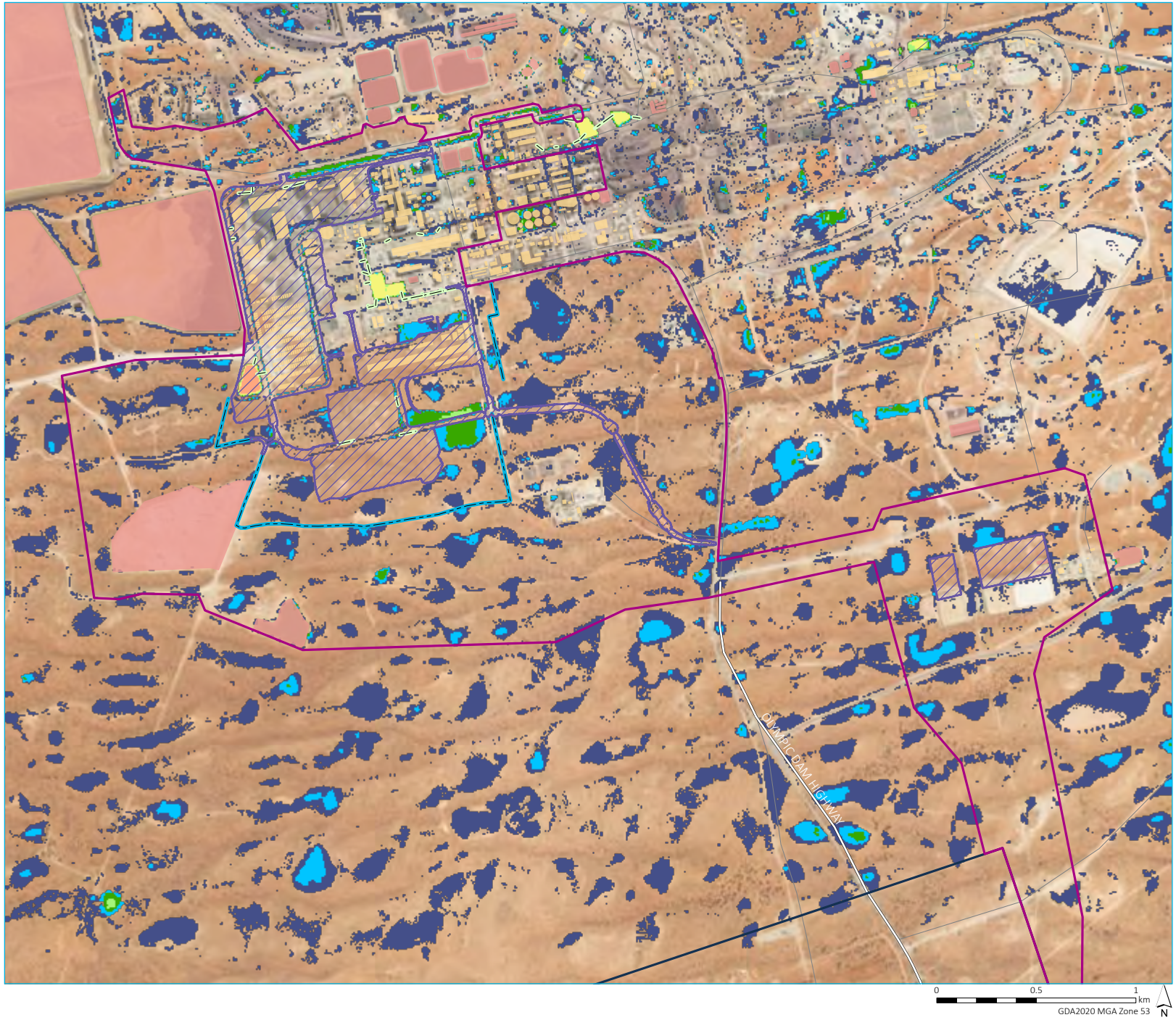
EMM
creating opportunities



Peak design flood hazard
Post-development
Current climate
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.3

EMM
creating opportunities

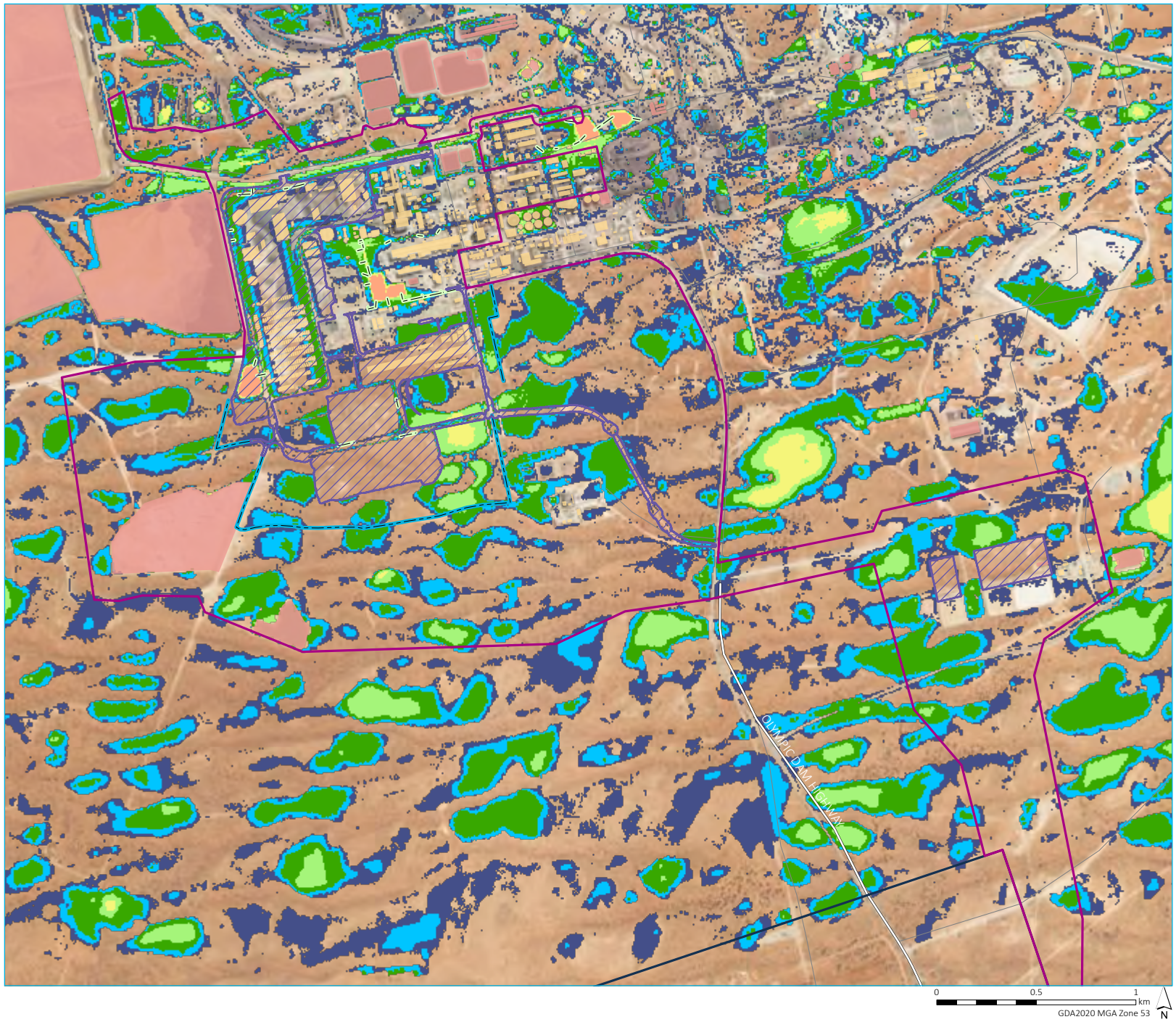


Peak design flood hazard
Post-development
Current climate
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.4

EMM
creating opportunities

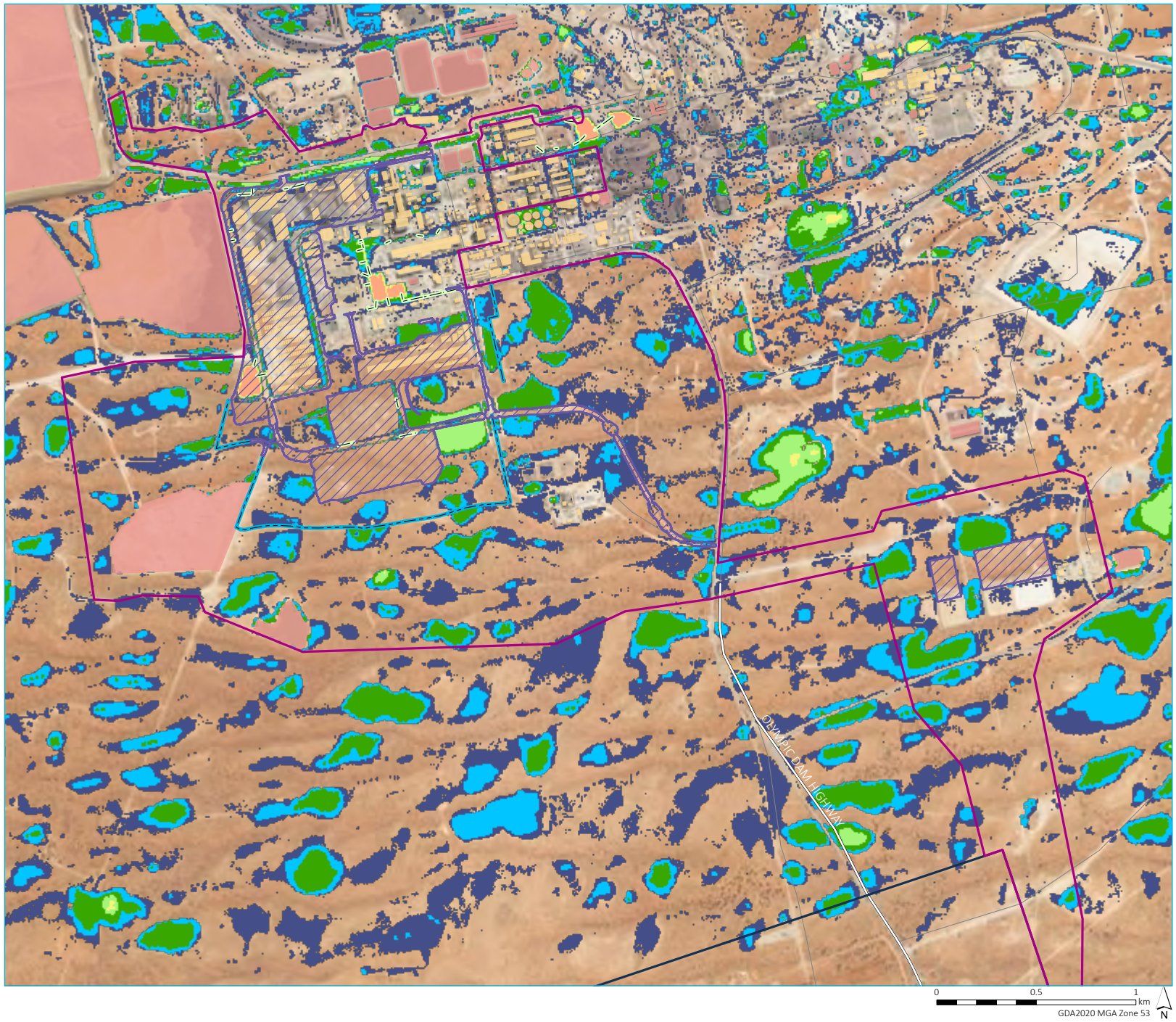
E.2 2.5 °C warming scenario



Peak design flood hazard
Post-development
2.5°C warming
0.2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.5

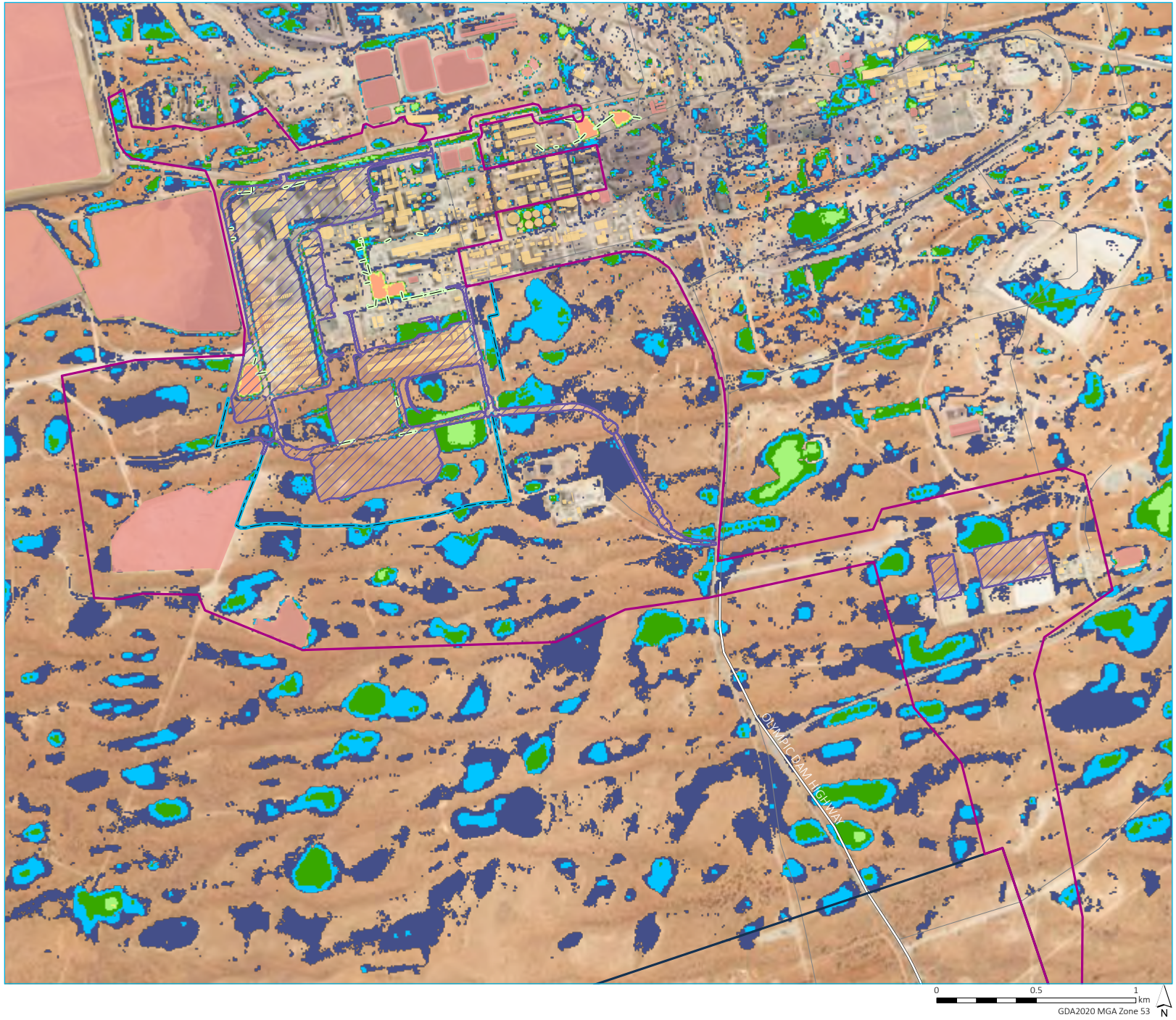
EMM
creating opportunities



Peak design flood hazard
Post-development
2.5°C warming
1% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.6

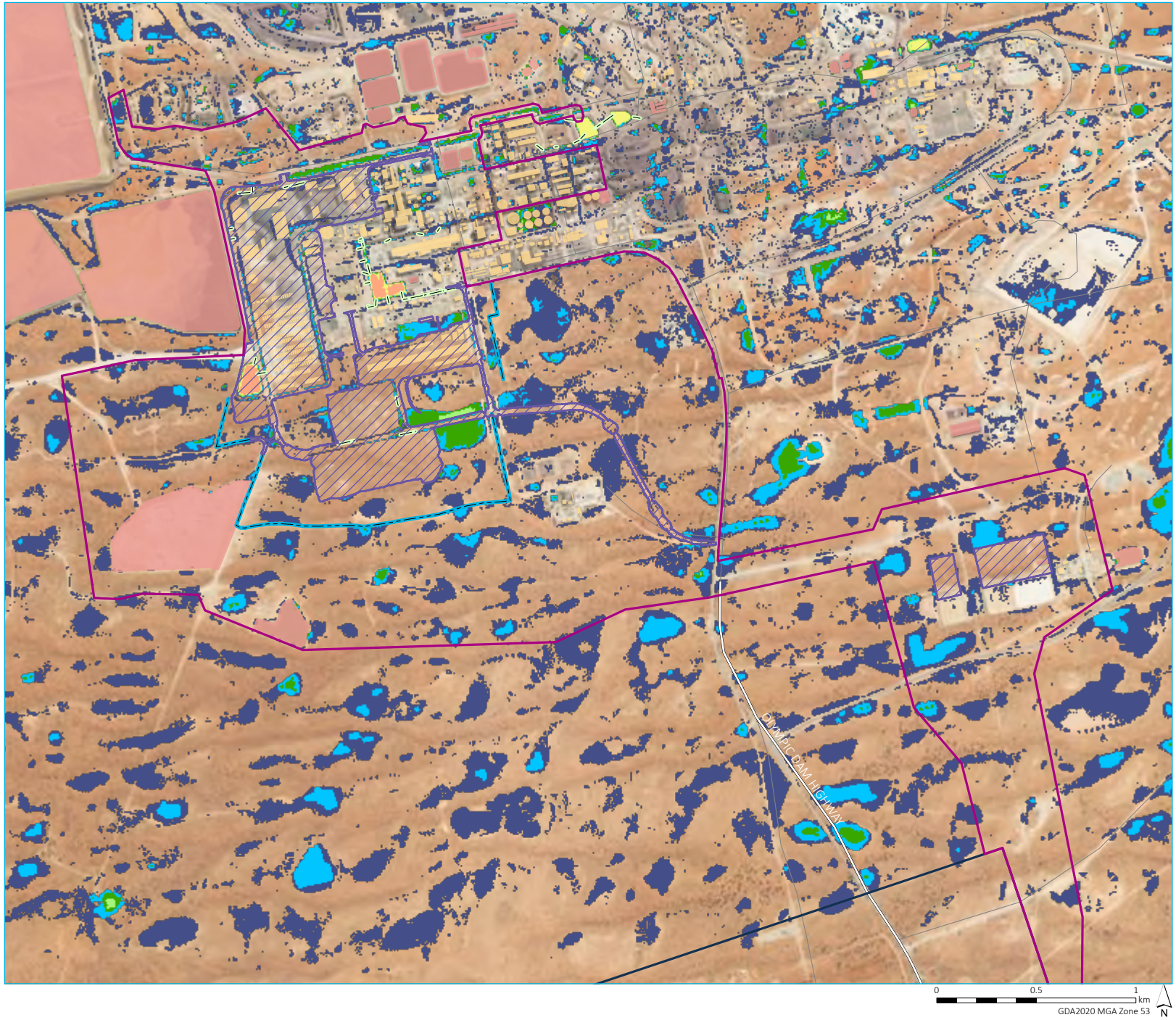
EMM
creating opportunities



Peak design flood hazard
Post-development
2.5°C warming
2% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.7

EMM
creating opportunities



Peak design flood hazard
Post-development
2.5°C warming
5% AEP storm

BHP SRE Project
Hydraulic Modelling Technical Report
Figure E.8

EMM
creating opportunities

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 2 95 North Quay
Brisbane QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2



linkedin.com/company/emm-consulting-pty-limited



emmconsulting.com.au

Appendix B
Assessment requirements

EMM
creating opportunities

B.1 Assessment requirements

Surface water and flooding assessment requirements and cross reference to where these are addressed in this report are outlined in Table B.1 below.

Table B.1 Assessment requirements

Environmental attributes	Reference	Assessment requirements	Cross reference
Surface Water	PE3	Describe existing surface water environmental conditions upstream and downstream of the site (including seasonal variations and variations with flow) of waterbodies, watercourses and drainage channels. Water quality, including any existing site contamination and potential sources of surface water pollution should be addressed.	Chapter 2
Surface Water	PE3	Describe potential alteration to surface water flows as a result of the development (including to waterbodies, watercourses, wetlands, floodplains, beds and banks) and include details of the nature of the works. Discuss the implications of these changes for downstream water uses and describe how these impacts will be minimised.	Chapter 3
Surface Water	PE3	Describe surface water/groundwaters that are of cultural significance to Traditional Owners and the proposed mitigation measures to protect environmental and cultural values for surface water quality during construction and operation.	No surface waters with cultural significance were identified
Surface Water	PE3	Provide details of proposed wastewater and stormwater management, as well as details of any sensitive design features as part of the development.	Appendix A (Section 3.9)
Surface Water	PE3	Describe all the options for supplying water to the development (including potable water (if relevant), the proposed Northern Water pipeline, GAB water, dewatering bores, TSF mound water and reuse water) and temporary demands during the construction period.	Section 3.2.3
Surface Water	PE3	Describe on-site storage and treatment requirements for any raw water, process water dams, RO water and brine ponds or any other wastewater from the development. Provide a water balance detailing how all water is to be used and how all wastewater would be captured and managed, including reuse or disposal options. Describe how any wastewater would be lined.	Refer EIS
Surface Water	PE3	Describe the wastewater management for any accommodation, offices and workshops related to the development.	Refer EIS
Surface Water	PE3	Identify the risks of contamination of land from chemical or acid spills (or fuel) or from waste generated by the proposed expansion. Describe measures for the prevention and containment of spills (including bunding) and describe the contingency plans to be implemented in the event of spills or leaching (including their expected effectiveness).	Section 3.2.1
Surface Water	PE3	Provide details of stormwater detention proposed for the site, ideally catering for a 1%AEP rain event.	Appendix A (Section 3.9.3)
Flooding	HR2	Identify the potential impacts on people, property, infrastructure and the environment from potential flood risk (where relevant).	Appendix A
Flooding	HR2	Evidence must be provided to demonstrate that the securing of storage containers of hazardous contaminants during flood events meets relevant requirements of the *Environment Protection Act 1993*.	Refer EIS

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 2 95 North Quay
Brisbane QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2



linkedin.com/company/emm-consulting-pty-limited



emmconsulting.com.au

BHP

Appendix C7.
Land use and planning

Land Use and Planning Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

Prepared for BHP Olympic Dam Corporation Pty Ltd

May 2026

Land Use and Planning Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

BHP Olympic Dam Corporation Pty Ltd

May 2026

Approved by

Paul Gibbons
Director – Major Projects & Approvals
22 May 2026

Level 4 74 Pirie Street
Adelaide SA 5000
ABN: 28 141 736 558

This report has been prepared in accordance with the brief provided by BHP Olympic Dam Corporation Pty Ltd and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purposed for which it has been provided. Except as permitted by the Copyright Act 1968 (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to BHP Olympic Dam Corporation Pty Ltd (and subject to the terms of EMM's agreement with BHP Olympic Dam Corporation Pty Ltd).

© EMM Consulting Pty Ltd, Level 10, 201 Pacific Highway, St Leonards NSW 2065. 2026.
ABN: 28 141 736 558

Executive summary

ES1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the Far North of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd and Lathwida Environmental Pty Ltd (EMM-Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM was commissioned by BHP to undertake a land use and planning impact assessment related SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline land use environment and conditions (baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to baseline land use values as a result of the SRE Project (assessment of effects in Chapter 3 of this report).

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

ES2 Baseline assessment

The baseline land use environment is characterised by the existing Olympic Dam mine and associated infrastructure (i.e. established mining industrial setting) and surrounded by low density primary production land uses and sparse remnant native vegetation.

The majority of the SRE Project activities, with the exception of ground re-profiling within the Electricity Infrastructure Area, would be located wholly within BHP's existing Special Mining Lease (SML).

It is anticipated that some minor changes to existing land use (i.e. greenfield development) within the SML would be necessary to support the SRE Project, while isolated vegetation disturbance and heritage clearance would be required in order to maintain regulatory clearance distances between the existing 275 kilovolt (kV) transmission line and the ground surface within Clause 28 land (i.e. Electricity Infrastructure Ground Re-Profiling Area) to enable safe operation.

ES3 Assessment of effects

The SRE Project has the potential to realise synergy value and increase copper production capacity up to 650,000 tonnes per annum (tpa) of total copper (plus associated products) by enabling Olympic Dam to receive, blend and smelt copper concentrates from Carrapateena and Prominent Hill mining operations, as well as possible future mining operations (e.g. Oak Dam) and other third-party suppliers.

The SRE Project is identified as being within the Remote Areas Zone of the Planning and Design Code (PlanSA 2023). The Desired Outcome (DO1) of Remote Areas Zone envisages a diverse range of uses, including mining and associated infrastructure.

The proposed SRE Project:

- is considered compatible with the scale, function, character and intensity of the existing land uses and surrounding areas
- is not located in proximity to sensitive receptors
- would be designed and constructed to minimise potential impacts to meet relevant environmental and amenity criteria.

The SRE Project would not significantly impact the baseline land use environment which is characterised by the existing Olympic Dam mine and associated infrastructure (i.e. established mining industrial setting) within the SML and transmission line infrastructure within Clause 28 land.

The impacts of the SRE Project to visual amenity have been assessed as low (EMM 2026a), while future closure and rehabilitation would be managed in accordance with BHP's Closure Management and Rehabilitation Plan for the Olympic Dam operations.

No change to existing land tenure or acquisition of land is required for the proposed SRE Project.

TABLE OF CONTENTS

Executive summary ES.1

1 Introduction 1

1.1 Project area definitions 1

1.2 Regulatory context 2

1.3 Project description 5

2 Baseline condition assessment 13

2.1 Project context 13

2.2 Land use environment 17

2.3 Conclusion 29

3 Assessment of effects 30

3.1 Potential impact events 30

3.2 Assessment of effects 32

3.3 Visual amenity 42

3.4 Site services and infrastructure 43

3.5 Employment land 43

3.6 Mine closure 43

3.7 Assessment results 43

3.8 Conclusion 45

References 46

Abbreviations and acronyms 47

Annexures

Annexure A Assessment requirements A.1

Tables

Table 1.1 Project stages and timing 6

Table 1.2 Key characteristics of the SRE Project 7

Table 2.1 Land tenure associated with the SRE Project within the SML 13

Table 2.2 Land tenure associated with the SRE Project within the EGIR Areas 14

Table 2.3 SRE Project overlapping exploration licences 15

Table 2.4 SRE Project overlapping petroleum exploration licence applications 15

Table 2.5 SRE Project overlapping geothermal exploration licences 15

Table 2.6	Historic heritage places	28
Table 2.7	Heritage places near the EIGR Area	29
Table 3.1	Preliminary SPR assessment – potential impact events	31
Table 3.2	Key planning controls applying to the SRE Project	35
Table 3.3	Key planning controls applying to the SRE Project – Electricity Infrastructure Ground Re-Profiling Area (portion) within CT 5439/775	39
Table 3.4	Historic heritage places near the SRE Project	42
Table 3.5	Heritage places near the EIGR Area	42
Table 3.6	Final SPR assessment – confirmed impact events	44
Table A.1	Assessment requirements	A.2

Figures

Figure 1.1	SRE Project Area - regional locality	10
Figure 1.2	SRE Project Area - SML Area	11
Figure 1.3	SRE Project Area - EIGR Areas	12
Figure 2.1	Land tenure at the SRE Project	16
Figure 2.2	IBRA subregions	19
Figure 2.3	Land use and zoning	23
Figure 2.4	Location of conservation areas	27
Figure 3.1	Copper SA province	33

1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the Far North of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd and Lathwida Environmental Pty Ltd (EMM-Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM was commissioned by BHP to undertake a land use and planning impact assessment of SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline land use conditions (baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to baseline land use conditions as a result of the SRE Project (assessment of effects in Chapter 3 of this report).

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

1.1 Project area definitions

To maintain consistency throughout the EIS and supporting technical assessments, the following terminology related to project infrastructure have been defined for the SRE Project where the **SRE Project Area** is defined at the boundary around the SRE Project for which BHP is seeking approval, including:

- **Special Mining Lease (SML) Area**, located within the SML (Figure 1.2), which is further delineated by the following areas:
  - **SRE Area**: the extent of the proposed SRE Project infrastructure required for construction and operation of the SRE Project within the SML. Includes the existing brownfield plant area, proposed facility relocation(s), proposed plant and laydown areas.
  - **General Infrastructure Area**: the extent of the proposed ancillary infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed infrastructure laydown areas, proposed stormwater dam location, proposed topsoil and subsoil storage areas.
  - **Water Infrastructure Area**: the extent of the proposed water infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed water pipeline and water storage dam locations.
- **Electricity Infrastructure Ground Re-Profiling Area (EIGR Area)**: the extent of the isolated proposed vegetation disturbance required to maintain regulatory clearance distances between the 275 kilovolt (kV) transmission line and the ground surface within Clause 28 land. It is noted that the transmission line and infrastructure are already in place, but additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging and, therefore, changes to existing clearance distances to enable safe operation (Figure 1.3).

1.2 Regulatory context

The SRE Project was declared an Impact Assessed development pursuant to section 108(1)(c) and 108(7) of the PDI Act on 29 August 2024. The declaration reflects the nature, scale and significance of the SRE Project to SA.

Impact Assessed Development is the most rigorous level of development assessment prescribed under the PDI Act.

Specifically, the Minister made the following declaration:

> Pursuant to Section 108(1)(c) and Section 108(7) of the Planning Development and Infrastructure Act 2016, having taken into account those principles prescribed under Regulation 27(2) of the Planning, Development and Infrastructure (General) Regulations 2017 (the Regulations) and having given consideration to the matters under Regulation 27(3) of the Regulations, I declare that all development of a kind specified in the Schedule to this Notice, to the extent that it is undertaken on land identified in Clause 28(1) of the Indenture as impact assessed development and that references to "development" include a project.

The majority of the SRE Project activities, with the exception of ground re-profiling within the Electricity Infrastructure Area, would be located wholly within the existing SML but does not include business-as-usual (BAU) operations (operations which enable existing approved production of up to approximately 200,000 tonnes per annum (tpa) total copper production) or activities associated with scheduled campaign maintenance 2027 (SCM27) works. These activities are subject to separate regulation (e.g. Environment Protection Authority (EPA) licensing) and approval. The SRE Project may also be supported by low impact development outside the SML, which could include, for example, minor road works and upgrades to accommodation infrastructure. It is proposed that any approvals required for these activities would be sought on an as-needs basis under applicable legislation and guidelines.

1.2.1 Planning Development and Infrastructure Act 2016

Development approval is required for the SRE Project under the PDI Act. The PDI Act established a new development assessment system in SA to streamline the assessment process. The PDI Act is supported by subordinate regulations, as well as practice directions and guidelines which are issued by the State Planning Commission, the state's independent principal planning body.

A key feature of the new planning system is the Planning and Design Code (the Code) which contains a single set of planning policy, rules and classifications for SA, which is applied spatially via mapping. The Code establishes a performance-based approach to planning and development assessment by including policies that address the scale, form and design of built structures and the contextual setting of the development.

The planning system established by the PDI Act includes five assessment pathways: accepted development, code assessed development (deemed-to-satisfy or performance assessed) and impact assessed development (restricted and impact assessed). As previously stated, impact assessed development is the most rigorous level of development assessment prescribed under the PDI Act.

i Ministerial declaration – impact assessed development

The declaration requires the preparation of an EIS requiring detailed environmental, social and economic assessment.

A Scoping Application was prepared by BHP to inform the development of EIS assessment requirements by the State Planning Commission (SPC). The EIS assessment requirements issued by the SPC summarise all potential issues needing to be addressed by BHP and highlight any further information required by the Minister to enable a proper assessment of the SRE Project.

Due to the operation of the *Roxby Downs (Indenture Ratification) Act 1982*, the Minister for Energy and Mining is the relevant Minister for the SRE Project.

Relevant Assessment Requirements for land use and site conditions (Appendix A) are as follows:

- Provide details of the existing land uses (including relevant Planning Code Overlays and Zones), land tenures and protected areas at, overlapping or adjoining the development site.
- Provide details of the development (activities or structures) with the potential to impact on existing land uses, land tenures and protected areas that overlap, adjoin or are in the region of the development.
- Provide details of site services and infrastructure including utility services (i.e. water, gas, electricity, sewerage disposal, wastewater, drainage, trenches or conduits), location of ground and roof plant and equipment (i.e. electricity transformers, air conditioning, solar panels etc.).
- Determine if current licencing of Crown Land comprising the Olympic Dam Industrial Estate and existing arrangements for tenants is the most suitable for enabling suitable supply of employment land, security of investment for tenants and infrastructure development given that the current arrangements have been in place for approximately 40 years.

1.2.2 Native Vegetation Act 1991

The *Native Vegetation Act 1991* (SA) (NV Act) and the associated Native Vegetation Regulations 2017 (SA) (the Regulations) outline incentives, education measures, and assistance to landowners in relation to the preservation and enhancement of native vegetation and acts to control the clearance of native vegetation.

Under the NV Act, legal clearance of native vegetation may be permissible through one of two mechanisms: either by an application to the Native Vegetation Council (NVC), or under exemptions contained within the Regulations. Vegetation clearance applications must meet requirements of the Native Vegetation Regulations 2017 (NVC 2024a). There are associated guidelines related to assessment and offset for approved vegetation clearance (NVC 2024a, 2024c, 2024d).

The Native Vegetation Regulations require consideration of the mitigation hierarchy for applications to clear native vegetation, specifically:

- avoidance—measures must be taken to avoid clearance of native vegetation
- minimisation—if clearance of native vegetation cannot be avoided, measures must be taken to minimise the duration, intensity and extent of impacts of the clearance on biological diversity to the fullest possible extent (whether the impact is direct, indirect or cumulative)
- rehabilitation or restoration—measures should be taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been destroyed, by impacts of clearance of native vegetation that cannot be avoided or further minimised
- offset—where required under these regulations, any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised must be offset by the achievement of a significant environmental benefit (SEB) that outweighs that impact (NVC 2024a, 2024b).

Native vegetation clearance approval for the SRE Project will occur concurrently with the EIS process under the PDI Act. Where possible, infrastructure will be strategically placed to minimise clearance; however, where avoidance is not possible, an offset will be required to lead to long-term increase in biodiversity values in the local area. BHP will determine the proposed SEB option(s) in consultation the NVC (e.g. Emerald Springs).

1.2.3 National Parks and Wildlife Act 1972 (SA)

The *National Parks and Wildlife Act 1972* (SA) (NPW Act) allows for the protection of habitat and wildlife through the establishment of parks and reserves (both on land and in State waters) and provides for the use of wildlife through a system of permits allowing certain actions (i.e. keeping, selling, trading, harvesting, farming, hunting and the destruction of native species). The NPW Act assigns flora and fauna species to State conservation categories (i.e. assigning the species as a threatened species): Endangered (Schedule 7), Vulnerable (Schedule 8), and Rare (Schedule 9).

Potential impacts to State-listed species are considered within the Ecological Impact Assessment (Appendix D1 to the EIS) vegetation clearance approvals and offset calculations. Presence of State-listed species contributes to condition scores of vegetation (e.g. Unit Biodiversity Scores) (NVC 2024c) and ultimately influences the environmental offset required for any clearance. Regional stakeholders may also have an interest in State-listed species.

1.2.4 Landscape South Australia Act 2019 (SA)

The *Landscape South Australia Act 2019* (SA) (LSA Act) is the key framework promoting the sustainable and integrated management of the State's natural resources (land, water, biodiversity) and for the management of pest plants and animals.

Under the LSA Act, South Australia is divided into eight regional Landscape Boards managed by the Government of South Australia. Each board develops its own Regional Plan designed to meet the needs of the local regions and contribute to State-level planning.

The SRE Project falls within the South Australian Arid Lands (SAAL) Region, with the LSA Act providing guidance for biodiversity management including management of pests, exotic flora and fauna, and plant diseases if relevant. The location of the SRE Project also influences the type of vegetation assessments required for any proposed impacts to native vegetation and associated approvals.

1.2.5 Aboriginal heritage

i Aboriginal Heritage Act 1979

Olympic Dam operates under the Olympic Dam and Stuart Shelf Indenture (Indenture), ratified by the *Roxby Downs (Indenture Ratification) Act 1982* (Ratification Act). Section 9 of the Ratification Act gives the *Aboriginal Heritage Act 1979* (SA) (AH Act) application to Olympic Dam operations that are carried out under the Indenture and occur within the Olympic Dam Area or the Stuart Shelf Area.

As the SRE Project is being carried out under the Indenture and will occur within the SML Area is located within the Olympic Dam Area or the Stuart Shelf Area, the AH Act applies to that area.

The purposes of the AH Act include the protection and preservation of sites and items of sacred, ceremonial, mythological or historic significance to the Aboriginal people.

Olympic Dam holds ministerial consents under the AH Act that authorise Olympic Dam Corporation to excavate land, explore for items of Aboriginal heritage and to remove or interfere with items of Aboriginal heritage in and around the SML.

ii Aboriginal Heritage Act 1988

The *Aboriginal Heritage Act 1988* (SA) (AH Act 1988) provides protection for all Aboriginal sites and objects in South Australia. An Aboriginal site is defined by the Act as being an area of land:

- that is of significance according to Aboriginal tradition, or
- that is of significance to Aboriginal archaeology, anthropology or history.

It is an offence under Section 23 of the AH Act 1988 to collect, damage or destroy Aboriginal sites, objects or remains without an authorisation from the Minister for Aboriginal Affairs.

BHP will undertake due diligence with respect to cultural heritage risk assessment of any Clause 28 land or activity within the EIGR Areas (i.e. outside the Olympic Dam Area or the Stuart Shelf Area) in accordance with the requirements of the AH Act 1988 and the outcomes of consultation with the Traditional Owners and Native Title holders of that land.

iii Native title

The *Native Title Act 1993* (Cth) recognises and protects Native Title, being the rights and interests in land and waters that Aboriginal and Torres Strait Islanders have under their traditional laws and customs.

Under the Native Title Act, Native Title is extinguished by various tenures, including freehold land and gazetted public roads. As the SRE Project Area is located within the SML (SML Area), which overlaps freehold title held by BHP, and within freehold Clause 28 land (EIGR Area), there are no legal Native Title implications associated with the SRE Project.

1.3 Project description

The objective of the SRE Project is to expand BHP's smelter and refinery capacity, enabling the Copper SA growth plan by:

- increasing copper production capacity up to 650,000 tpa of total copper plus associated products from the current average production of approximately 200,000 tpa
- delivering a sustainable, highly productive, and more resilient smelting and refining flowsheet
- ensuring the Cu:S ratio is resolved at Olympic Dam for copper concentrate production
- delivering reliable and predictable production outcomes following the 2023 acquisition of OZ Minerals' Carrapateena and Prominent Hill mining operations to realise Copper SA province opportunities.

Key elements of the SRE Project are:

- expansion of, and additions to, the existing smelter and refinery to enable total production of up to 650,000 tpa copper plus associated products
- introduction of a two-stage smelting involving the installation of a new primary flash-smelting furnace (FSF) to produce copper matte, adding material smelting capacity
- conversion of the existing direct-to-blister flash furnace (DBF) to a flash-converting furnace (FCF), which would process the matte into blister

- addition of an acid plant of similar nature and scale to the existing acid plant and subsequent upgrade of the existing acid plant
- expansion of the electro-refinery and precious metals recovery facilities to produce cathode copper, gold, and silver.

Associated with these key elements, the SRE Project would require new supporting facilities, infrastructure and services and the upgrade, removal and/or relocation of existing facilities and services within the SML Area (Figure 1.2).

External to the SML Area, electricity would be supplied to the SRE Project through the existing 275 kV line from Davenport substation (near Port Augusta) to Olympic Dam mine, located within Clause 28 land[1] (EGIR Areas). Whilst the transmission line and infrastructure are already in place, additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging, reducing the existing electrical clearances that are required to enable safe operation. The maintenance of the required electrical clearances between the 275 kV line and the ground surface would necessitate isolated areas of land disturbance and associated vegetation clearance (Figure 1.3).

The SRE Project would be constructed and operated in a staged manner to enable production capacity up to 650,000 tpa of total copper and associated products, with stages detailed in Table 1.1.

This technical assessment has been prepared based upon the maximum potential impacts associated with Stage 2 (i.e. the greatest impact scenario) to ensure that the full extent of all potential impacts is identified and assessed.

The indicative location of key infrastructure is shown in Figure 1.2 and Figure 1.3, while the key project characteristics are outlined in Table 1.2.

Table 1.1 Project stages and timing

Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
Stage 1a	1,100,000	Stage 1a includes: • an increase of smelter throughput to approximately 1,100,000 tpa of concentrate producing an output of approximately 390,000 tpa of total copper • a new regional concentrate receiving, handling and blending facility • upgrade and expansion of the existing smelter feed preparation, including additional concentrate storage, blending and a new steam dryer • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to an FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure and decommissioning of the existing electric slag reduction furnace (EF), if required • expansion of the brownfield slag concentrator supported by FSF slag cooling pits, a new interim slag stockpile and associated environmental management infrastructure • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant, additional acid storage, and an associated acid loading station to allow the export of acid • a new electrorefinery and associated anode preparation infrastructure • a new slimes treatment plant • expansion of the precious-metals refinery (PMR) facility.	2028 to 2032

[1] Clause 28 land as defined under the RDIR Act

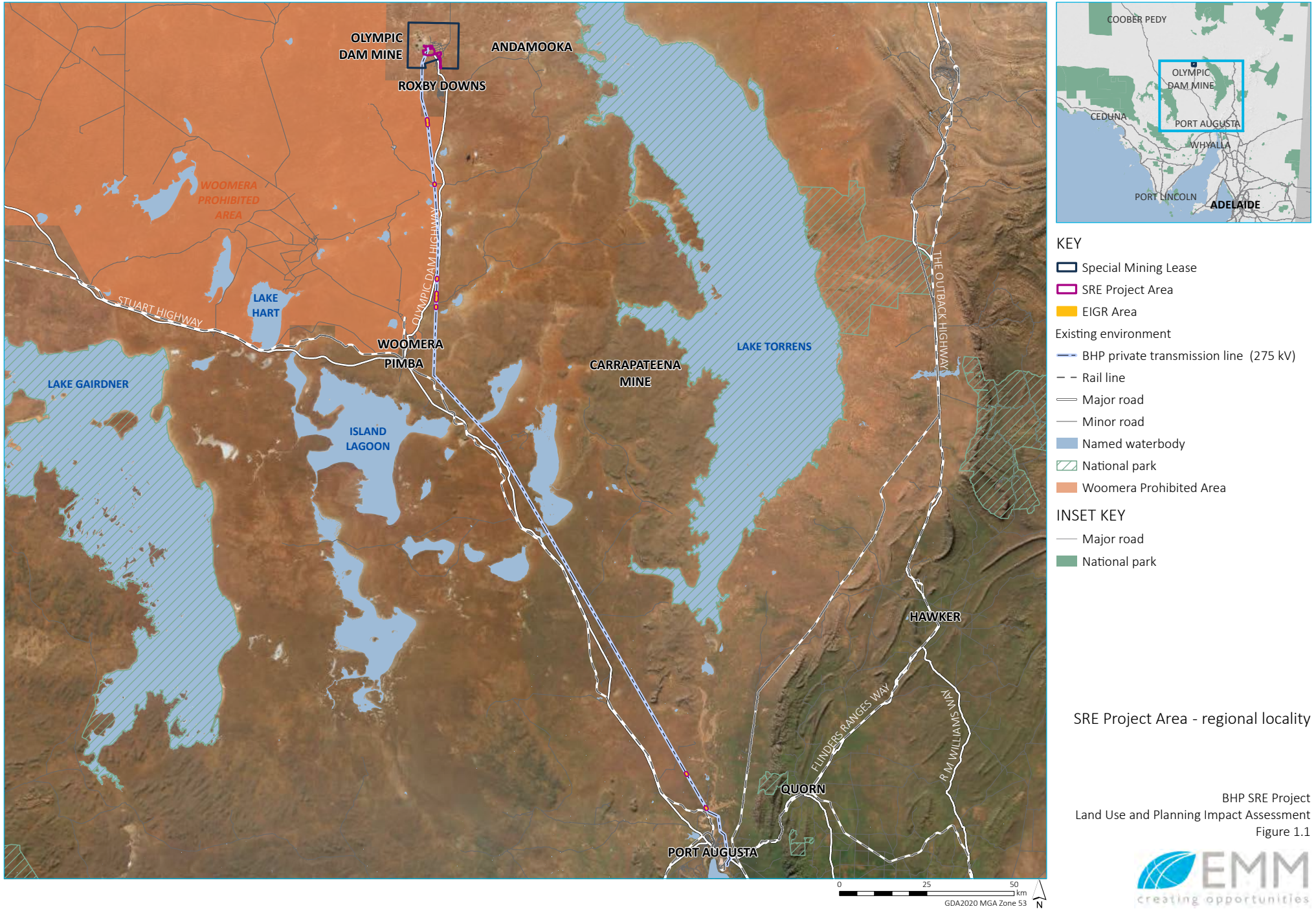
Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
Stage 1b	1,400,000	Stage 1b includes: • an increase in smelter throughput to approximately 1,400,000 tpa of concentrate producing an output of approximately 500,000 tpa of total copper • installation of additional concentrate leach thickening and filtration infrastructure • development of greenfield slag concentrator and associated stockpile and decommissioning of brownfield slag concentrator • incremental expansion of Stage 1a infrastructure and services, including: – the installation of additional electrorefinery modules – expansion of feed preparation, FCF feed system (including lime addition), off-gas management, acid plant, slimes treatment and PMR capacities.	2032 to 2036
Stage 2	2,000,000	Stage 2 includes: • an increase in smelter throughput to approximately 2,000,000 tpa of concentrate producing an output of approximately 650,000 tpa of total copper • installation of new concentrate leach circuit for treatment of imported- concentrate • incremental expansion of Stage 1b infrastructure and services, including: – the installation of additional electrorefinery modules – the installation of an additional anode furnace and associated off-gas management infrastructure – expansion of feed preparation, FSF and FCF feed systems, off-gas and slag management, acid plant, slimes treatment and PMR capacities.	2038 to closure

Table 1.2 Key characteristics of the SRE Project

Project element	Summary
Smelter and refinery expansion and additions	Expansion of, and additions to, the existing smelter and refinery to enable production of up to 650,000 tpa copper plus associated products (gold, silver, and acid). This would include: • a new concentrate handling and blending facility • additional concentrate leach capacity • upgrade and expansion of the existing smelter feed preparation • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to a FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure • upgrade of the existing slag concentrator circuit and subsequent development of a new slag concentrator circuit • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant and upgrade of the existing acid plants • a new electro-refinery and associated infrastructure • a new slimes treatment plant • expansion of PMR facility. • slag stockpile and treatment.

Project element	Summary
Electricity demand, supply and distribution	An electricity demand of up to 68 mega volt-amperes (MVA) net load increase would be required for the SRE Project. The additional electrical demand due to the SRE Project would be met by capacity from the national grid via the existing 275 kV transmission line (noting potential for below line land disturbance and associated vegetation clearance outside of the SML). Minor augmentation of existing onsite electricity supply infrastructure at Olympic Dam within the SML would be to ensure the additional capacity could be achieved and maintained. New high voltage and low voltage power supply and reticulation infrastructure would be required to all smelter infrastructure.
Water demand	Water demand of between 2 and 16 megalitres per day (ML/day) required for the SRE Project in addition to the existing supply for current operations.
Water supply and distribution	The SRE Project proposes no additional water abstraction from the Great Artesian Basin (GAB) above daily average --BAU volumes. Water supply for the SRE Project would nominally be provided from the Department for Infrastructure and Transport (DIT) Northern Water Project (NWP) infrastructure, following commissioning of the initial 90 ML/d capacity of the NWP. This would require new water storage and distribution infrastructure to connect the SRE Project to the NWP connection point at the SML boundary. The NWP water supply may be supplemented or offset by the provision of local groundwater supply (subject to further approvals). This water supply would occur via existing process storage dams, the desalination plant at the Olympic Dam site, and/or through the distribution of the existing water supply within daily average BAU volumes. The additional water supplies are likely to require augmentation of the existing desalination water treatment plant and water distribution network, and a demineralised water plant will be required to support the SRE Project operations.
Supporting infrastructure	Supporting infrastructure includes: • civil infrastructure works, such as roads and stormwater infrastructure • new offices and crib rooms • new workshops • new laydown areas • process control system upgrades • concrete batching • other supporting infrastructure as required to facilitate the implementation and operation of the SRE Project
Waste management	Development of the SRE Project may require decommissioning of the existing processing plant components including dryers, the electric furnace and the existing concentrate storage and transfer system. Some of the decommissioned infrastructure would be retained in-situ to preserve operational flexibility or for future management under the site Closure Management and Rehabilitation Plan; however, some elements may require disposal as a component of the SRE Project. Waste generated during construction would be managed as follows: • where practicable, demolition materials would be removed from site and recycled • materials not suitable for removal from site would be managed on the SML via existing waste management facilities. All waste generated from construction of the SRE Project would be managed in accordance with existing site procedures and approved management plans. Operational wastes associated with the SRE Project consist of processing and non-processing wastes where: • processing wastes are limited to low-copper slags generated from the smelting and slag concentrator operations that are not suitable for reprocessing and effluent streams from various process operations that are directed to tailings, including from the PMR and smelter off-gas systems • non-processing wastes including reagent packaging wastes and operational consumables.

<table>
<tr><th>Project element</th><th>Summary</th></tr>
<tr><td>Workforce</td><td>100% fly-in/fly-out (FIFO) workforce is assumed for construction and the SRE Project operational workforce. Estimated peak construction workforce numbers (in full time equivalents (FTE)) are summarised below.
<table>
<tr><th>Construction stage</th><th>Average FTE</th><th>Peak FTE</th></tr>
<tr><td>Stage 1a</td><td>~708</td><td>~1,313</td></tr>
<tr><td>Stage 1b</td><td>~260</td><td>~515</td></tr>
<tr><td>Stage 2</td><td>~519</td><td>~978</td></tr>
</table>
Following construction, the SRE Project would require the permanent operational workforce summarised below:
<table>
<tr><th>Operational stage</th><th>Additional SRE Project operational workforce</th><th>Total Olympic Dam Smelter and Refinery workforce</th></tr>
<tr><td>Stage 1a</td><td>~207</td><td>766</td></tr>
<tr><td>Stage 1b</td><td>~57 (additional to Stage 1a)</td><td>823</td></tr>
<tr><td>Stage 2</td><td>~244 (additional to Stage 1b)</td><td>1,067</td></tr>
</table>
SRE Project construction and operational workforce is proposed to utilise existing and new accommodation to be established by BHP for the scheduled campaign maintenance 2027 (SCM27) shutdown, Olympic Dam future campaign maintenance accommodation, and/or greenfield accommodation (subject to separate approvals).</td></tr>
<tr><td>Concentrate import</td><td>Import of copper concentrate from Prominent Hill and Carrapateena mining operations, as well as possible future mining operations (e.g. Oak Dam), and maintain the ability to receive copper concentrate from other third-party suppliers.
Prominent Hill concentrate may be passed through concentrate leach to remove fluorides prior to smelter feed preparation. Carrapateena concentrate to pass directly to smelter feed preparation. Other, third-party concentrates may be passed through concentrate leach to remove deleterious elements (e.g. fluorides) prior to smelter feed preparation as required.</td></tr>
<tr><td>Production and export</td><td>Total production volumes of up to:
~650,000 tpa of cathode copper
~893,000 ounces per annum of gold
~3,950,000 ounces per annum of silver
~4,900 tpa of uranium oxide concentrate; note that the SRE Project does not materially change existing uranium production, with an increase of approximately 1% expected as a result of the leaching of Prominent Hill concentrate to remove fluoride. No upgrade or modification of uranium production facilities is proposed as a part of the SRE Project.
~1,700,000–1,900,000 tpa of 98% sulphuric acid (H_2SO_4), of which up to approximately 810,000 tpa may be exported from Olympic Dam (i.e. operations become ‘net’ sulphuric acid producer).</td></tr>
</table>



KEY

- Special Mining Lease
- SRE Project Area
- EIGR Area

Existing environment

- BHP private transmission line (275 kV)
- Rail line
- Major road
- Minor road
- Named waterbody
- National park
- Woomera Prohibited Area

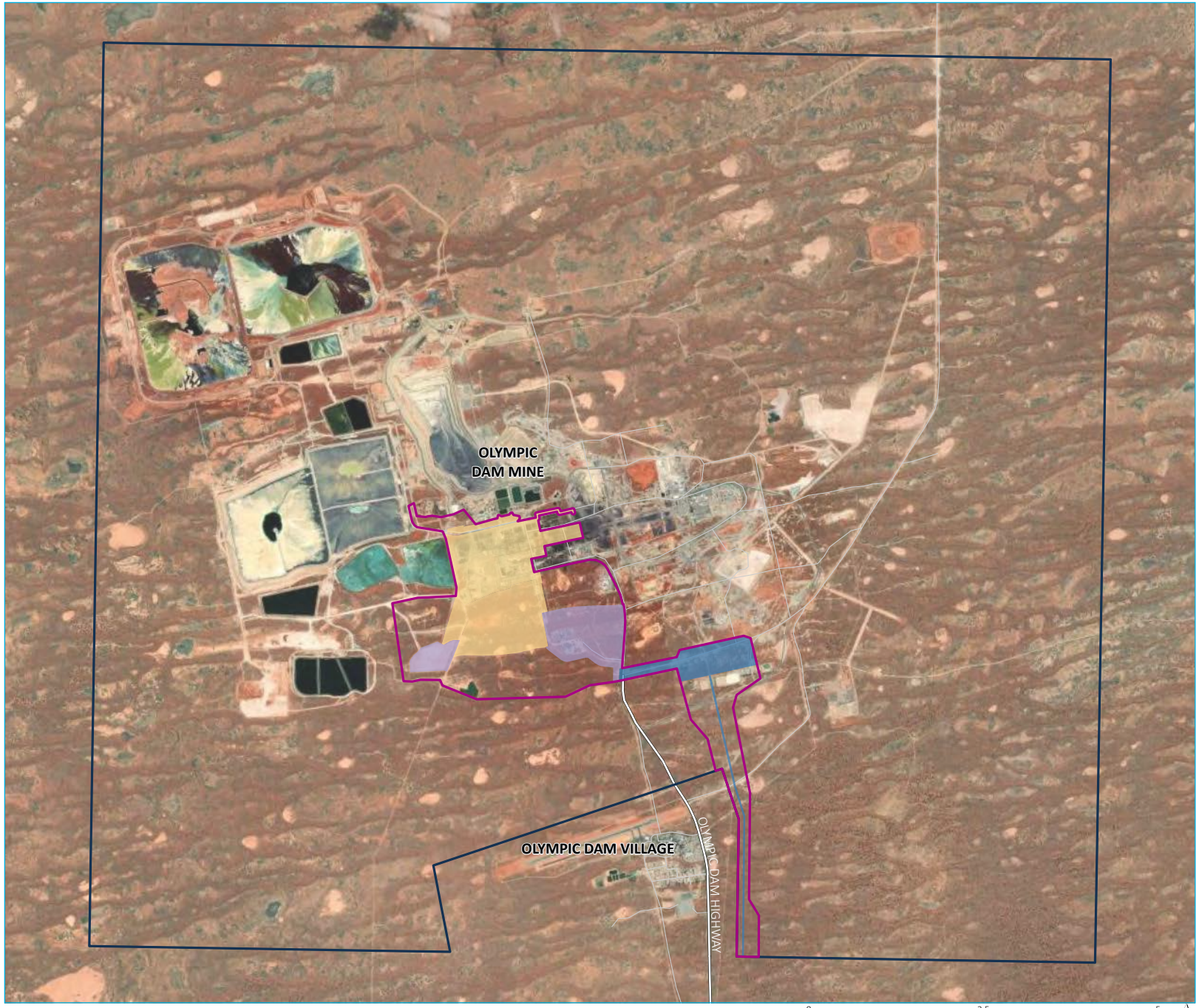
INSET KEY

- Major road
- National park

SRE Project Area - regional locality

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 1.1

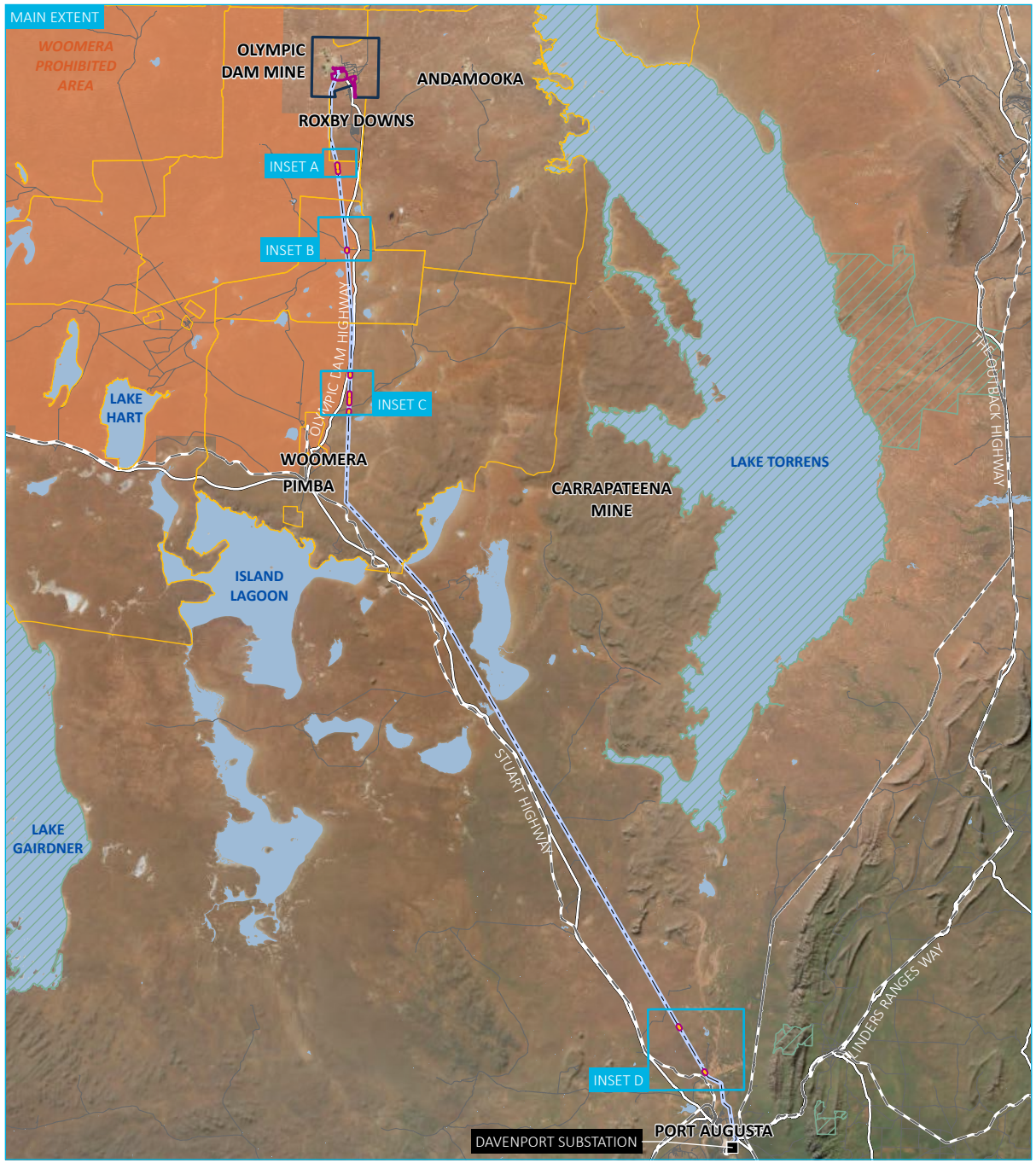
EMM creating opportunities

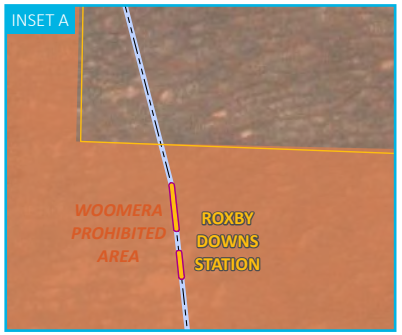


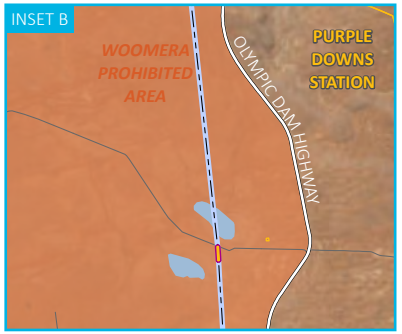
SRE Project Area - SML Area

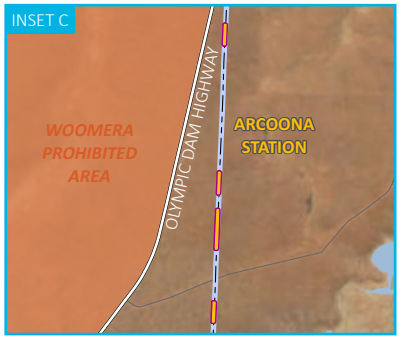
BHP SRE Project
Land Use and Planning Impact Assessment
Figure 1.2

EMM
creating opportunities



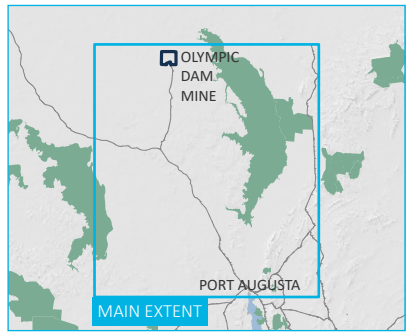








0 25 50 km
GDA2020 MGA Zone 53
N



KEY

- Special Mining Lease
- SRE Project Area
- EIGR Area

Existing environment

- Transmission substation
- BHP private transmission line (275 kV)
- Rail line
- Major road
- Minor road
- Named waterbody
- National park
- Pastoral station
- Woomera Prohibited Area

INSET KEY

- Major road
- National park

SRE Project Area - EIGR Areas

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 1.3

EMM
creating opportunities

2 Baseline condition assessment

In order to quantify the potential effects of the SRE Project on land use values and receptors, it is necessary to understand the existing baseline environment, and specifically:

- to classify and describe the existing land use environment prior to the development of the SRE Project
- to provide a basis for project activities aimed at describing the likely change in the baseline environment as a result of the development of the SRE Project and quantifying the significance of resultant impacts to receptors.

2.1 Project context

2.1.1 Study area

The study area for this report is contained wholly within the SRE Project areas shown on Figure 1.2 and Figure 1.3 which have been used to assess the SRE Project's potential impacts on existing land uses, land tenure and protected areas that overlap, adjoin or are in the region, such as through land use interface, construction activities and or operations.

2.1.2 Land tenure

The Olympic Dam mine is located on freehold land held by BHP and subject to a SML, granted to BHP under the Olympic Dam and Stuart Shelf Indenture and the ratifying *Roxby Downs (Indenture Ratification) Act 1982* (RDIR Act).

The majority of the SRE Project would be located within the Olympic Dam SML. The land tenure details are summarised in Table 2.1 and shown on Figure 2.1.

Table 2.1 Land tenure associated with the SRE Project within the SML

Land tenure	Description
Tenement type	SML
Tenure description	SML1 overlays the freehold tenure (CT 5140/575)
Tenure holder	BHP Olympic Dam Corporation Pty Ltd
Purpose	Operating Olympic Dam mine (Copper; Uranium Oxide; Dolomite; Sand; Gold; Silver; Limestone)
Location of land	560 kilometres (km) north of Adelaide in the Far North of SA
Area	Approximately 17,800 hectares (ha)

The land tenure details for the SRE Project aspects located with Clause 28 land associated with the electricity transmission line are summarised in Table 2.2.

Table 2.2 Land tenure associated with the SRE Project within the EGIR Areas

Land tenure	Description
Tenure type	Clause 28 land
Tenure description	Clause 28 land overlays the following land tenure: • CT5439/775 • CT5480/470 • CT5480/618 • CT5441/913 • CT5441/914.
Tenure holder	BHP Olympic Dam Corporation Pty Ltd
Purpose	Transmission line
Location of land	275 kV transmission line between Port Augusta (Davenport substation) and Olympic Dam mine in the Far North of SA
Area	Approximately 87.45 ha

2.1.3 Native title holders

The SRE Project is located entirely within the Native Title determination boundary of the Kokatha People (Part A), tribunal file number SCD2014/004, determined in September 2014.

The southern portion of the EIGR Areas (CT 5480/470, CT 5439/775) are located within the Native Title determination boundary of the Barngarla People, tribunal file number SCD2016/001 determined in June 2016.

With respect to cultural values, BHP has undertaken, and would continue to undertake:

- identification of Aboriginal cultural heritage values compiled through background research, Aboriginal consultation, archaeological field investigations and anthropological assessments
- cultural heritage surveys in accordance with the Olympic Dam Agreement (ODA) and consultation with Kokatha Aboriginal Corporation (KAC), Kuyani Yartah Association (KYA) and Barngarla Determination Aboriginal Corporation (BDAC) Indigenous groups.

The presence of any artefacts or identified Aboriginal cultural heritage values, including landscape features, within the SRE Project will be handled in accordance with legislation and the agreed procedures and protocols for heritage management with the Kokatha Aboriginal Corporation (KAC), Kuyani Yartah Association (KYA) and Barngarla Determination Aboriginal Corporation (BDAC) Indigenous Groups.

2.1.4 Pastoral leases and local government area

The Olympic Dam SML is bounded to the south and east by Crown land under the management of the Municipal Council of Roxby Downs, to the west and north by Roxby Downs Pastoral Station and to the north-east and south-east by Andamooka Pastoral Station. The leases associated with both Roxby Downs and Andamooka pastoral stations are currently held by BHP and are sub-leased to Kokatha Pastoral Pty Ltd for the ongoing management of pastoral activities.

The EIGR Areas are located entirely within freehold Clause 28 land held by BHP.

2.1.5 Exploration licences

The area surrounding the SML is the subject of Exploration Licence (EL) 5941 covering approximately 1,751 square kilometres (km^2) and currently held by BHP. The EIGR Areas overlap with the ELs described in (Table 2.3), petroleum exploration licence applications (PELAs) described in Table 2.4 and geothermal exploration licences (GELs) described in Table 2.5. Land tenure for the SRE Project is presented in Figure 2.1.

There are no easements or other overlapping interests relevant to the SRE Project.

Table 2.3 SRE Project overlapping exploration licences

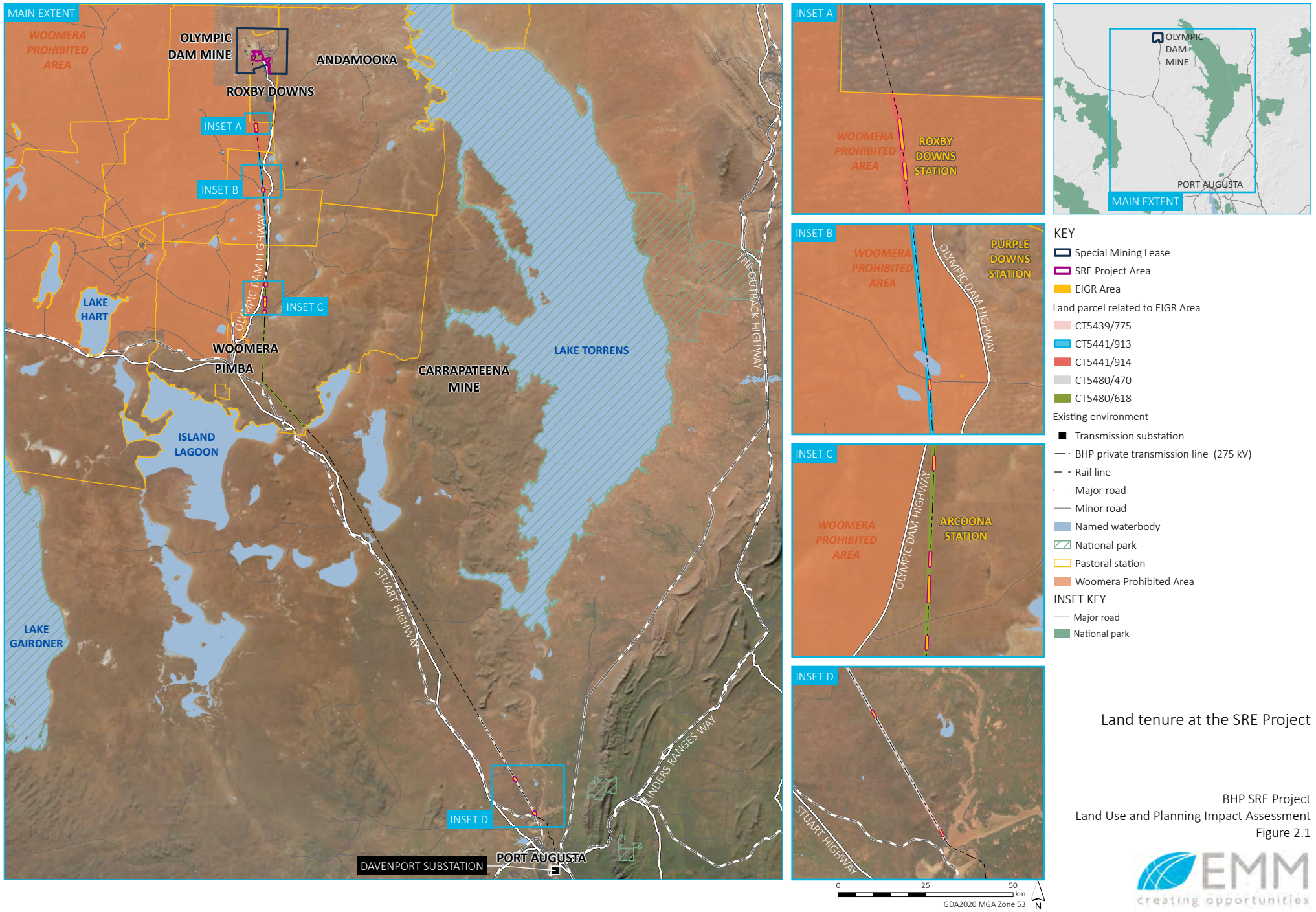
EL No.	EL Holder	Expiry Date
EL 5835	OZ Exploration Pty Ltd (100%)	30/06/2027
EL 5941	BHP Olympic Dam Corporation Pty Ltd (100%)	21/02/2028
EL 5959	BHP Olympic Dam Corporation Pty Ltd (100%)	3/05/2028
EL 6707	Petratherm Ltd (100%)	30/03/2028

Table 2.4 SRE Project overlapping petroleum exploration licence applications

PELA No.	Applicant	Application Date
PELA 601	Gehyra Exploration Pty Ltd	14/11/2011
PELA 644	Banjo Energy Pty Ltd	15/07/2014
PELA 748	Cryptid Clean Energy Pty Ltd	22/02/2022

Table 2.5 SRE Project overlapping geothermal exploration licences

GEL No.	Licensee	Expiry Date
GEL 692	Volt Geothermal Pty Ltd	11/12/2027
GEL 694	Volt Geothermal Pty Ltd	11/12/2027
GEL 693	Volt Geothermal Pty Ltd	11/12/2027



Land tenure at the SRE Project

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 2.1

EMM
creating opportunities

2.2 Land use environment

This section summarises the baseline aspects of land use, consisting of

- topography and landscape
- land use and the local community
- area development plan
- interaction with public infrastructure
- sensitive receptors.

2.2.1 Topography and landscape

The SRE Area is located within the Gawler Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion which spans approximately 123,605 km². This bioregion is characterised by semi-arid to arid flat to rounded landscapes, rocky hills, plains and salt-encrusted lake beds. Vegetation types across the bioregion include open woodlands of Black Oak (*Casuarina pauper*) and wattles, open mallee scrub, chenopod shrublands (bluebush/saltbush) and tall Mulga (*Acacia aneura*) shrublands. The native vegetation across the area is generally relatively intact, but highly disturbed in some areas particularly near stock watering points or infrastructure.

More specifically, the SRE Project sits within the Roxby IBRA Subregion (Figure 2.2), which is characterised by low sand dunes with low open woodland and mixed grasses, sandy interdune swales within Acacia low open woodland over Chenopod low open shrubland and interdune swales with clay soils supporting Cane-grass tall grassland. Broad vegetation communities found in this sub-region include:

- low sand dunes with White Cypress-pine (*Callitris glaucophylla*)/Narrow-leaf Mulga (*Acacia aptaneura*), low open woodland over Sandhill Cane-grass (*Zygochloa paradoxa*) and Loose-flowered Rattlepod (*Crotalaria eremaea*)
- sandy interdune swales with Western Myall (*Acacia papyrocarpa*) and Narrow-leaf Mulga low open woodland over Chenopod low open shrubland or grasses
- cracking clays interdune swales with Swamp Cane-grass (*Eragrostis australasica*) tall grassland
- occasional inland saline depression of Melaleuca and Samphire
- occasional drainage lines and swale with tall Chenopod shrubs (Lathwida 2024).

The surrounding landscape of the SRE Project includes the Olympic Dam operations, Olympic Dam Airport, and Olympic Dam Village (ODV) and the nearby township of Roxby Downs, which is connected by a network of established roads. Beyond this, there are large areas of native vegetation to which are subject to pastoral leasing (with a long history of livestock grazing) and/or other land uses such as the Woomera Prohibited Area (Department of Defence).

The closest conservation area is the Arid Recovery Reserve (ARR) which is located north of the Olympic Dam mine and over 6 km from the SRE Project. The ARR spans a total of 12,300 ha across six large enclosures and is Australia's largest feral animal-proof fenced reserve.

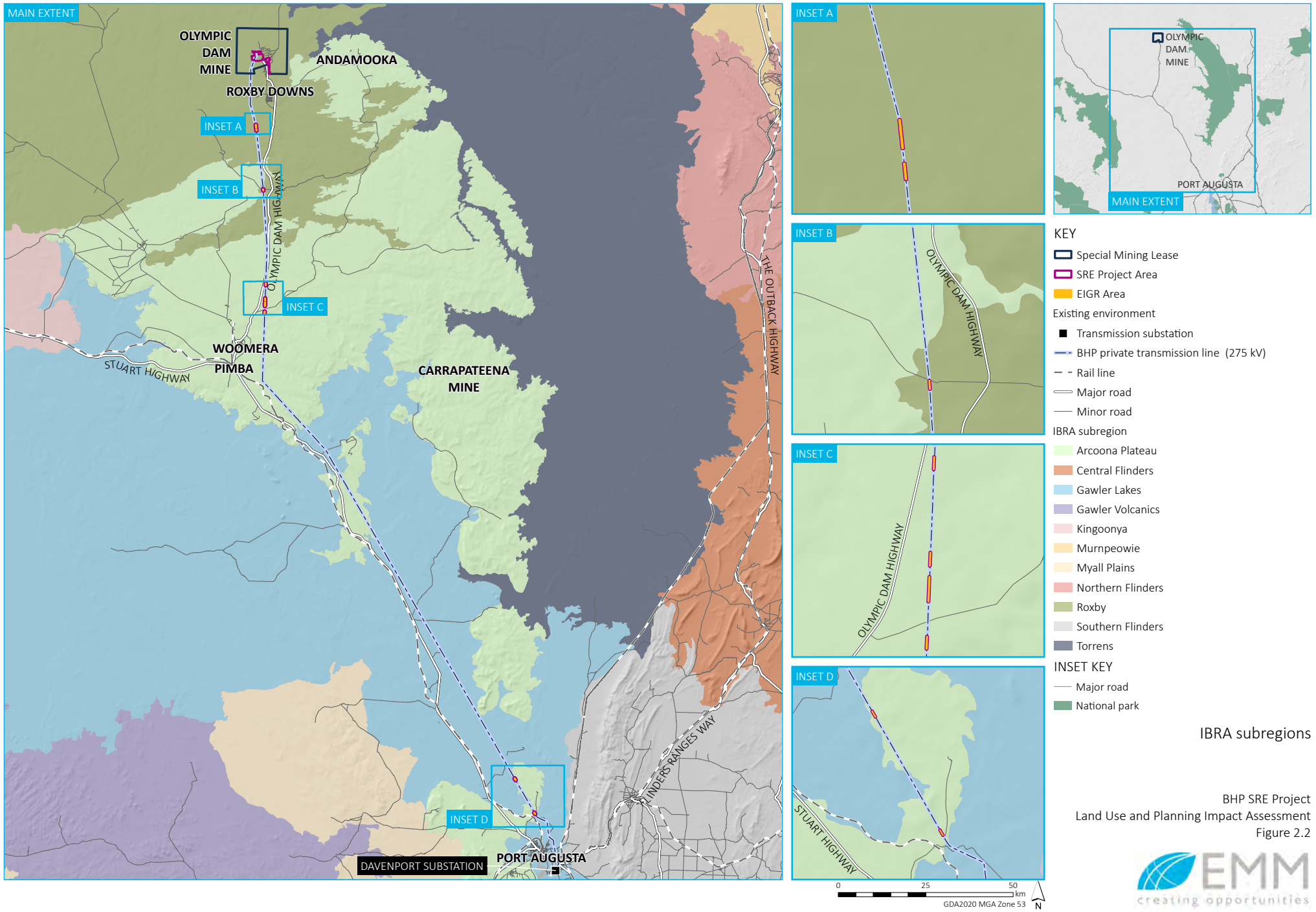
Lake Torrens National Park is located approximately 40 km to the east of the SRE Project. There are no Native Vegetation Heritage Agreements (NVHA) under the NV Act within 50 km of the SRE Project, with the closest BHP SEB being the Grosse NVHA located approximately 160 km to the north-west of the SML.

Within the wider region, arid inland lakes collectively form a Nationally Important Wetland known as Inland Saline Lakes listed under the Commonwealth Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Directory of Important Wetlands in Australia. The collective wetland includes Lake Torrens (570,000 ha) and Lake Frome (259,000 ha). When these areas are in flood, they provide suitable inland habitat for large wader populations and migratory birds.

Lake Callabonna and Lake Torrens are known to support 30 waterbird species, including 9 breeding species. These lakes are also migration stop-over sites for Marsh Sandpiper, Common Greenshank, Red-necked Stint, Sharp-tailed Sandpiper, Curlew Sandpiper and Australian Pratincole (DCCEEW 2021).

Another area of important shorebird habitat in the wider region includes the Arcoona Lakes important shorebird habitat. This system represents 12,000 ha of inland lakes between Woomer and Roxby Downs with diverse hydrology. Some are large and highly saline and provide rich ephemeral shorebird habitat. Others provide deep freshwater habitat for several years. They fill and remain inundated following above-average rainfall. Wet and dry cycles provide abundant resource pulses for waterbirds. This system is represented by 13 wetlands: Coorlay Lagoon, Chances Swamp, Lake Mary, Lake Bessie, Purple Lake, Purple Swamp, Red Swamp, Lake Koolymilka, Lake Echo North, Lake Echo South, Lake Campbell, Arcoona Lake, and Lake Richardson (Weller et al. 2020).

None of these key wetlands or shorebird habitats are in proximity to the SRE Area, with the closest being Coorlay Lagoon and Chances Swamp (over 30 km south-east and south-west of Olympic Dam, respectively) and Lake Torrens, which is over 40 km east of Olympic Dam (DEW 2024).



IBRA subregions

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 2.2

EMM
creating opportunities

2.2.2 Land use and community

i Historical land use

Due to the sparsely populated nature of the region and the distance to the neighbouring major towns, most historical land use of the region relates to the pastoral industry, mining, mineral exploration and transport.

The late 1800s saw the establishment of large pastoral leases in the region, including Arcoona, Purple Downs, Andamooka, Pernatty, and Bosworth operating as sheep or cattle stations. Due to the isolation of the region and the long-standing pastoral lease use of the land, the recent history of the landscape has been primarily broadacre farming.

The properties operate on pastoral leases managed by SAs Department for Environment and Water (DEW) under the advice of the Pastoral Board of SA. Under the *Pastoral Land Management and Conservation Act 1989* (Pastoral Act) (SA), pastoral leases provide pastoralists with access to Crown land for the purposes of raising livestock and developing related infrastructure.

ii Current land use

Activities within the SML are wholly associated with the ongoing Olympic Dam operations and associated mineral exploration and infrastructure maintenance activities (Photograph 2.1), with electricity supplied via an existing 275 kV transmission line from the national grid (Photograph 2.2).

Together with the neighbouring Purple Downs Pastoral Lease (also owned by BHP), the Andamooka and Roxby Downs pastoral leases encompass over 5,000 km^2 of land that is sub-leased to and managed by KAC and currently stocked with around 2,000 head of cattle.

Towns surrounding Olympic Dam include ODV and Roxby Downs to the immediate south of the SML, Woomera and Pimba approximately 95 km and 105 km to the south of the SML, respectively, and Andamooka, approximately 35 km to the east of the SML, each of which was established within the last 90 years. Andamooka was established in 1933 to support opal mining, Woomera in 1947 to service the Woomera Rocket Range and Roxby Downs and ODV in 1986 to service the Olympic Dam operations.



Photograph 2.1 Existing Olympic Dam surface infrastructure

Source: BHP 2025



Photograph 2.2 Existing 275 kV transmission line

Source: Lathwida 2025

a Olympic Dam smelter operations (existing)

BHP Olympic Dam's smelter operations include a mining concentrator, smelter and refinery, with the smelter treating high grade copper concentrates through a single-stage DBF smelter, with an average output of approximately 200,000 tpa of total copper (and associated products).

The current smelting process has suited Olympic Dam's high (>1.5) copper to sulphur (Cu:S) Northern Mining Area (NMA) resource since the expanded mine and surface operation was commissioned in 1998. Since 2017, mining has gradually moved away from the NMA into the Southern Mining Area (SMA), a different part of the orebody providing a lower Cu:S ore feed. Mining from higher Cu:S areas in the NMA will occur for the Life of Asset; however, the NMA volumes will reduce in proportion to the increase in SMA volumes over time.

Since 2021, further drilling within the SMA and associated mineralogy studies has confirmed that the Cu:S ratios of the smelter feed will decline with this change to a point where a change in configuration of the smelter is required to maintain the current sulphur removal efficiency.

iii Pre-existing land disturbance

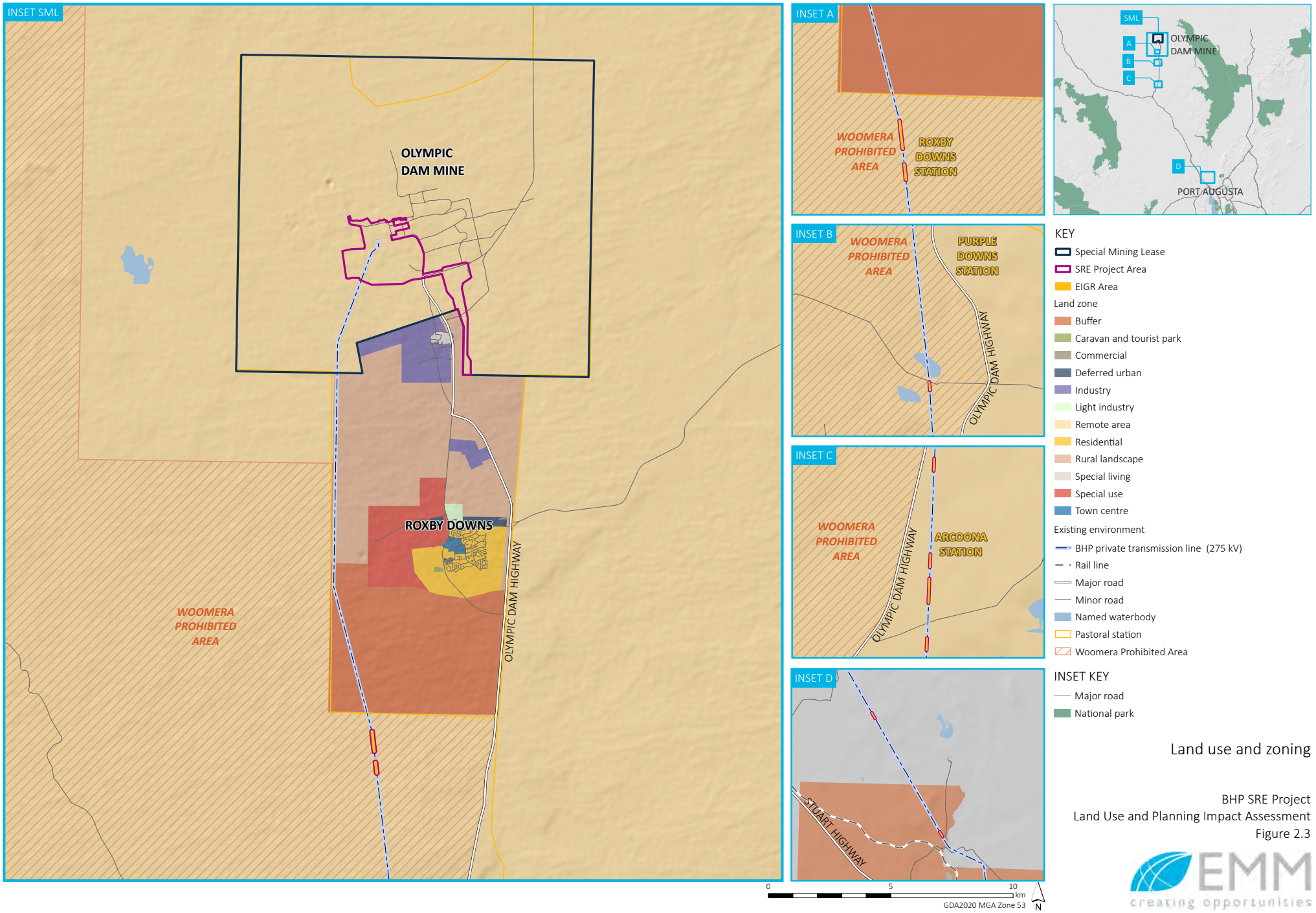
Within the SML, existing disturbance is wholly associated with the ongoing Olympic Dam operations and associated mineral exploration and infrastructure maintenance activities. Total disturbance within the 17,788 ha SML is 5,826.91 ha to the end of FY23 (BHP 2023a).

2.2.3 Area development plan

The majority of the SRE Project, comprising SRE Area, General Infrastructure Area, Water Infrastructure Area and EIGR Area (northern portion), is identified as being within the Remote Areas Zone of the Code (PlanSA 2023). The Desired Outcome (DO1) of the Remote Areas Zone (PlanSA, 2023) envisages a diverse range of uses, including mining and workers' accommodation (Figure 2.3).

Overlays of relevance include Airport Building Heights (Aircraft Landing Area), Building Near Airfields, Hazards (bushfire – outback, bushfire - regional and flooding) key outback and rural routes, native vegetation and water resources.

A southern portion of the EIGR Area within CT 5439/775 is identified as being within the Rural Zone of the Code (PlanSA 2023). DO1 of the Rural Zone envisages supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.



Land use and zoning

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 2.3

EMM
creating opportunities

2.2.4 Interaction with public infrastructure

Roxby Downs has the most varied facilities and services available in the region, which include primary and secondary schools, emergency services, community centres, sports facilities and utility services. Residents of surrounding communities are likely to travel to Roxby Downs or Port Augusta to access social infrastructure and services, such as health services.

i Transport

Transport and connectivity are important elements for remote communities, especially for those communities located in the Far North Region (FNR) of SA. Regionally significant road networks near to the SRE Project include:

- Olympic Dam Highway, connecting the Stuart Highway at Pimba to Roxby Downs via Woomera, also providing access to Olympic Dam mine
- Stuart Highway, connecting Port Augusta to Darwin via Alice Springs.

The Stuart Highway is the major inter-city linkage for the movement of freight and passengers between Adelaide and Darwin and provides access to mining operations, pastoral properties, tourist destinations, and rural and remote communities. The annual average daily traffic count along Olympic Dam Highway between Woomera and Roxby Downs was an average of 500 vehicles daily in 2018. Andamooka Road recorded an average of 310 vehicles in 2018.

There is limited public transport across the nearby communities.

Nationally significant rail networks also traverse the FNR, with the rail corridor running through Pimba. The Great Southern Railway operates The Ghan train from Adelaide to Darwin via Alice Springs twice weekly. It also operates the Indian Pacific train once or twice each week from Sydney to Perth, stopping enroute in Adelaide.

The nearest commercial airport is Olympic Dam Airport. Alliance Airlines operate a daily public transport service between Olympic Dam and Adelaide.

ii Electricity transmission

The following three high voltage electricity transmission lines connect the FNR of SA to the Davenport Substation (Figure 2.4), south of Port Augusta:

- BHP private transmission line (275 kV) to Olympic Dam mine
- BHP Hill-to-Hill (H2H) private transmission line (275 kV to Mount Gunson South Substation, 132 kV to Prominent Hill mine, with a 132 kV feeder line to Carrapateena mine from Mount Gunson South Substation)
- ElectraNet (132 kV) transmission line to Woomera, with a BHP private connection from Woomera to the Olympic Dam mine.

iii Water supply

The SA Water Port Augusta to Woomera water supply pipeline supplies treated Murray River water to Woomera, with some pastoral offtakes along the way.

The proposed DIT NWP aims to develop a desalination plant on Eyre Peninsula and an associated water supply pipeline to Olympic Dam, with offtakes to pastoral operations, communities and industry along the route. First water from the NWP is scheduled for 2032.

2.2.5 Interaction with existing Olympic Dam mine ancillary infrastructure

A summary of the key utility service requirements for the SRE Project are provided below, while the EIS describes in detail existing Olympic Dam mine site services and infrastructure capacity and associated connection and/or augmentation of utility services to accommodate the SRE Project's load demands (i.e. water, gas, electricity, wastewater, surface water drainage).

i Site access and internal roads

An SRE Project gatehouse would be constructed and consist of a small modular building with an office, amenities and boom gates, staffed 24-hours-a-day, seven-days-per-week.

The SRE Project would require new or upgraded internal roads to accommodate construction and operation with detailed layouts, designed in accordance with relevant Australian Standards, to ensure safe access and egress.

All internal SML access points to the SRE Project would be appropriately signposted to prevent inadvertent access by the public.

ii Electricity

An electricity demand of up to 68 megavolt-amperes (MVA) net load increase would be required for the SRE Project.

The additional electrical demand due to the SRE Project would be met by capacity from the national grid via the existing 275 kV transmission line. Minor augmentation of existing onsite electricity supply infrastructure at Olympic Dam within the SML would be required to ensure the additional capacity could be achieved and maintained.

New high voltage and low voltage power supply and reticulation infrastructure would be required to all smelter infrastructure.

iii Wastewater

Olympic Dam operates two separate sewage and wastewater facilities to contain and facilitate the anaerobic treatment of sewage from the processing plant, mine and ODV. The onsite sewage facility consists of a high-density polyethylene (HDPE)-lined primary lagoon and two larger HDPE-lined evaporation ponds.

There is also a facility at ODV which consists of a lined primary lagoon and seven anaerobic ponds managed under a separate EPA Licence (EPA Licence 3054).

The SRE Project would augment connections into the existing Olympic Dam wastewater network for treatment and management.

iv Water supply and distribution

The SRE Project proposes no additional water extraction from GAB above current daily average --BAU volumes.

The SRE Project would be supplied external (raw) water through existing water supply infrastructure and, when this reaches current capacities, through either/or:

- provision of water from DIT's NWP infrastructure, following commissioning of the initial 90 ML/d capacity of the NWP in 2032 (this would require new water storage and distribution infrastructure to connect the SRE Project to the NWP connection point at the SML boundary)
- local groundwater supply (subject to further approvals) via existing process storage dams and the desalination plant at the Olympic Dam site.

Both additional water supply alternatives are likely to require augmentation of the existing desalination water treatment plant and water distribution network.

v Industrial land

The SRE Project does not propose the expansion of the existing light or heavy industrial land precinct located south of ODV.

Any potential new and or expanded mining services enterprises, including establishing new or relocating existing business activities and or services currently located on the mine, as part of broader Olympic Dam mine operations would be investigated as part of BHP --BAU operations and subject to separate approvals if required.

2.2.6 Sensitive receptors

i Socio-economic

The SRE Project is situated within SA's defined FNR, which spans approximately 800,000 km² and has a population of approximately 25,560 people (ABS 2021a). The Far North Region includes the following local government areas (LGAs):

- Anangu Pitjantjatjara Yankunytjatjara
- City of Port Augusta
- District Council of Coober Pedy
- Flinders Ranges Council
- Municipal Council of Roxby Downs.

Municipal services to communities located outside the above listed LGAs, but within the FNR, are provided directly by the Government of SA via the Outback Communities Authority, which was created to assist with local governance across remote townships in SA. The Outback Communities Authority works in partnership with the peak community organisation of the individual townships to manage facilities and services.

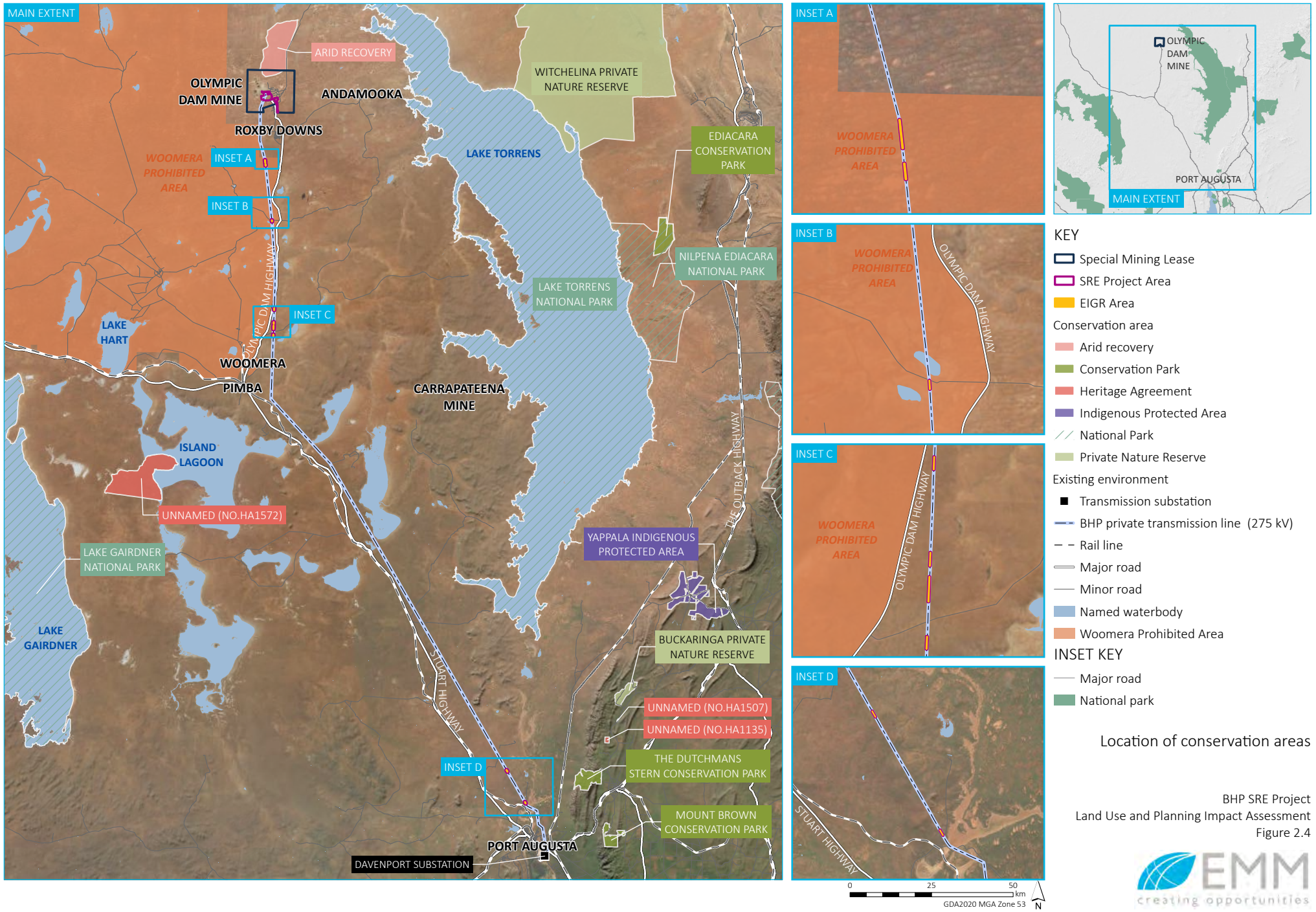
ii Proximity to conservation areas

The SRE Project does not overlap any national parks, reserves, private conservation areas, Commonwealth or State-recognised conservation areas, heritage agreement areas or geological heritage sites (Figure 2.4).

The closest gazetted conservation area is Lake Torrens National Park, located approximately 40 km to the east of the SML Area. There are no vegetation Heritage Agreements located within 50 km of the SML Area or EIGR Areas, with the nearest being HA 1572 west of Island Lagoon (just over 50 km from a central discrete EIGR Area) and HA 1573 (over 75 km north-west of Olympic Dam) (DEW 2025).

The Arid Recovery Reserve (ARR) is located 20 km north of Roxby Downs. The reserve spans a total of 12,300 ha across six large enclosures (or exclosures) and is Australia's largest feral-proof fenced reserve. It is located north of the Olympic Dam mine and spanning 4.7 to 21 km from the SML Area. The reserve is used to protect and research local native fauna including a number of national and state-listed fauna; Kowari, Western Quoll, Greater Bilby, Plains Mouse, Burrowing Bettong, Shark Bay Bandicoot, Greater Stick-nest Rat (Arid Recovery 2025, DEW 2025).

Within the wider region, arid inland lakes collectively form a 'Nationally Important Wetland' known as 'Inland Saline Lakes'. The collective wetland includes Lake Torrens (570,000 ha) and Lake Frome (259,000 ha).



Location of conservation areas

BHP SRE Project
Land Use and Planning Impact Assessment
Figure 2.4

EMM creating opportunities

iii Cultural heritage

a Aboriginal heritage

The cultural heritage of the SRE Project has been studied as a component of the greater SML and surrounding area since planning for the Olympic Dam operations began in the late 1970s. Many sites and artefacts remain as evidence of historical indigenous nomadic occupation and use, and the wider Olympic Dam region is rich in surface scatters of stone artefacts and quarries.

The presence of any artefacts or identified Aboriginal cultural heritage values, including landscape features, within the SRE Project will be handled in accordance with legislation and the agreed procedures and protocols for heritage management with the KAC, KYA and BDAC Indigenous groups.

The KAC, KYA and BDAC have been engaged to conduct cultural heritage surveys within and surrounding the SRE Project activities in the SML to establish any significant cultural heritage material and document any ethnographic findings.

BHP will undertake due diligence with respect to cultural heritage risk assessment of any Clause 28 land or activity within the SRE Project electricity infrastructure ground re-profiling area (i.e. outside the Olympic Dam Area or the Stuart Shelf Area) in accordance with the requirements of the *Aboriginal Heritage Act 1988* and the outcomes of consultation with the Traditional Owners and Native Title holders.

b Non-indigenous historic heritage

Evidence of past historic land uses and settlement, such as old fences, stockyards, ruined huts and windmills, are scattered throughout the region. Most of these features, however, are commonplace and have been found to be of little heritage significance.

Results of a search of the National Heritage Database and the SA Heritage Places Database are presented in Table 2.6 and Table 2.7. The closest sites of historical significance are located at:

- Andamooka, approximately 27 km east of the SRE Area
- Port Augusta, approximately 10 km north of the southern portion of the EIGR Area.

Table 2.6 Historic heritage places

Site name	Heritage class	Location	Distance to SRE Project	Description
Andamooka Historic Reserve	State	Andamooka	˜27 km	Andamooka Historic Precinct (Historical Museum Reserve), including Frank Albertoni's house, Bob Cutzow's Dugout, Tom Brady's Dugout, Mrs Perry's Kitchen, and Andy Absalom's House
Dick Clark’s Residence	State	Andamooka	˜27 km	Dick Clark's Residence including semi-dugout living room, two detached sleep-outs and workroom, together with dry-stone walling and connecting paths

Table 2.7 Heritage places near the EIGR Area

Site name	Heritage list	Location	Distance to Study Area	Description
Ostrich Farm (ID no. 12702)	South Australian Heritage Places (South Australian Heritage Register, (SAHR))	Port Augusta	~8 km	Former Ostrich Farm, Emeroo Station, including Original Homestead, Ruins of Hatching Shed, Exotic Plants and Ostrich Fences
Port Augusta West Water Tower (ID no. 10198)	South Australian Heritage Places (South Australian Heritage Register)	Port Augusta	~10 km	Water tower

2.3 Conclusion

The baseline land use environment is characterised by the existing Olympic Dam mine and associated infrastructure (i.e. established mining industrial setting) and surrounded by low density primary production land uses and sparse remnant native vegetation. The majority of the proposed SRE Project activities, with the exception of ground re-profiling within the Electricity Infrastructure Area, would be located within the existing SML.

It is anticipated that some minor changes to existing land use (i.e. greenfield development) within the SML would be necessary to support the SRE Project, while isolated vegetation disturbance and heritage clearance would be required in order to maintain regulatory clearance distances between the existing 275 kV transmission line and the ground surface within Clause 28 land to enable safe operation.

No change to existing land tenure or acquisition of land is required for the proposed SRE Project.

3 Assessment of effects

An assessment of effects was undertaken to determine the change in the existing land use environment as a result of the proposed SRE Project activities. The assessment of effects included the following works:

- obtain input and qualitative data to determine the baseline environment
- review of the SRE Project activities and the identified potential impact events for the effects assessment
- complete effects assessment.

3.1 Potential impact events

BHP has identified three potential impact events associated with likely changes to the baseline land use environment as a result of the SRE Project. These events represent scenarios for which there is, or is likely to be, a linkage between SRE Project activities (sources), land (pathways) and the identified future land use (receptors).

To ensure a consistent approach to impact assessment for the SRE Project, sources, pathways, and receptors (SPR) are defined and applied in this assessment as follows:

- Source – the SRE Project activities (i.e. potential impact event) which, alone or in combination, has the potential to impact a receptor.
- Pathway – the pathway, means or route (with consideration of any natural barriers) by which the receptor can be exposed to, or may reasonably be expected to be impacted by, the source.
- Receptor – the receptor that may be impacted by the source via the pathway (e.g. third-party users, future users, indigenous community).

The detailed list of potential impact events is provided in the environmental impact assessment tables appendix to the EIS and are summarised for the land pathways in Table 3.1. The scope of this assessment of effects presented herein has considered these identified potential impact events.

Table 3.1 Preliminary SPR assessment – potential impact events

Impact ID	Potential impact event	Source	Pathway	Receptor	Linkage
L4	The clearing of native vegetation associated with the construction of SRE Project infrastructure may result in disturbance, removal or damage to cultural artefacts	Land clearing	Land	Cultural heritage	Unconfirmed - refer Cultural Heritage Assessment
L5	The clearing of native vegetation associated with the construction of SRE Project infrastructure comprises Aboriginal intangible ethnographic values of an area through alteration or damage to the cultural landscape/features	Land clearing	Land	Cultural values	Unconfirmed - refer Cultural Heritage Assessment
L12	Changes to the prevailing visual amenity may occur as a result of the SRE Project but are unlikely to materially impact the existing industrial landscape of the site	All project activities	Land	Amenity	Unconfirmed - refer Visual Impact Assessment
L33	During construction, land clearing associated with the construction of SRE Project infrastructure results in disturbance to an unknown non-Indigenous heritage site.	Land clearing	Land	Cultural amenity (Historic heritage)	Unconfirmed - refer Historic Heritage Impact Assessment
SE9	The SRE Project results in benefits to the local, regional and State economy through local purchasing and increases in employment opportunities, impacting on the social value of the local community	All project activities	Socio-economic	Social value	Unconfirmed - refer Economic Impact Assessment
SE25	Reduced rural and agricultural amenity due to presence of heavy industry of the project	All project activities	Socio-economic	Local community (social value)	Unconfirmed

3.2 Assessment of effects

An assessment of effects was undertaken to determine the change in the existing land pathway environment as a result of the proposed SRE Project activities. The assessment of effects includes the following works:

- obtaining input data (i.e. baseline environment) by reviewing relevant assessment reports and visiting the SRE Project areas and locality
- review of the SRE Project activities and the identified potential impact events to determine effects assessments
- completion of effects assessment to determine the likely magnitude of the change to the land use environment as a result of the SRE Project.

3.2.1 Land use environment

i Strategic alignment

Several State Government strategic plans and policy documents are of relevance in providing context and justification for the SRE Project. These are summarised below.

a South Australia's Copper Strategy

The vision for SA's Copper Strategy vision is that by 2030 SA will be the major contributor to Australia's position as the world's third-largest copper producer.

The Copper Strategy sets an objective to triple SA's copper production to 1 million tonnes per annum (Mtpa) by 2030 by:

- accelerating exploration, discovery and information
- developing innovative infrastructure, services and research
- building industry and community capacity.

BHP's copper commodity strategy is focused on both organic growth from existing assets, including implementation of innovation and technology initiatives, and discovering, acquiring and developing new resources to double copper production by 2040.

Copper SA plays a unique position in this objective, with a combination of assets and exploration potential in close proximity. Copper SA has an enviable mineral resource base of approximately 12.6 billion tonnes (Bt), with contained 166 million tonnes (Mt) of copper equivalent metal.

BHP's 2023 acquisition of OZ Minerals' assets, including the Carrapateena and Prominent Hill mining operations, has resulted in the establishment of a copper province similar to those commodity-based integrated operations established by BHP in Western Australia Iron Ore (WAIO) and the BHP Mitsubishi Alliance (BMA) in the Queensland Bowen Basin.

The Copper SA province presents attractive economic returns with provincial scale synergies through multiple mines and resource opportunities to supply copper concentrate into a single smelting and refining facility.

As part of the establishment of the Copper SA province, and subject to approvals, the SRE Project would enable Olympic Dam to receive, blend and smelt copper concentrates from Carrapateena and Prominent Hill mining operations, as well as possible future mining operations (e.g. Oak Dam), and maintain the ability to receive copper concentrate from other third-party suppliers (Figure 3.1).

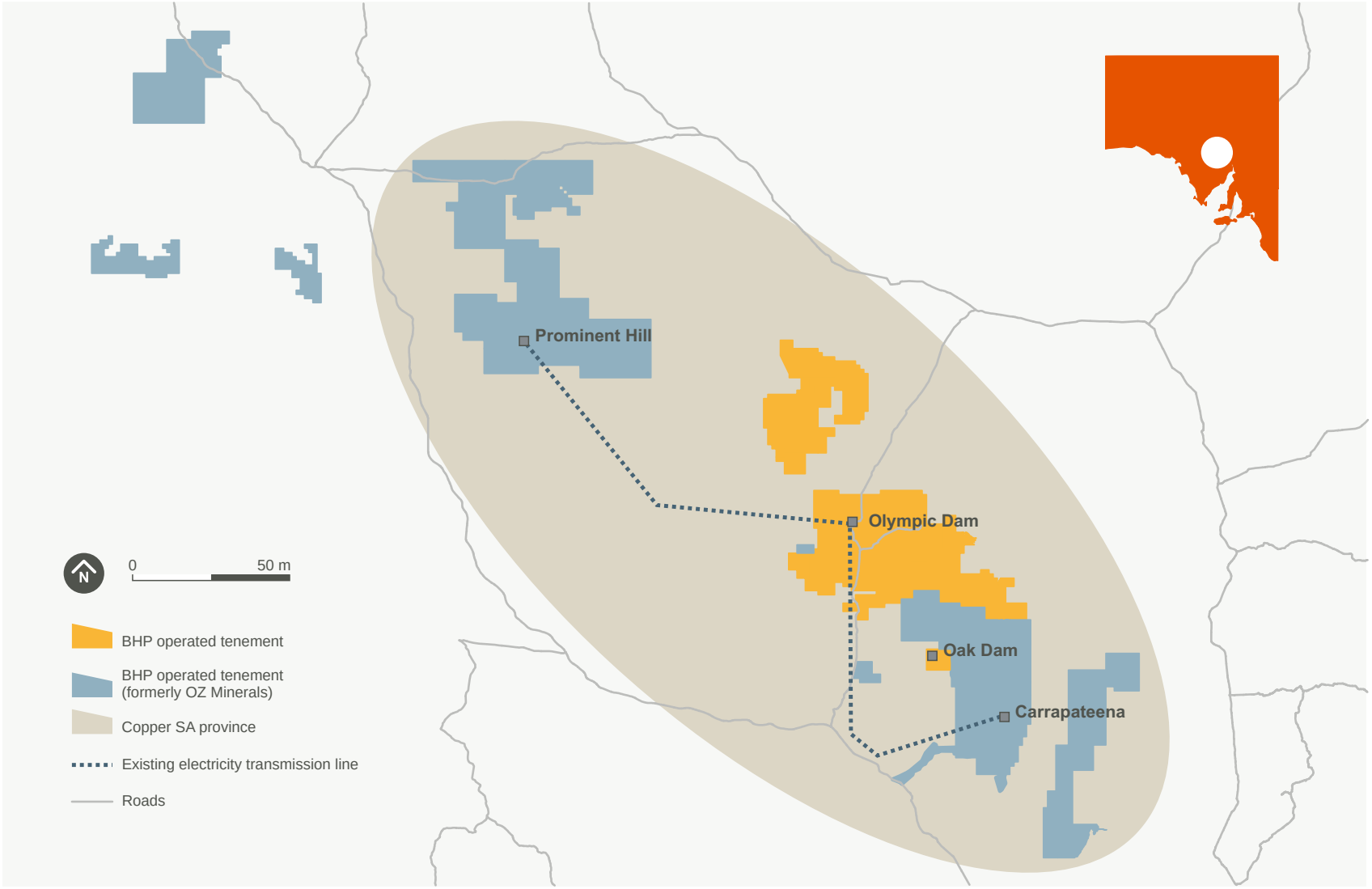


Figure 3.1 | Copper SA province

The SRE Project, as part of the Copper SA growth plan, has the potential to realise synergy value and increase copper production capacity up to 650,000 tpa of total copper (plus associated products) from the current average output of approximately 200,000 tpa.

b Regional Development Strategy

SA's Regional Development Strategy acknowledges that the Far North is home to some of the richest mining resources in the world, attributing to over 50% of the state's developing mining projects. Value adding industries to support agricultural and horticultural production are also seen as a key priority.

The SRE Project would help strengthen the prosperity of the region by:

- unlocking the potential of the Gawler Craton through a multi-mine province with centralised regional processing
- establishing SA as a globally significant mine-to-metal copper province with increased smelting and refining capacity
- simulating investment in Roxby Downs and the Far North region
- generating short and long-term employment opportunities
- creating a sustainable impact on the local economy.

c Roxby Council Strategic Plan 2021–2025

The aspiration of the Roxby Council Strategic Plan 2021–2025 is that Roxby Downs is Australia's most highly regarded mining town (Municipal Council of Roxby Downs 2021).

The Strategic Plan is based on the following community foundations:

- leadership and governance: an organisation that has a culture of accountability, improvement and acts with a set of shared values and behavioural standards
- health and wellbeing: a place that provides services and facilities to assist our community to achieve positive wellbeing outcomes
- community vibrancy: a vibrant, active, inclusive and engaging community that fosters connections between community members
- environment and sustainability: a town which respects its natural heritage and offers practical initiatives that benefit the community and preserve the environment
- economic development: provides efficient services to the business sector which will contribute to its success in our local economy
- infrastructure and essential services: provide quality, contemporary, value for money community assets and services on sustainable infrastructure and essential services
- community services: the needs of our diverse community are supported by the delivery of responsive and relevant community services
- communication: timely and consistent professional communication that engages community, business and other stakeholders. Facilitate opportunity for comment and input in decision-making.

BHP's SRE Project provides an opportunity for the Olympic Dam operation to continue to support the aspiration of Roxby Council's Strategic Plan and the surrounding region to continue to be a sustainable and thriving regional community.

ii Planning and Design Code

a Remote Areas Zone

The majority of the SRE Project, comprising SRE Area, General Infrastructure Area and Water Infrastructure Area, is identified as being within the Remote Areas Zone of the Code (PlanSA 2023).

The Code under the PDI Act envisages: "a diverse range of uses, including mining and workers accommodation."

A summary of the key planning controls applying to the project site, as derived from the Code, and an assessment of the SRE Project against these controls are provided in Table 3.2.

Table 3.2 Key planning controls applying to the SRE Project

Planning control	Zoning, performance outcomes	Planning assessment
Property zoning	**Remote Areas**	**-**
Desired outcome	DO1 – A zone that includes a diverse range of uses including pasture growing, grazing, farming, agricultural processing and transportation, mining and petroleum, energy generation and storage, pipeline infrastructure, aerospace and defence-related facilities, Aboriginal lands and related activities, tourist development, and settlements.	The SRE Project is consistent with the desired outcome of the Remote Areas Zone which envisages mining and transmission line development of the nature and scale proposed. The SRE Project involves the efficient use of suitability zoned land for mining related activities within the SML and Clause 28 land which is located and designed to minimise potential impacts on surrounding land uses and meet relevant environmental and amenity criteria. The SRE Project: • represents a significant economic investment by BHP in new, augmented and upgraded smelting, refinery and ancillary infrastructure to increase copper production capacity of Olympic Dam mine up to 650,000 tpa in a planned and orderly manner • will deliver reliable and predictable production outcomes to support BHP's Copper SA province and the states economic growth.
Land use and intensity	PO 1.1 – Land used primarily for primary production, remote rural activities and remote rural settlements.	The SRE Project is compatible with the scale, function, character and intensity of the existing land uses and surrounding areas which predominantly comprises mining related activities for the Olympic Dam mine (within the SML) and transmission line infrastructure (within Clause 28 land). The SRE Project development is not located in proximity to sensitive receptors and would be designed and constructed to minimise potential impacts to meet relevant environmental and amenity criteria.

Planning control	Zoning, performance outcomes	Planning assessment
Built form and character	PO 2.1 – Development is sited and designed to protect natural features and the conservation value of the area. PO 2.2 – Large buildings are designed and sited to reduce impacts on scenic and rural vistas by: a) having substantial setbacks from boundaries and adjacent public roads b) using low reflective materials and finishes that blend with the surrounding landscape c) being located below ridgelines where practicable.	The SRE Project has been purposely sited and designed with infrastructure and building work sited largely adjacent to existing structures which minimises the bulk and scale of the development. The proposed site infrastructure is also setback within the SRE project area and SML will help to blend in with the existing mining infrastructure and surrounding natural landscape as far as practicable.
Hazard risk minimisation	PO 3.1 – Habitable buildings are designed and sited to manage the risks of natural hazards on personal and public safety and property.	All habitable buildings and structures will be designed and constructed in accordance with relevant Australian Standards and the Building Code of Australia. Storage and bunding of all diesel, flammable liquids (e.g. LPG) and chemicals will be in accordance with relevant environmental legislative requirements.
Advertisements	PO 4.1 – Freestanding advertisements that identify the associated business without creating a visually dominant element within the locality.	Not applicable.
Concept plans	PO 5.1 – Development is compatible with the outcomes sought by any relevant Concept Plan contained within Part 12 - Concept Plans of the Planning and Design Code to support the orderly development of land through staging of development and provision of infrastructure.	Not applicable.
Planning overlays		
Building near airfields	DO 1 - Maintain the operational and safety requirements of certified commercial and military airfields, airports, airstrips and helicopter landing sites through management of non-residential lighting, turbulence and activities that may attract or result in the congregation of wildlife. PO 1.1 – Outdoor lighting associated with a non-residential use does not pose a hazard to commercial or military aircraft operations.	The SRE Project proposes infrastructure development within proximity to the existing Olympic Dam airport with all buildings and structures to be adequately setback, designed (i.e. heights, lighting) and constructed to avoid any impacts to flightpaths and obstacle limitation surface (OLS) in accordance with relevant Civil Aviation Safety Authority (CASA) Manual of Standards 139 (MOS139), Australian Standards and the Building Code of Australia.
Hazard (bushfire – outback)	DO 1 – Development is located to minimise the threat and impact of bushfires on life and property taking into account the increased frequency and intensity of bushfires as a result of climate change. DO 2 – To facilitate access for emergency service vehicles to aid the protection of lives and assets from bushfire danger. PO 2.1 - Roads are designed and constructed to facilitate the safe and effective: a) access, operation and evacuation of fire-fighting vehicles and emergency personnel b) evacuation of residents, occupants and visitors PO 2.2 – Access to habitable buildings is designed and constructed to facilitate the safe and effective: a) access, operation and evacuation of fire-fighting and emergency personnel b) evacuation of residents, occupants and visitors.	The SRE Project within the SML will ensure all habitable buildings and structures will be designed and constructed in accordance with relevant Australian Standards and the Building Code of Australia. Storage and bunding of all diesel, flammable liquids (e.g. LPG) and chemicals will be in accordance with relevant environmental legislative requirements. Within Clause 28 land the additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging with proposed ground re-profiling and associated vegetation clearance intended to enable safe operation and maintain clearance distances. The SRE Project would not increase bushfire risk within the locality.

Planning control	Zoning, performance outcomes	Planning assessment
Hazards (flooding – evidence required)	DO 1 – Development adopts a precautionary approach to mitigate potential impacts on people, property, infrastructure and the environment from potential flood risk through the appropriate siting and design of development. PO 1.1 – Development is sited, designed and constructed to minimise the risk of entry of potential floodwaters where the entry of flood waters is likely to result in undue damage to or compromise ongoing activities within buildings. PO 2.1 – Buildings and structures used either partly or wholly to contain or store hazardous materials are designed to prevent spills or leaks leaving the confines of the building.	No impacts to water quantity (and quality) are expected as a result of the SRE Project with a surface water assessment and associated flooding modelling having been undertaken – refer Surface Water Assessment of the EIS.
Key outback and rural routes	DO 1 – Safe and efficient movement of vehicle and freight traffic on Key Outback and Rural Routes. DO 2 – Provision of safe and efficient vehicular access to and from Key Outback and Rural Routes. PO 1.1 – Access is designed to allow safe entry and exit to and from a site to meet the needs of development and minimise traffic flow interference associated with access movements along adjacent State maintained roads. PO 2.1 – Sufficient accessible on-site queuing adjacent to access points is provided to meet the needs of development so that all vehicle queues can be contained fully within the boundaries of the development site to minimise interruption of the functional performance of the road and maintain safe vehicle movements. PO 3.1 – Existing access points designed to accommodate the type and volume of traffic likely to be generated by development. PO 4.1 – New access points are spaced apart from any existing access point or public road junction to manage impediments to traffic flow and maintain safe and efficient operating conditions on the road.	The SRE Project will complement existing mining related infrastructure and activities within the SML with limited proposed changes to the existing road network. The traffic impact assessment did not identify any project-related significant impacts associated with turning lane warrants at intersections, sight distance or swept path, while proposed peak construction traffic volumes would not impact the existing level of service for the overall road network in the peak period – refer Traffic Impact Assessment of the EIS. The proposed SRE Project would not significantly impact the local traffic network.
Native vegetation	DO 1 – Areas of native vegetation are protected, retained and restored in order to sustain biodiversity, threatened species and vegetation communities, fauna habitat, ecosystem services, carbon storage and amenity values. PO 1.1 – Development avoids, or where it cannot be practically avoided, minimises the clearance of native vegetation taking into account the siting of buildings, access points, bushfire protection measures and building maintenance. PO 1.2 – Native vegetation clearance in association with development avoids the following: a) significant wildlife habitat and movement corridors b) rare, vulnerable or endangered plants species c) native vegetation that is significant because it is located in an area which has been extensively cleared d) native vegetation that is growing in, or in association with, a wetland environment.	All native vegetation clearance associated with the SRE Project has been assessed in accordance with the NV Act with an SEB for proposed vegetation clearance – refer Ecological Impact Assessment of the EIS.

Planning control	Zoning, performance outcomes	Planning assessment
	PO 1.4 – Development restores and enhances biodiversity and habitat values through revegetation using locally indigenous plant species.	
Water resources	DO 1 – Protection of the quality of surface waters considering adverse water quality impacts associated with projected reductions in rainfall and warmer air temperatures as a result of climate change. PO 1.5 – Development that increases surface water run-off includes a suitably sized strip of vegetated land on each side of a watercourse to filter runoff to: a) reduce the impacts on native aquatic ecosystems b) minimise soil loss eroding into the watercourse. PO 1.7 – Watercourses, floodplains (1% AEP flood extent) and wetlands protected and enhanced by retaining and protecting existing native vegetation. PO 1.8 – Watercourses, floodplains (1% AEP flood extent) and wetlands are protected and enhanced by stabilising watercourse banks and reducing sediments and nutrients entering the watercourse. PO 1.9 – Dams, water tanks and diversion drains are located and constructed to maintain the quality and quantity of flows required to meet environmental and downstream needs.	No impacts to water quantity (and quality) are expected as a result of the SRE Project with a surface water assessment and associated flooding modelling having been undertaken – refer Surface Water Assessment of the EIS.
General Development Policies		
Site contamination	DO 1 – Ensure land is suitable for the proposed use in circumstances where it is, or may have been, subject to site contamination. PO 1.1 – Ensure land is suitable for use when land use changes to a more sensitive use.	A preliminary site investigation has been undertaken for the SRE Project to characterise existing soil and geochemistry environment conditions. No exceedances of CoPC above the site assessment criteria (SAC) were identified for contaminants of potential concern (CoPC) – refer Preliminary Site Investigation of the EIS. The potential contamination risk related to the construction and operation of the SRE Project is considered to be low and can be appropriately mitigated and managed in accordance with best practice to relevant Australian Standards, construction environmental management and operational control measures to relevant environmental legislation, guidelines and policies.

b Rural Zone

A portion of the Electricity Infrastructure Ground Re-Profiling Area within CT 5439/775 is identified as being within the Code (PlanSA 2023).

The Code under the PDI Act envisages:

> A zone supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.

A summary of the key planning controls applying to the project site, as derived from the Code, and an assessment of the SRE Project against these controls are provided in Table 3.3.

Table 3.3 Key planning controls applying to the SRE Project – Electricity Infrastructure Ground Re-Profiling Area (portion) within CT 5439/775

Planning control	Zoning, Performance Outcomes	Planning assessment
Property zoning	**Rural Areas**	-
Desired outcome	DO1 – A zone supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.	The SRE Project is consistent with the desired outcome of the Rural Zone which accommodated existing transmission line development. The proposed Electricity Infrastructure Ground Re-Profiling Area does not propose to establish new infrastructure. Within Clause 28 land the additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging with proposed ground re-profiling and associated vegetation clearance intended to enable safe operation and maintain clearance distances. The SRE Project: • represents a significant economic investment by BHP in new, augmented and upgraded smelting, refinery and ancillary infrastructure to increase copper production capacity of Olympic Dam mine up to 650,000 tpa in a planned and orderly manner • will deliver reliable and predictable production outcomes to support BHP's Copper SA province and the states economic growth.
Land use and intensity	PO 1.1 – The productive value of rural land for a range of primary production activities and associated value adding, processing, warehousing and distribution is supported, protected and maintained	The SRE Project is compatible with the scale, function, character and intensity of the existing land uses and surrounding areas which predominantly comprises transmission line infrastructure (within Clause 28 land). The SRE Project development is not located in proximity to sensitive receptors and would be designed and constructed to minimise potential impacts to meet relevant environmental and amenity criteria.
Planning overlays		
Hazard (bushfire – regional)	DO 1 – Development, including land division responds to the relevant level of bushfire risk and is sited and designed to mitigate the threat and impact of bushfires on life and property taking into account the increased frequency and intensity of bushfires as a result of climate change. DO 2 – To facilitate access for emergency service vehicles to aid the protection of lives and assets from bushfire danger.	Within Clause 28 land the additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging with proposed ground re-profiling and associated vegetation clearance intended to enable safe operation and maintain clearance distances. The SRE Project would not increase bushfire risk within the locality.

Planning control	Zoning, Performance Outcomes	Planning assessment
Hazards (flooding – evidence required)	DO 1 – Development adopts a precautionary approach to mitigate potential impacts on people, property, infrastructure and the environment from potential flood risk through the appropriate siting and design of development. PO 1.1 – Development is sited, designed and constructed to minimise the risk of entry of potential floodwaters where the entry of flood waters is likely to result in undue damage to or compromise ongoing activities within buildings. PO 2.1 – Buildings and structures used either partly or wholly to contain or store hazardous materials are designed to prevent spills or leaks leaving the confines of the building.	No impacts to water quantity (and quality) are expected as a result of the SRE Project with a surface water assessment and associated flooding modelling having been undertaken – refer Surface Water Assessment of the EIS.
Native vegetation	DO 1 – Areas of native vegetation are protected, retained and restored in order to sustain biodiversity, threatened species and vegetation communities, fauna habitat, ecosystem services, carbon storage and amenity values. PO 1.1 – Development avoids, or where it cannot be practically avoided, minimises the clearance of native vegetation taking into account the siting of buildings, access points, bushfire protection measures and building maintenance. PO 1.2 – Native vegetation clearance in association with development avoids the following: a) significant wildlife habitat and movement corridors b) rare, vulnerable or endangered plants species c) native vegetation that is significant because it is located in an area which has been extensively cleared d) native vegetation that is growing in, or in association with, a wetland environment. PO 1.4 – Development restores and enhances biodiversity and habitat values through revegetation using locally indigenous plant species.	All native vegetation clearance associated with the SRE Project has been assessed in accordance with the NV Act with an SEB for proposed vegetation clearance – refer Ecological Impact Assessment of the EIS.
Water resources	DO 1 – Protection of the quality of surface waters considering adverse water quality impacts associated with projected reductions in rainfall and warmer air temperatures as a result of climate change. PO 1.5 – Development that increases surface water run-off includes a suitably sized strip of vegetated land on each side of a watercourse to filter runoff to: a) reduce the impacts on native aquatic ecosystems b) minimise soil loss eroding into the watercourse. PO 1.7 – Watercourses, floodplains (1% AEP flood extent) and wetlands protected and enhanced by retaining and protecting existing native vegetation. PO 1.8 – Watercourses, floodplains (1% AEP flood extent) and wetlands are protected and enhanced by stabilising watercourse banks and reducing sediments and nutrients entering the watercourse. PO 1.9 – Dams, water tanks and diversion drains are located and constructed to maintain the quality and quantity of flows required to meet environmental and downstream needs.	No impacts to water quantity (and quality) are expected as a result of the SRE Project with a surface water assessment and associated flooding modelling having been undertaken – refer Surface Water Assessment of the EIS.

Planning control	Zoning, Performance Outcomes	Planning assessment
General Development Policies		
Site contamination	DO 1 – Ensure land is suitable for the proposed use in circumstances where it is, or may have been, subject to site contamination. PO 1.1 – Ensure land is suitable for use when land use changes to a more sensitive use.	The potential contamination risk related to the construction and operation of the SRE Project is considered to be low and can be appropriately mitigated and managed in accordance with best practice to relevant Australian Standards, construction environmental management and operational control measures to relevant environmental legislation, guidelines and policies.

3.2.2 Cultural heritage

i Aboriginal heritage

Olympic Dam holds ministerial consents under the AH Act that authorise Olympic Dam Corporation to excavate land, explore for items of Aboriginal heritage and to remove or interfere with items of Aboriginal heritage in and around the SML.

BHP has undertaken due diligence with respect to cultural heritage risk assessment of Clause 28 land and proposed activities within the SRE Project electricity infrastructure ground re-profiling area (i.e. outside the Olympic Dam Area or the Stuart Shelf Area) in accordance with the requirements of the *Aboriginal Heritage Act 1988* and the outcomes of consultation with the Traditional Owners and Native Title holders.

Specifically, BHP has undertaken, and would continue to undertake:

- identification of Aboriginal cultural heritage values compiled through background research, Aboriginal consultation, archaeological field investigations and anthropological assessments
- cultural heritage surveys with the Kokatha Aboriginal Corporation (KAC), Kuyani Yartah Association (KYA) and Barngarla Determination Aboriginal Corporation (BDAC) in accordance with the Olympic Dam Agreement (ODA).

The presence of any artefacts or identified Aboriginal cultural heritage values, including landscape features, within the SRE Project will be handled in accordance with legislation and the agreed procedures and protocols for heritage management with the KAC, KYA and BDAC.

A copy of the cultural heritage assessment is provided as Section D4 of the EIS.

ii Non-indigenous historic heritage

A historic heritage (non-Indigenous) impact assessment (HHIA) undertaken for the SRE Project identified no historic archaeological sites would be impacted (EMM 2026). Table 3.4 outlining the two closest listed heritage items to the SRE Area, while Table 3.5 provides the two closest heritage places to southern portion of the EIGR Area.

Table 3.4 Historic heritage places near the SRE Project

Site name	Heritage list	Location	Distance to SRE Project	Description
Andamooka Historic Reserve (ID no. 13075)	South Australian Heritage Places (South Australian Heritage Register, (SAHR))	Andamooka	~27 km	Andamooka Historic Precinct (Historical Museum Reserve), including Frank Albertoni's house, Bob Cutzow's Dugout, Tom Brady's Dugout, Mrs Perry's Kitchen, and Andy Absalom's House.
Dick Clark's Residence (ID no. 12663)	South Australian Heritage Places (SAHR)	Andamooka	~27 km	Dick Clark's Residence, including semi-dugout living room, two detached sleep-outs and workroom, together with dry-stone walling and connecting paths.

Table 3.5 Heritage places near the EIGR Area

Site name	Heritage list	Location	Distance to Study Area	Description
Ostrich Farm (ID no. 12702)	South Australian Heritage Places (SAHR)	Port Augusta	~8 km	Former Ostrich Farm, Emeroo Station, including Original Homestead, Ruins of Hatching Shed, Exotic Plants and Ostrich Fences
Port Augusta West Water Tower (ID no. 10198)	South Australian Heritage Places (SAHR)	Port Augusta	~10 km	Water tower

The HHIA concluded that while there are no surface indications and no historical sites, there remains the low to very low to potential for subsurface historical archaeological features to be encountered during ground disturbing construction activities (i.e. unconfirmed potential impact event).

The following mitigation and management measure has been proposed to reduce the impact significance to as low as reasonably achievable:

- implement a stop works procedure for unexpected historical archaeological finds in the construction environmental management plan (CEMP).

A copy of the HHIA is provided as Appendix D4 of the EIS.

3.3 Visual amenity

A visual impact assessment (VIA) undertaken for the SRE Project concluded that impacts to visual amenity would be low given the established industrial setting of the Olympic Dam mine and is unlikely to be observed beyond 3 km of the proposed project infrastructure (EMM 2026a).

The zone of visual influence (ZVI), being areas where the SRE Project will be visible, is limited to a relatively small radius, equating to approximately 3 km distance along Olympic Dam Highway (public road) and the Borefield Road (public road).

A key mitigating factor includes the lack of sensitive receptors within the viewshed area (i.e. Roxby Downs township is approximately 15 km to the south of the SRE Project), while travellers along Olympic Dam Highway and Bosworth Road would have limited time to be impacted by the view.

No design and control measures, except for lighting for SRE Project elements, were identified in the LVIA as relevant for visual amenity.

A copy of the VIA is provided as Appendix D5 of the EIS.

3.4 Site services and infrastructure

Section 2.2.4 and Section 2.2.5 provides a summary of the key site service and infrastructure requirements for the SRE Project, while the EIS describes in detail existing Olympic Dam mine site services and infrastructure capacity and associated connection and or augmentation of utility services to accommodate the SRE Project's load demands (i.e. water, gas, electricity, wastewater, surface water drainage).

The SRE Project required site service and infrastructure connections and augmentation is not considered to introduce new or increased land use and planning impacts not envisaged and or anticipated under the Planning and Design Code. The existing zoning envisages the nature and scale of the proposed mining development to facilitate the efficient use of SML and Clause 28 land in a planned and orderly manner.

3.5 Employment land

The existing Olympic Dam Industrial Estate, located adjacent ODV, is a commercial and industrial precinct accommodating third-party contractors, logistics providers, engineering firms and mining supply companies that support BHP's OD mine operations.

The SRE Project does not propose changes or require additional industrial land within the Olympic Dam Industrial Estate. BHP will continue to engage with Roxby Downs Council and the State Government under the Indenture on the suitability of the current licencing of Crown Land comprising the Olympic Dam Industrial Estate and existing arrangements for tenants to determine suitability for enabling future supply of employment land, security of investment for tenants and infrastructure development long term.

Notwithstanding this, BHP commissioned Deloitte to undertake an Economic Impact Assessment (EIA) of the SRE Project to ensure adverse economic impacts arising from construction and operation of the development are avoided or mitigated, and net economic benefits to the region and state are created. A copy of the EIA is provided as Appendix D3 of the EIS.

3.6 Mine closure

BHP maintains a Closure Management and Rehabilitation Plan for the existing Olympic Dam operation. This plan is considered industry best practice, and would update to reflect the proposed SRE Project. As the existing plan is revised to take account of the proposed infrastructure, BHP will consult and engage with relevant government agencies and other key stakeholders to further develop and refine the closure criteria, including final land uses, rehabilitation, management and ongoing monitoring.

3.7 Assessment results

Table 3.6 presents the revised SPR assessment with respect to land use following completion of the assessment of effects.

Table 3.6 Final SPR assessment – confirmed impact events

Impact ID	Potential impact event	Receptor	Linkage	Linkage justification
SE25	Reduced rural and agricultural amenity due to presence of heavy industry of the project	Local community (social value)	No	The SRE Project is identified as being within the Remote Areas Zone of the Code (PlanSA 2023). The Desired Outcome (DO1) of Remote Areas Zone envisages a diverse range of uses, including mining and associated infrastructure with the SRE Project: • considered compatible with the scale, function, character and intensity of the existing land uses and surrounding areas • is not located in proximity to sensitive receptors • would be designed and constructed to minimise potential impacts to meet relevant environmental and amenity criteria.

3.7.1 Mitigation and management

Irrespective of the land use assessment outcome, each confirmed impact event is required to have a description of proposed management and mitigation measures applied, aimed at either breaking the SPR linkage (i.e. avoiding the impact) or otherwise reducing the impact significance to as low as reasonably achievable (ALARA).

On this basis, EMM recommend:

- implement a stop works procedure for unexpected historical archaeological finds in the CEMP – refer HHIA.

3.8 Conclusion

The SRE Project has the potential to realise synergy value and increase copper production capacity up to 650,000 tpa of total copper (plus associated products) by enabling Olympic Dam to receive, blend and smelt copper concentrates from Carrapateena and Prominent Hill mining operations, as well as possible future mining operations (e.g. Oak Dam) and other third-party suppliers.

The SRE Project is identified as being within the Remote Areas Zone of the Code (PlanSA 2023). The Desired Outcome (DO1) of Remote Areas Zone envisages a diverse range of uses, including mining and associated infrastructure.

The SRE Project:

- is considered compatible with the scale, function, character and intensity of the existing land uses and surrounding areas
- is not located in proximity to sensitive receptors
- would be designed and constructed to minimise potential impacts to meet relevant environmental and amenity criteria.

The SRE Project would not significantly impact the baseline land use environment which is characterised by the existing Olympic Dam mine and associated infrastructure (i.e. established mining industrial setting) within the SML and transmission line infrastructure within Clause 28 land.

The impacts of the SRE Project to visual amenity have been assessed as low (EMM 2026a), while future closure and rehabilitation would be managed in accordance with BHP's Closure Management and Rehabilitation Plan for the Olympic Dam operations.

No change to existing land tenure or acquisition of land is required for the proposed SRE Project.

References

ABS (Australian Bureau of Statistics) (2021a) *2021 Census All Persons QuickStats*. ABS, Commonwealth of Australia.

BHP (2023a). *Annual Environmental Protection and Management Program Report Olympic Dam, 1 July 2022-30 June 2023*.

Deloitte (2026). *Copper SA – Smelter and Refinery Expansion Economic Assessment*. Prepared for BHP.

EMM 2026, *Historic Heritage (non-Indigenous) Impact Assessment – Olympic Dam Smelter and Refinery Expansion Project*. Prepared for BHP. Dated 19 January 20265

EMM 2026a, *Visual Impact Assessment – Olympic Dam Smelter and Refinery Expansion Project*. Prepared for BHP. Dated 19 January 2026

Municipal Council of Roxby Downs (2021), Roxby Council – Strategic Plan 2021-2025. Municipal Council of Roxby Downs.

Native Vegetation Council (NVC) (2024a) *Policy for a Significant Environmental Benefit Under the Native Vegetation Act 1991 and Native Vegetation Regulations 2017*. Department of Environment and Water (Native Vegetation Branch), Government of South Australia.

Native Vegetation Council (2024b) *Guide for calculating a Significant Environmental Benefit under the Native Vegetation Act 1991 and Native Vegetation Regulations 2017*. Department of Environment and Water (Native Vegetation Branch), Government of South Australia.

NVC (Native Vegetation Council) (2024c) *Native Vegetation Council Rangelands Assessment Manual*. Prepared for NVC by the Natural Resources Group of Department of Environment and Water (Native Vegetation Branch), Government of South Australia.

PlanSA (2023) *South Australia's Online Planning and Design Code*. Government of South Australia's Department for Trade and Investment. Accessed at code.plan.sa.gov.au.

Abbreviations and acronyms

Acronym	Expansion
ALARA	As Low As Reasonably Achievable
ARR	Arid Recovery Reserve
BAU	Business-as-usual
BDAC	Barngarla Determination Aboriginal Corporation
BHP	BHP Olympic Dam Corporation Pty Ltd
CEMP	Construction Environmental Management Plan
Copper SA	Copper South Australia
DBF	Direct-to-blister flash furnace
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEW	Department for Environment and Water
DIT	Department for Infrastructure and Transport
EF	Electric slag reduction furnace
EIS	Environment Impact Statement
EPA	Environment Protection Authority
FCF	Flash-converting furnace
FIFO	Fly-in/fly-out
FNR	Far North Region
FSF	Flash-smelting furnace
GAB	Great Artesian Basin
IBRA	Interim Biogeographic Regionalisation for Australia
KAC	Kokatha Aboriginal Corporation
KYA	Kuyani Yartah Association
LGA	Local Government Area
NVC	Native Vegetation Council
NWP	Northern Water Project
ODA	Olympic Dam Agreement
ODV	Olympic Dam Village
PDI Act	*Planning, Development and Infrastructure Act 2017* (South Australia)
PMR	Precious metal refinery

Acronym	Expansion
SA	South Australia
SAAL	South Australian Arid Lands
SCM27	Scheduled Campaign Maintenance 2027
SEB	Significant Environmental Benefit
SML	Special Mining Lease
SPC	State Planning Commission
SPR	Source-pathway-receptor
SRE	Smelter and Refinery Expansion

Appendix A
Assessment requirements

EMM
creating opportunities

A.1 Assessment requirements

Land use and site condition assessment requirements and cross reference to where these are addressed in this report are outlined in Table A.1 below.

Table A.1 Assessment requirements

Environmental attributes	Reference	Assessment requirements	Cross reference
Land Tenure, Protected Areas and Land Use	LUSC1	Provide details of the existing land uses (including relevant Planning Code Overlays and Zones), land tenures and protected areas at, overlapping or adjoining the development site.	Section 3.2.1ii
Land Tenure, Protected Areas and Land Use	LUSC1	Provide details of the development (activities or structures) with the potential to impact on existing land uses, land tenures and protected areas that overlap, adjoin or are in the region of the development.	Section 3.2
Land Tenure, Protected Areas and Land Use	LUSC1	Provide details of site services and infrastructure including utility services (water, gas, electricity, sewerage disposal, wastewater, drainage, trenches or conduits); location of ground and roof plant and equipment (electricity transformers; air conditioning; solar panels etc).	Section 2.2.4, Section 2.2.5 and Section 3.4
Land Tenure, Protected Areas and Land Use	LUSC1	Determine if current licencing of Crown Land comprising the Olympic Dam Industrial Estate and existing arrangements for tenants is the most suitable for enabling suitable supply of employment land, security of investment for tenants and infrastructure development given that the current arrangements have been in place for approximately 40 years.	Section 3.5

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 2 95 North Quay
Brisbane QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2



linkedin.com/company/emm-consulting-pty-limited



emmconsulting.com.au

Appendix C8.
Traffic

Traffic Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

Prepared for BHP Olympic Dam Corporation Pty Ltd

October 2026

Traffic Impact Assessment

Olympic Dam Smelter and Refinery Expansion Project

BHP Olympic Dam Corporation Pty Ltd

October 2026

Approved by

Abdullah Uddin
Associate Traffic Engineer
1 October 2026

Level 4 74 Pirie Street
Adelaide SA 5000
ABN: 28 141 736 558

This report has been prepared in accordance with the brief provided by BHP Olympic Dam Corporation Pty Ltd and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purposed for which it has been provided. Except as permitted by the *Copyright Act 1968* (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to BHP Olympic Dam Corporation Pty Ltd (and subject to the terms of EMM's agreement with BHP Olympic Dam Corporation Pty Ltd).

© EMM Consulting Pty Ltd, Level 10, 201 Pacific Highway, St Leonards NSW 2065. 2026.
ABN: 28 141 736 558

Executive Summary

ES1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the far north of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd and Lathwida Environmental Pty Ltd (EMM-Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM was commissioned by BHP to undertake a traffic impact assessment (TIA) related SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline traffic environment and conditions (baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to the surrounding road network as a result of the SRE Project (assessment of effects in Chapter 3 of this report)
- quantify the likely impacts resulting from the predicted change to baseline traffic and transport during construction and operation on identified receptors (impact assessment in Chapter 4 of this report).

This TIA considers the worst-case construction scenario (SRE Project – Stage 2 construction and Stage 1a and 1b operation, July 2037) and the worst-case operation scenario (SRE Project – Stage 1a, 1b and Stage 2 operation, April 2039). The construction traffic is temporary while the operation traffic will be ongoing and includes the existing Olympic Dam mine and Stage 1a, 1b and Stage 2 operation of the SRE Project.

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

ES2 Baseline environment

The SRE Project is located on the far north of South Australia, approximately 580 kilometres (km) north of Adelaide and 15 km north of Roxby Downs, with access via the Olympic Dam Highway to the existing mine site. The project is serviced by internal and proposed new access roads, with public access restricted at the mine's main entrance. The Olympic Dam airport is located 6 km south of the mine site. The site includes two permanent accommodation villages, Olympic Dam Village (ODV) and Olympic Dam Village South[1] (ODS), adjacent to the Special Mining Lease (SML), and a temporary construction camp. Another accommodation village, Roxby Downs Village (RDV), is located within the Roxby Downs township. Currently, approximately 90% of BHP staff and contractors reside at ODV and RDV, with 10% living in individual houses in Roxby Downs.

Olympic Dam Highway, Olympic Dam Way, Stuart Highway and Augusta Highway, all State-managed arterial roads, serve the SRE Project. These roads are currently in good condition and have sufficient capacity for heavy vehicles, including road trains. Olympic Dam Way connects Roxby Downs to the existing Olympic Dam mine site, with restrictions in place to divert mine-related vehicles away from the township via Olympic Dam Highway which links Stuart Highway to Roxby Downs township. Augusta Highway provides the main connection from Stuart Highway to Adelaide. Two key intersections near Roxby Downs are priority-controlled and primarily handle Olympic Dam mine-related traffic. A priority-controlled seagull intersection near Port Augusta provides access from Stuart Highway towards Adelaide. All intersections are well-maintained with safety measures, such as dedicated turning lanes, line marking, rumble strips and adequate signage.

[1] ODS is currently in 'care and maintenance' and not occupied by BHP staff or contractors.

Traffic volumes are moderate on the Olympic Dam Highway, low on Olympic Dam Way, moderate on Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection), low on Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection), high on Stuart Highway (within the Port Augusta township), very high on Augusta Highway (within the Port Augusta township) and high on Augusta Highway (south-east of Port Augusta), with heavy vehicles forming a significant proportion of traffic. The largely transient population within the Roxby Downs Council area, along with the absence of populated areas around Pimba (noting Woomera also has a transient population), and the lack of a clear long-term upward growth trend in Port Augusta, despite being a larger and more stable population centre, minimises the potential for long-term traffic growth within the road network.

Between 2019 and 2023, 21 crashes were reported near the SRE Project, which is considered low for a significant stretch of road. Furthermore, no heavy vehicles were involved in these incidents, and none of the crashes were attributed to existing road deficiencies. Consequently, the road network adjacent to the site can generally be regarded as safe, with a low crash history and no major road safety issues identified.

The area is not serviced by public transport or active transport infrastructure consistent with its regional setting.

Two at grade railway level crossings are located along the haulage route south of the SRE Project. One crossing is located on Olympic Dam Highway at Pimba, approximately 100 km south of the SRE Project site and 950 metres (m) north of the Stuart Highway intersection, providing adequate road storage for queuing vehicles. The second crossing is located on Stuart Highway at Kootaberra, approximately 215 km south of the SRE Project site and 1 km north of Yudnapinna Road, also providing adequate road storage for queuing vehicles.

The first at grade railway level crossing is equipped with boom gates and flashing lights. The second crossing is controlled by only flashing lights. Both crossings serve both freight and passenger trains. On average, around 12 freight trains (up to 1,800 m long) pass through Pimba and Kootaberra daily, with approximately two operating during each road peak period (i.e. 8:00 am to 9:00 am and 5:00 pm to 6:00 pm). Passenger services, including The Ghan and the Indian Pacific (600 m long), operate seven times per week.

ES3 Assessment of effects

A preliminary identification of potential impact events was undertaken, identifying six traffic and transport related events for the SRE Project. An assessment of effects was undertaken, focusing on the below:

- SRE Project construction related traffic, which results in an increase in heavy vehicle traffic, including oversized and restricted movements.
- For the purpose of this TIA, construction traffic comprises oversize and overmass (OSOM) modules assumed to be up to 25 m long, 3.5 m wide and 5 m high (i.e. within the Heavy Vehicle National Law and associated regulations). This TIA is seeking endorsement of using these OSOM vehicles which are under the Heavy Vehicle National Law and associated regulations as part of the SRE Project.
- Any additional OSOM greater than 25 m long, 3.5 m wide and 5 m high would be subject to a separate detailed OSOM assessment and approval from the Department for Infrastructure and Transport (DIT) and the National Heavy Vehicle Regulator (NHVR).
- SRE Project operation related traffic, resulting in an increase in heavy vehicle traffic.

Baseline traffic surveys were undertaken at the following key intersections within the Municipal Council of Roxby Downs (sensitive receptor):

- Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs).
- Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs).

Traffic count data has also been analysed for the Stuart Highway/Olympic Dam Highway and the Augusta Highway/Eyre Highway/Stuart Highway intersections, supporting the traffic volume assessment of the road network at these locations.

The results indicating that the baseline traffic environment operates well within capacity achieving Level of Service (LOS) A (good operation) at all intersections.

ES4 Impact assessment

This TIA has been prepared in accordance with Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments, 2020 and the DIT SA Guideline for the preparation of a Traffic Impact Statement (Version 5), 2023.

The potential traffic impact events were assessed to quantify the likely significance of the impact against the SRE Project's Environmental Impact Assessment Framework (EIAF) impact significance criteria. All six confirmed impact events were determined to be Level 1 (not significant) or Level 2 (not significant).

The TIA concluded the following regarding SRE Project construction and operation traffic:

- The Olympic Dam Highway/Olympic Dam Way intersections, Stuart Highway/Olympic Dam Highway intersection, along with the Augusta Highway/Eyre Highway/Stuart Highway intersection, can effectively accommodate SRE Project traffic volumes associated with both construction and operation, including assumed oversized and restricted movements, without significantly impacting performance.

- Olympic Dam Highway, Olympic Dam Way, Stuart Highway and Augusta Highway can effectively accommodate SRE Project traffic volumes associated with both construction and operation without significantly increasing the likelihood of traffic accidents (i.e. impacting public health and safety).

- SRE Project traffic volumes associated with both construction and operation would not results in significant increases in travel time, impacting existing social values (i.e. amenity).

- The at grade railway level crossings at Pimba along Olympic Dam Highway and Kootaberra along Stuart Highway can effectively accommodate SRE Project traffic volumes associated with both construction and operation, including assumed oversized and restricted movements, without significantly impacting Olympic Dam Highway (i.e. causing traffic queues due to passing trains).

Irrespective of this outcome, the following mitigation and management measures have been identified that may be implemented to reduce the impact significance to as low as reasonably achievable (ALARA):

- Implement a Construction Traffic Management Plan (CTMP) to ensure the safety of all workers and road users within the vicinity of the SRE Project.

  BHP will undertake a pre-condition visual pavement assessment of Olympic Dam Highway and Olympic Dam Way prior to the commencement of construction and operational haulage activities associated with the SRE Project. This assessment will establish the existing pavement condition along these portions of the haulage route[2] and provide a baseline for monitoring any changes during the construction and operational phases of the SRE Project.

[2] Stuart Highway and Augusta Highway are major arterial roads that carries a substantial proportion of through traffic and high proportion of heavy vehicles (Section 2.5). Furthermore, it is noted that the Pimba rail line is assumed to be utilised where feasible for freight transport to the SRE Project, however this has not yet been quantified for the construction phase and therefore has not been assessed for the 2037 Stage 2 Construction scenario (Hatch Fluor 2025). For the purpose of this TIA is has been assumed that all Stage 2 construction traffic would be via road (i.e. worst-case scenario) (Section 3.3.4).

- Address any complaints relating to traffic and transport to ensure active and positive community consultation with local residents impacted by the SRE Project.
- OSOM greater than 25 m long, 3.5 m wide and 5 m high would be subject to separate detailed OSOM assessment and approval from the DIT and the NHVR.
- Implement an Operational Traffic Management Plan (OTMP) to outline all relevant site and locality road safety and traffic management measures.

The construction and operation of the SRE Project would not significantly impact Olympic Dam Highway, Stuart Highway or Augusta Highway traffic volumes and/or public health and safety.

Should minor upgrades to the road network due to oversize and restricted movements be required as part of secondary permitting, DIT, being the body responsible for the construction, safe and efficient operation, and maintenance of the road system, and any affected local Council would be consulted accordingly.

TABLE OF CONTENTS

Executive Summary **ES.1**

1 Introduction **1**

1.1 Project area definitions 1

1.2 Regulatory context 2

1.3 Scope of this report 4

1.4 Project description 4

2 Baseline condition assessment **13**

2.1 Site location and access 13

2.2 Accommodation villages 13

2.3 Road network 15

2.4 Key intersections 22

2.5 Existing traffic volumes 27

2.6 Crash analysis 35

2.7 Public transport 37

2.8 Airport 37

2.9 Active transport 37

2.10 Railway level crossing 37

2.11 Conclusion 38

3 Assessment of effects **40**

3.1 Potential impact events 40

3.2 Assessment of effects 42

3.3 Construction 42

3.4 Over size over mass (OSOM) vehicles during construction 50

3.5 Operations 56

3.6 Growth of background traffic 69

3.7 Projected traffic volumes 70

3.8 Conclusion 71

4 Impact assessment **73**

4.1 Confirmed impact events 73

4.2 Impact significance criteria 73

4.3 Impact assessment 75

4.4 Road design standards 82

4.5 Impact assessment 93
4.6 Management and mitigation 96
5 Conclusion 98
References 101
Abbreviations and acronyms 102

Tables

Table 1.1 Project stages and timing 5
Table 1.2 Key characteristics of the SRE Project 7
Table 2.1 Olympic Dam Highway (B97) 18
Table 2.2 Olympic Dam Way 19
Table 2.3 Stuart Highway (A87) 20
Table 2.4 Augusta Highway (A1) 21
Table 2.5 Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs) 23
Table 2.6 Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs) 24
Table 2.7 Stuart Highway/Olympic Dam Highway intersection (Pimba) 25
Table 2.8 Augusta Highway/Eyre Highway/Stuart Highway intersection (Port Augusta) 26
Table 2.9 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (north of Roxby Downs) 29
Table 2.10 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (south of Roxby Downs) 29
Table 2.11 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Way 30
Table 2.12 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (Pimba) 30
Table 2.13 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection) 31
Table 2.14 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection) 31
Table 2.15 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (within Port Augusta township) 32
Table 2.16 SA Gov Location SA Map Viewer daily traffic volumes – Augusta Highway (within Port Augusta township) 33
Table 2.17 SA Gov Location SA Map Viewer daily traffic volumes – Augusta Highway (south-east of Port Augusta) 33
Table 2.18 Intersection peak hours 34
Table 2.19 Crash data summary on the road network 36
Table 2.20 Distribution of westbound and eastbound passenger and freight trains at Pimba and Hesso 38
Table 3.1 Preliminary SPR assessment – potential impact events 41
Table 3.2 Construction traffic volumes 44

Table 3.3	Peak hour movement distribution (July 2037, SRE Project – Stage 2 construction)	44
Table 3.4	Peak hour movement distribution (July 2037, SRE Project - Stage 1a and Stage 1b operation)	47
Table 3.5	Over size over mass vehicle movements	51
Table 3.6	Oversized load categories	51
Table 3.5	Outcome of the preliminary OSOM assessment	53
Table 3.6	Operation deliveries – Peak daily truck trips (commodities)	60
Table 3.7	Operation deliveries – Peak daily road/rail trips (consolidated)	61
Table 3.8	Operation deliveries – Peak hour truck trips	62
Table 3.9	Operation personnel – Peak daily light vehicle trips	62
Table 3.10	Operation personnel – Peak hour light vehicle trips	62
Table 3.11	Peak hour movement distribution (April 2039, SRE Project – Stage 1a, 1b and 2 operation)	63
Table 3.12	Estimated resident population – Roxby Downs	69
Table 3.13	Census data – Woomera	69
Table 3.14	Census data – Port Augusta	69
Table 3.15	Final SPR assessment – confirmed impact events	72
Table 4.1	Consequence definitions and significance determination	74
Table 4.2	Intersection LOS standards	75
Table 4.3	SIDRA modelling result for Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs)	76
Table 4.4	SIDRA modelling result for Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs)	77
Table 4.5	Average daily traffic volume increase on Olympic Dam Highway and Olympic Dam Way	78
Table 4.6	Austroads road design for rural road (sealed)	82
Table 4.7	Baseline and future daily traffic volumes and design standards compliance	83
Table 4.8	Urban arterial road widths	84
Table 4.9	Peak hour traffic volumes at Olympic Dam Highway (Pimba)	90
Table 4.10	Pimba level crossing queuing assessment (Austroads)	90
Table 4.11	Pimba level crossing queuing assessment (SIDRA)	91
Table 4.12	Peak hour traffic volumes at Stuart Highway (Kootaberra)	91
Table 4.13	Kootaberra level crossing queuing assessment (SIDRA)	92
Table 4.14	Significance assessment of confirmed impact events	94
Table H.1	Assessment requirements	H.1

Figures

Figure 1.1	SRE Project Area - regional locality	10
Figure 1.2	SRE Project Area - SML Area	11
Figure 1.3	SRE Project Area - EIGR Areas	12

Figure 2.1	Site layout	14
Figure 2.2	Road network and traffic characteristics	16
Figure 2.3	Functional Hierarchy of road network	17
Figure 2.4	SA Gov Location SA Map Viewer traffic volume estimates	28
Figure 2.5	2024 existing peak hour traffic volumes	35
Figure 3.1	Proposed construction delivery route	45
Figure 3.2	Proposed construction delivery route (within vicinity of Olympic Dam and Roxby Downs township)	46
Figure 3.3	2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Roxby Downs)	48
Figure 3.4	2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Pimba)	49
Figure 3.5	2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Port Augusta)	49
Figure 3.6	Construction OSOM (Preferred Route)	54
Figure 3.7	OSOM approved roads (25 m 59.5 t low loader)	55
Figure 3.8	Example of 18 Axle BAB-Quad	57
Figure 3.9	Pimba Intermodal Terminal to Olympic Dam mine site route	58
Figure 3.10	Operation delivery route (copper concentrate)	64
Figure 3.11	Operation delivery route (other commodities)	65
Figure 3.12	Operation delivery and personnel route (within vicinity of Olympic Dam mine and Roxby Downs)	66
Figure 3.13	2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Roxby Downs)	67
Figure 3.14	2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Pimba)	68
Figure 3.15	2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Port Augusta)	68
Figure 3.16	2037 baseline + construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) peak hour intersection volumes	70
Figure 3.17	2039 baseline + operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes	71
Figure 4.1	Austroads warrant design charts for high-speed rural intersection turning lanes	81
Figure 4.2	Austroads warrant design chart for rural intersection left turning lane to Olympic Dam Highway (east leg) during operation period (SRE Project – Stage 1a, 1b and 2)	82
Figure 4.3	Sight distance to the left and right of Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs)	85
Figure 4.4	Sight distance to the left and right of Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs)	86
Figure 4.5	Sight distance to the left and right of Stuart Highway/Olympic Dam Highway intersection	87

Figure 4.6 Sight distance to the left and right of Augusta Highway/Eyre Highway/Stuart Highway intersection 88
Figure 4.7 Kangaroo warning sign 89

1 Introduction

BHP Olympic Dam Corporation Pty Ltd (BHP) is proposing to develop the Smelter and Refinery Expansion Project (SRE Project) at the Olympic Dam mining operations, in the far north of South Australia (SA) (Figure 1.1).

EMM Consulting Pty Ltd and Lathwida Environmental Pty Ltd (EMM–Lathwida) are preparing an Environmental Impact Statement (EIS) for the SRE Project in accordance with EIS assessment requirements and Practice Direction 17 Impact Assessed Development under the *Planning, Development and Infrastructure Act 2016* (PDI Act) (SA).

EMM was commissioned by BHP to undertake a traffic impact assessment (TIA) of the proposed construction and operation related SRE Project activities to:

- determine if the activities have the potential to result in changes to the baseline traffic environment and conditions (baseline condition assessment in Chapter 2 of this report)
- determine the likely magnitude of the change to the surrounding road network as a result of the SRE Project (assessment of effects assessment in Chapter 3 of this report)
- quantify the likely impacts resulting from the predicted change to baseline traffic volumes during construction and operation on identified receptors (impact assessment in Chapter 4 of this report).

This TIA considers the worst-case construction scenario (SRE Project – Stage 2 construction and Stage 1 operation, December 2034) and the worst-case operation scenario (SRE Project – Stage 1 and Stage 2 operation, May 2037). The construction traffic is temporary while the operation traffic will be ongoing and includes the existing, Stage 1 and Stage 2 operation of the SRE Project.

This report supports the EIS, which will be submitted to the Government of South Australia's Minister for Energy and Mining as the relevant Minister for the SRE Project under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

1.1 Project area definitions

To maintain consistency throughout the EIS and supporting technical assessments, the following terminology related to project infrastructure have been defined for the SRE Project where the **SRE Project Area** is defined at the boundary around the SRE Project for which BHP is seeking approval, including:

- **Special Mining Lease (SML) Area**, located within the SML (Figure 1.2), which is further delineated by the following areas:
    - **SRE Area**: the extent of the proposed SRE Project infrastructure required for construction and operation of the SRE Project within the SML. Includes the existing brownfield plant area, proposed facility relocation(s), proposed plant and laydown areas.
    - **General Infrastructure Area**: the extent of the proposed ancillary infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed infrastructure laydown areas, proposed stormwater dam location, proposed topsoil and subsoil storage areas.
    - **Water Infrastructure Area**: the extent of the proposed water infrastructure and ancillary activities required for construction and operation within the SML. Includes the proposed water pipeline and water storage dam locations.

- **Electricity Infrastructure Ground Re-Profiling Area (EIGR Area)**: the extent of the isolated proposed vegetation disturbance required to maintain regulatory clearance distances between the 275 kilovolt (kV) transmission line and the ground surface within Clause 28 land. It is noted that the transmission line and infrastructure are already in place, but additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging and therefore changes to existing clearance distances to enable safe operation (Figure 1.3).

1.2 Regulatory context

The SRE Project was declared an Impact Assessed development pursuant to section 108(1)(c) and 108(7) of the PDI Act on 29 August 2024. The declaration reflects the nature, scale and significance of the SRE Project to SA.

Impact Assessed Development is the most rigorous level of development assessment prescribed under the PDI Act.

Specifically, the Minister made the following declaration:

> Pursuant to Section 108(1)(c) and Section 108(7) of the Planning Development and Infrastructure Act 2016, having taken into account those principles prescribed under Regulation 27(2) of the Planning, Development and Infrastructure (General) Regulations 2017 (the Regulations) and having given consideration to the matters under Regulation 27(3) of the Regulations, I declare that all development of a kind specified in the Schedule to this Notice, to the extent that it is undertaken on land identified in Clause 28(1) of the Indenture as impact assessed development and that references to "development" include a project.

The majority of the SRE Project activities, with the exception of ground re-profiling within the Electricity Infrastructure Area, would be located wholly within the existing SML but does not include business-as-usual (BAU) operations (operations which enable existing approved production of up to approximately 200,000 tonnes per annum (tpa) total copper production) or activities associated with scheduled campaign maintenance 2027 (SCM27) works. These activities are subject to separate regulation (e.g. Environment Protection Authority (EPA) licensing) and approval. The SRE Project may also be supported by low impact development outside the SML, which could include, for example, minor road works and upgrades to accommodation infrastructure. It is proposed that any approvals required for these activities would be sought on an as-needs basis under applicable legislation and guidelines.

1.2.1 Planning Development and Infrastructure Act 2016 (SA)

Development approval is required for the SRE Project under the PDI Act. The PDI Act established a new development assessment system in SA to streamline the assessment process. The PDI Act is supported by subordinate regulations, as well as practice directions and guidelines which are issued by the State Planning Commission, the state's independent principal planning body.

A key feature of the new planning system is the Planning and Design Code (the Code) which contains a single set of planning policy, rules and classifications for SA, which is applied spatially via mapping. The Code establishes a performance-based approach to planning and development assessment by including policies that address the scale, form and design of built structures and the contextual setting of the development.

The planning system established by the PDI Act includes five assessment pathways; accepted development, code assessed development (deemed-to-satisfy or performance assessed) and impact assessed development (restricted and impact assessed). As previously stated, impact assessed development is the most rigorous level of development assessment prescribed under the PDI Act.

i Ministerial declaration – impact assessment development

The declaration subjects the SRE Project to an EIS process requiring detailed environmental, social and economic assessment.

A Scoping Application was prepared by BHP to inform the development of EIS Assessment Requirements by the State Planning Commission (SPC). The EIS Assessment Requirements issued by the SPC summarise all potential issues needing to be addressed by BHP and highlight any further information required by the Minister to enable a proper assessment of the proposed SRE Project.

Due to the operation of the *Roxby Downs (Indenture Ratification) Act 1982*, the Minister for Energy and Mining is the relevant Minister for the SRE Project.

Specific Assessment Requirements for traffic and transport (Appendix G) are as follows:

- A TIA should be prepared by a suitably qualified traffic and access engineer, evaluating current and proposed access arrangements including the effect on the arterial road network and car parking, and vehicle interface with the local road network. Any assessment must address implications for the entire supply chain and the traffic and access impact for the construction, operation, maintenance and decommissioning phases.

- The assessment should determine the transport system asset improvements, asset management / maintenance requirements, and operational management requirements to accommodate the increase in movements and/or vehicle sizes/mass for affected transport assets and services across all modes for the proposal's construction/implementation and operational phases. The assessment should provide where relevant:

    - a summary of the transport task for the development (including workforce and end-to-end supply chain (input and output)) during all phases of the development. This should address predicted traffic volumes, proposed vehicle types, number/frequencies, hours of activity and traffic peaks, any requirements that are outside of the current gazetted heavy vehicle networks, and any measures required to ensure compliance with the 'Heavy Vehicle National Law'

    - a description of the existing local and regional transport and traffic environment (using traffic data, accident statistics) and include (where relevant) public transport networks, car parking, school bus routes, and public pedestrian, cycle pathways or trails

    - any operational management measures to minimise delays and ensure safety for other transport users (e.g. temporary road closures/detours), including transport of plant and equipment to/from the site

    - requirements for temporary or permanent modifications to roads or rail infrastructure (including rail crossings and bridges), upgrades to road surfaces, access on arterial and/or local roads and car parking as a result of the development including any increase (temporary or ongoing) in maintenance requirements of transport assets

    - any management measures for transport of hazardous materials, especially where using the Stuart Highway and the Eyre Highway

    - how identified impacts to transport and access will be mitigated. Mitigation strategies may include works, contributions or other strategies that can be documented in a traffic management plan. Strategies must be prepared in close consultation with relevant transport authorities, including local government.

Consideration should be given to the implications for the road network through and around Port Augusta, especially the Joy Baluch AM Bridge and the Yorkeys Crossing bypass Guidelines for preparation of the traffic impact assessment.

This TIA has been prepared in accordance with:

- *Austroads Guide to Traffic Management,* Part 12 (Integrated Transport Assessments for Developments), 2020
- DIT, *Guideline for the preparation of a Traffic Impact Statement* (Version 5), 2023.

1.3 Scope of this report

This TIA incorporates the following investigations and analysis:

- A description of the existing traffic and transport environment in the locality of the SRE Project.
- An assessment of the traffic volumes at the surrounding road network.
- An assessment of the forecast traffic generation during various stages of construction (including oversize and overmass (OSOM) vehicles) and operation of the SRE Project.
- An assessment of the potential impacts of the project on the external road network and site access intersection.
- Recommendations on minimising and managing potential traffic impacts.

1.4 Project description

The objective of the SRE Project is to expand BHP's smelter and refinery capacity, enabling the Copper SA growth plan by:

- increasing copper production capacity up to 650,000 tpa of total copper plus associated products from the current average production of approximately 200,000 tpa
- delivering a sustainable, highly productive, and more resilient smelting and refining flowsheet
- ensuring the Cu: S ratio is resolved at Olympic Dam for copper concentrate production
- delivering reliable and predictable production outcomes following the 2023 acquisition of OZ Minerals' Carrapateena and Prominent Hill mining operations to realise Copper SA province opportunities.

Key elements of the SRE Project are:

- expansion of, and additions to, the existing smelter and refinery to enable total production of up to 650,000 tpa copper plus associated products
- introduction of a two-stage smelting involving the installation of a new primary flash smelting furnace (FSF) to produce copper matte, adding material smelting capacity
- conversion of the existing direct-to-blister flash furnace (DBF) to a flash-converting furnace (FCF), which would process the matte into blister
- addition of an acid plant of similar nature and scale to the existing acid plant and subsequent upgrade of the existing acid plant

- expansion of the electrorefinery and precious metals recovery facilities to produce cathode copper, gold, and silver.

Associated with these key elements, the SRE Project would require new supporting facilities, infrastructure and services and the upgrade, removal and/or relocation of existing facilities and services within the SML Area (Figure 1.2).

External to the SML Area, electricity would be supplied to the SRE Project through the existing 275 kV line from Davenport substation (near Port Augusta) to Olympic Dam mine, located within Clause 28 land[3] (EIGR Areas). Whilst the transmission line and infrastructure are already in place, additional electricity loads required for the SRE Project will result in increased transmission line temperature and more pronounced line sagging, reducing the existing electrical clearances that are required to enable safe operation. The maintenance of the required electrical clearances between the 275 kV line and the ground surface would necessitate isolated areas of land disturbance and associated vegetation clearance (Figure 1.3).

The SRE Project would be constructed and operated in a staged manner to enable production capacity up to 650,000 tpa of total copper and associated products, with stages detailed in Table 1.1.

This technical assessment has been prepared based upon the maximum potential impacts associated with Stage 2 (i.e. the greatest impact scenario) to ensure that the full extent of all potential impacts is identified and assessed.

The indicative location of key infrastructure is shown in Figure 1.2 and Figure 1.3, while the key project characteristics are outlined in Table 1.2.

Table 1.1 Project stages and timing

Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
Stage 1a	1,100,000	Stage 1a includes: • an increase of smelter throughput to approximately 1,100,000 tpa of concentrate producing an output of approximately 390,000 tpa of total copper • a new regional concentrate receiving, handling and blending facility • upgrade and expansion of the existing smelter feed preparation, including additional concentrate storage, blending and a new steam dryer • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to an FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure and decommissioning of the existing electric slag reduction furnace (EF) if required • Expansion of the brownfield slag concentrator supported by FSF slag cooling pits, a new interim slag stockpile and associated environmental management infrastructure • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant, additional acid storage, and an associated acid loading station to allow the export of acid • a new electrorefinery and associated anode preparation infrastructure • a new slimes treatment plant • expansion of the precious-metals refinery (PMR) facility	2028 to 2032

3 Clause 28 land as defined under the *Roxby Downs (Indenture Ratification) Act 1982* (SA).

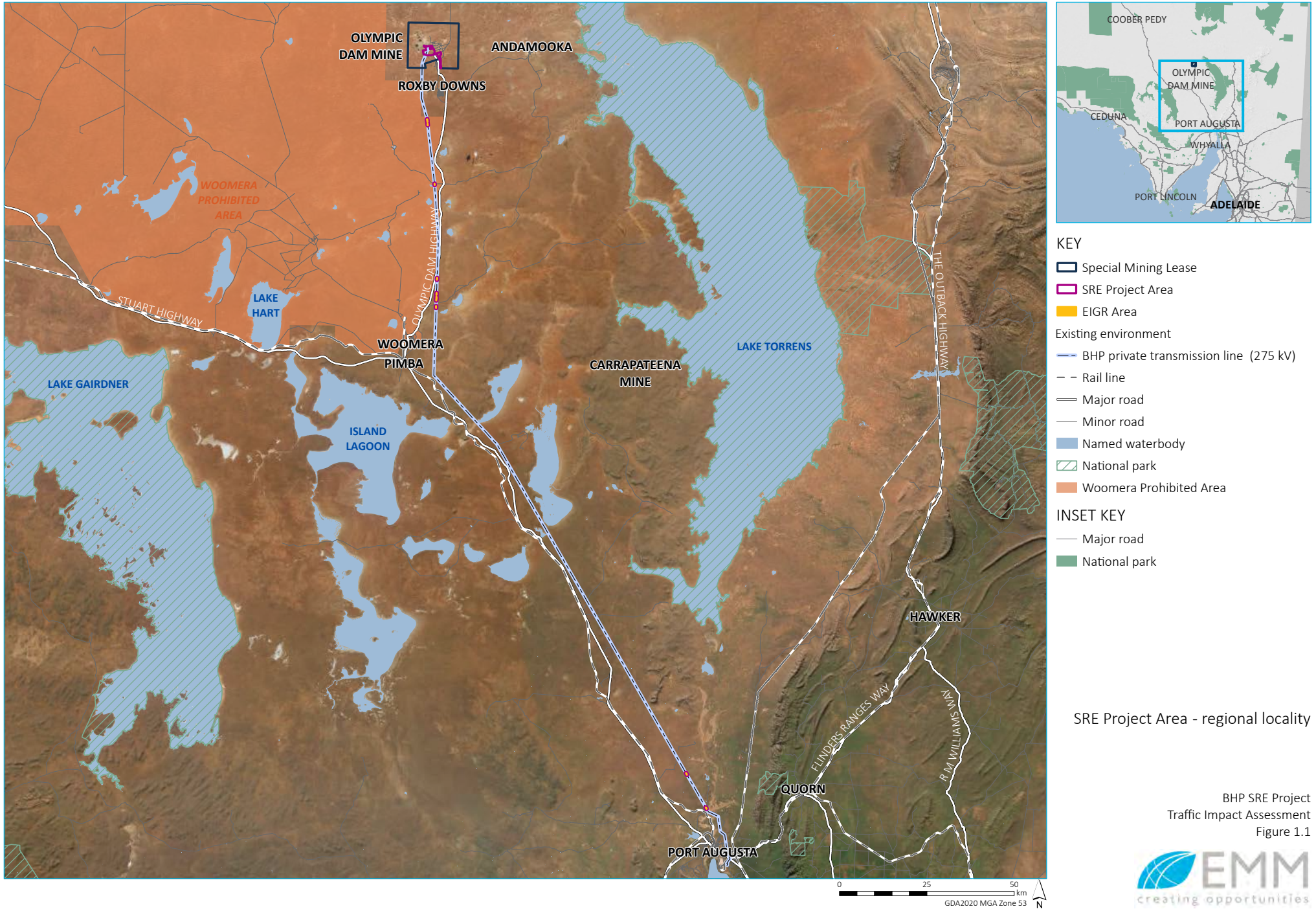
Stage	Smelter concentrate throughput (tpa)	Description	Anticipated timing
Stage 1b	1,400,000	Stage 1b includes: • an increase in smelter throughput to approximately 1,400,000 tpa of concentrate producing an output of approximately 500,000 tpa of total copper • installation of additional concentrate leach thickening and filtration infrastructure • development of greenfield slag concentrator and associated stockpile and decommissioning of brownfield slag concentrator • incremental expansion of Stage 1a infrastructure and services, including: – the installation of additional electrorefinery modules – expansion of feed preparation, FCF feed system (including lime addition), off-gas management, acid plant, slimes treatment and PMR capacities	2032 to 2036
Stage 2	2,000,000	Stage 2 includes: • an increase in smelter throughput to approximately 2,000,000 tpa of concentrate producing an output of approximately 650,000 tpa of total copper • installation of new concentrate leach circuit for treatment of imported concentrate • incremental expansion of Stage 1b infrastructure and services, including: – the installation of additional electrorefinery modules – the installation of an additional anode furnace and associated off-gas management infrastructure – expansion of feed preparation, FSF and FCF feed systems, off-gas and slag management, acid plant, slimes treatment and PMR capacities	2038 to closure

Table 1.2 Key characteristics of the SRE Project

Project element	Summary
Smelter and refinery expansion and additions	Expansion of, and additions to, the existing smelter and refinery to enable production of up to 650,000 tpa copper plus associated products (gold, silver, and acid). This would include: • a new concentrate handling and blending facility • additional concentrate leach capacity • upgrade and expansion of the existing smelter feed preparation • installation of a new primary FSF to produce copper matte and conversion of the existing DBF to a FCF to convert matte to blister, including additional anode furnace and anode casting infrastructure • upgrade of the existing slag concentrator circuit and subsequent development of a new slag concentrator circuit • new off-gas management infrastructure, including additional gas and dust handling equipment • a new acid plant and upgrade of the existing acid plants • a new electrorefinery and associated infrastructure • a new slimes treatment plant • expansion of PMR facility • slag stockpile and treatment.
Electricity demand, supply and distribution	An electricity demand of up to 68 mega volt-amperes (MVA) net load increase would be required for the SRE Project. The additional electrical demand due to the SRE Project would be met by capacity from the national grid via the existing 275 kV transmission line (noting potential for below line land disturbance and associated vegetation clearance outside of the SML). Minor augmentation of existing onsite electricity supply infrastructure at Olympic Dam within the SML would be to ensure the additional capacity could be achieved and maintained. New high voltage and low voltage power supply and reticulation infrastructure would be required to all smelter infrastructure.
Water demand	Water demand of between 2 and 16 megalitres per day (ML/day) required for the SRE Project in addition to the existing supply for current operations.
Water supply and distribution	The SRE Project proposes no additional water abstraction from the Great Artesian Basin (GAB) above daily average BAU volumes. Water supply for the SRE Project would nominally be provided from the Department for Infrastructure and Transport (DIT) Northern Water Project (NWP) infrastructure, following commissioning of the initial 90 ML/d capacity of the NWP. This would require new water storage and distribution infrastructure to connect the SRE Project to the NWP connection point at the SML boundary. The NWP water supply may be supplemented or offset by the provision of local groundwater supply (subject to further approvals). This water supply would occur via existing process storage dams, the desalination plant at the Olympic Dam site, and/or through the distribution of the existing water supply within daily average BAU volumes. The additional water supplies are likely to require augmentation of the existing desalination water treatment plant and water distribution network, and a demineralised water plant will be required to support the SRE Project operations.
Supporting infrastructure	Supporting infrastructure includes: • civil infrastructure works, such as roads and stormwater infrastructure • new offices and crib rooms • new workshops • new laydown areas • process control system upgrades • concrete batching • other supporting infrastructure as required to facilitate the implementation and operation of the SRE Project.

<table>
<tr><th>Project element</th><th>Summary</th></tr>
<tr><td>Waste management</td><td>Development of the SRE Project may require decommissioning of the existing processing plant components including dryers, the electric furnace and the existing concentrate storage and transfer system. Some of the decommissioned infrastructure would be retained in-situ to preserve operational flexibility or for future management under the site Closure Management and Rehabilitation Plan, however some elements may require disposal as a component of the SRE Project.
Waste generated during construction would be managed as follows:
• Where practicable, demolition materials would be removed from site and recycled.
• Materials not suitable for removal from site would be managed on the SML via existing waste management facilities.
All waste generated from construction of the SRE Project would be managed in accordance with existing site procedures and approved management plans.
Operational wastes associated with the SRE Project consist of processing and non-processing wastes where:
• processing wastes are limited to low-copper slags generated from the smelting and slag concentrator operations that are not suitable for reprocessing and effluent streams from various process operations that are directed to tailings, including from the PMR and smelter off-gas systems
• non-processing wastes including reagent packaging wastes and operational consumables</td></tr>
<tr><td>Workforce</td><td>100% fly-in/fly-out (FIFO) workforce is assumed for construction and the SRE Project operational workforce. Estimated peak construction workforce numbers (in full time equivalents (FTE)) are summarised below.
<table>
<tr><th>Construction stage</th><th>Average FTE</th><th>Peak FTE</th></tr>
<tr><td>Stage 1a</td><td>~708</td><td>~1,313</td></tr>
<tr><td>Stage 1b</td><td>~260</td><td>~515</td></tr>
<tr><td>Stage 2</td><td>~519</td><td>~978</td></tr>
</table>
Following construction, the SRE Project would require the permanent operational workforce summarised below.
<table>
<tr><th>Operational stage</th><th>Additional SRE Project operational workforce</th><th>Total Olympic Dam Smelter and Refinery workforce</th></tr>
<tr><td>Stage 1a</td><td>~207</td><td>766</td></tr>
<tr><td>Stage 1b</td><td>~57 (additional to Stage 1a)</td><td>823</td></tr>
<tr><td>Stage 2</td><td>~244 (additional to Stage 1b)</td><td>1,067</td></tr>
</table>
SRE Project construction and operational workforce is proposed to utilise existing and new accommodation to be established by BHP for the scheduled campaign maintenance 2027 (SCM27) shutdown, Olympic Dam future campaign maintenance accommodation, and/or greenfield accommodation (subject to separate approvals).</td></tr>
<tr><td>Concentrate import</td><td>Import of copper concentrate from Prominent Hill and Carrapateena mining operations, as well as possible future mining operations (e.g. Oak Dam), and maintain the ability to receive copper concentrate from other third-party suppliers.
Prominent Hill concentrate may be passed through concentrate leach to remove fluorides prior to smelter feed preparation. Carrapateena concentrate to pass directly to smelter feed preparation. Other, third-party concentrates may be passed through concentrate leach to remove deleterious elements (e.g. fluorides) prior to smelter feed preparation as required.</td></tr>
</table>

Project element	Summary
Production and export	Total production volumes of up to: • ~650,000 tpa of cathode copper • ~893,000 ounces per annum of gold • ~3,950,000 ounces per annum of silver • ~4,900 tpa of uranium oxide concentrate; note that the SRE Project does not materially change existing uranium production, with an increase of approximately 1% expected as a result of the leaching of Prominent Hill concentrate to remove fluoride. No upgrade or modification of uranium production facilities is proposed as a part of the SRE Project) • ~1,700,000–1,900,000 tpa of 98% sulphuric acid (H_2SO_4), of which up to approximately 810,000 tpa may be exported from Olympic Dam (i.e. operations become 'net' sulphuric acid producer).



KEY

- Special Mining Lease
- SRE Project Area
- EIGR Area

Existing environment

- BHP private transmission line (275 kV)
- Rail line
- Major road
- Minor road
- Named waterbody
- National park
- Woomera Prohibited Area

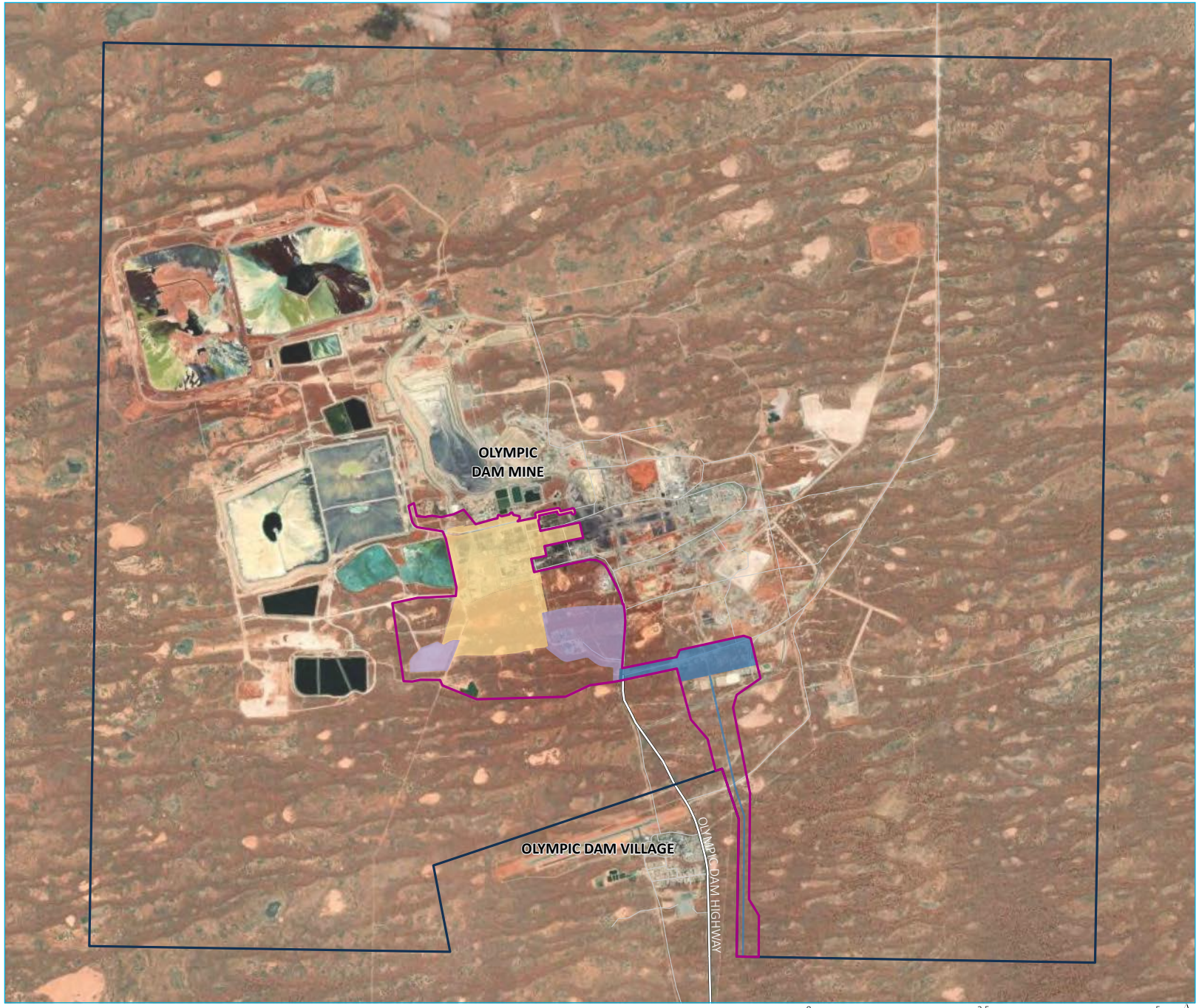
INSET KEY

- Major road
- National park

SRE Project Area - regional locality

BHP SRE Project
Traffic Impact Assessment
Figure 1.1

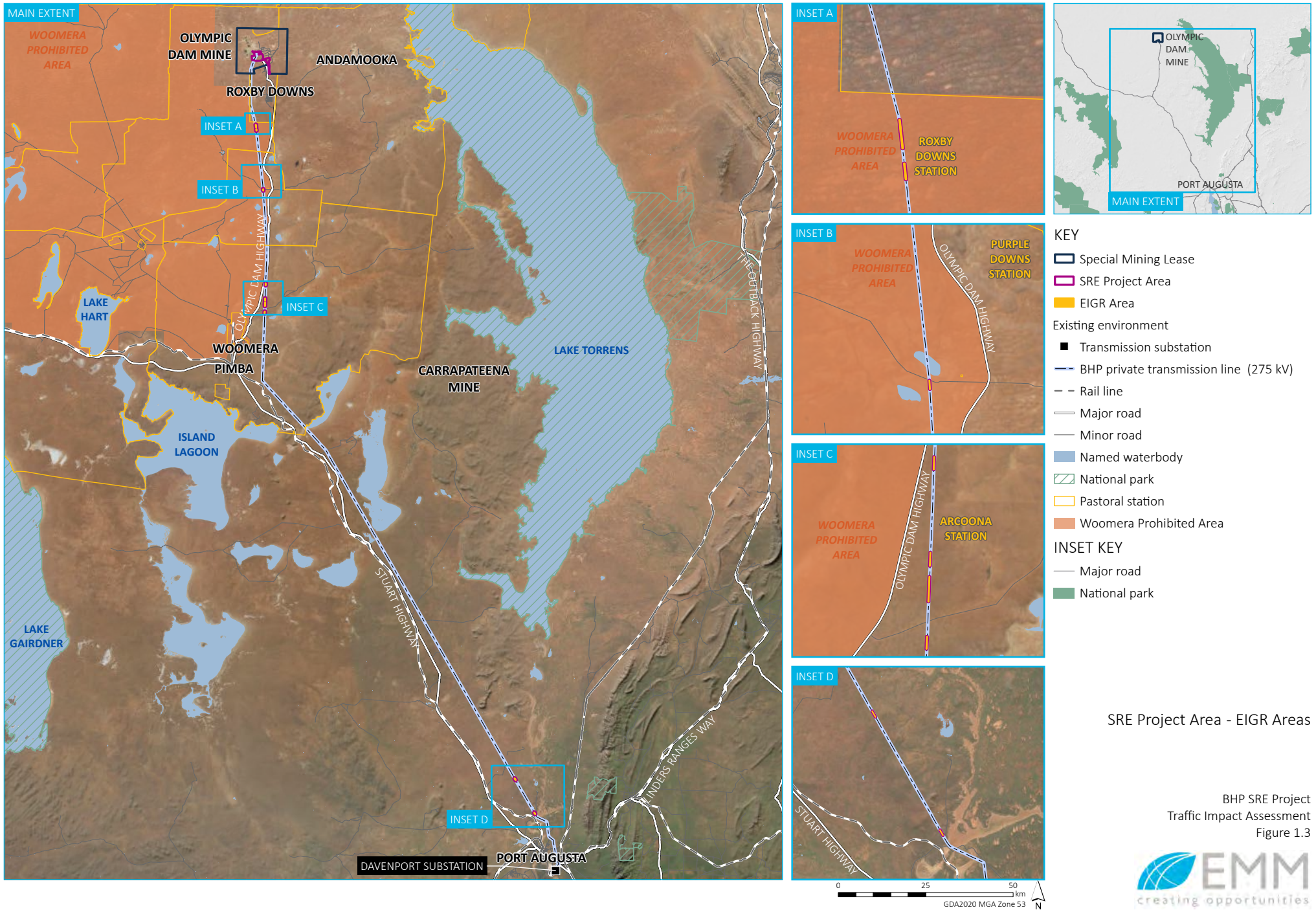
EMM
creating opportunities



SRE Project Area - SML Area

BHP SRE Project
Traffic Impact Assessment
Figure 1.2

EMM
creating opportunities



SRE Project Area - EIGR Areas

BHP SRE Project
Traffic Impact Assessment
Figure 1.3

EMM
creating opportunities

2 Baseline condition assessment

2.1 Site location and access

The SRE Project is located at the Olympic Dam mining operations, approximately, 580 kilometres (km) north of Adelaide in the far north of South Australia (Figure 1.1).

The existing BHP Olympic Dam includes a mining concentrator, smelter and refinery, with the smelter treating high grade copper concentrates through a single-stage DBF smelter, with an average output of approximately 200,000 tpa of total copper (and associated products).

Site access is via Olympic Dam Highway to the existing Olympic Dam mine site. The SRE Project is serviced by internal (and proposed new) access road, with public access restricted at the main entrance to the mine site (Photograph 2.1).

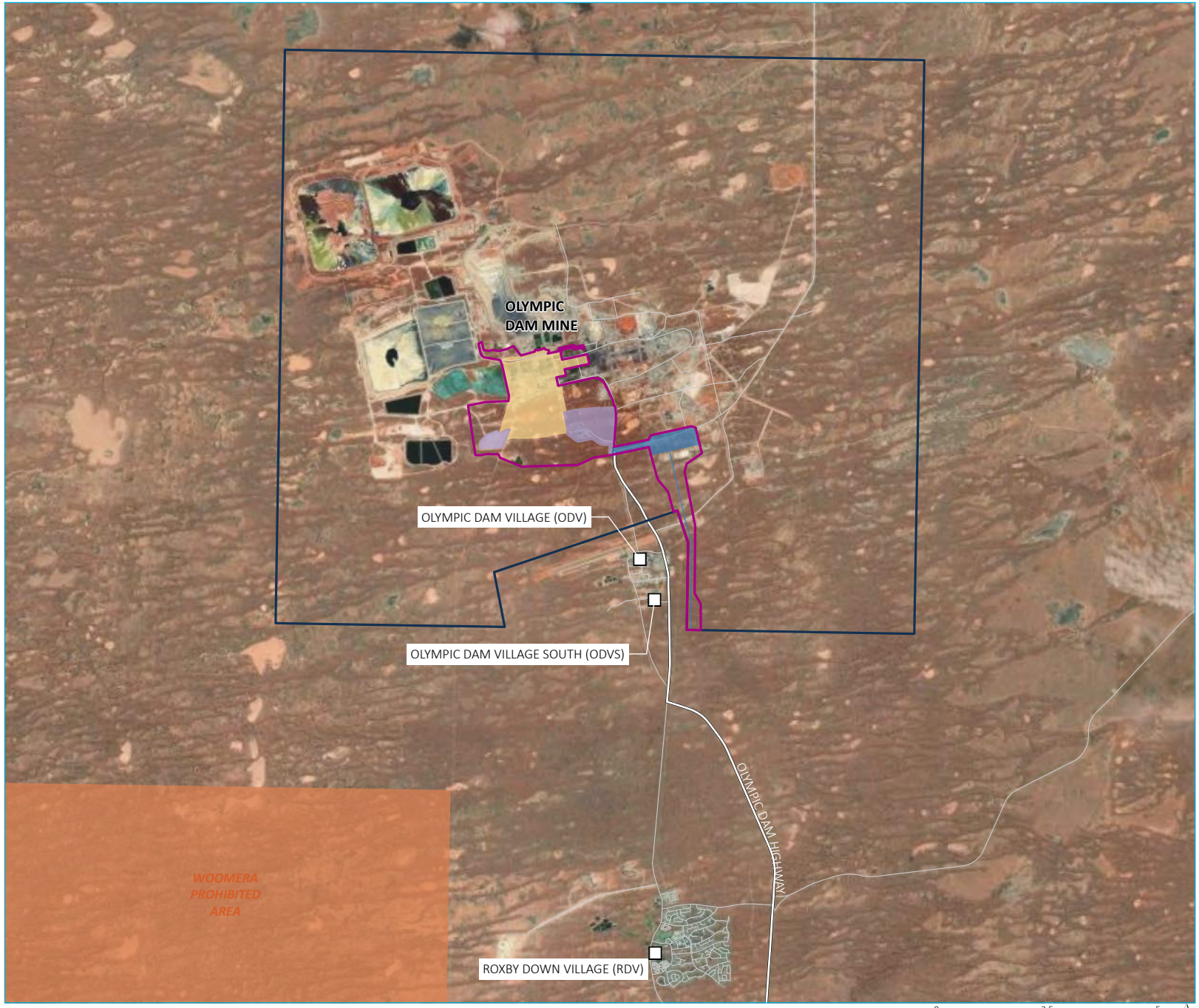
Olympic Dam airport is located approximately 6 km south of the existing Olympic Dam mine. The closest township is Roxby Downs which is approximately 15 km south of the mine site.

2.2 Accommodation villages

The existing Olympic Dam mine site has two permanent accommodation villages and one temporary construction camp, located adjacent the Olympic Dam mine site SML, being Olympic Dam Village (ODV) and Olympic Dam Village South (ODS), and the other within the Roxby Downs township, being Roxby Downs Village (RDV).

All construction personnel are assumed to be located at the ODV and ODS, located adjacent the SML and will be transported to the worksites by shuttle buses on a daily basis.

Currently approximately 90% of operational staff reside at the ODV and RDV and 10% staff residing in Roxby Downs in individual houses.



Site layout

BHP SRE Project
Traffic Impact Assessment
Figure 2.1

EMM
creating opportunities



Photograph 2.1 Mine access from Olympic Dam Highway

2.3 Road network

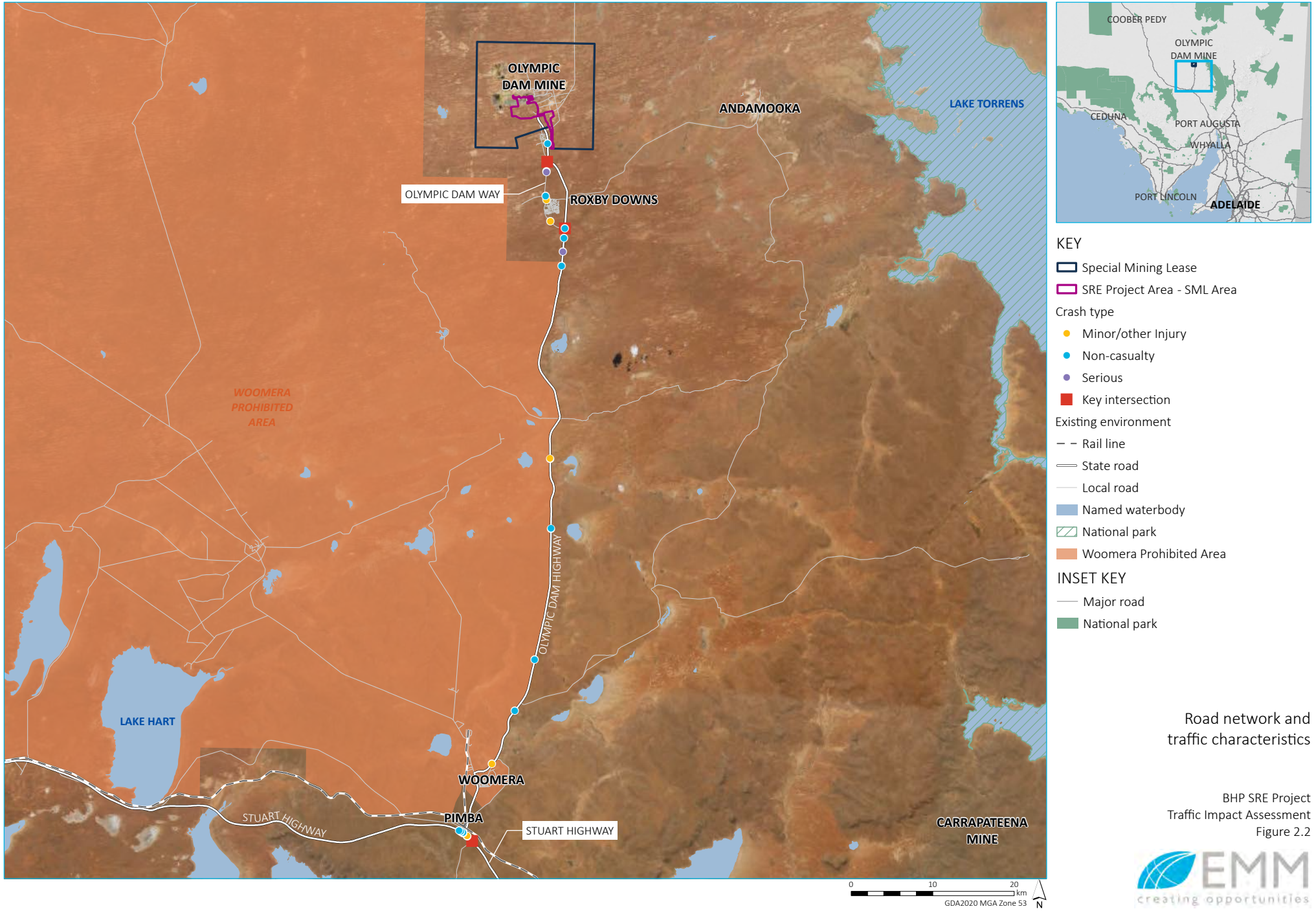
Regionally significant road and transport networks near to the SRE Project include Olympic Dam Highway, Andamooka Road, Borefield Road and Stuart Highway.

An overview of the surrounding road network and traffic characteristics is relevant to the SRE Project is presented in Figure 2.2, Table 2.1 and Table 2.2 and its associated photographs.

The South Australia DIT road hierarchy comprises the following road classifications:

- Arterial roads – State managed.
- Local roads – Council managed.

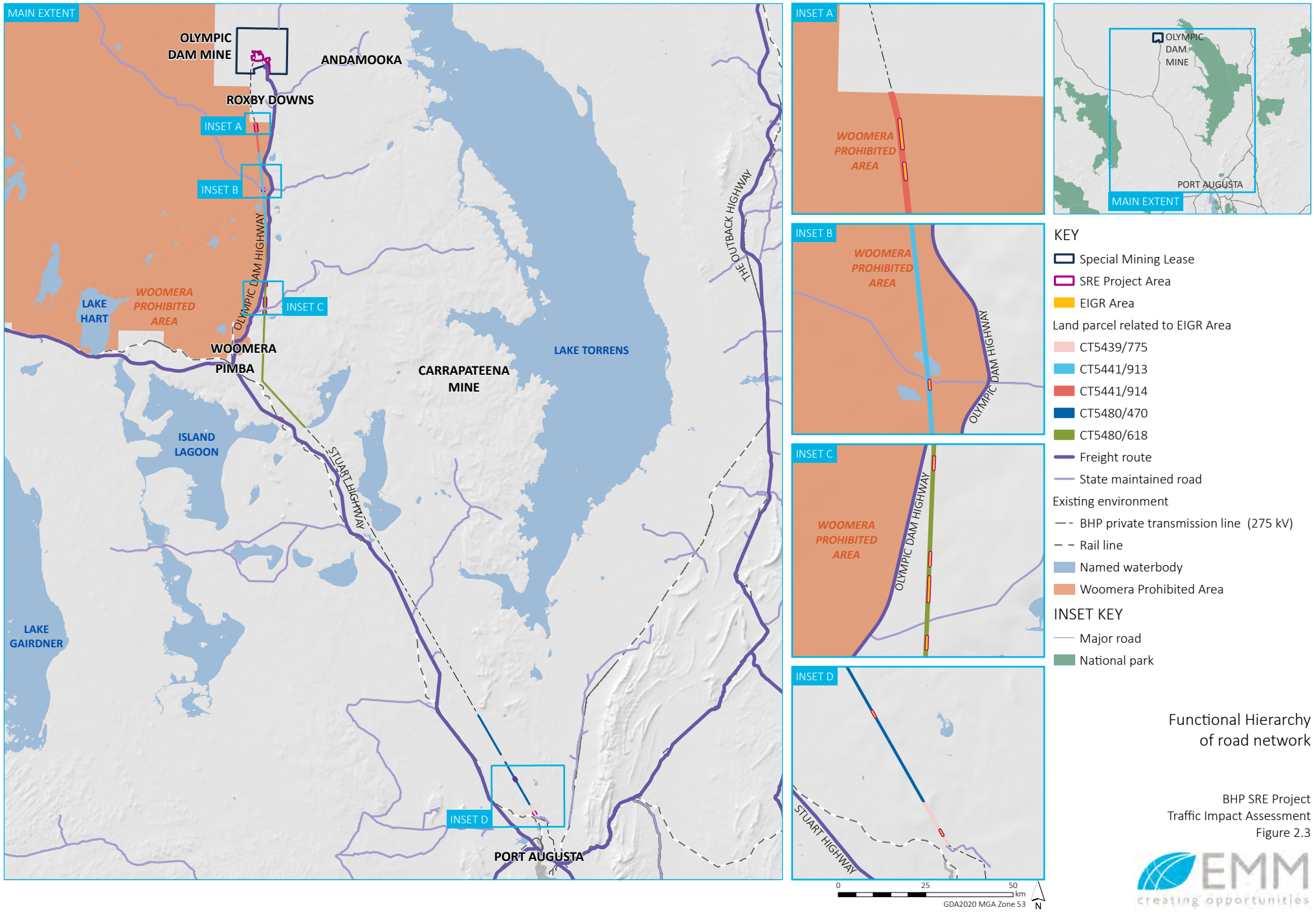
The SRE Project is served by arterial roads (Figure 2.3) and forms a major freight route between Olympic Dam and Adelaide, outlined in DIT's *A Functional Hierarchy for South Australia's Land Transport Network* (2013).



Road network and traffic characteristics

BHP SRE Project
Traffic Impact Assessment
Figure 2.2

EMM
creating opportunities



Functional Hierarchy of road network

BHP SRE Project
Traffic Impact Assessment
Figure 2.3

EMM creating opportunities

Table 2.1 Olympic Dam Highway (B97)

Aspect	Description
Road classification and connectivity	State Road which provides direct connection to the Olympic Dam mine site from the south (Pimba)
Alignment	Generally north–south
Number of lanes	One lane each way, with additional capacity at intersections
Carriageway type	Sealed road
Carriageway width	Approximately 9.0 m width including sealed shoulders
Posted speed limit	110 kilometres per hour (km/h) in rural sections
Heavy vehicle access	[4]Yes, for all heavy vehicles, including 53.5 m road train (BAB-quad)
Traffic function	Predominantly carries arterial traffic
Additional comments	The road is currently in good condition at the vicinity of the SRE Project



Photograph 2.2 Olympic Dam Highway (looking west, near northern Olympic Dam Way intersection)

[4] Source: https://maps.nhvr.gov.au/?networkLayerContext=NATIONAL_MAP&view=Category&viewBy=Vehicle+Categories&states=SA&parentCategory=rt&category=rtbabquad&exemptionSetId=405&networkIds=%5B4996%2C569%5D

Table 2.2 Olympic Dam Way

Aspect	Description
Road classification and connectivity	Partially State controlled Local Road (refer Figure 2.2)
Alignment	Generally north–south travel along the western boundary of Roxby Downs township
Number of lanes	One lane each way, with additional capacity at intersections
Carriageway type	Sealed road
Carriageway width	Approximately 8.5 m width including sealed shoulders
Posted speed limit	110 km/h in rural section and lower speed near Roxby Downs
Heavy vehicle access	General access vehicle only, all mine related vehicle must bypass Roxby Downs
Traffic function	Provides access to Roxby Downs township from the south and the Olympic Dam mine (north)
Additional comments	The 9.2 km road is currently in good condition with no major apparent pavement defect.



Photograph 2.3 Olympic Dam Way (looking east towards Olympic Dam Highway)

Table 2.3 Stuart Highway (A87)

Aspect	Description
Road classification and connectivity	State Road which starts at Port Augusta on the southern end and finishes at Darwin on the northern end
Alignment	Generally north–south
Number of lanes	One lane each way, with additional capacity at intersections
Carriageway type	Sealed road
Carriageway width	Approximately 11 m width including sealed shoulders
Posted speed limit	110 km/h in rural sections
Heavy vehicle access	[5]Yes, for all heavy vehicles, including 53.5 m road train (BAB-quad)
Traffic function	Predominantly carries arterial traffic
Additional comments	N/A



Source: Google Maps

Photograph 2.4 Stuart Highway (looking east, near Stuart Highway/Olympic Dam Highway intersection)

[5] Source: https://maps.nhvr.gov.au/?networkLayerContext=NATIONAL_MAP&view=Category&viewBy=Vehicle+Categories&states=SA&parentCategory=rt&category=rtbabquad&exemptionSetId=405&networkIds=%5B4996%2C569%5D

Table 2.4 Augusta Highway (A1)

Aspect	Description
Road classification and connectivity	State Road which starts at Port Wakefield on the southern end and finishes at Port Augusta on the northern end
Alignment	Generally north–south
Number of lanes	One lane in each direction, with additional capacity provided at intersections and within the Port Augusta town centre.
Carriageway type	Sealed road
Carriageway width	Approximately 10 m width including sealed shoulders
Posted speed limit	110 km/h in rural sections
Heavy vehicle access	[6]Yes, for all heavy vehicles, including 53.5 m road train (BAB-quad)
Traffic function	Predominantly carries arterial traffic
Additional comments	N/A



Source: Google Maps

Photograph 2.5 Augusta Highway (looking south-east, near Port Augusta township)

In addition to the above key roads, Borefield Road is a DIT controlled road used by tourists to access the Oodnadatta Track, located north of the Olympic Dam mine.

[6] Source: https://maps.nhvr.gov.au/?networkLayerContext=NATIONAL_MAP&view=Category&viewBy=Vehicle+Categories&states=SA&parentCategory=rt&category=rtbabquad&exemptionSetId=405&networkIds=%5B4996%2C569%5D

2.4 Key intersections

Two key intersections adjacent Roxby Downs township (sensitive receptor) have been identified for this traffic analysis for the SRE Project. Furthermore, two key intersections have been included to assess the broader impact of the SRE Project on the regional road network.

The key intersections are:

1. Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs)
2. Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs)
3. Stuart Highway/Olympic Dam Highway
4. Augusta Highway/Eyre Highway/Stuart Highway.

The intersections are described in Table 2.5, Table 2.6, Table 2.7 and Table 2.8 and shown in Photograph 2.6, Photograph 2.7, Photograph 2.8 and Photograph 2.9.

2.4.1 Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs)

Table 2.5 Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs)

Aspect	Description
Location from the site	Approximately 10 km south of Olympic Dam mine
Intersection control	Priority controlled
Major Road	Olympic Dam Highway
North Approach	Two lanes on approach (including one short turning lane) and one lane on departure
South Approach	Two lanes on approach (including one short turning lane) and one lane on departure
East Approach	One approach and departure lane
Pedestrian Connectivity	No pedestrian connectivity due to the rural location of the intersection
Traffic function	Predominantly carries mine related traffic from the south and Roxby Downs
Speed limit	110 km/h on the major approach (north-south) and lower speed on the minor approach (east) on approach to the T-intersection
Additional comments	In addition to pavement marking, rumble strips are provided as a safety feature



Source: LocationSA MapViewer

Photograph 2.6 Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs)

2.4.2 Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs)

Table 2.6 Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs)

Aspect	Description
Location from the site	Approximately 18 km south of Olympic Dam mine
Intersection control	Priority controlled
Major Road	Olympic Dam Highway
North Approach	Two lanes on approach (including one short turning lane) and one lane on departure
South Approach	Two lanes on approach (including one short turning lane) and one lane on departure
West Approach	One approach and departure lane
Pedestrian Connectivity	No pedestrian connectivity due to the rural location of the intersection
Traffic function	Predominantly carries mine related traffic to BHP mine and access to Roxby Downs
Speed limit	110 km/h on the major approach (north-south) and lower speed on the minor approach (west) on approach to the T-intersection
Additional comments	In addition to pavement marking, rumble strips are provided as a safety feature



Source: LocationSA MapViewer

Photograph 2.7 Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs)

2.4.3 Stuart Highway/Olympic Dam Highway

Table 2.7 Stuart Highway/Olympic Dam Highway intersection (Pimba)

Aspect	Description
Location from the site	Approximately 96 km south of Olympic Dam mine
Intersection control	Priority controlled
Major Road	Stuart Highway
North Approach	Two lanes on approach (including one left turn slip lane) and one lane on departure
East Approach	Two lanes on approach (including one right-turn bay) and one lane on departure
West Approach	Two lanes on approach (including one short left-turn lane) and lane on departure
Pedestrian Connectivity	No pedestrian connectivity due to the rural location of the intersection
Traffic function	Predominantly carries long distance freight, tourist and regional traffic
Speed limit	110 km/h on the major approach (east-west) and lower speed on the minor approach (north) on approach to the T-intersection
Additional comments	In addition to pavement marking, rumble strips are provided as a safety feature



Source: LocationSA MapViewer

Photograph 2.8 Stuart Highway/Olympic Dam Highway intersection (Pimba)

2.4.4 Augusta Highway/Eyre Highway/Stuart Highway

Table 2.8 Augusta Highway/Eyre Highway/Stuart Highway intersection (Port Augusta)

Aspect	Description
Location from the site	Approximately 270 km south of Olympic Dam mine
Intersection control	Priority controlled
Major Road	Augusta, Eyre and Stuart Highway
North Approach	Two lanes on approach (including one left turn slip lane) and one lane on departure
East Approach	Three lanes on approach (including one right-turn bay) and two lanes on departure
West Approach	Three lanes on approach (including one short left-turn lane) and two lanes on departure
Pedestrian Connectivity	No pedestrian connectivity is provided due to the intersection being located between three highways
Traffic function	Predominantly carries long distance freight, tourist, local and regional traffic
Speed limit	60 km/h on all approaches
Additional comments	The intersection is designed as a seagull intersection.



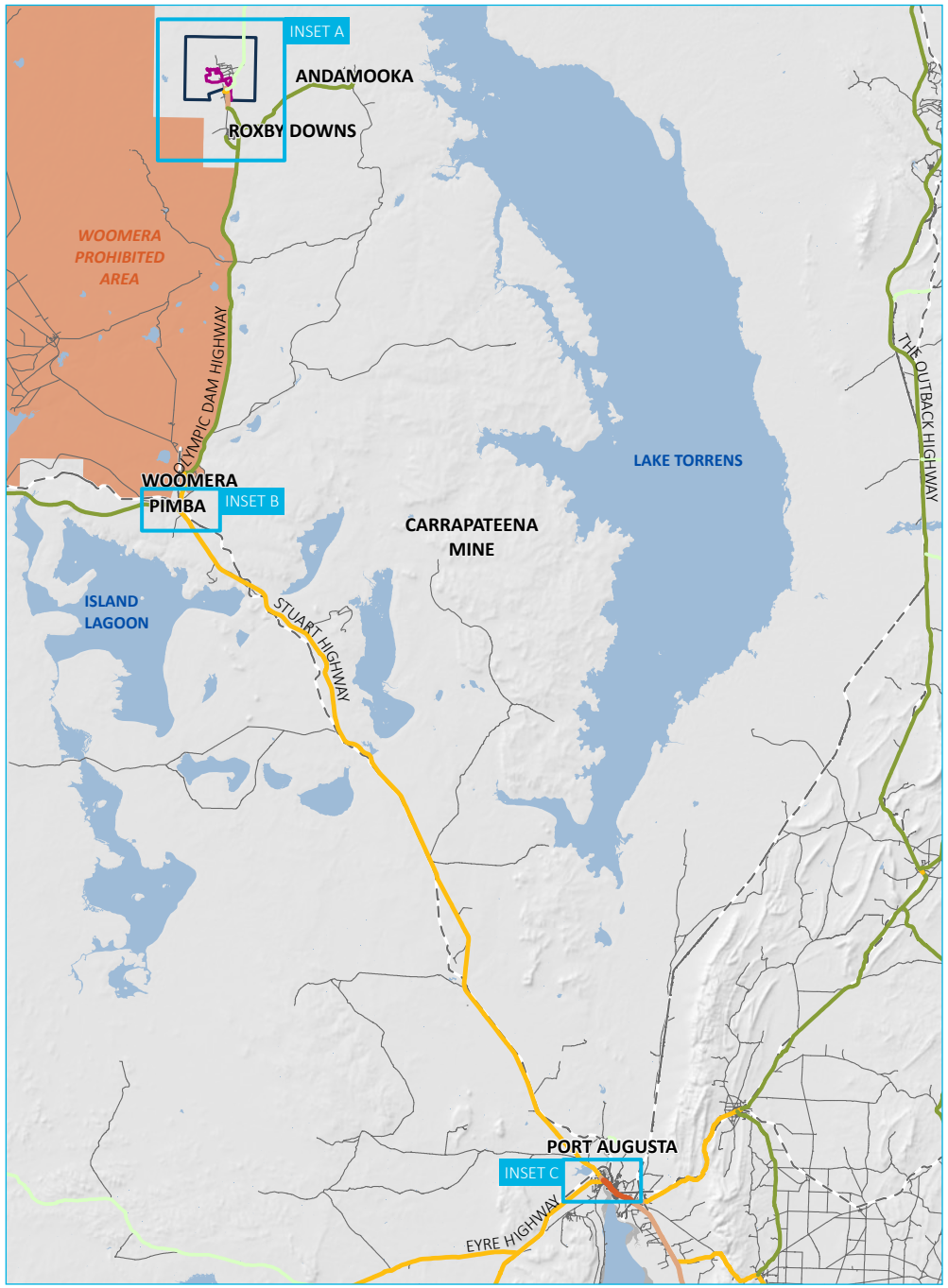
Source: LocationSA MapViewer

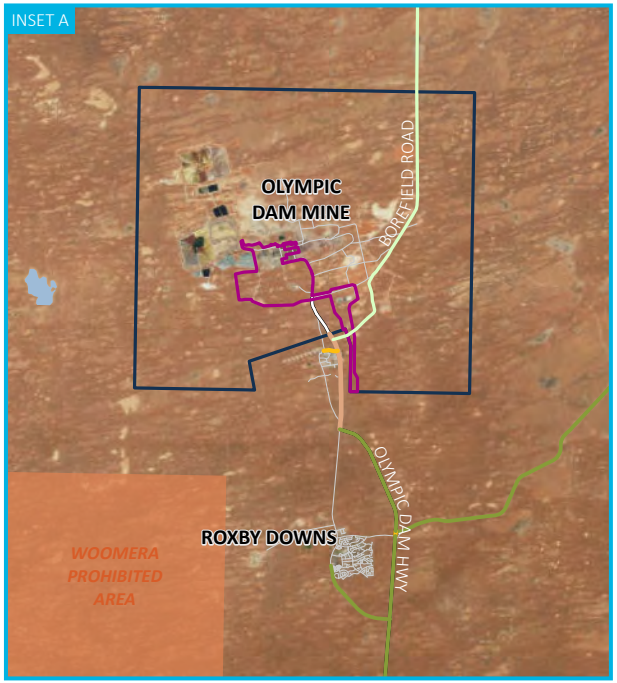
Photograph 2.9 Augusta Highway/Eyre Highway/Stuart Highway intersection (Port Augusta)

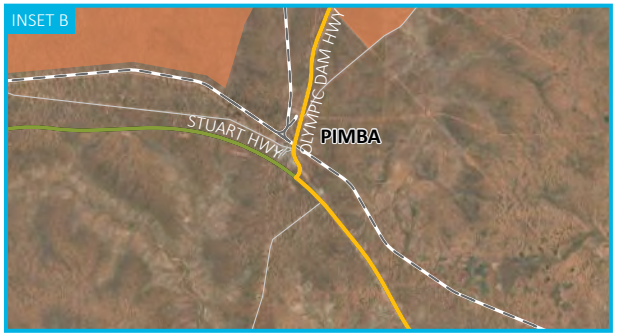
2.5 Existing traffic volumes

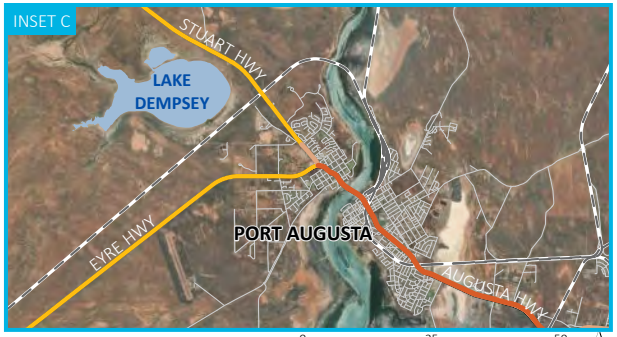
Traffic volumes in sealed public roads in South Australia are available in Location SA Map Viewer (Figure 2.4). The traffic volumes are estimated by calculating the sum of traffic travelling in both directions on a two-way road passing a roadside observation point over the period of a full year divided by the number of days in the year. However, it should be noted that for the SRE Project, the road network (Section 2.3) is situated in a remote rural area with minimal development or activity that could influence the traffic patterns. This is highlighted by the transient local population of Roxby Downs township (Section 3.6) and the absence of populated areas around Pimba, noting that Woomera also has a transient population. Port Augusta is a larger and more stable population centre; however, population data indicates no clear long-term upward growth trend in the area.

The annual average daily bi-directional traffic volumes for the road network are presented in Table 2.9 to Table 2.17.









KEY

- Special Mining Lease
- SRE Project Area - SML Area

Traffic volume estimate

- 3 - 100
- 101 - 500
- 501 - 3000
- 3001 - 10000
- 10001 - 20000

Existing environment

- Rail line
- Minor road
- Named waterbody
- Woomera Prohibited Area

0 25 50 km

GDA2020 MGA Zone 53

N

SA Gov Location SA Map Viewer
traffic volume estimates

BHP SRE Project
Traffic Impact Assessment
Figure 2.4

EMM
creating opportunities

2.5.1 Olympic Dam Highway (north of Roxby Downs township)

The traffic data on Olympic Dam Highway at north of Roxby Downs township is provided in Table 2.9.

Table 2.9 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (north of Roxby Downs)

Parameter	Value
Road number	01503
Daily volumes (Annual average Daily Traffic or AADT)	4,200
Base Year	2006
Heavy Vehicle (HV) Percentage	9%
Number of HVs	380
Class 3-5 Vehicles	280
Class 6-9 Vehicles	32
Class 10 Vehicles	12
Class 11 Vehicles	42

Source: LocationSA MapViewer

This section of Road No 01503 carries a high traffic volume of 4,200 vehicles per day, with the 91% consisting of light vehicles travelling to and from the Olympic Dam mine site, accommodation villages and Roxby Downs township. Heavy vehicles account for the remaining 9% (380 vehicles). Among these, the majority are medium-weight vehicles (280), while 86 belong to heavier classes, including 42 Class 11 vehicles, highlighting substantial freight movement by large articulated vehicles or road trains.

2.5.2 Olympic Dam Highway (south of Roxby Downs township)

The traffic data on Olympic Dam Highway at south of Roxby Downs is provided in Table 2.10.

Table 2.10 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (south of Roxby Downs)

Parameter	Value
Road number	01503
Daily volumes (AADT)	500
Base Year	2018
Heavy Vehicle (HV) Percentage	26%
Number of HVs	130
Class 3-5 Vehicles	39
Class 6-9 Vehicles	13
Class 10 Vehicles	9
Class 11 Vehicles	70

Source: LocationSA MapViewer

This section of Road No 01503 carries a low traffic volume of 500 vehicles per day, with a significant portion (26%) consisting of heavy vehicles. A large proportion of these are Class 11 vehicles (70 vehicles), indicating substantial heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.3 Olympic Dam Way

The traffic data on Olympic Dam Way is provided in Table 2.11.

Table 2.11 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Way

Parameter	Value
Road number	15002
Daily volumes (Annual average AADT)	430
Base Year	2011
Heavy Vehicle (HV) Percentage	11.5%
Number of HVs	49
Class 3-5 Vehicles	33
Class 6-9 Vehicles	9
Class 10 Vehicles	2
Class 11 Vehicles	4

Source: LocationSA MapViewer

This section of Road No 15002 carries a low traffic volume of 430 vehicles per day, with a small proportion (11.5%) consisting of heavy vehicles. Most of these are Class 3-5 vehicles (33 vehicles), with limited heavy vehicles such as Class 10 (2 vehicles) and Class 11 (4 vehicles), indicating dominant light vehicular activity on this road.

2.5.4 Olympic Dam Highway (Pimba)

The traffic data on Olympic Dam Highway at Pimba is provided in Table 2.12.

Table 2.12 SA Gov Location SA Map Viewer daily traffic volumes – Olympic Dam Highway (Pimba)

Parameter	Value
Road number	01503
Daily volumes (Annual average Daily Traffic or AADT)	650
Base Year	2004
Heavy Vehicle (HV) Percentage	18.5%
Number of HVs	120
Class 3–5 Vehicles	45
Class 6–9 Vehicles	17
Class 10 Vehicles	4
Class 11 Vehicles	31

Source: LocationSA MapViewer

This section of Road No 01503 carries a low traffic volume of 650 vehicles per day, with a moderate proportion (18.5%) consisting of heavy vehicles. A significant proportion of these are Class 11 vehicles (31 vehicles), indicating substantial heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.5 Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection)

The traffic data on Stuart Highway east of Stuart Highway/Olympic Dam Highway intersection is provided in Table 2.13.

Table 2.13 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection)

Parameter	Value
Road number	01000
Daily volumes (Annual average Daily Traffic or AADT)	950
Base Year	2025
Heavy Vehicle (HV) Percentage	37%
Number of HVs	350
Class 3–5 Vehicles	110
Class 6–9 Vehicles	65
Class 10 Vehicles	13
Class 11 Vehicles	95

Source: LocationSA MapViewer

This section of Road No 01000 carries a moderate traffic volume of 950 vehicles per day, with a significant portion (37%) consisting of heavy vehicles. A large proportion of these are Class 11 vehicles (95 vehicles), indicating substantial heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.6 Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection)

The traffic data on Stuart Highway west of Stuart Highway/Olympic Dam Highway intersection is provided in Table 2.14.

Table 2.14 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection)

Parameter	Value
Road number	01000
Daily volumes (Annual average Daily Traffic or AADT)	470
Base Year	2025
Heavy Vehicle (HV) Percentage	40.5%
Number of HVs	190
Class 3–5 Vehicles	55
Class 6–9 Vehicles	41

Parameter	Value
Class 10 Vehicles	6
Class 11 Vehicles	45

Source: LocationSA MapViewer

This section of Road No 01000 carries a low traffic volume of 470 vehicles per day, with a significant proportion (40.5%) consisting of heavy vehicles. Most of these are Class 3–5 vehicles (55 vehicles), with a notable proportion of heavy vehicles such as Class 10 (6 vehicles) and Class 11 (45 vehicles), indicating moderate heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.7 Stuart Highway (within the Port Augusta township)

The traffic data on Stuart Highway within the Port Augusta township is provided in Table 2.15.

Table 2.15 SA Gov Location SA Map Viewer daily traffic volumes – Stuart Highway (within Port Augusta township)

Parameter	Value
Road number	01000
Daily volumes (Annual average Daily Traffic or AADT)	4700
Base Year	2023
Heavy Vehicle (HV) Percentage	18%
Number of HVs	850
Class 3–5 Vehicles	440
Class 6–9 Vehicles	150
Class 10 Vehicles	39
Class 11 Vehicles	160

Source: LocationSA MapViewer

This section of Road No 01000 carries a high traffic volume of 4,700 vehicles per day, with a moderate proportion (18%) consisting of heavy vehicles. Most of these are Class 3–5 vehicles (440 vehicles), with a notable proportion of heavy vehicles such as Class 10 (39 vehicles) and Class 11 (160 vehicles), indicating moderate heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.8 Augusta Highway (within Port Augusta township)

The traffic data on Augusta Highway within Port Augusta township is provided in Table 2.16.

Table 2.16 SA Gov Location SA Map Viewer daily traffic volumes – Augusta Highway (within Port Augusta township)

Parameter	Value
Road number	03500
Daily volumes (Annual average Daily Traffic or AADT)	16100
Base Year	2023
Heavy Vehicle (HV) Percentage	15.5%
Number of HVs	2500
Class 3–5 Vehicles	1600
Class 6–9 Vehicles	360
Class 10 Vehicles	130
Class 11 Vehicles	370

Source: LocationSA MapViewer

This section of Road No 03500 carries a high traffic volume of 16,100 vehicles per day, with a moderate proportion (15.5%) consisting of heavy vehicles. Most of these are Class 3–5 vehicles (1600 vehicles), with a notable proportion of heavy vehicles such as Class 10 (130 vehicles) and Class 11 (370 vehicles), indicating moderate heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.9 Augusta Highway (south-east of Port Augusta)

The traffic data on Augusta Highway south-east of Port Augusta township is provided in Table 2.17.

Table 2.17 SA Gov Location SA Map Viewer daily traffic volumes – Augusta Highway (south-east of Port Augusta)

Parameter	Value
Road number	03500
Daily volumes (Annual average Daily Traffic or AADT)	4800
Base Year	2025
Heavy Vehicle (HV) Percentage	27%
Number of HVs	1300
Class 3–5 Vehicles	500
Class 6–9 Vehicles	270
Class 10 Vehicles	120
Class 11 Vehicles	340

Source: LocationSA MapViewer

This section of Road No 03500 carries relatively high traffic volume of 4,800 vehicles per day, with a significant proportion (27%) consisting of heavy vehicles. Most of these are Class 3–5 vehicles (500 vehicles), with a notable proportion of heavy vehicles such as Class 6–9 (120 vehicles) and Class 11 (340 vehicles), indicating moderate heavy freight traffic, particularly road trains or large heavy vehicles.

2.5.10 Intersection count

The key intersections (refer to Section 2.4) were surveyed in 15-minute intervals from 4:00 pm to 6:00 pm on Monday, 11 November 2024 and from 7:00 am to 9:00 am on Tuesday, 12 November 2024 during the non-school holiday period. The peak hours for the intersection are summarised in Table 2.18.

The surveyed intersection traffic volumes during the AM and PM peak hours are summarised in Figure 2.5.

It should be noted that the traffic surveys have captured the traffic generation associated with the existing operation of the Olympic Dam mine.

Table 2.18 Intersection peak hours

Intersection	AM peak hour	PM peak hour
Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs)	7:30 am to 8:30 am	5:00 pm to 6:00 pm
Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs)	8:00 am to 9:00 am	5:00 pm to 6:00 pm

The traffic count data is attached in Appendix A.

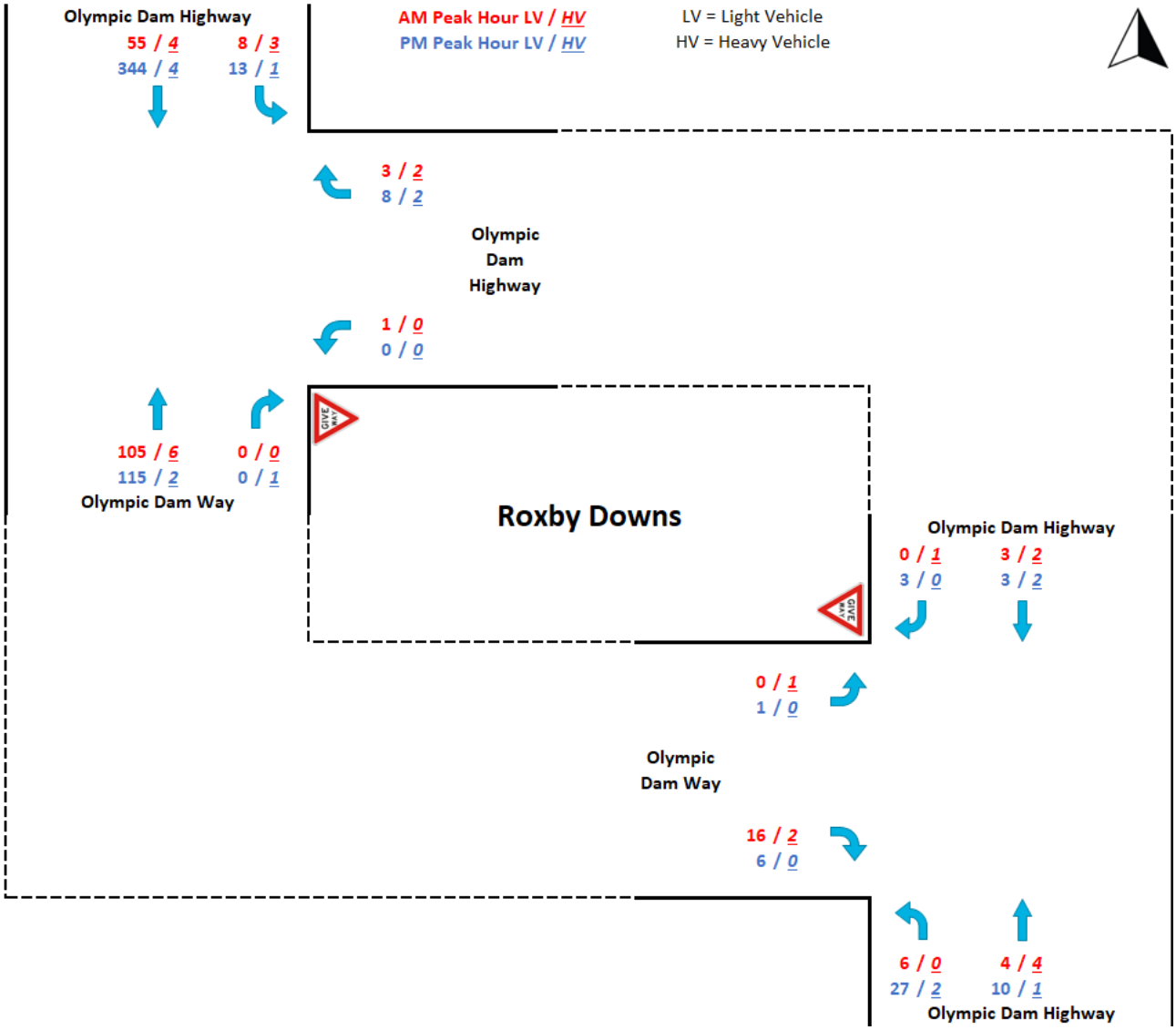


Figure 2.5 2024 existing peak hour traffic volumes

2.6 Crash analysis

Crash data in the vicinity of the SRE Project is available from Location SA Map Viewer (SA Government 2024) in the five-year period from 2019 to 2023 (inclusive).

The data is categorised based on the severity of the crashes as follows:

- fatal
- serious injury
- minor/other injury
- non-casualty (towaway).

A total of 21 crashes were found to have occurred on the external road network along the haulage route. The distribution of the crashes is presented in Figure 2.2 and summarised in Table 2.19.

Table 2.19 Crash data summary on the road network

Type of crash	Severity of injury			
	Non-casualty	Minor/other	Serious	Fatal
Olympic Dam Highway				
Rear-end	1			
Roll over	2	2		
Run off road into object	2		1	
Animal collision	1			
Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs)				
Right-angle collision	1			
Olympic Dam Way				
Animal collision			1	
Roll over		1	1	
Other	1			
Parked vehicle collision		1		
Stuart Highway/Olympic Dam Highway (Pimba)				
Right-angle collision		1		
Stuart Highway (near Stuart Highway/Olympic Dam Highway intersection)				
Roll over		1		
Head on	1			
Rear-end	1			
Animal collision	2			
Total	**12**	**6**	**3**	**0**

Source: LocationSAMapViewer.

The analysis identified 21 crashes, resulting in three serious injuries, six minor/other injuries, and 12 crashes with no injuries.

Among the ten recorded crashes:

- one serious incident occurred 3 km south of the Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs township), where a vehicle ran off the road and hit a fixed object. The Olympic Dam Highway at the crash site shows no deficiencies, making it unlikely that road conditions contributed to the crash
- two serious crashes occurred 2 km south of the Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs township): one involving an animal collision and another a vehicle rollover. Olympic Dam Way at the crash site also shows no deficiencies, suggesting road conditions likely did not contribute to the rollover. However, the animal collision may be linked to a lack of wildlife warning signage in the area.

The Olympic Dam Highway, Olympic Dam Way, Stuart Highway, and their intersections are fully upgraded with large geometries and no sight distance issues. Therefore, it is unlikely that the remaining crashes were caused by existing road deficiencies. It should be noted that none of the crashes involved heavy vehicles.

In summary, 21 crashes over five years along a significant stretch of road is considered to be low. Consequently, the road network adjacent to the site can generally be regarded as safe and does not require any immediate road safety measures.

2.7 Public transport

There is no public transport in the vicinity of the SRE Project that will be affected by the project.

2.8 Airport

The nearest commercial airport is Olympic Dam Airport. Alliance Airlines operate daily flights between Olympic Dam and Adelaide.

2.9 Active transport

There is no provision for active transport infrastructure in the vicinity of the SRE Project due to the remote regional location.

2.10 Railway level crossing

There is no existing rail network in the vicinity of the SRE Project. However, an at grade railway level crossing on the Trans-Australian Railway line runs through Olympic Dam Highway, Pimba which is approximately 100 km to the south of the SRE Project. In addition, another at-grade railway level crossing is located on Stuart Highway, approximately 215 km south of the SRE Project.

A subject railway level crossing intersects the east-west railway line in Pimba approximately 950 m north of the Stuart Highway/Olympic Dam Highway intersection. For the northbound traffic on Olympic Dam Way, this provides a 950 m section of road storage available to queue vehicles when the level crossing is occupied by a passing train. The level crossing is controlled by both boom gates and flashing lights.

The other subject railway level crossing intersects the east–west railway line in Kootaberra, approximately 2 km north of Hesso Train Station. The closest intersecting road is Yudnapinna Road, located approximately 1 km south of the crossing. For northbound traffic on Stuart Highway, this provides approximately 1 km of available road storage for queued vehicles when the level crossing is occupied by a passing train. This level crossing is controlled by flashing lights.

Great Southern Rail operates The Ghan, a recreational passenger train running from Adelaide to Darwin via Alice Springs, twice weekly. They also operate the Indian Pacific, a recreational passenger service running from Sydney to Perth, typically once or twice per week with a scheduled stop in Adelaide.

The Australian Rail Track Corporation (ARTC) website provides train timetable for the freight and passenger trains for any specific township. Train timings for Pimba and Hesso are shown in Appendix G.

Table 2.20 presents the daily distribution of the westbound and eastbound passenger and freight trains at Pimba and Hesso.

Table 2.20 Distribution of westbound and eastbound passenger and freight trains at Pimba and Hesso

Day	Westbound passenger	Westbound freight	Eastbound passenger	Eastbound freight	Total
Monday	0	3	1	4	8
Tuesday	0	4	1	5	10
Wednesday	1	6	0	8	16
Thursday	0	5	0	6	11
Friday	1	4	1	4	10
Saturday	0	8	1	8	17
Sunday	1	7	0	9	17
Average	**0.4**	**5.3**	**0.6**	**6.3**	**12.6**

There are a total of 89 freight and passenger trains passing through Pimba and Hesso in a week. This includes seven passenger train movements per week, comprising three westbound and four eastbound services. The passenger trains are approximately 600 m in length.

There are on average 11.6 to 12 freight trains (5.3 westbound and 6.3 eastbound) every day. The freight trains are up to 1,800 m in length. Two freight trains typically operate during the AM peak hour (8:00 to 9:00 am) and another two during the PM peak hour (5:00 to 6:00 pm). These peak periods apply to train movements only.

It should be noted that the Pimba rail line is assumed to be utilised where feasible for freight transport to the SRE site, however this has not yet been quantified for the construction phase.

2.11 Conclusion

The SRE Project is located in the far north of South Australia, approximately 580 km north of Adelaide. Site access is via Olympic Dam Highway to the existing Olympic Dam mine site. The SRE Project is serviced by internal (and proposed new) access road, with public access restricted at the main entrance to the mine site. Olympic Dam airport is located approximately 6 km south of the existing Olympic Dam mine. The closest township is Roxby Downs which is approximately 15 km south of the mine site.

The existing Olympic Dam mine site has two permanent accommodation villages and one temporary construction camp, located adjacent the Olympic Dam mine site Special Mining Lease (SML), being Olympic Dam Village (ODV) and Olympic Dam Village South (ODS), and the other within the Roxby Downs township, being Roxby Downs Village (RDV). Currently approximately 90% of operational staff reside at the ODV and RDV and 10% staff residing in Roxby Downs in individual houses.

The site is served by Olympic Dam Highway, Olympic Dam Way and Stuart Highway, all of which are State-managed arterial roads. The roads are currently in good condition with sufficient capacity for heavy vehicles, including road trains. Olympic Dam Way connects Roxby Downs township and the Olympic Dam mine site, with restrictions for mine-related vehicles bypassing Roxby Downs. Olympic Dam Highway links Stuart Highway to Roxby Downs township.

Two critical intersections adjacent Roxby Downs township (sensitive receptor) are priority-controlled and primarily handle existing and proposed SRE Project mine-related traffic. Furthermore, a third key intersection, which is also priority-controlled, has been included to assess the broader impact of the SRE Project on the wider road network. All intersections are well-maintained with safety features, such as dedicated turning lane, linemarking, rumble strips and adequate signage.

Traffic data indicates moderate volumes on the Olympic Dam Highway, low volumes on Olympic Dam Way, moderate volumes on Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection) and low volumes on Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection). Heavy vehicles comprise a significant portion of traffic. A transient local population within the Municipal Council of Roxby Downs, along with the absence of populated areas around Pimba (noting that Woomera also has a transient population), and the lack of a clear long-term upward growth trend in Port Augusta, despite being a larger and more stable population centre, minimises the potential for long-term traffic growth within the road network.

From 2019 to 2023, 21 crashes occurred in the vicinity of the SRE Project, which is considered low for a significant stretch of road. Therefore, there are no major road safety issues on the public roads at the vicinity of the site.

There is no public transport, or active transport infrastructure in the area, reflecting its rural nature.

Two at grade railway level crossings are located along the haulage route south of the SRE Project. One crossing is located on Olympic Dam Highway at Pimba, approximately 100 km south of the SRE Project site and 950 m north of the Stuart Highway intersection, providing adequate road storage for queuing vehicles. The crossing is equipped with boom gates and flashing lights and serves both freight and passenger trains. The second crossing is located on Stuart Highway at Kootaberra, approximately 215 km south of the SRE Project site and 1 km north of Yudnapinna Road, also providing adequate road storage for queuing vehicles, and is controlled by flashing lights.

On average, around 12 freight trains (up to 1,800 m long) pass through Pimba and Hesso daily, with approximately two operating during each road peak period (8:00 am–9:00 am and 5:00 pm–6:00 pm). Passenger services, including The Ghan and the Indian Pacific (600 m long), operate seven times per week. It should be noted that the Pimba rail line may be utilised where feasible for freight transport for the SRE Project, however this has not yet been quantified for the construction phase with all traffic assumed to be road based (i.e. worst-case scenario).

Overall, the road network near the SRE Project is currently in good condition and adequately supports current traffic demands.

3 Assessment of effects

3.1 Potential impact events

BHP has identified six potential impact events associated with likely changes to the baseline traffic environment and conditions as a result of the implementation of the SRE Project. These events represent scenarios for which there is, or is likely to be, a linkage between SRE Project activities (sources), socio-economic (pathways) and the identified local community (receptors).

To ensure a consistent approach to impact assessment for the SRE Project, sources, pathways, and receptors (SPR) are defined and applied in this assessment as follows:

- Source – the SRE Project activities (i.e. potential impact event) which, alone or in combination, has the potential to impact a receptor.
- Pathway – the pathway, means or route (with consideration of any natural barriers) by which the receptor can be exposed to, or may reasonably be expected to be impacted by, the source.
- Receptor – the receptor that may be impacted by the source via the pathway (e.g. local community).

The detailed list of potential impact events is provided in the Environmental Impact Assessment Tables Appendix to the EIS and are summarised for the socio-economic pathways in Table 3.1. The scope of this assessment of effects presented herein has considered these identified potential impact events.

Table 3.1 Preliminary SPR assessment – potential impact events

Impact ID	Potential impact event	Source	Pathway	Receptor	Linkage
SE1	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, leads to degradation, increasing the risk to public health and safety.	Transport and logistics	Socio-economic	Local community (health and safety)	Unconfirmed
SE2	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, results in an increase in likelihood of traffic accidents, impacting on the health and safety of the local community.	Transport and logistics	Socio-economic	Local community (health and safety)	Unconfirmed
SE3	Increases in heavy vehicle traffic associated with the movement of construction materials, including oversized and restricted movements, leads to increase travel times affects road users, impacting on the social value of the local community.	Transport and logistics	Socio-economic	Local community (social value – amenity)	Confirmed
SE4	During operations, increases in heavy vehicle traffic associated with the movement of operational reagents and concentrates affects road users and impacts on the health and safety of the local community.	Transport and logistics	Socio-economic	Local community (health and safety)	Unconfirmed
SE5	During operations, increase in road traffic results in the degradation of the roads and increases risk to the public health and safety.	Transport and logistics	Socio-economic	Local community (health and safety)	Unconfirmed
SE6	During operations, the increased movement of heavy vehicles results in increases in travel times within the local and regional areas, impacting existing social values.	Transport and logistics	Socio-economic	Local community (social value – amenity)	Confirmed

3.2 Assessment of effects

An assessment of effects was undertaken to determine the change in the existing traffic environment and conditions as a result of the proposed SRE Project activities. The assessment of effects included:

- acquisition of input traffic data to determine the baseline environment
- review of the SRE Project traffic and transport activities and the identified potential impact events for the effects assessment
- complete effects assessment to determine the likely magnitude of the change to the surrounding road network as a result of the SRE Project.

3.2.1 Methodology

This TIA has been prepared in accordance with *Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments*, 2020 and DIT SA *Guideline for the preparation of a Traffic Impact Statement* (Version 5), 2023.

Unless stated otherwise, all assumptions are based on the *Hatch Fluor Approvals Traffic and Transport Report* dated 19 December 2025 (Hatch Fluor 2025) provided in Appendix F.

3.3 Construction

3.3.1 Construction hours

Construction personnel are expected to work 11.5-hour shifts, starting at 6:00 am and ending at 5:30 pm (Hatch Fluor 2025).

3.3.2 Construction workforce and accommodation

The construction personnel profile has a peak Stage 1a workforce of 1,313 full-time equivalents (FTEs), a Stage 1b workforce of 515 FTEs and a Stage 2 peak workforce of 978 FTEs (Hatch Fluor 2025).

All construction personnel are assumed to be residing at the ODV and ODS accommodation villages.

The peak construction workforce generally determines the daily peak hour volumes. However, during the construction period, personnel will travel exclusively between the accommodation villages and the SRE Project, thereby limiting any impacts to the broader public road network outlined in Section 2.3.

3.3.3 Construction coach operation

It is assumed that approximately 90% of construction personnel residing at the ODV and ODS accommodation villages would travel to/from the SRE Project by 57-seater coaches and the remaining 10% by light vehicles, with a vehicle occupancy of 2 persons per vehicle (Hatch Fluor 2025).

It is assumed that coaches will operate at full capacity in both directions between the ODV and ODS accommodation villages and the worksite and will remain parked at the villages when not in use. Coaches used for the day shift will also accommodate night shift personnel, with no additional coaches required (Hatch Fluor 2025).

3.3.4 Construction vehicle types

The longest construction-related heavy vehicles will be 25 m B-double tankers, excluding OSOM vehicles (refer Section 3.4).

It is noted that the Pimba rail line is assumed to be utilised where feasible for freight transport to the SRE Project, however this has not yet been quantified for the construction phase and therefore has not been assessed for the 2037 Stage 2 Construction scenario (Hatch Fluor 2025). For the purpose of this TIA is has been assumed that all Stage 2 construction traffic would be via road (i.e. worst-case scenario).

3.3.5 Construction material and equipment deliveries

Trucks will not be scheduled to arrive at peak hour shift change times. Logistics and personnel traffic peaks are not added together for daily peak hour considerations (Hatch Fluor 2025).

Since construction personnel traffic is confined to travel between accommodation villages and SRE Project, the construction delivery vehicle volumes will determine the daily peak hour volumes for the road network outlined in Section 2.3.

Delivery frequency and arrival time is consistent across weekdays, weekends and public holidays (Hatch Fluor 2025).

Additionally, during Stage 1a and Stage 1b, up to 70,000 m^3 of aggregate for road and hardstand topping course may be sourced from the existing Roxby Downs Quarry, equating to approximately 2,200 road train movements. The existing intersection geometry is sufficient to accommodate these heavy vehicles. Furthermore, these traffic volumes are already approved and operating within the road network and are therefore captured in the existing traffic volumes surveyed on Tuesday, 12 November 2024 (Figure 2.5).

3.3.6 Construction year and month

The peak construction year and month used in this TIA analysis are based on the period with the highest number of construction delivery vehicles per day (refer Section 3.3.5).

The highest peak daily vehicle movements across the construction stages are expected to occur in Stage 2 during Q3 2037 (July to September), being approximately 269 heavy vehicles per day, where it overlaps with Stage 1a and Stage 1b operations (refer to Table 3.2, Table 3.7, Hatch Fluor 2025).

3.3.7 Construction traffic generation

Construction traffic for the SRE Project will comprise of materials and equipment deliveries, as well as workforce traffic. However, workforce traffic is confined to travel between the accommodation villages and the SRE Project (Section 3.3.2). As a result, peak hour traffic analysis focuses solely on materials and equipment deliveries (Section 3.3.5).

The AM and PM peak hour are assumed to align with the existing intersection peak hours as shown in Table 2.18.

The construction traffic movements are detailed in Table 3.2 and incorporates the following assumptions derived from Hatch Fluor (2025):

- A vehicle trip is defined as one inbound and one outbound movement. One vehicle trip equates to two vehicular movements in the same hour.
- Construction will be occurring throughout the whole week (i.e. seven days). Delivery frequency and arrival time is consistent across weekdays, weekends and public holidays.

- EMM has assumed that the maximum number of heavy vehicles per day during the peak month (Stage 2 construction, July 2037) represents the worst-case scenario as mentioned in Section 3.3.6 since this period overlaps with Stage 1a and 1b operation.
- Furthermore, as July 2037 represents the worst-case scenario, EMM has included existing operational traffic volumes which were captured during the traffic survey conducted on 11–12 November 2024 (refer to Section 2.5.2). These volumes will be shown in Section 3.3.8.
- EMM have assumed 15% of the daily heavy vehicle volume during the peak month will represent the AM and PM peak hour traffic scenario.

Table 3.2 Construction traffic volumes

Units	SRE Project – Stage 1a	SRE Project – Stage 1b	SRE Project – Stage 2
Total number of heavy vehicles	16,665	7,460	8,930
Duration of construction deliveries (days)	1,260	709	709
Average heavy vehicle trips per day	13	11	13
Peak heavy vehicle trips per day	[7]30 (Q4-2028)	[8]30 (Q4-2028)	[9]37 (Q1-2038)
Peak hour heavy vehicle trips	**5**	**5**	**6**
Peak hour heavy vehicle movements	**10**	**10**	**12**

Source: Construction traffic volumes derived from Hatch Fluor 2025.

Note: Values have been rounded up to provide a conservative estimate.

3.3.8 Construction traffic distribution

i SRE Project – Stage 2 construction

All construction materials and equipment delivery vehicles (not including OSOM vehicles) are assumed to originate from Adelaide, refer Figure 3.1.

Heavy vehicles will be travelling via Olympic Dam Highway avoiding the township of Roxby Downs, refer Figure 3.2.

The peak hour traffic distribution is summarised in Table 3.3 and Figure 3.3.

Table 3.3 Peak hour movement distribution (July 2037, SRE Project – Stage 2 construction)

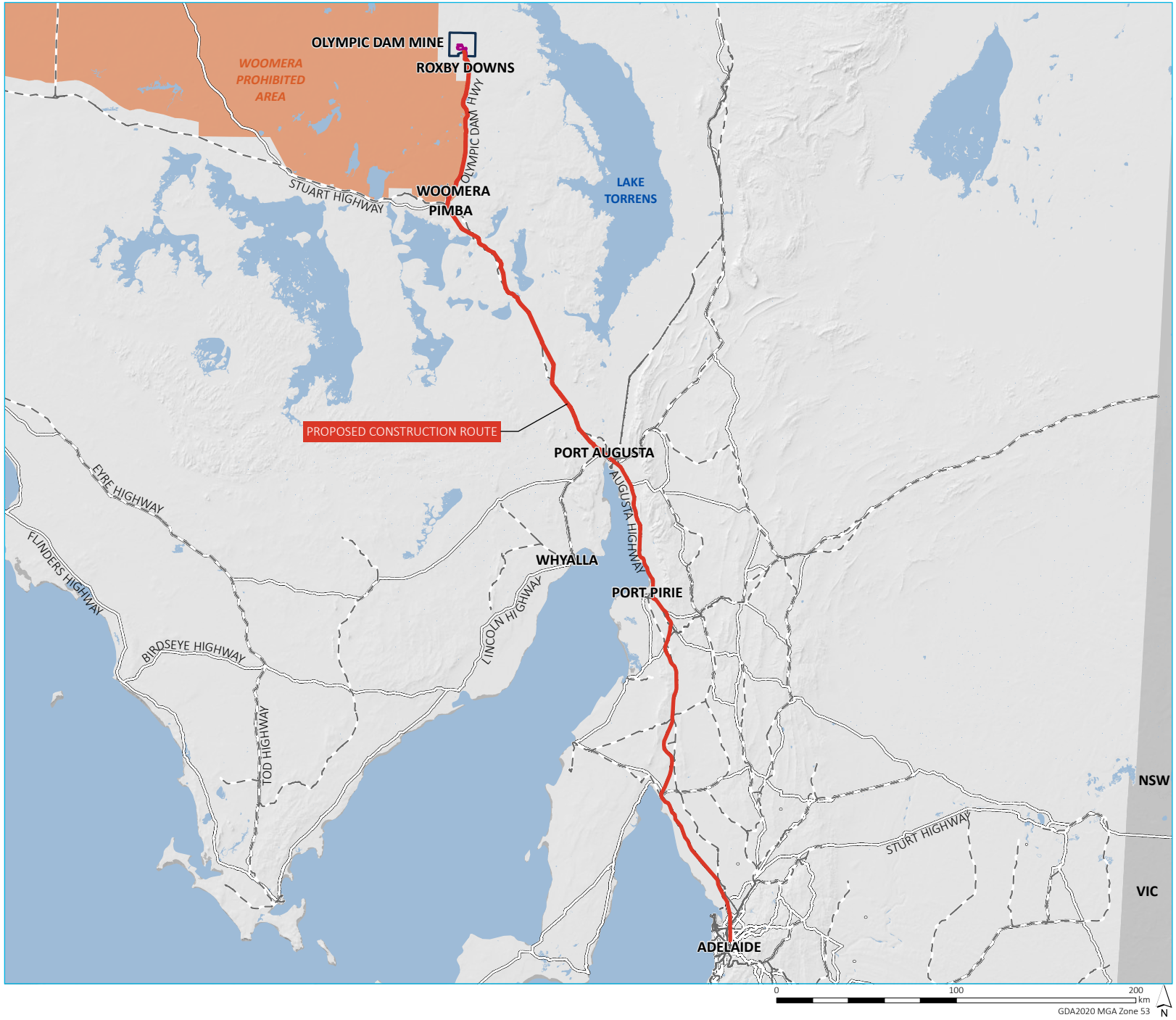
Olympic Dam to/from	AM Peak		PM Peak	
	Inbound	Outbound	Inbound	Outbound
Adelaide	6	6	6	6

Note: All vehicle movements are heavy vehicles in the construction peak hour.

7 Volume taken from Table 3-2 of Hatch Fluor 2025 report.

8 Volume taken from Table 3-3 of Hatch Fluor 2025 report.

9 Volume taken from Table 3-4 of Hatch Fluor 2025 report.



KEY

- Special Mining Lease
- SRE Project Area - SML Area
- Proposed construction delivery route

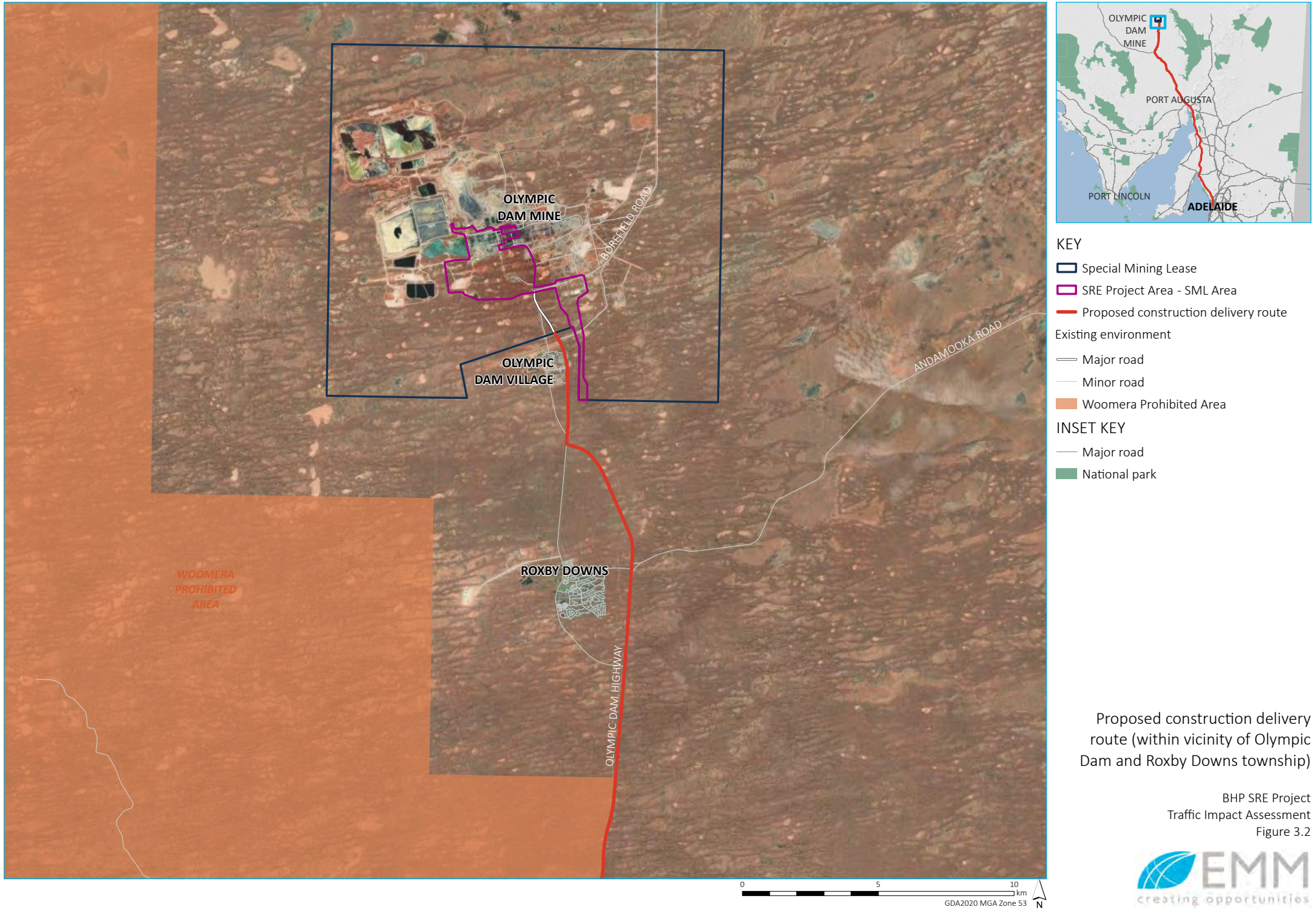
Existing environment

- Rail line
- Major road
- Named waterbody
- Woomera Prohibited Area

Proposed construction delivery route

BHP SRE Project
Traffic Impact Assessment
Figure 3.1

EMM
creating opportunities



Proposed construction delivery route (within vicinity of Olympic Dam and Roxby Downs township)

BHP SRE Project
Traffic Impact Assessment
Figure 3.2

EMM
creating opportunities

ii SRE Project – Stage 1a and Stage 1b operations

Stage 1a and 1b operation vehicles are taken from Table 3.8 and Table 3.10 and summarised in Table 3.4.

All operational material and equipment delivery vehicles are assumed to originate from the areas listed in Table 3.7. The Stage 1a and Stage 1b vehicle routes are outline in Figure 3.10 and Figure 3.11.

Heavy vehicles will be travelling via Olympic Dam Highway avoiding the township of Roxby Downs township, while personnel light vehicles will travel from Roxby Downs township via Olympic Dam Way, refer Figure 3.12.

Personnel light vehicles are assumed to travel in both directions during peak hours, similar to the shuttle bus movements to/from the ODV and ODS accommodation villages, due to the shift-based nature of the operational jobs.

Table 3.4 Peak hour movement distribution (July 2037, SRE Project - Stage 1a and Stage 1b operation)

Olympic Dam to/from	AM Peak				PM Peak			
	Light vehicles		Heavy vehicles		Light vehicles		Heavy vehicles	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Road								
Carrapateena	0	0	4	4	0	0	4	4
Prominent Hill	0	0	2	2	0	0	2	2
Roxby Downs	9	9	0	0	9	9	0	0
Adelaide	0	0	4	4	0	0	4	4
Pimba Intermodal Terminal*	0	0	28	28	0	0	28	28

Notes: *Rail movements comprising Adelaide to Pimba Intermodal Terminal and Port Augusta to Pimba Intermodal Terminal

iii 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) peak hour intersection volumes (Roxby Downs)

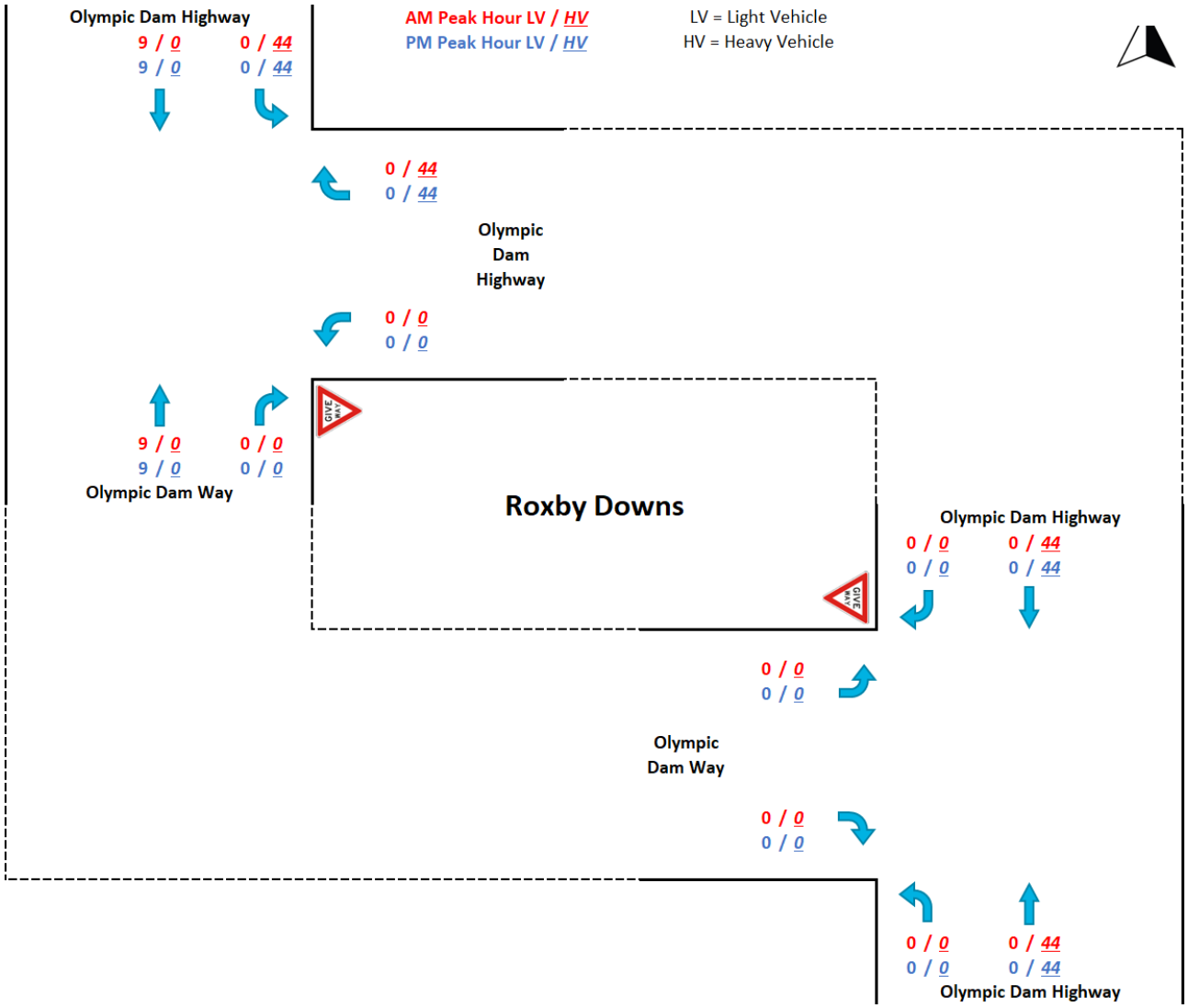
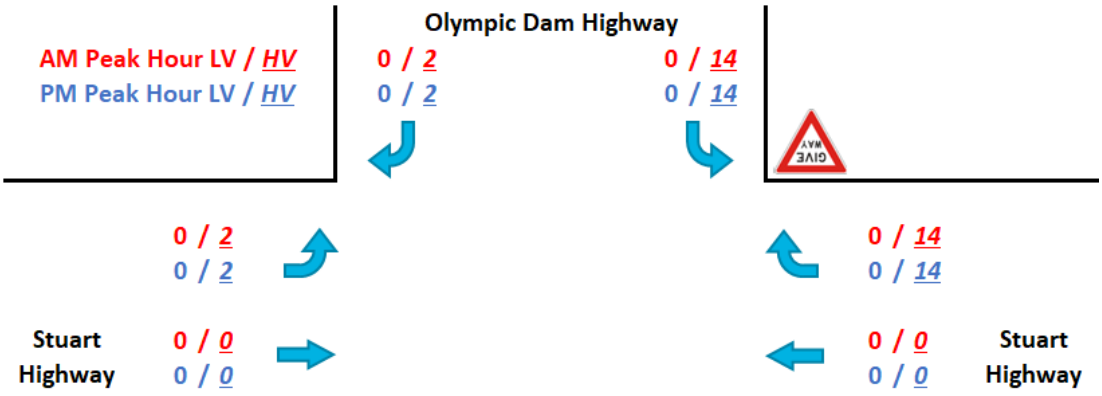


Figure 3.3 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Roxby Downs)

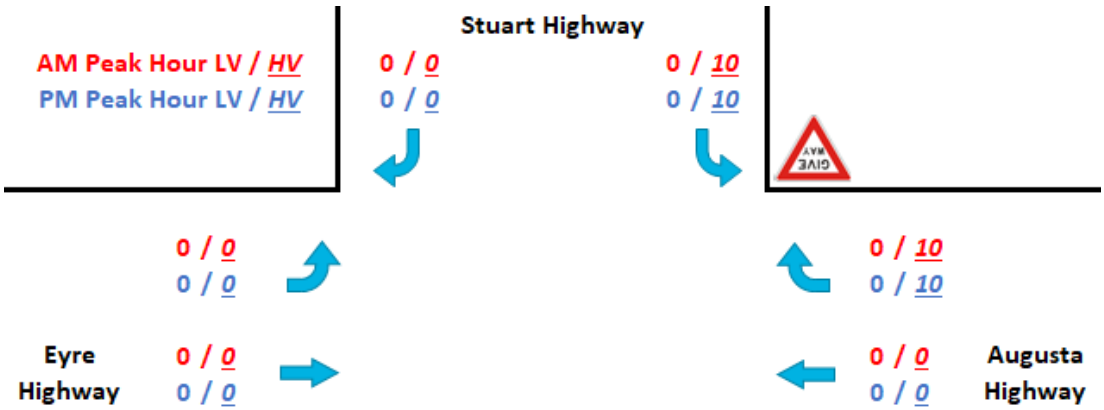
iv 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) peak hour intersection volumes (Pimba)



LV = Light Vehicle
HV = Heavy Vehicle

Figure 3.4 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Pimba)

v 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) peak hour intersection volumes (Port Augusta)



LV = Light Vehicle
HV = Heavy Vehicle

Figure 3.5 2037 construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and Stage 1b) peak hour intersection volumes (Port Augusta)

3.3.9 EIGR areas

BHP propose to undertake the isolated areas of land disturbance and associated vegetation clearance for the required electrical clearances between the 275 kV line and the ground surface (Figure 1.3).

The proposed minor clearance of land would be undertaken using a grader and or dozer under BHP's existing transmission line maintenance agreements and subject to secondary permitting and approvals (e.g. native vegetation clearance approval).

3.4 Over size over mass (OSOM) vehicles during construction

For the purpose of this TIA, OSOM modules for the SRE Project are assumed to be up to 25 m long, 3.5 m wide and 5 m high (i.e. within the Heavy Vehicle National Law and associated regulations).

The preferred OSOM construction route for the SRE Project originates from the Port of Whyalla, via Port Augusta and Pimba as follows:

- Port of Whyalla
- Lincoln Highway (B100)
- Eyre Highway (A1)
- Stuart Highway (A87)
- Olympic Dam Highway (B97)
- Olympic Dam mine site entry gate.

No OSOM is proposed via the Joy Baluch AM Bridge or the Yorkeys Crossing bypass following preliminary discussions with DIT and Port Augusta Council.

The total length of the route is approximately 335 km which primarily uses the arterial road network (refer Figure 3.6).

The OSOM route from Whyalla to the SRE Project is approved for 25 m long 59.5 tonne (t) low loaders which accommodates vehicles up to 3.5 m in width and 4.6 m in height.

For the purpose of this TIA, EMM has undertaken a preliminary OSOM assessment for vehicles greater than 25 m long, 3.5 m wide and 5 m high to assess potential intersection constraints, with Section 3.4.1 outlining that existing intersections can accommodate a conservative OSOM vehicle configuration of 47 m long, 8.0 m wide and 4.5 m high with no additional upgrades required.

Notwithstanding this, all OSOM greater than 25 m long, 3.5 m wide and 5 m high would be subject to a separate detailed OSOM assessment and approval from the DIT, the National Heavy Vehicle Regulator (NHVR), affected Local Council(s) and the electricity utility provider (i.e. subject to separate approval).

The total number of OSOM deliveries for the SRE Project are summarised in Table 3.5.

Table 3.5 Over size over mass vehicle movements

Row Labels	SRE Project OSOM modules – less than 25 m long, 3.5 m wide and 5 m high	SRE Project OSOM modules – greater than 25 m long, 3.5 m wide and 5 m high (subject to separate OSOM assessment secondary permitting)	
		Escorting - pilot load	Escorting – police escort load
Stage 1a	173	99	78
Stage 1b	26	17	7
Stage 2	25	18	7
Total	**224**	134	92

Source: Hatch Fluor 2025.

All OSOM categories requiring escorting (pilot and police escorts) are outlined in Table 3.6.

Table 3.6 Oversized load categories

Category	Length (m)	Width (m)	Height (m)	Load mass (t)	Escort requirements	Description
Pilot Load	< 33 m	< 5.5 m	< 4.3 m	< 59 t	2 pilots	B triple or smaller/low loader
Police Escort Load	< 40 m	< 8 m	< 4.3 m	< 90 t	2 pilots 2 police	Special purpose vehicle

Source: Hatch Fluor 2025.

All OSOM deliveries up to 25 m long, 3.5 m wide and 5 m high are able to travel independently (i.e. no pilot or police escort vehicle(s)) with OSOM signs at the front and back of the vehicle under Heavy Vehicle National Law and associated regulations. OSOM deliveries greater than 25 m long, 3.5 m wide and 5 m high would require escort (e.g. pilot load, police escort load – refer to Table 3.5) for the road safety reasons and would be subject to separate OSOM assessment and secondary permit from DIT and the NHVR.

It is expected that OSOM drivers would take due diligence care with safety features embedded into the heavy vehicles, e.g. flashing lights, flags/lights at the side for the vehicles to alert oncoming motorists of their dimensions and presence.

This TIA is seeking the endorsement of approval for 224 OSOM vehicle movements that are within the Heavy Vehicle National Law and associated regulations as part of the SRE Project.

3.4.1 Preliminary OSOM assessment

A preliminary OSOM assessment has been undertaken by EMM which identifies potential intersection constraints (i.e. pinch points) along the preferred OSOM construction route.

A 20 × 8 platform trailer, 36 m in length (total length 47 m including the prime mover) with a wheelbase width of 6 m and an 8 m wide load, has been assumed for this preliminary assessment. The preliminary swept paths are provided in Appendix E.

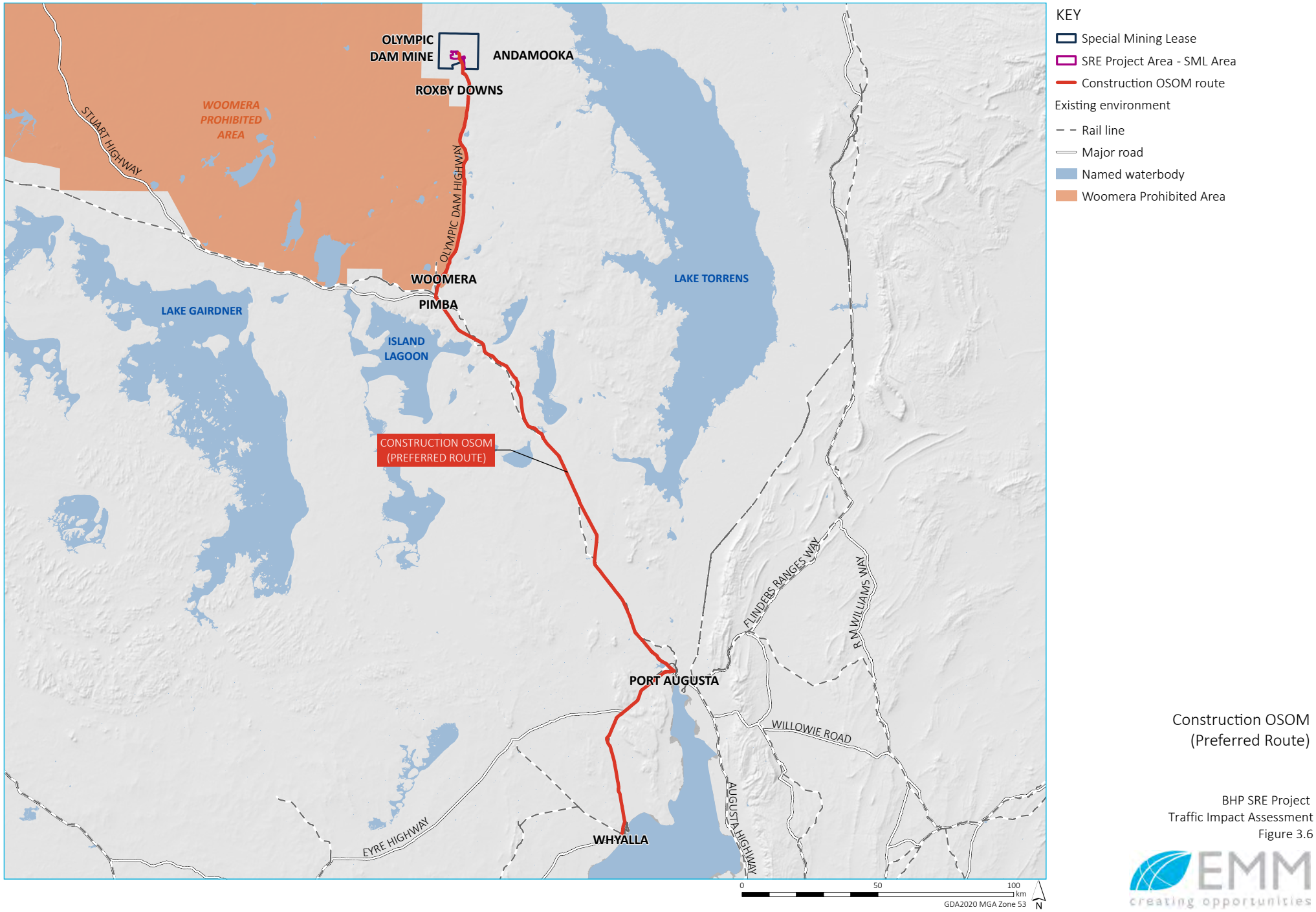
Table 4.1 outlines key locations along the preferred OSOM construction route, with a focus on turning movement suitability and available road width.

A colour code has been used to highlight the nature of the potential road infrastructure impacts:

- **Green**: No impact. Four locations are identified having no impact.
- **Yellow**: Minor impact where temporary change to existing road infrastructure is required (e.g. removal and reinstatement of signage or parking) or if the vehicle travels over mountable infrastructure. One location was assessed as having minor impact.
- **Orange**: Medium impact, where permanent changes to road infrastructure is required (e.g. additional hardstand area, traffic island modifications). No locations are identified as having medium impact.

Table 3.5 Outcome of the preliminary OSOM assessment

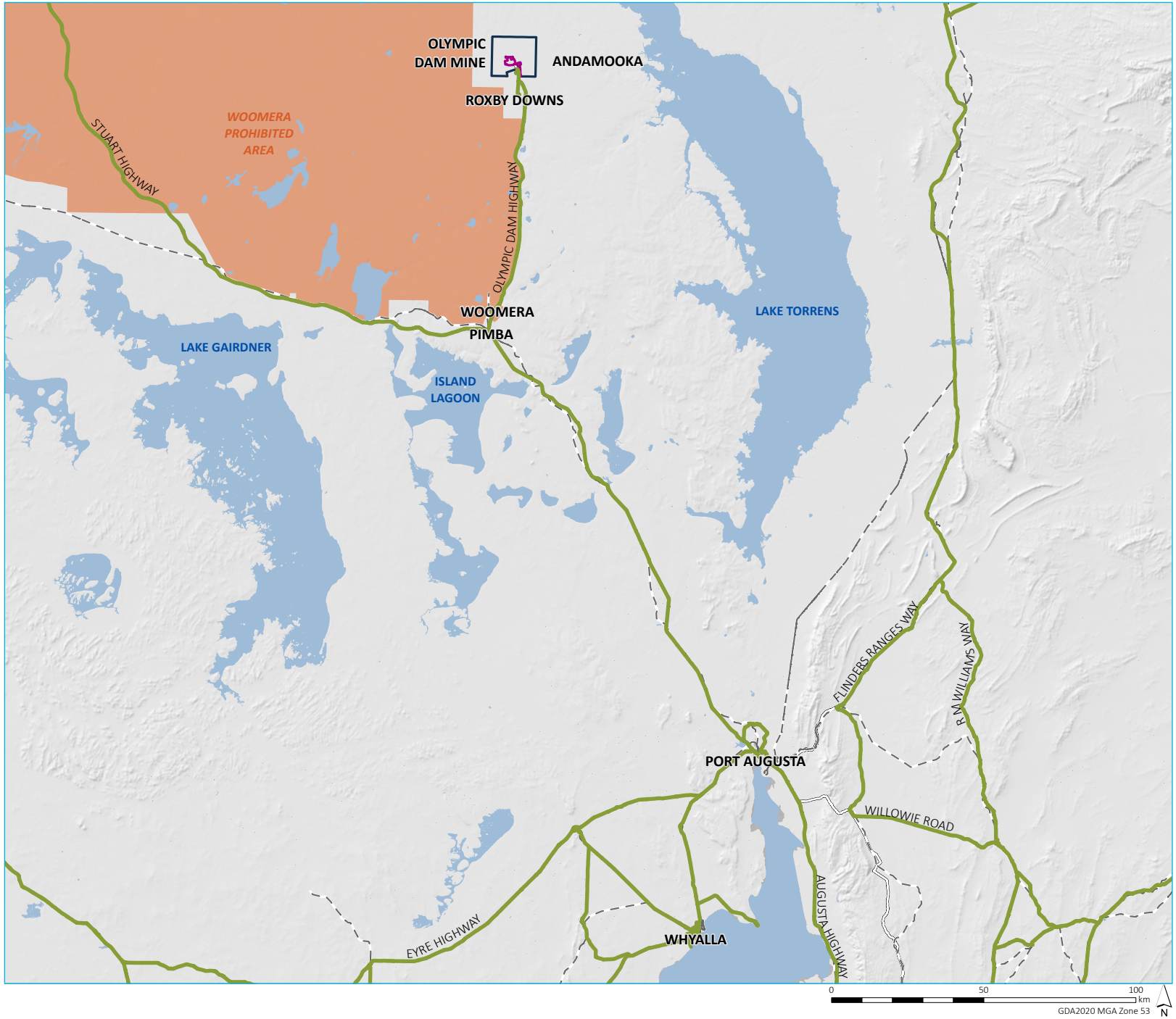
ID	Chainage	Suburb	Location	Drawing reference	Movement occurs on correct side of the road? (Yes/No)	Road infrastructure likely to be affected?
K1	76 km	Port Augusta West	Eyre Highway/Princes Highway/Stuart Highway intersection	EMM-001	No – cannot achieve turning radius on correct side.	Yes, OSOM vehicle to travel over mountable median strip and kerb on the north approach which would be subject to secondary permitting from DIT, NHVR, affected Local Council(s) and electricity utility provider (i.e. subject to separate approval).
K2	246 km	Pimba	Stuart Highway/Olympic Dam Highway intersection	EMM-002	No – cannot achieve turning radius on correct side.	No
K3	247 km	Pimba	Olympic Dam Highway rail level crossing	EMM-003	No	No
K4	254 km	Woomera	Olympic Dam Highway/Tech Road intersection	EMM-004	No	No
K5	335 km	Roxby Downs	Olympic Dam Highway/Olympic Way intersection	EMM-005	No	No



Construction OSOM
(Preferred Route)

BHP SRE Project
Traffic Impact Assessment
Figure 3.6

EMM
creating opportunities



KEY

- Special Mining Lease
- SRE Project Area - SML Area
- OSOM approved roads (25 m 59.5 t low loader)

Existing environment

- Rail line
- Major road
- Named waterbody
- Woomera Prohibited Area

OSOM approved roads
(25 m 59.5 t low loader)

BHP SRE Project
Traffic Impact Assessment
Figure 3.7

EMM
creating opportunities

3.5 Operations

3.5.1 Operational hours

Operational work is assumed to occur 24/7, 365 days of the year.

3.5.2 Operational workforce and accommodation

The operation personnel profile has a peak Stage 1a workforce of 207 FTEs, a Stage 1b workforce of 264 FTEs and a Stage 2 peak workforce of 508 FTEs (Hatch Fluor 2025).

SRE Project construction and operational workforce is proposed to utilise existing and new accommodation to be established by BHP for the Scheduled Campaign Maintenance 2027 (SCM27) shutdown, Olympic Dam future campaign maintenance accommodation, and/or greenfield accommodation (subject to separate approvals).

3.5.3 Operational shuttle bus operation

i Accommodation Village

90% of operational staff are expected to reside at the ODV, ODS and RDV accommodation, while the remaining 10% will reside in Roxby Downs (Hatch Fluor 2025).

Operational staff residing at the ODV and ODS accommodation villages would travel to/from the site in either 57-seater shuttle buses or light vehicles with an average vehicle occupancy of 2 persons per vehicle (Hatch Fluor 2025).

Shuttle buses would be stationed at the accommodation villages and are assumed to be fully utilised for transport in both directions (Hatch Fluor 2025).

The buses used for dayshift transportation will also accommodate the nightshift workers, meaning no additional shuttle buses are required for the nightshift operations (Hatch Fluor 2025).

ii Roxby Downs township

Approximately 10% of operational staff are expected to reside in Roxby Downs (Hatch Fluor 2025).

Operational staff residing in Roxby Downs travel to/from the site in light vehicles, average occupancy 2 person per vehicle (Hatch Fluor 2025).

3.5.4 Operational vehicle types

i Light vehicles

Operational staff from both the accommodation village and Roxby Downs will use light vehicles for commuting, with an average occupancy of two persons per vehicle (Hatch Fluor 2025).

ii Heavy vehicles

The longest operation-related heavy vehicles will be 53.5 m BAB-Quad trucks (Figure 3.8).

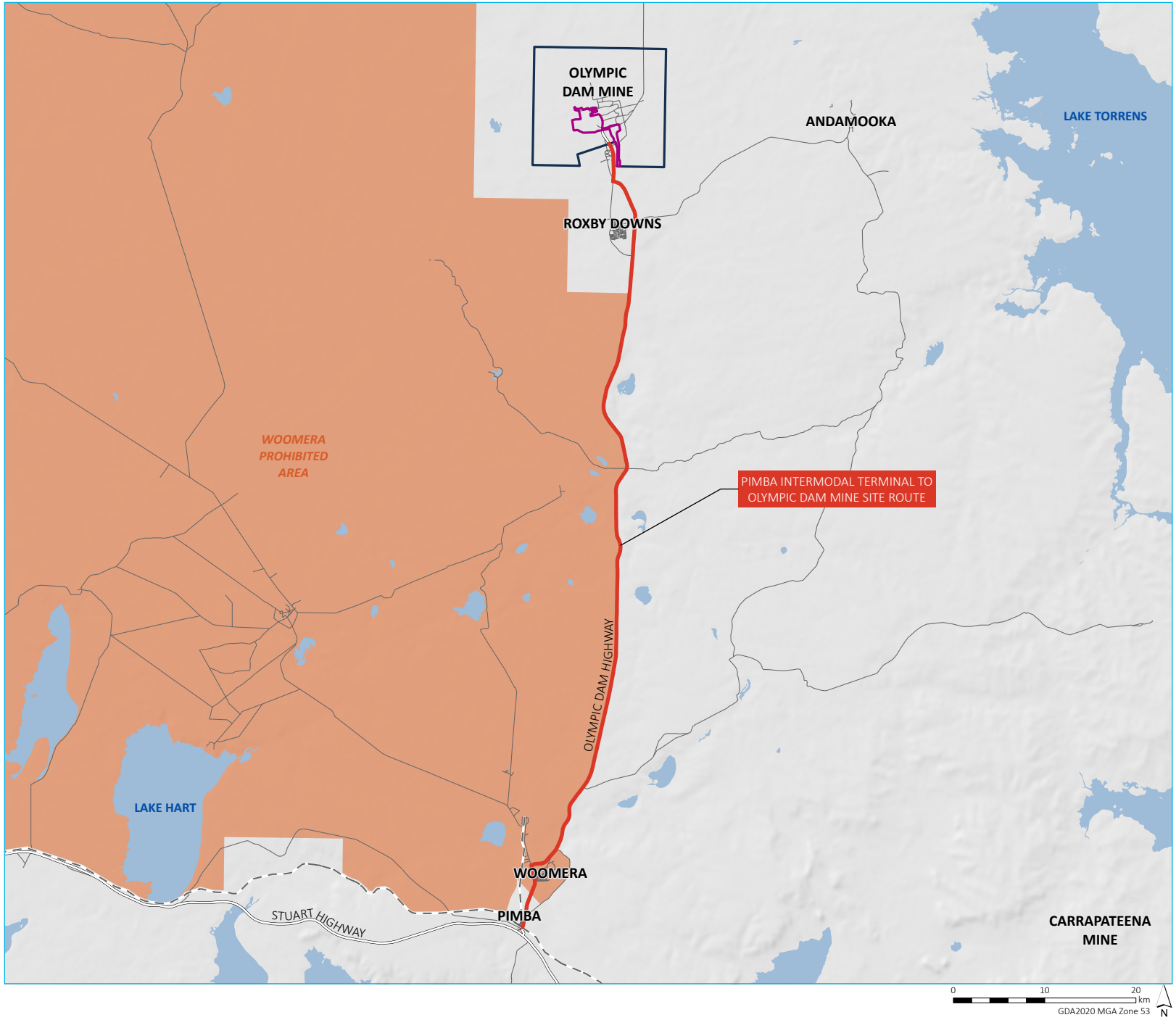


Source: NHVR

Figure 3.8 Example of 18 Axle BAB-Quad

iii Trains

During the operational phase of the SRE Project, BHP's transport strategy is proposed to prioritise the Trans-Australian Railway line at Pimba to utilise the Pimba intermodal terminal (currently under construction) as an alternative freight option for deliveries to the Olympic Dam mine site (see Figure 3.9, Section 3.5.6). Freight would be unloaded from the rail at the designated transfer point and then loaded onto trucks for transport to a logistics hub located within the SRE Project.



Pimba Intermodal Terminal to Olympic Dam mine site route

BHP SRE Project
Tra ic Impact Assessment
Figure 3.9

EMM
creating opportunities

3.5.5 Operational material delivery

SRE Project deliveries would only occur during daylight hours, with no nighttime delivery scheduled to occur (Hatch Fluor 2025).

Delivery frequency and arrival times will remain consistent across weekdays, weekends, and public holidays, operating 365 days a year (Hatch Fluor 2025).

3.5.6 Operational traffic generation

Operational traffic for the SRE Project will comprise of materials and equipment deliveries, as well as workforce traffic. However, 90% of workforce traffic is confined to travel between the ODV and ODS accommodation village and the Olympic Dam mine site (Section 3.5.2).

As a result, peak hour traffic analysis for this TIA has focused on materials and equipment deliveries, along with the 10% of workforce travelling between Roxby Downs township and the SRE Project as these trips will affect the two analysed intersections.

The AM and PM peak hour are assumed to align with the existing intersection peak hours in Table 2.18.

The operational traffic movements are detailed in the following tables and incorporates the following assumptions derived from Hatch Fluor (2025):

- A vehicle trip is defined as one inbound and one outbound movement. One vehicle trip equates to two vehicular movements.
- Operation deliveries will be occurring throughout the whole week. Delivery frequency and arrival times will remain consistent across weekdays, weekends, and public holidays, operating 365 days a year.
- Deliveries will occur only during daylight, with no nighttime deliveries occurring.
- Operational personnel will work throughout the week, covering both the dayshift and nightshift.
- EMM has assumed that the PM peak hour of 5:00 pm–6:00 pm (Table 2.18) is considered within daylight hours year-round.
- EMM has assumed the commencement of Stage 2 operations in April 2039 as the peak daily vehicle volume, as it includes the combined traffic volumes from existing, Stage 1a, 1b and 2 operations, representing the worst-case scenario.
- EMM has captured existing operation volumes in the traffic survey performed between 11–12 November 2024 (Section 2.5.10) and are therefore not to be included in Table 3.7, Table 3.8, Table 3.9 and Table 3.10.
- EMM has assumed 15% of the daily heavy vehicle volume during the peak month will represent the peak hour traffic scenario.

Table 3.6 Operation deliveries – Peak daily truck trips (commodities)

Commodity	Route	Existing	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2
Copper concentrate	Carrapateena to/from Olympic Dam	1	12	13	9
Copper concentrate	Prominent Hill to/from Olympic Dam	1	5	6	4
Copper concentrate	Oak Dam to/from Olympic Dam	0	0	0	18
Acid Import	Adelaide to/from Olympic Dam	4	0	0	0
Acid Export	Olympic Dam to/from Adelaide	0	19	19	27
Ammonia	Adelaide to/from Olympic Dam	1	1	1	1
Caustic Soda	Adelaide to/from Olympic Dam	1	1	2	2
Cement (Mortar)/MineCem (CAF)	Port Augusta to/from Olympic Dam	11	22	31	37
Quick Lime (CAF)	Port Augusta to/from Olympic Dam	1	1	0	0
Coke	Adelaide to/from Olympic Dam	1	0	0	0
Cyanide	Adelaide to/from Olympic Dam	1	1	1	1
Diluent (Shell_2046 Kerosene)	Adelaide to/from Olympic Dam	1	1	1	1
Electrode Paste	Adelaide to/from Olympic Dam	1	0	0	0
Ethanol	Adelaide to/from Olympic Dam	1	1	1	1
Ammonia Nitrate	Adelaide to/from Olympic Dam	1	1	1	1
MAG E10 (Flocculant)	Adelaide to/from Olympic Dam	1	1	1	1
MAG 919 (Flocculant)	Adelaide to/from Olympic Dam	1	1	1	1
Diesel (All users)	Port Augusta to/from Olympic Dam	3	1	1	1
Interfroth 754	Adelaide to/from Olympic Dam	1	1	1	1
Fuel Oil	Adelaide to/from Olympic Dam	1	2	2	2
General Freight North (To Site)	Adelaide to/from Olympic Dam	1	1	2	2
General Freight North (To Site)	Adelaide to/from Olympic Dam	1	1	1	1
Hydrogen Peroxide	Adelaide to/from Olympic Dam	1	1	1	1
LPG	Adelaide to/from Olympic Dam	3	2	2	2
Autran TO 430 (Cat. Trans Fluid)	Adelaide to/from Olympic Dam	1	1	1	1
Autran TO 430 (Cat. Drive Fluid)	Adelaide to/from Olympic Dam	1	1	1	1
Energol HLP-HM 68 (Hydraulic Fluid)	Adelaide to/from Olympic Dam	1	1	1	1
Mine Multi Diesel (Engine oil)	Adelaide to/from Olympic Dam	1	1	1	1
Vectron (Engine oil)	Adelaide to/from Olympic Dam	1	1	1	1
Polysil_Peg (Coagulant)	Adelaide to/from Olympic Dam	1	1	1	1
IETC Promoter_CMS2500	Adelaide to/from Olympic Dam	1	1	1	1

Commodity	Route	Existing	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2
Oxime_Copper SX	Adelaide to/from Olympic Dam	1	1	1	1
Clay_Copper SX	Adelaide to/from Olympic Dam	1	1	1	1
Diatomaceous earth_Copper SX	Adelaide to/from Olympic Dam	1	1	1	1
Amine_Uranium SX	Adelaide to/from Olympic Dam	1	1	1	1
Soda Ash_Uranium SX	Adelaide to/from Olympic Dam	1	1	1	1
Isodecanol_Uranium SX	Adelaide to/from Olympic Dam	1	1	1	1
Sodium Chlorate	Adelaide to/from Olympic Dam	1	1	1	1
Sulphur	Adelaide to/from Olympic Dam	3	2	2	2
Xanthate	Adelaide to/from Olympic Dam	1	1	1	1
Copper Cathode (ER+EW)	Olympic Dam to/from Adelaide	13	12	16	22
Uranium Oxide Concentrate (UOC)	Olympic Dam to/from Adelaide	1	1	1	1
Precious Metals (Gold+Silver)	Olympic Dam to/from Adelaide	1	2	2	2
Silver Flux	From Olympic Dam	0	8	10	16
Larox Cake	From Olympic Dam	0	51	70	83

Source: Hatch Fluor 2025.

By consolidating the peak daily truck trips in Table 3.6 based on common routes, the volumes have been combined and presented in Table 3.7.

All commodities transported by rail will be conveyed between Pimba Intermodal Terminal and SRE Project via heavy vehicles.

Table 3.7 Operation deliveries – Peak daily road/rail trips (consolidated)

Route	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2	Total
Road				
Carrapateena to/from Olympic Dam	12	13	9	34
Prominent Hill to/from Olympic Dam	5	6	4	15
Oak Dam to/from Olympic Dam (subject to separate approval)	0	0	18	18
Adelaide to/from Olympic Dam	12	12	12	36
Pimba Intermodal Terminal	79	93	105	277

Source: Hatch Fluor 2025.

By applying the 15% factor to the peak daily truck trips, we estimate the peak hour truck trips as shown in Table 3.8.

Table 3.8 Operation deliveries – Peak hour truck trips

Route	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2	Total
Road				
Carrapateena to/from Olympic Dam	2	2	2	6
Prominent Hill to/from Olympic Dam	1	1	1	3
Oak Dam to/from Olympic Dam (subject to separate approval)	0	0	3	3
Adelaide to/from Olympic Dam	2	2	2	6
Pimba Intermodal Terminal	13	15	17	45

Note: Values have been rounded up to provide a conservative estimate.

Table 3.9 Operation personnel – Peak daily light vehicle trips

Route	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2	Total
Olympic Dam to/from Roxby Downs township (Day shift)	21	27	51	99
Olympic Dam to/from Roxby Downs township (Night shift)	20	26	50	96

Source: Hatch Fluor 2025.

By applying the 15% factor to the peak daily light vehicle trips, we estimate the peak hour light vehicle trips as shown in Table 3.10.

Table 3.10 Operation personnel – Peak hour light vehicle trips

Route	SRE Project Stage 1a	SRE Project Stage 1b	SRE Project Stage 2	Total
Olympic Dam to/from Roxby Downs (Day shift)	4	5	8	17
Olympic Dam to/from Roxby Downs (Night shift)	3	4	8	15

Note: Values have been rounded up to provide a conservative estimate.

3.5.7 Operational traffic distribution

All operational material and equipment delivery vehicles are assumed to originate from the areas shown in the vehicle routes are outlined in Figure 3.10 and Figure 3.11.

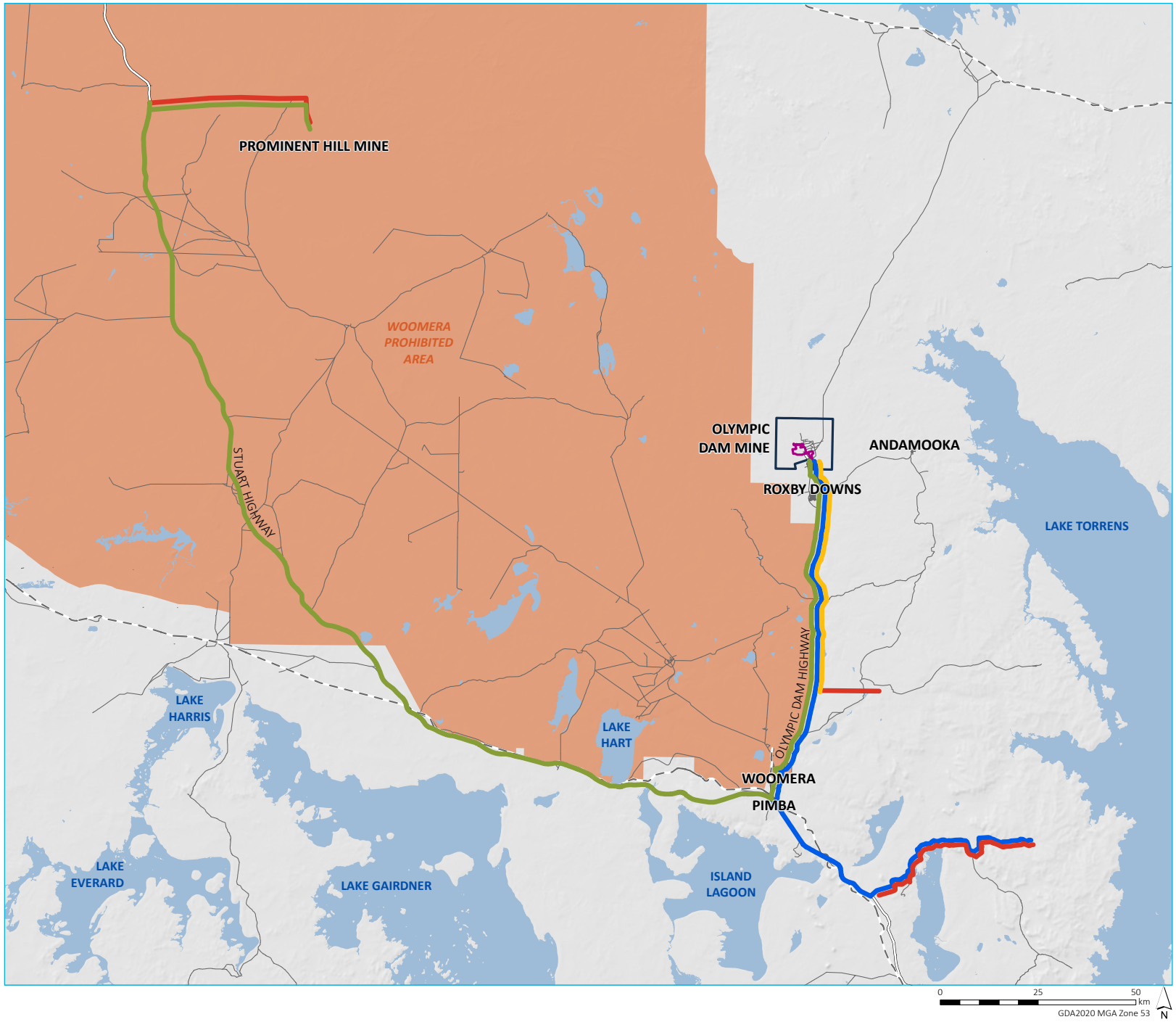
Heavy vehicles will be travelling via Olympic Dam Highway avoiding the township of Roxby Downs township, while personnel light vehicles will travel from Roxby Downs township via Olympic Dam Way, refer Figure 3.12.

Personnel light vehicles are assumed to travel in both directions during peak hours, similar to the shuttle bus movements to/from the ODV and ODS accommodation villages, due to the shift-based nature of the operational jobs.

The peak hour traffic distribution is summarised in Table 3.11, Figure 3.13 and Figure 3.14.

Table 3.11 Peak hour movement distribution (April 2039, SRE Project – Stage 1a, 1b and 2 operation)

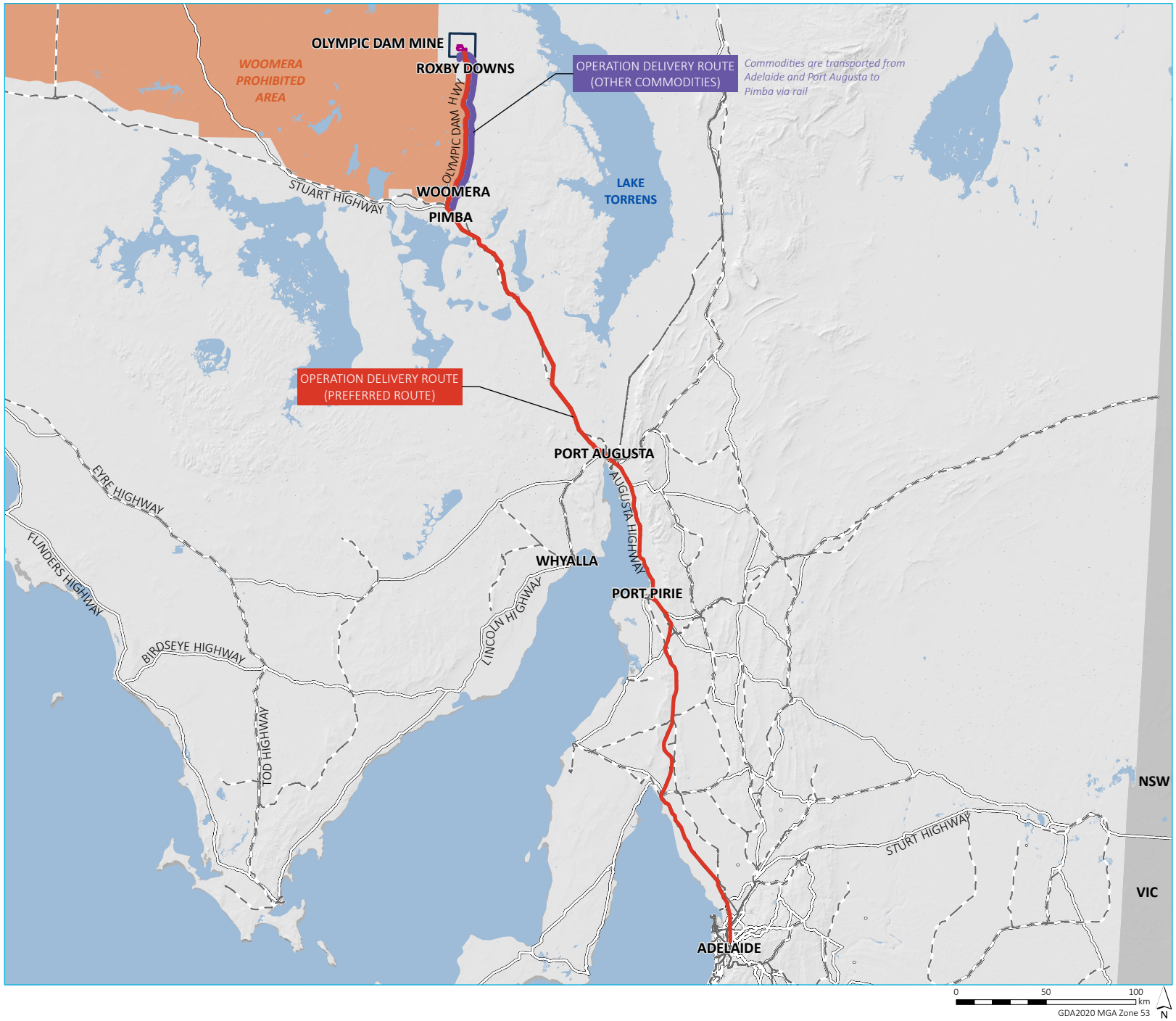
Olympic Dam to/from	AM Peak				PM Peak			
	Light vehicles		Heavy vehicles		Light vehicles		Heavy vehicles	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Road								
Carrapateena	0	0	6	6	0	0	6	6
Prominent Hill	0	0	3	3	0	0	3	3
Oak Dam	0	0	3	3	0	0	3	3
Roxby Downs	15	15	0	0	15	15	0	0
Adelaide	0	0	6	6	0	0	6	6
Pimba Intermodal Terminal	0	0	45	45	0	0	45	45



Operation delivery route
(copper concentrate)

BHP SRE Project
Traffic Impact Assessment
Figure 3.10

EMM
creating opportunities



KEY

- Special Mining Lease
- SRE Project Area - SML Area
- Operation delivery route (other commodities)
- Operation delivery route (precious metals)

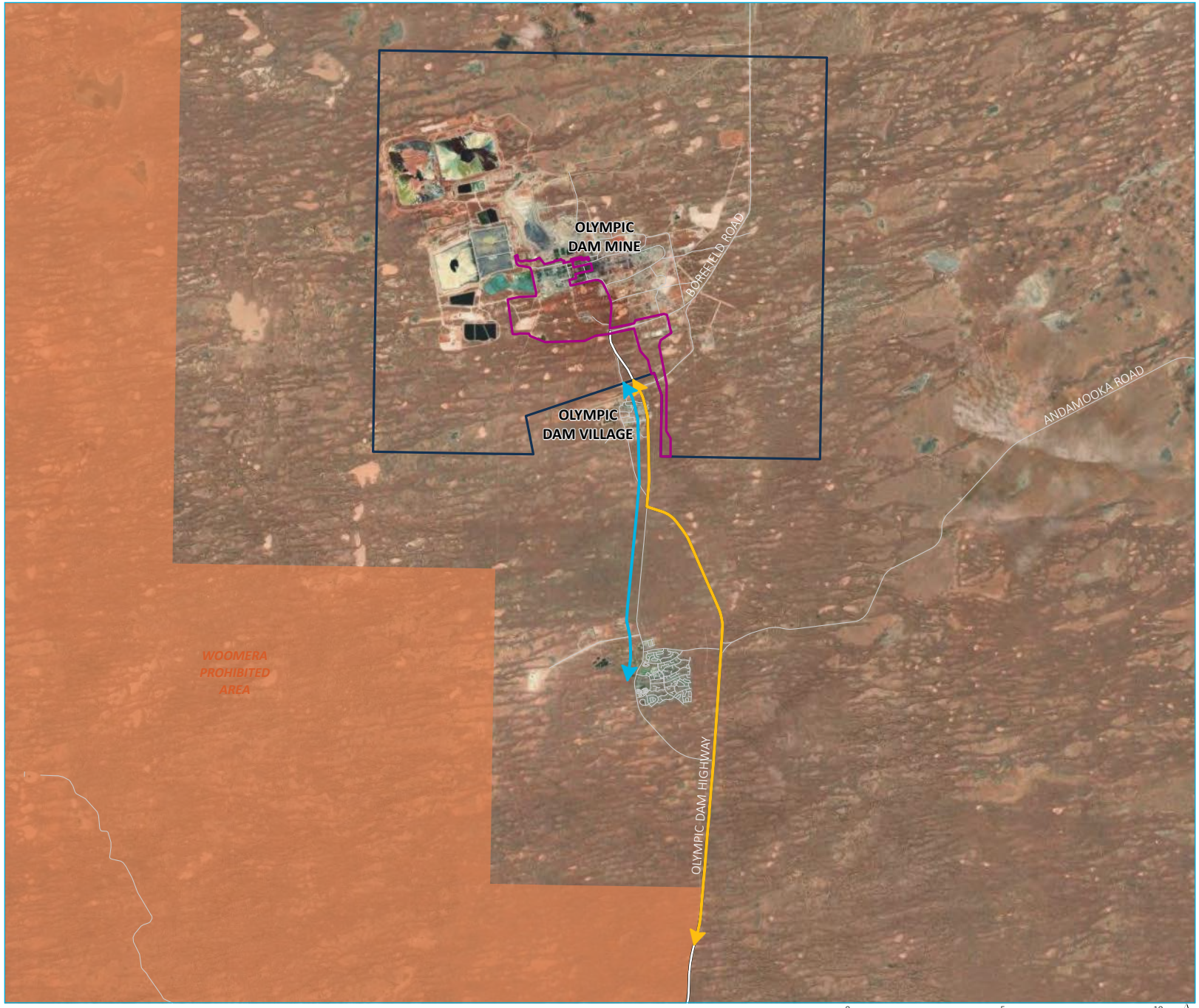
Existing environment

- Rail line
- Major road
- Named waterbody
- Woomera Prohibited Area

Operation delivery route (other commodities)

BHP SRE Project
Tra ic Impact Assessment
Figure 3.11

EMM creating opportunities



Operation delivery and personnel route (within vicinity of Olympic Dam mine and Roxby Downs)

BHP SRE Project
Traffic Impact Assessment
Figure 3.12

EMM
creating opportunities

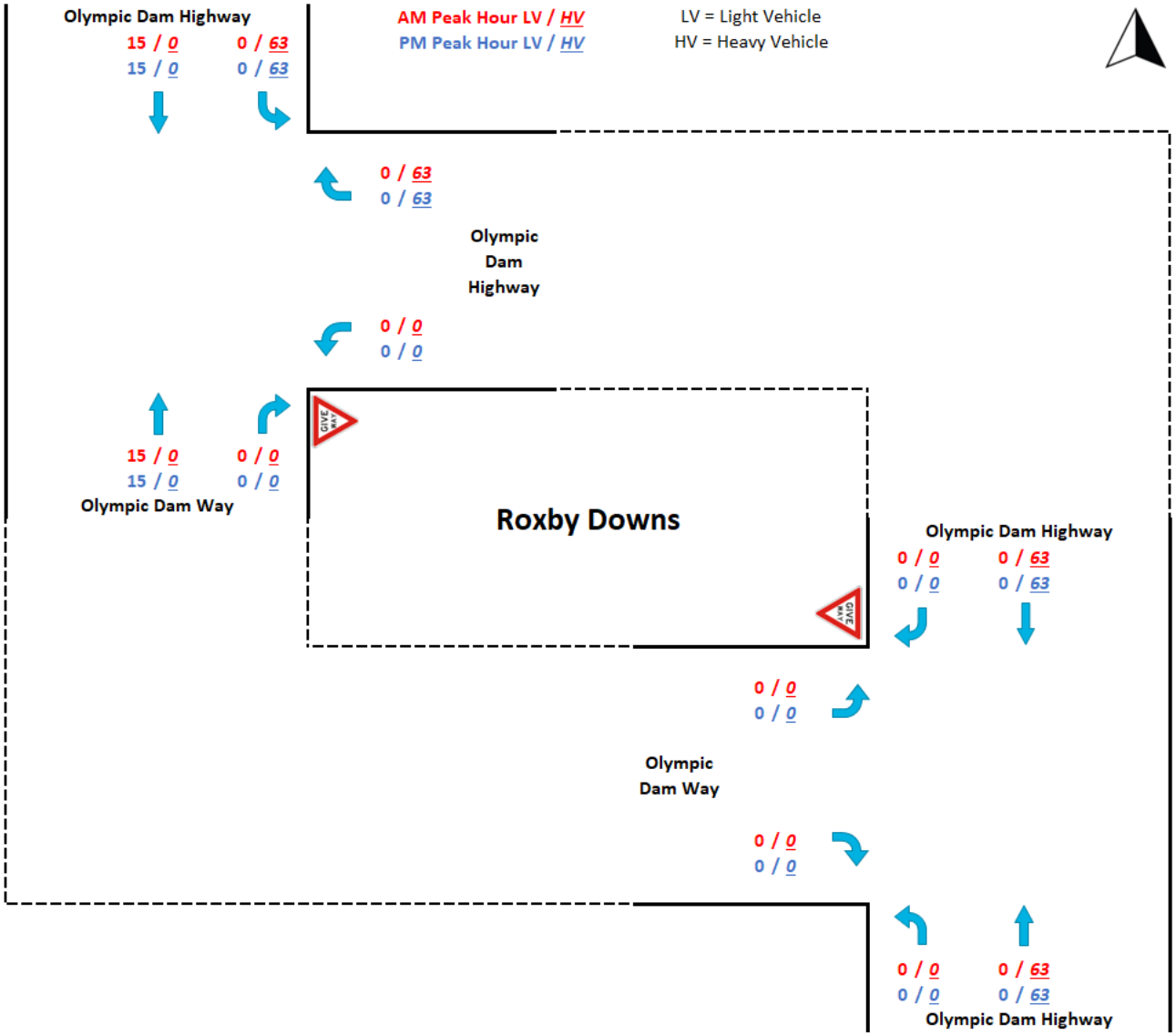


Figure 3.13 **2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Roxby Downs)**

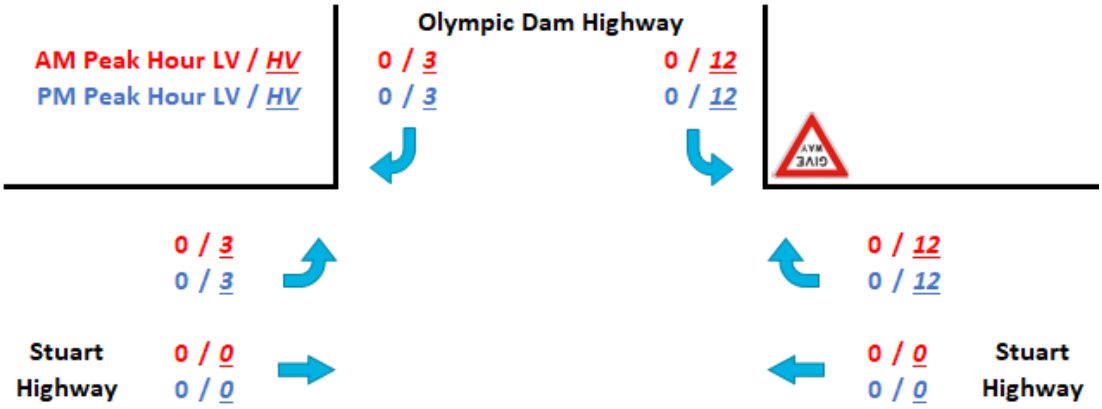


Figure 3.14 2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Pimba)

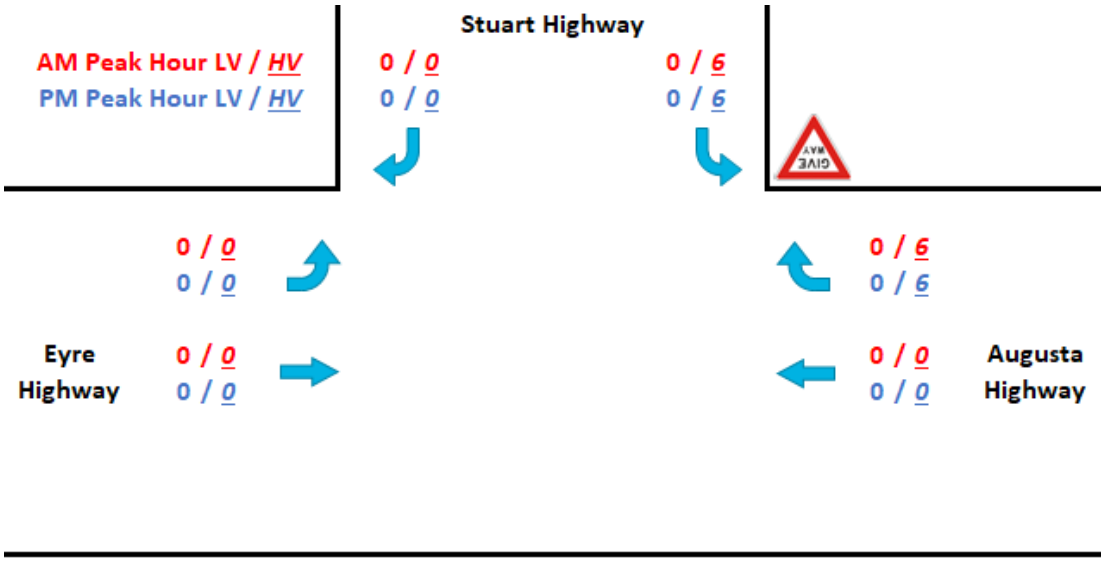


Figure 3.15 2039 operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes (Port Augusta)

3.6 Growth of background traffic

Roxby Downs has a highly transient population, primarily supporting the Olympic Dam mine site, which highlights the stability of local conditions. There is no consistent pattern of growth. Census data indicates that the population grew steadily between 2001 and 2011, before declining in 2016 and increasing again in 2021. The 2021 population remains slightly lower than the 2006 population (Table 3.12). Furthermore, there are no populated areas around Pimba, with the only noteworthy location being Woomera, which also has a transient population with Table 3.13 showing a decline in population since 2021. In addition, Port Augusta, located approximately 175 km south of Pimba, has experienced only minor population fluctuations over time, with no clear long-term upward growth trajectory.

Table 3.12 Estimated resident population – Roxby Downs

Year	Number
2001	3803
2006	4055
2011	4702
2016	3884
2021	3976

Source: ABS.

Table 3.13 Census data – Woomera

Year	Number
2001	598
2006	295
2011	216
2016	146
2021	132

Source: ABS.

Table 3.14 Census data – Port Augusta

Year	Number
2001	13474
2006	13874
2011	13985
2016	13808
2021	13829

Source: ABS.

Due to the above reason, it is reasonable to rely on data from previous years without applying a linear background growth adjustment. As such, a linear growth of background traffic on the road network has not been applied for this traffic analysis. Therefore, the baseline traffic volumes for 2028 and 2039 remains the same as the existing 2024 volumes, refer to Section 2.5.10. Similarly, no background traffic growth has been applied to the tube count data in Section 2.5 for the traffic volume assessment in Section 4.3.2.

3.7 Projected traffic volumes

The estimated future traffic volumes are provided in the following Figure 3.16 and Figure 3.17.

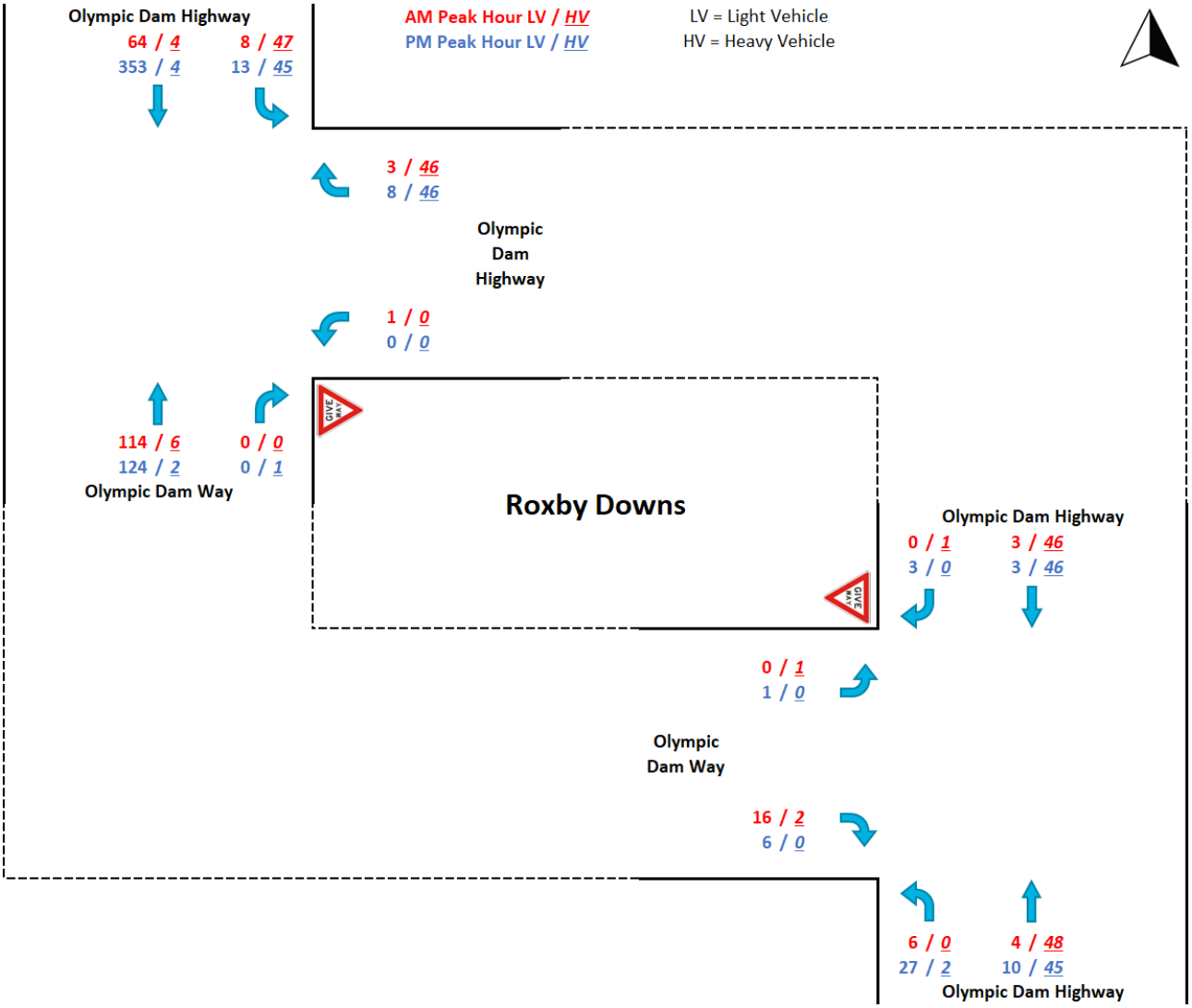


Figure 3.16 2037 baseline + construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) peak hour intersection volumes

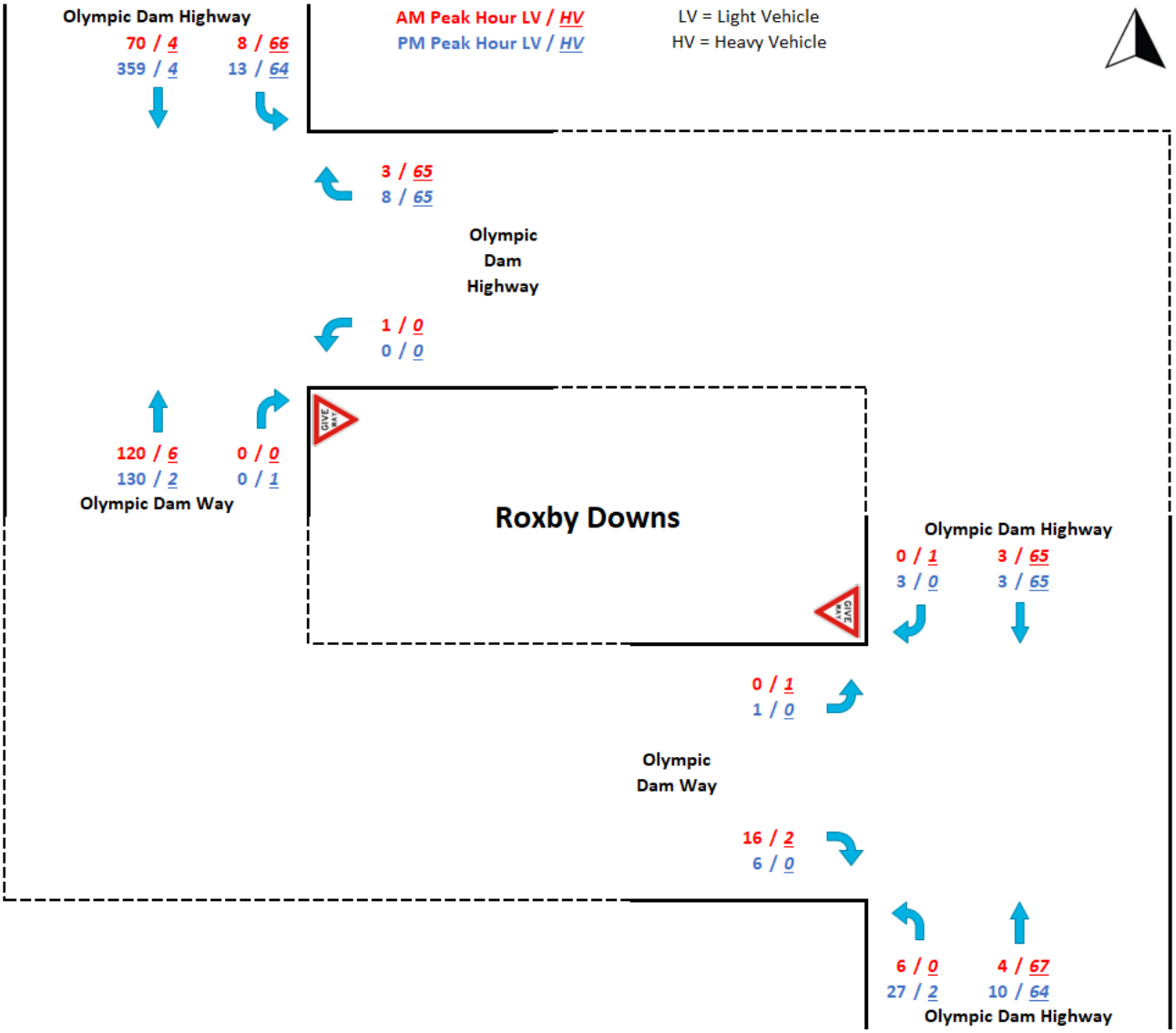


Figure 3.17 2039 baseline + operation (SRE Project – Stage 1a, 1b and 2) peak hour intersection volumes

3.8 Conclusion

Table 3.15 presents the revised SPR assessment with respect to traffic and transport following completion of the assessment of effects. Those potential impact events for which a linkage has been demonstrated have been carried forward for impact assessment (refer Chapter 4).

Table 3.15 Final SPR assessment – confirmed impact events

Impact ID	Potential impact event	Receptor	Linkage	Linkage justification
SE1	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, leads to degradation, increasing the risk to public health and safety.	Local community (health and safety)	Yes	The proposed SRE Project activities will increase heavy vehicle traffic on the road network requiring impact assessment (refer Chapter 4).
SE2	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, results in an increase in likelihood of traffic accidents, impacting on the health and safety of the local community.	Local community (health and safety)	Yes	The proposed SRE Project activities will increase heavy vehicle traffic and potential for traffic accidents requiring impact assessment (refer Chapter 4).
SE3	Increases in heavy vehicle traffic associated with the movement of construction materials, including oversized and restricted movements, leads to increase travel times affects road users, impacting on the social value of the local community.	Local community (social value – amenity)	Yes	The proposed SRE Project activities will increase travel time within the local and regional areas requiring impact assessment (refer Chapter 4).
SE4	During operations, increases in heavy vehicle traffic associated with the movement of operational reagents and concentrates affects road users and impacts on the health and safety of the local community.	Local community (health and safety)	Yes	The proposed SRE Project activities will increase heavy vehicle traffic on the road network requiring impact assessment (refer Chapter 4).
SE5	During operations, increase in road traffic results in the degradation of the roads and increases risk to the public health and safety.	Local community (health and safety)	Yes	The proposed SRE Project activities will increase heavy vehicle traffic and potential for traffic accidents requiring impact assessment (refer Chapter 4).
SE6	During operations, the increased movement of heavy vehicles results in increases in travel times within the local and regional areas, impacting existing social values.	Local community (social value – amenity)	Yes	The proposed SRE Project activities will increase travel time within the local and regional areas requiring impact assessment (refer Chapter 4).

4 Impact assessment

4.1 Confirmed impact events

Following the assessment of effects, the following impact events have been confirmed:

- SE1– Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, leads to degradation, increasing the risk to public health and safety.
- SE2 – Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, results in an increase in likelihood of traffic accidents, impacting on the health and safety of the local community.
- SE3 – Increases in heavy vehicle traffic associated with the movement of construction materials, including oversized and restricted movements, leads to increase travel times affects road users, impacting on the social value of the local community.
- SE4 – During operations, increases in heavy vehicle traffic associated with the movement of operational reagents and concentrates affects road users and impacts on the health and safety of the local community.
- SE5 – During operations, increase in road traffic results in the degradation of the roads and increases risk to the public health and safety.
- SE6 – During operations, the increased movement of heavy vehicles results in increases in travel times within the local and regional areas, impacting existing social values.

4.2 Impact significance criteria

To determine impact significance this TIA has applied the potential impact event consequence matrix outlined in BHP's Environmental Impact Assessment Framework Appendix of the EIS and summarised in Table 4.1, in terms of traffic impacts.

Table 4.1 Consequence definitions and significance determination

Severity level	1	2	3	4	5
Significance	**Not Significant**		**Significant**		
Adjoining land and infrastructure (third-party users, indigenous community, social value)	No measurable impact to surrounding land and infrastructure.	Minor repairable damage to land and infrastructure with short-term disruption to use. Minor damage to a conservation area that can be repaired without impacting on conservation values. Suspension of important community services (e.g., transport, telecommunications, energy) for up to one hour.	Damage to land and infrastructure that results in remediation costs and/or loss of income of up to US $1m. Damage to a conservation area that can be fully remediated within 12 months. Suspension of important community services (e.g. transport, telecommunications, energy) for up to one day.	Damage to land and infrastructure that results in remediation costs and/or loss of income of up to US$10m. Damage to a conservation area that cannot be remediated within six months and results in the temporary loss of one or more values for which the area was reserved. Suspension of important services to the community (e.g. transport, telecommunications, energy) for more than one week.	Extensive damage to land and infrastructure that results in remediation costs and/or loss of income of over US$10m. Irreversible damage to a conservation area resulting in permanent loss of one or more of the values for which the area was reserved. Suspension of important services to the community (e.g. transport, telecommunications, energy) for more than a month.
Economic (social value, local community, indigenous community)	No measurable adverse impact on local communities or businesses.	Short-term impacts on local businesses and/or wellbeing of local communities where those affected could be expected to adapt or cope.	Ongoing impacts on the wellbeing of local communities that results in members of the community leaving the area and/or significant mental health issues across the community. Ongoing impacts on local businesses that result in closures and (direct and indirect) loss of employment for up to 20 people.	Ongoing impacts on the wellbeing of local communities that results in a significant proportion of the community leaving the area and/or serious mental health issues across the affected communities. Ongoing impacts to businesses that result in closures and (direct and indirect) loss of employment for up to 100 people.	Ongoing impacts on the wellbeing of communities that leads to towns being unable to effectively function. Ongoing impacts to businesses that result in closures and (direct and indirect) loss of employment for more than 100 people and/or towns in the region becoming unviable.
Public health and safety (human health, indigenous community, local community, social value)	Injury or illness requiring first aid treatment with immediate release.	Injury or illness requiring short-term (less than one week) hospitalisation with full recovery.	Reversable impairment or serious injuries requiring long-term hospitalisation to one or more members of public.	Single fatality or injury or illness that results in permanent disablement.	Multiple fatalities or serious disabling injuries.

4.3 Impact assessment

4.3.1 Intersection performance

The key SRE Project intersections have been modelled with the SIDRA Intersection 10 software, a micro-analytical tool for individual intersections and linked intersection-network modelling. The modelling is based on the existing traffic survey data detailed in Sections 2.5.10 and the projected traffic volumes detailed in Section 3.7.

SIDRA provides the following performance indicators:

- Degree of saturation (DOS) – the total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation (e.g. 0.8 = 80% saturation). In practice the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to. These are usually called 'practical degrees of saturation'.

- Average delay (DEL) – for a signalised or roundabout intersection, this is the average delay in seconds encountered by all vehicles passing through the intersection. For a priority-controlled intersection, this is the average delay experienced by the worst approach and turning movement. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.

- Level of service (LOS) – this is a categorisation of average delay, intended for simple reference. For a priority-controlled intersection, this is the categorisation of the average delay experienced by the worst approach and turning movement.

- 95% queue lengths (Q95) – is defined to be the queue length in metres that has only a 5% probability of being exceeded during the analysed time period. It transforms the average delay into measurable distance units.

The LOS is a good indicator of overall performance for individual intersections, with each level summarised in Table 4.2.

Table 4.2 Intersection LOS standards

LOS	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('Stop' and 'Give Way')
A	<14	Good operation	Good operations
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At traffic signals, incidents will cause extensive delays. Roundabouts require other control mode.	At capacity, required other control mode
F	>71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; required other control mode

Source: DIT Traffic Modelling Guidelines – SIDRA INTERSECTION (Department of Infrastructure and Transport 2022).

SIDRA modelling for all key intersections (Section 2.4) has been conducted for the following scenarios:

- **2037/2039 Baseline Peak Hour Traffic Volumes:** Identical baseline peak hour traffic volumes for both years (Figure 2.5).
- **2037 Construction and Operation Peak Hour Traffic Volumes:** Includes construction traffic for SRE Project – Stage 2 and operational traffic for SRE Project – Stage 1a and 1b (Figure 3.16).
- **2039 Operation Peak Hour Intersection Volumes:** Includes operational traffic for SRE Project – Stages 1a, 1b and 2 (Figure 3.17).

The following abbreviations are used for the vehicle movements:

- TH: through movement
- LT: left turn
- RT: right turn

The SIDRA results for the key intersections are presented in Section 4.3.1i. Detailed SIDRA results can be found in Appendix B.

i SIDRA modelling results

The SIDRA modelling results for Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs township) are provided in Table 4.3.

Table 4.3 SIDRA modelling result for Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs)

Control: Priority controlled (Give Way)	AM Peak						PM Peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 direction and approach**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 direction and approach**
2024 (Existing)	198	7.5	A	0.059	0.2	RT from the east approach	517	10.2	A	0.187	0.6	RT from the east approach
2037 (Baseline + construction + operation)	309	9.9	A	0.095	4.7	RT from the east approach	628	17.0	B	0.192	8.2	RT from the east approach
2039 (Baseline + operation)	362	10.6	A	0.140	7.1	RT from the east approach	681	19.7	B	0.273	13.6	RT from the east approach

The assessment for intersection performance concluded:

- the right turn from Olympic Dam Highway (east) decreases from LOS A to LOS B in the following scenarios:
  - 2037 baseline + construction + operation PM peak
  - 2039 baseline + operation PM peak

- all other scenarios operate well within capacity achieving LOS A (good operation)
- the intersection can effectively accommodate SRE Project traffic volumes associated with both construction and operation without significantly impacting its performance.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

The SIDRA modelling results for Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs township) are provided in Table 4.4.

Table 4.4 SIDRA modelling result for Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs)

Control: Priority controlled (Give Way)	AM Peak						PM Peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 direction and approach**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 direction and approach**
2024 (Existing)	41	5.8	A	0.017	0.5	RT from west	58	5.7	A	0.019	0.1	RT from west
2037 (Baseline + construction + operation)	134	6.6	A	0.043	0.6	RT from west	151	6.4	A	0.044	0.2	RT from west
2039 (Baseline + operation)	174	7.0	A	0.059	0.6	RT from west	191	6.8	A	0.060	0.2	RT from west

The assessment for intersection performance concluded:

- during both the AM and PM periods, the intersection operates well within capacity, achieving a LOS A (good operation) across all scenarios
- the intersection can effectively accommodate SRE Project traffic volumes associated with both construction and operations without significantly impacting its performance.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

4.3.2 Traffic volume assessment

As discussed in Section 2.5, the average daily traffic volumes are presented in Table 4.5.

Projected traffic volumes for SRE Project Stage 2 construction are sourced from Table 3.2, Table 3.4 and Table 3.9, while projected traffic volumes for SRE Project Stage 2 operations are sourced from Table 3.3 and Table 3.9. Traffic volumes are doubled to account for two one-way movements which equates a total trip.

Table 4.5 Average daily traffic volume increase on Olympic Dam Highway and Olympic Dam Way

Count location	Existing average daily two-way traffic volume	Existing average heavy vehicle percentage	SRE Project – Stage 2 construction and Stage 1a and 1b operation traffic (2037)	Percentage increase traffic volume	SRE Project – Stage 2 operation traffic (2039)	Percentage increase traffic volume
Olympic Dam Highway (north of Roxby Downs)	4200	9%	726	17.3%	1150	27.4%
Olympic Dam Highway (south of Roxby Downs)	500	26%	538	107.6%	760	152.0%
Olympic Dam Way	430	11.5%	188	43.7%	390	90.7%
Olympic Dam Highway (Pimba)	650	18.5%	194	29.8%	170	26.2%
Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection)	950	37%	172	18.1%	140	14.7%
Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection)	470	40.5%	22	4.7%	30	6.4%
Augusta Highway (south-east of Port Augusta)	4800	27%	122	2.5%	72	1.5%
Within Port Augusta township						
Stuart Highway	4700	18%	122	2.6%	72	1.5%
Augusta Highway	16100	15.5%	122	0.8%	72	0.4%

Note: It is assumed that the tube count data accounts for the existing operational traffic volumes at Olympic Dam.

The traffic volume assessment for SRE Project – Stage 2 Construction and Stage 1a and 1b operation Impacts concluded:

- Olympic Dam Highway (north of Roxby Downs):
  - Traffic volumes are expected to increase by 17.3%. The impact is minimal due to already high baseline traffic volumes (4200 vehicles per day) from township and Olympic Dam traffic.
- Olympic Dam Highway (south of Roxby Downs):
  - A large percentage increase in traffic (107.6%) is projected due to low existing volumes (500 vehicles per day). This route mainly serves traffic coming from the south of Roxby Downs.
- Olympic Dam Way:
  - Traffic volumes are predicted to rise by 43.7%, driven by light vehicles for mine operations and personnel movements. This road typically carries lower traffic (430 vehicles per day), so the relative increase is significant.
  - No heavy vehicle impact during this phase, as trucks avoid this road to bypass the township.

- Olympic Dam Highway (Pimba):
  - A moderate increase in traffic (29.8%) is projected, relative to the existing low traffic volumes (approximately 650 vehicles per day). This route mainly serves traffic coming from Stuart Highway.
- Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection):
  - A small increase of 18.1% in traffic volumes is projected, driven by heavy vehicles for the mine operation and construction deliveries. The existing road has moderate baseline volumes (950 vehicles per day).
- Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection):
  - A minor increase in traffic (4.7%) is projected for this section. Existing volumes are low (470 vehicles per day), and the impact from project traffic is expected to be negligible.
- Augusta Highway (south-east of Port Augusta):
  - A minor increase in traffic (2.5%) is projected for this section. Existing volumes are high (4,800 vehicles per day), and the impact from project traffic is expected to be negligible.
- Stuart Highway (within Port Augusta township):
  - A minor increase in traffic (2.6%) is projected for this section. Existing volumes are high (4,700 vehicles per day), and the impact from project traffic is expected to be negligible.
- Augusta Highway (within Port Augusta township):
  - A minor increase in traffic (0.8%) is projected for this section. As the existing traffic volumes are higher (16100 vehicles per day), and the impact from project traffic is expected to be negligible.

The traffic volume assessment for SRE Project – Stage 2 Operation Impacts concluded:

- Olympic Dam Highway (north of Roxby Downs):
  - A 27.4% increase in traffic is expected due to more delivery vehicles and personnel commuting between Roxby Downs and Olympic Dam.
- Olympic Dam Highway (south of Roxby Downs):
  - Traffic volumes are projected to more than double, with a 152% increase. The low baseline volume amplifies the impact of additional traffic.
- Olympic Dam Way:
  - Large impact (90.7% increase), as this road becomes a major route for personnel travelling between the township and Olympic Dam, significantly increasing traffic volumes on a road typically handling lower traffic levels.
  - No heavy vehicle impact during this phase, as trucks avoid this road to bypass the township.

- Olympic Dam Highway (Pimba):
  - A moderate increase of 26.2% is projected, relative to the existing low traffic volumes (approximately 650 vehicles per day). This route mainly serves traffic coming from Stuart Highway.
- Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection):
  - A small increase of 14.7% in traffic volumes is projected, driven by heavy vehicles for the mine operation. The existing road has moderate baseline volumes (950 vehicles per day).
- Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection):
  - A minor increase in traffic (6.4%) is projected for this section. Existing volumes are low (470 vehicles per day), and the impact from project traffic is expected to be negligible.
- Augusta Highway (south-east of Port Augusta):
  - A minor increase in traffic (1.5%) is projected for this section. Existing volumes are high (4,800 vehicles per day), and the impact from project traffic is expected to be negligible.
- Stuart Highway (within Port Augusta township):
  - A minor increase in traffic (1.5%) is projected for this section. As the existing volumes are higher (4,700 vehicles per day), and the impact from project traffic is expected to be negligible.
- Augusta Highway (within Port Augusta township):
  - A minor increase in traffic (0.4%) is projected for this section. As the existing volumes are higher (16,100 vehicles per day), and the impact from project traffic is expected to be negligible.

These findings highlight the differing traffic impacts on each route during the construction and operational phases of the SRE Project, with Olympic Dam Highway (south of Roxby Downs) and Olympic Dam Way experiencing the largest percentage increases due to their low baseline volumes. However, the estimated traffic increase in Olympic Dam Way are only light vehicles associated with the SRE Project – Stage 1a and 1b and Stage 2 operation phases.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

4.3.3 Austroads turn warrant assessments

Intersection operations are assessed from a combination of the peak hourly through and turning traffic movements that occur at each intersection. This determines the need for additional intersection turning lanes (e.g. basic, auxiliary lane and channelised) in accordance with the current intersection design standards (Austroads 2023) *Guide to Road Design Part 4a, Unsignalised and Signalised Intersections* (Figure 4.1), where:

- curve 1 (red line) represents the boundary between a basic right turn (BAR) and a channelised short right turn (CHR(S)) turn treatment and between a basic left turn (BAL) and an auxiliary short left turn (AUL(S)) turn treatment
- curve 2 (blue line) represents the boundary between a CHR(S) and a full length channelised right turn (CHR) treatment and between an AUL(S) and a full length auxiliary left turn (AUL) or channelised left turn (CHL) treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

Figure 4.1 contains two graphs for the selection of turn treatments on roads with a design speed more than or equal to 100 km/h, which is appropriate for high-speed rural roads.

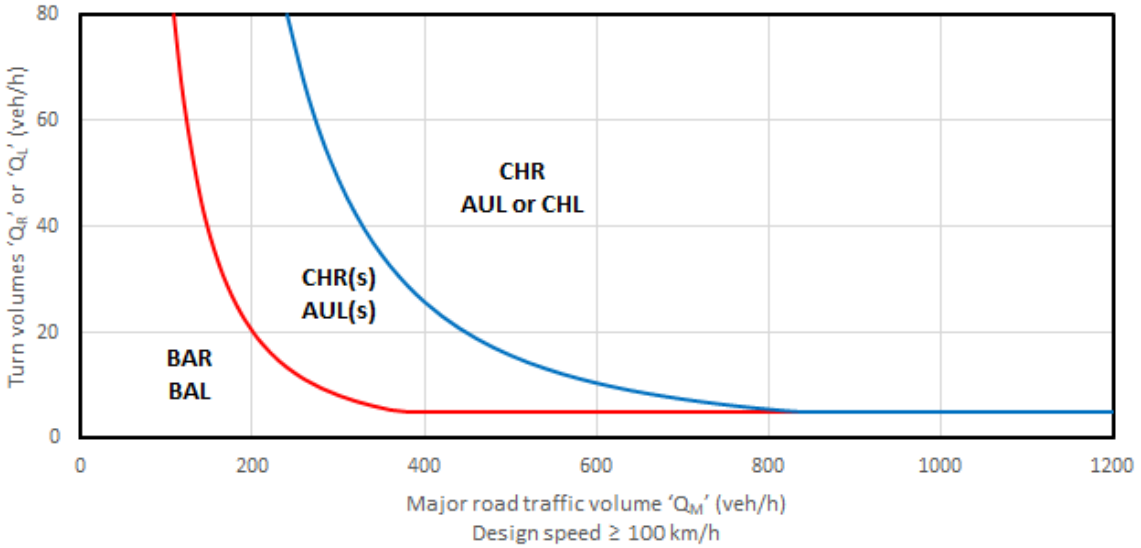


Figure 4.1 Austroads warrant design charts for high-speed rural intersection turning lanes

The Standard recommends intersections should be designed for a travel speed 10 km/h greater than the posted speed limit.

To ensure conservative results, the warrant for turn treatments was assessed using the 2039 baseline + operation (SRE Project – Stage 1a, 1b and 2) traffic volumes (Figure 3.17), representing the worst-case scenario.

The assessment of Austroads turn warrant concluded that the only turn made by the additional operation traffic is the intersection located at north of Roxby Downs township. The southern intersection has no projected additional turn movement, hence turn treatment warrant assessment is not required.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

i Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs township)

Olympic Dam Highway (north leg) near Olympic Dam Highway (east leg) has a speed limit of 100 km/h, therefore a design speed of 110 km/h is considered. HVs are assumed to be coming from the north on Olympic Dam Highway. Therefore, an assessment is required for a possible left turn bay from Olympic Dam Highway (north leg). The left turn treatment warrant design chart is shown in Figure 4.2.

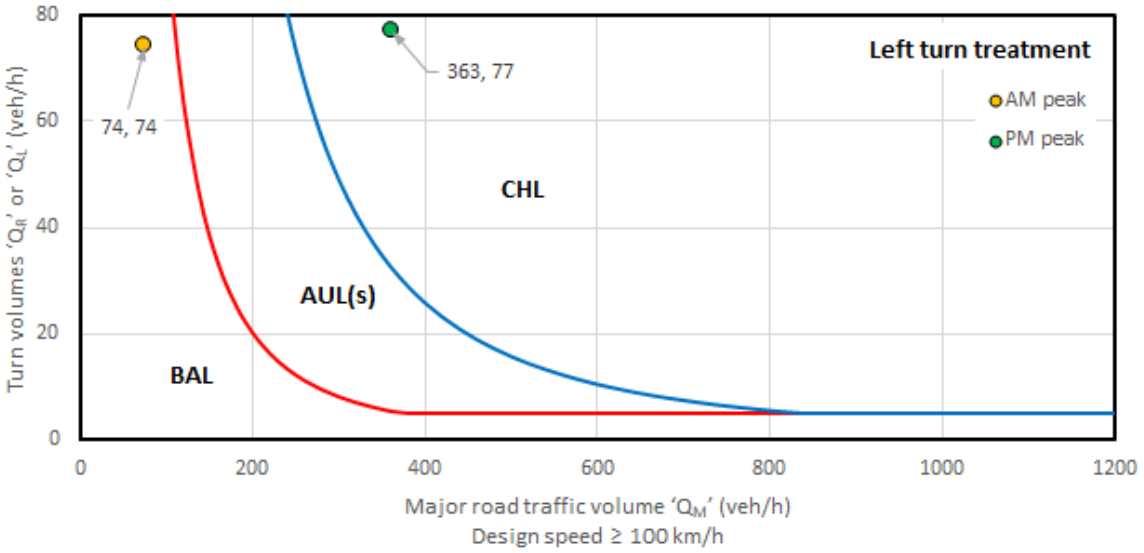


Figure 4.2 Austroads warrant design chart for rural intersection left turning lane to Olympic Dam Highway (east leg) during operation period (SRE Project – Stage 1a, 1b and 2)

For 77 left turning vehicles and 363 southbound vehicles on Olympic Dam Highway (north leg) during the PM peak hour, a channelised left-turn treatment is the minimum requirement. The existing intersection adopts a channelised left-turn treatment with a high entry angle which meets the minimum requirement.

The assessment of Austroads turn warrant concluded that the existing intersection does not require any further upgrade.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

4.4 Road design standards

4.4.1 Rural roads

Road width design standards for low volume rural roads are defined by the:

- *Guide to Road Design Part 3: Geometric Design* (Austroads 2021) for sealed roads.

These standards are based on daily traffic volumes, as shown in Table 4.6.

The existing road width measurements, traffic volumes and compliance for each road portion along the proposed SRE Project construction and operation route is shown in Table 4.7. The traffic volumes for the following roads have been taken from Table 4.5.

Table 4.6 Austroads road design for rural road (sealed)

Threshold band (daily traffic volumes)	Design standard
1–150	8.7 m wide total carriage (if unsealed) or minimum 3.7 m wide seal.
150–500	Minimum 7.2 m wide seal, consisting of 3.1 m wide traffic lanes and 0.5 m wide sealed shoulders on each side.
500–1,000	Minimum 7.2 m, up to 8 m wide seal, consisting of 3.1–3.5 m wide traffic lanes and 0.5 m wide sealed shoulders on each side.

Threshold band (daily traffic volumes)	Design standard
1,000–3,000	Minimum 9 m wide seal, consisting of 3.5 m wide traffic lanes and 1.0 m wide sealed shoulders on each side.
> 3,000	Minimum 10 m wide seal, consisting of 3.5 m wide traffic lanes and 1.5 m wide sealed shoulders on each side.

Source: Austroads 2021 Table 4.5.

Table 4.7 Baseline and future daily traffic volumes and design standards compliance

Road	2037/2039 baseline daily traffic volume	2037 baseline + construction (SRE Project – Stage 2) and operation (SRE Project – Stage 1a and 1b) daily traffic volume	2039 baseline + operation (SRE Project – Stage 1a, 1b and 2) daily traffic volume	Existing road width	Design standard	Currently meets relevant standard?
Olympic Dam Highway (Pimba)	650	844	820	Approximately 9.0 m sealed	Minimum 9 m wide sealed	Yes
Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection)	950	1122	1090	Approximately 11 m sealed	Minimum 9 m wide sealed	Yes
Stuart Highway (west of Stuart Highway/Olympic Dam Highway intersection)	440	462	470	Approximately 11 m sealed	Minimum 7 m wide sealed	Yes
Augusta Highway (south-east of Port Augusta)	4800	4922	4872	Approximately 10 m sealed	Minimum 10 m wide sealed	Yes

Note: According to Austroads, a minimum 7.0 m seal should be provided on designated heavy vehicle routes (or where the AADT contains more than 15% heavy vehicles).

As presented in Table 4.7, the Olympic Dam Highway, Stuart Highway and Augusta Highway within the road network meet the Austroads design standards for rural roads.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

4.4.2 Urban roads

Road width design standards for urban arterial roads are defined by the:

- *Guide to Road Design Part 3: Geometric Design* (Austroads 2021) for sealed roads.

These standards are based on the criteria shown in Table 4.8. Daily traffic volumes are generally not considered in the design of these roads, with greater emphasis placed on the intended function and use of each road.

Table 4.8 Urban arterial road widths

Element	Lane width (m)	Comments
General traffic lane	3.5	General traffic lane width to be used for all roads
	3.0 – 3.4	Suitable for low-speed roads with low truck volumes
Service road lane	3.4 – 5.5	Range of lane widths for service roads
Wide kerbside lane	4.2	Suitable for locations with high truck volumes
	4.2 – 4.5	Suitable where motorists and cyclists share the same lane
High Occupancy Vehicle (HOV) lane	3.5 – 4.5	Bus lane
	3.3	Tram/light rail vehicle lane
Minimum width between kerb and channel (to provide for passing of broken-down vehicles)	5.0 – 6.5	Width of a single lane suitable for a left-turn slip lane, or a two-lane two-way divided road with a raised median
	2 × 4.0 (8.0)	Width of two lanes allowing two lines of traffic to slowly pass a broken-down vehicle

Source: Austroads 2021 Table 4.4.

Stuart Highway and Augusta Highway within the Port Augusta township are both fully upgraded to accommodate for high truck volumes and meet the Austroads design standards for urban roads.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

4.4.3 Road safety assessment

In accordance with Austroads *Guide to Road Design Part 4A*: *Unsignalised and Signalised Intersections* (Austroads 2023), all unsignalised T-intersections need to have clear visibility between the through traffic travelling on the major road and the turning traffic exiting from the minor road, so that the turning traffic can observe gaps to turn safely to merge with the major road traffic. This visibility measurement is called sight distance.

The safe intersection sight distance (SISD) will be assessed for each intersection, which varies according to the design speed of the road. Normally a design speed 10 km/h higher than the posted speed limit is used to calculate the SISD.

i Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs township) sight distance assessment

The sight distances on Olympic Dam Highway (north leg) and Olympic Dam Way at Olympic Dam Highway (east leg) have been estimated based on the line of sight and observations at this intersection (Figure 4.3).

As Olympic Dam Highway (north leg) and Olympic Dam Way have a speed limit of 110 km/h near the Olympic Dam Highway (east leg), a presumed design speed of 120 km/h has been considered. In accordance with Austroads (2023), the minimum SISD required for a general minimum two second driver reaction time is 324 m.

The assessment of sight distances to both sides of the intersection meets the minimum SISD requirement.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).



Sight distance to the left (~700 m)

Sight distance to the right (~500 m)

Figure 4.3 **[10]Sight distance to the left and right of Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs)**

[10] Photographs undertaken 12/11/2024

ii Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs township) sight distance assessment

The sight distances on Olympic Dam Highway at Olympic Dam Way have been estimated based on the line of sight and observations at this intersection (Figure 4.4).

As Olympic Dam Highway has a speed limit of 110 km/h near Olympic Dam Way, a presumed design speed of 120 km/h has been considered. In accordance with Austroads (2023), the minimum SISD required for a general minimum two second driver reaction time is 324 m.

The assessment of sight distances to both sides of the intersection meets the minimum SISD requirement.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).



Sight distance to the left (~1,400 m)

Sight distance to the right (~615 m)

Figure 4.4 **[11]Sight distance to the left and right of Olympic Dam Highway/Olympic Dam Way intersection (south of Roxby Downs)**

[11] Photographs undertaken 12/11/2024

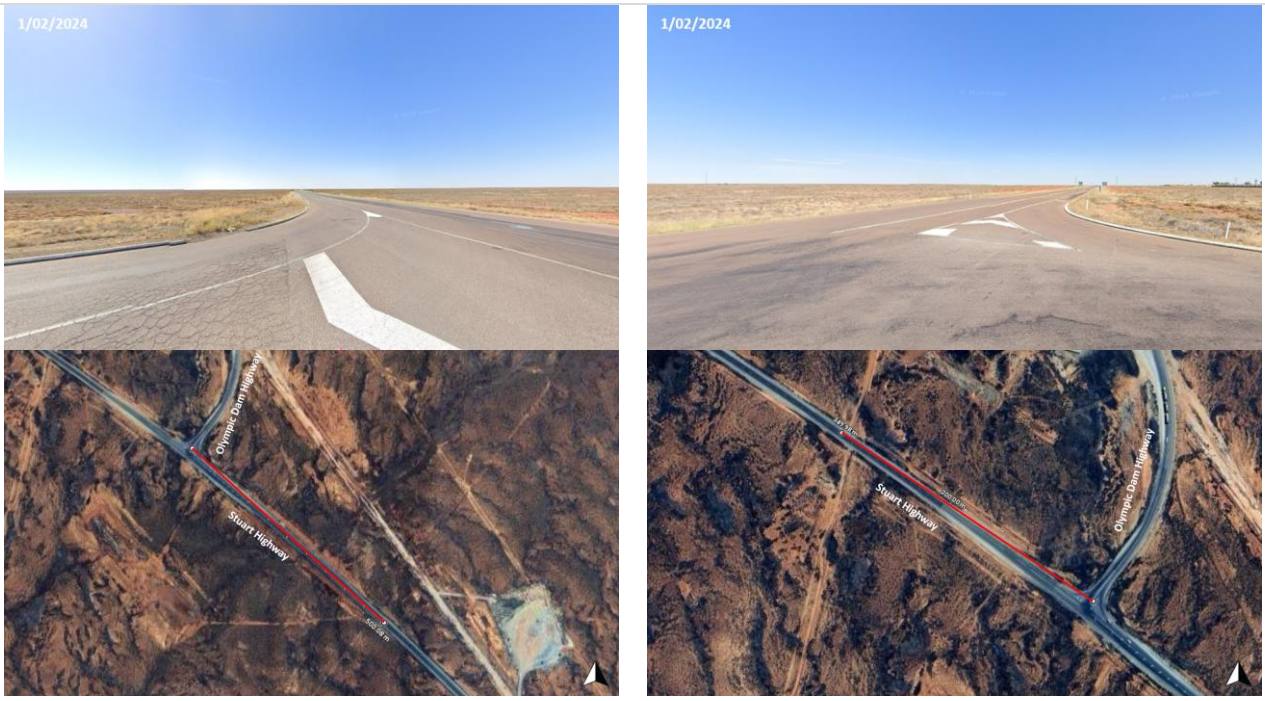
iii Stuart Highway/Olympic Dam Highway

The sight distances on Stuart Highway at Olympic Dam Highway have been estimated based on the line of sight and observations at this intersection (Figure 4.5).

As Stuart Highway has a speed limit of 110 km/h near Olympic Dam Highway, a presumed design speed of 120 km/h has been considered. In accordance with Austroads (2023), the minimum SISD required for a general minimum two second driver reaction time is 324 m.

The assessment of sight distances to both sides of the intersection meets the minimum SISD requirement.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).



Sight distance to the left (~500 m)

Sight distance to the right (~350 m)

Figure 4.5 Sight distance to the left and right of Stuart Highway/Olympic Dam Highway intersection

iv Augusta Highway/Eyre Highway/Stuart Highway

The sight distances on Eyre Highway and Augusta Highway at Stuart Highway have been estimated based on the line of sight and observations at this intersection (Figure 4.6).

As Eyre Highway and Augusta Highway have a speed limit of 60 km/h near Stuart Highway, a presumed design speed of 70 km/h has been considered. In accordance with Austroads (2023), the minimum SISD required for a general minimum two second driver reaction time is 151 m.

The assessment of sight distances to both sides of the intersection meets the minimum SISD requirement.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).



Sight distance to the left (~195 m)

Sight distance to the right (~130 m)

Figure 4.6 Sight distance to the left and right of Augusta Highway/Eyre Highway/Stuart Highway intersection

v Wildlife warning sign

As stated in Section 2.6, there was a serious crash on Olympic Dam Highway/Olympic Dam Way intersection (north of Roxby Downs township) involving an animal, along with three other animal-related incidents that did not result in casualties. A site visit performed by EMM on 11–13 November 2024 showed that majority of the roadkill found on the road were kangaroos. Therefore, it is considered that there is merit of installing kangaroo warning sign/s at this location to mitigate the risks, if it is deemed necessary by DIT (Figure 4.7).



Source: *Operational Instruction – Wildlife Warning Signs on Roads*, Department for Infrastructure and Transport (2021).

Figure 4.7 Kangaroo warning sign

vi Impact on public transport, school buses, cyclists and pedestrians

The SRE Project is unlikely to have any significant impact on the public transport, cyclists and pedestrians. Due to the remote location of the SRE Project, there are no notable presence of pedestrians or cyclists. The heavy vehicles passing regional townships should adopt an appropriate care and control, which will need to be covered in Drivers Code of conduct.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

4.4.4 Swept path assessment

As Olympic Dam Highway is an arterial road and major freight route for the Olympic Dam mine site, the existing intersections have generally large geometry, designed to accommodate longer vehicles. The mine currently utilises 53.4 m long BAB-Quad trucks to transport materials which will continue to occur in the future. Based on this, no specific swept path assessment is necessary.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

4.4.5 Railway level crossing assessment

As per the details of trains passing through the existing Trans-Australian Railway level crossing at Pimba and Kootaberra (near Hesso Train Station) (Section 2.10), there are typically two freight trains passing the level crossing during the AM peak (8:00 am to 9:00 am) and another two during the PM peak hour (5:00 pm to 6:00 pm). These peak periods apply to train movements only.

The total time the level crossing is assumed to be closed to vehicular traffic is estimated at four minutes. This includes approximately three minutes for a train to pass through Olympic Dam Highway in Pimba and Stuart Highway in Kootaberra, as well as an additional one-minute warning period. It should be noted that this estimate is conservative.

It is noted that during the operational phase of the SRE Project, the transport strategy prioritises the Pimba rail line as the preferred freight option for deliveries to site. It is assumed that freight will be accommodated within existing rail services, with no additional train services required on the rail line.

A queueing assessment has been conducted using equation 3.5 from *Austroads Guide to Traffic Management Part 2: Traffic Theory Concepts* (Austroads 2020).

Using the traffic volumes from Table 4.5, the following assumptions have been applied to estimate the traffic flow rate over the level crossing. These are summarised in Table 4.9:

- 10% of daily traffic volumes will occurring during the train peak hours.
- 70% of the peak hour volumes are assumed to occur in each direction, as a conservative estimate.

i Pimba

Table 4.9 Peak hour traffic volumes at Olympic Dam Highway (Pimba)

Stage	Both	Northbound	Southbound
Baseline	65	46	46
SRE Project – Stage 2 construction and Stage 1a and 1b operation traffic (2037)	20	14	14
SRE Project – Stage 1a, 1b and 2 operation traffic (2039)	17	12	12

Note: Volumes generated by the SRE Project will all be heavy vehicles

According to Table 2.12, heavy vehicles account for 18.5% of total traffic on the Olympic Dam Highway at Pimba. Therefore, it is assumed that 18.5% of vehicles in the queue will be heavy vehicles (approximately 14 m long (average), including clearance space), while the remaining 81.5% will be light vehicles (approximately 8 m long (average), including clearance space).

Based on the volumes in Table 4.9, the peak hour traffic volumes on the Olympic Dam Highway at Pimba are similar in both **northbound and southbound** directions during the AM and PM peak hours. As such, the queuing assessment presented in Table 4.10 represents a generalised scenario that applies to all peak hour direction movements.

Table 4.10 Pimba level crossing queuing assessment (Austroads)

Description	2037/2039 Baseline	Baseline + SRE Project – Stage 2 construction and Stage 1a and 1b operation traffic (2037)	Baseline + SRE Project – Stage 1a, 1b and 2 operation traffic (2039)
Traffic volume over level crossing (vehicles per hour)	46	60	58
Average volume for 240 seconds (vehicles)	3	4	4
X (queuing vehicles)	11	8	8
Queuing (m)	101	73	73

As shown in Table 4.10, the estimated traffic flow over the level crossing in the 2037/2039 baseline scenario is relatively low at 46 vehicles per hour. However, the calculated queuing length (101 m) is longer than in the higher-volume future scenarios. This is due to the conservative nature of the queuing methodology, which applies the 95th percentile to account for variability in vehicle arrivals. At low flow rates, vehicle arrivals are more sporadic and less uniform, and the use of a Poisson-based approach can result in an overestimation of queue lengths to cover the possibility of clustered arrivals during the train closure period.

Therefore, a SIDRA analysis was conducted to determine the 95th percentile queue length, which provides a conservative analysis of the maximum queue length on Olympic Dam Highway. The model was developed as a signalised intersection, with two trains crossing in one hour, each assumed to block traffic for four minutes in every 30-minute interval. The queue lengths for Olympic Dam Highway at the level crossing are presented in Table 4.11. The SIDRA results are attached in Appendix C.

Table 4.11 Pimba level crossing queuing assessment (SIDRA)

Description	2037/2039 Baseline	Baseline + SRE Project – Stage 2 construction and Stage 1 operation traffic (2037)	Baseline + SRE Project – Stage 2 operation traffic (2039)
Queuing (m)	45.2	68.6	65.2

As per Table 4.11, the increase in queue length between the baseline and worst-case scenario is 23.4 m, which is considered negligible given the ample road space available for vehicle queuing.

Based on the above, the impact significance has been rated as Level 1 (not significant).

ii Kootaberra (near Hesso Train Station)

Table 4.12 Peak hour traffic volumes at Stuart Highway (Kootaberra)

Stage	Both	Northbound	Southbound
Baseline	95	67	67
SRE Project – Stage 2 construction and Stage 1a and 1b operation traffic (2037)	12	9	9
SRE Project – Stage 1a, 1b and 2 operation traffic (2039)	7	5	5

1. The baseline traffic volumes are based on Stuart Highway (east of the Stuart Highway/Olympic Dam Highway intersection), consistent with data from Location SA Map Viewer for the same location.
2. Volumes generated by the SRE Project will all be heavy vehicles

According to Table 2.13, heavy vehicles account for 37% of total traffic on Stuart Highway at Kootaberra. Therefore, it is assumed that 37% of vehicles in the queue will be heavy vehicles (approximately 14 m long (average), including clearance space), while the remaining 63% will be light vehicles (approximately 8 m long (average), including clearance space).

Based on the volumes in Table 4.12, the peak hour traffic volumes on Stuart Highway at Kootaberra are similar in both **northbound and southbound** directions during the AM and PM peak hours. As such, the queuing assessment presented in Table 4.12 represents a generalised scenario that applies to all peak hour direction movements.

Similarly to above, a SIDRA analysis was conducted to determine the 95th percentile queue length, which provides a conservative analysis of the maximum queue length on Stuart Highway. The model was developed as a signalised intersection, with two trains crossing in one hour, each assumed to block traffic for four minutes in every 30-minute interval. The queue lengths for Stuart Highway at the level crossing are presented in Table 4.13. The SIDRA results are attached in Appendix C.

Table 4.13 Kootaberra level crossing queuing assessment (SIDRA)

Description	2037/2039 Baseline	Baseline + SRE Project – Stage 2 construction and Stage 1 operation traffic (2037)	Baseline + SRE Project – Stage 2 operation traffic (2039)
Queuing (m)	77.4	93	86

As per Table 4.13, the increase in queue length between the baseline and worst-case scenario is 15.6 m, which is considered negligible given the ample road space available for vehicle queuing.

Based on the above, the impact significance has been rated as Level 1 (not significant).

4.4.6 Parking provision

All workers parking during construction and operation will be accommodated within designated parking areas. Hence, there should be no new or minimal impact to the public roads.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

4.4.7 EIGR Areas

EIGR Area land disturbance would require mobilisation of minor plant and equipment (i.e. grader and or dozer) within Clause 28 land and would not affect or impact the existing road network.

All clearing activities would follow BHP's Land Clearance Approval procedure and be subject to secondary permitting and approvals (i.e. Department for Environment and Heritage native vegetation clearance approval).

On this basis of the above, the impact significance has been rated as Level 1 (not significant).

4.4.8 OSOM

The SRE Project proposes up to 224 OSOM vehicle movements that are within the Heavy Vehicle National Law and associated regulations (i.e. up to 25 m long, 3.5 m wide and 5 m high). These OSOM vehicles are able to travel independently (i.e. no pilot or police escort vehicle(s)) with OSOM signs at the front and back of the vehicle under Heavy Vehicle National Law and associated regulations.

OSOM deliveries greater than 25 m long, 3.5 m wide and 5 m high would require escort (e.g. pilot load, police escort load – refer Table 3.5) for the road safety reasons and would be subject to separate OSOM assessment and approval from DIT and the NHVR.

It is expected that OSOM drivers would take due diligence care with safety features embedded into the heavy vehicles e.g. flashing lights, flags/lights at the side for the vehicles to alert oncoming motorists of their dimensions and presence.

Based on the above, the impact significance for OSOM has been rated as Level 2 (not significant).

4.4.9 Cumulative traffic assessment

DIT's proposed Northern Water Pipeline Project is currently undergoing an EIS assessment however no traffic data is currently available that can be used to perform a reliable cumulative assessment.

Otherwise, there is no known nearby planned or approved significant developments, therefore a cumulative traffic assessment is not required.

On the basis of the above, the impact significance has been rated as Level 1 (not significant).

4.4.10 Transportation of dangerous goods

Any dangerous goods assessment is beyond the scope of this TIA and are subject to separate approvals.

For any transportation of dangerous goods, necessary approval would be sought from the SafeWorkSA and NHVR (i.e. secondary permits, approvals and licences). The *Dangerous Substances Act 1979* (SA) and *Dangerous Substances (Dangerous Goods Transport) Regulations 2023* (SA) require that all heavy vehicles intended to transport dangerous goods must meet the requirements set out in the Australian Code for the Transport of Dangerous Goods by Road and Rail.

Operators must obtain a Performance Based Standards (PBS) vehicle approval from the NHVR and approval from the Competent Authority in the jurisdiction they wish to operate for the carriage of dangerous goods which describes the requirements for PBS approved tankers carrying dangerous goods. Further information can be found [12]here.

On the basis of the above, the impact significance has been rated as Level 2 (not significant).

4.4.11 Traffic assessment for decommissioning stage

As the operation of the mine comes to completion, the decommissioning of the site will be to dismantle the infrastructure and rehabilitate the site. The traffic impacts are expected to be equal to, or slightly less than, the construction/operational phase, hence, any traffic assessment for the decommissioning phase is not required.

4.5 Impact assessment

Outcomes of the impact assessment are presented in Table 4.14. The impact assessment also includes an uncertainty assessment.

[12] https://www.nhvr.gov.au/files/201811-0932-pbs-vehicles-carrying-dangerous-goods.pdf

Table 4.14 Significance assessment of confirmed impact events

Impact ID	Confirmed impact event	Impact significance	Significance justification	Uncertainty
SE1	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, leads to degradation, increasing the risk to public health and safety.	Level 2 – not significant	Traffic impact assessment of SRE Project proposed construction transport and key Olympic Dam Highway/Olympic Dam Way intersections, along with the Stuart Highway/Olympic Dam Highway intersection, concluded the existing road network intersection performance, traffic volumes, Austroads turn warrant, road safety, swept path and railway level crossing can effectively accommodate traffic volumes associated with construction, including oversized and restricted movements, without significantly impacting performance and or safety.	Low – the SRE Project will generate negligible changes to existing traffic patterns on Olympic Dam Highway, Olympic Dam Way and Stuart Highway. These negligible changes are unlikely to generate an increased risk to public health and safety.
SE2	Increases in vehicle traffic associated with the movement of construction materials, general travel, including oversized and restricted movements, results in an increase in likelihood of traffic accidents, impacting on the health and safety of the local community.	Level 2 – not significant	Between 2019 and 2023, 21 crashes were reported at the external road network along the haulage route, which is considered low for a significant stretch of road. Furthermore, no heavy vehicles were involved in these incidents, and none of the crashes were attributed to existing road deficiencies. Given the existing intersection design and performance, crash history, and the minor increase in traffic volumes generated by the SRE Project, the probability of vehicular crashes on Olympic Dam Highway and Olympic Dam Way will be low.	Low – the SRE Project road network can generally be regarded as safe, with a low crash history and no major road safety issues identified.
SE3	Increases in heavy vehicle traffic associated with the movement of construction materials, including oversized and restricted movements, leads to increase travel times affects road users, impacting on the social value of the local community	Level 1 – not significant	Traffic impact assessment of SRE Project concluded the existing road network and associated intersection can effectively accommodate SRE Project traffic volumes associated with construction without significantly impacting its performance or significantly increase travel time for other road users.	Low - SIDRA modelling during both the AM and PM periods, at Olympic Dam Highway/Olympic Dam Way intersections predict they will both operate within capacity, achieving a LOS A (good operation) across all scenarios.

Impact ID	Confirmed impact event	Impact significance	Significance justification	Uncertainty
SE4	During operations, increases in heavy vehicle traffic associated with the movement of operational reagents and concentrates affects road users and impacts on the health and safety of the local community.	Level 2 – not significant	Traffic impact assessment of SRE Project proposed operations transport and key Olympic Dam Highway/Olympic Dam Way intersections, along with the Stuart Highway/Olympic Dam Highway intersection, concluded the existing road network intersection performance, traffic volumes, Austroads turn warrant, road safety, swept path and railway level crossing can effectively accommodate traffic volumes associated with operations without significantly impacting performance and or safety. For any transportation of dangerous goods, necessary approval would be sought from the SafeWorkSA and NHVR (i.e. secondary permits, approvals and licences). The *Dangerous Substances Act 1979* (SA) and *Dangerous Substances (Dangerous Goods Transport) Regulations 2023* (SA) require that all heavy vehicles intended to transport dangerous goods must meet the requirements set out in the Australian Code for the Transport of Dangerous Goods by Road and Rail.	Low – the SRE Project will generate negligible changes to existing traffic patterns on Olympic Dam Highway, Olympic Dam Way and Stuart Highway. These negligible changes are unlikely to generate an increased risk (e.g. transport of dangerous goods) to public health and safety.
SE5	During operations, increase in road traffic results in the degradation of the roads and increases risk to the public health and safety	Level 2 – not significant	Traffic impact assessment of SRE Project proposed operations transport and key Olympic Dam Highway/Olympic Dam Way intersections, along with the Stuart Highway/Olympic Dam Highway intersection, concluded the existing road network intersection performance, traffic volumes, Austroads turn warrant, road safety, swept path and railway level crossing can effectively accommodate traffic volumes associated with operations without significantly impacting performance and or safety.	Low – the SRE Project will generate negligible changes to existing traffic patterns on Olympic Dam Highway, Olympic Dam Way and Stuart Highway. These negligible changes are unlikely to generate an increased risk to public health and safety.
SE6	During operations, the increased movement of heavy vehicles results in increases in travel times within the local and regional areas, impacting existing social values	Level 1 – not significant	Traffic impact assessment of SRE Project concluded the existing road network and associated intersection can effectively accommodate SRE Project traffic volumes associated with operations without significantly impacting its performance or significantly increase travel time for other road users.	Low - SIDRA modelling during both the AM and PM periods, at Olympic Dam Highway/Olympic Dam Way intersections predict they will both operate within capacity, achieving a LOS A (good operation) across all scenarios.

4.6 Management and mitigation

Irrespective of the TIA outcome, each confirmed impact event is required to have a description of proposed management and mitigation measures applied, aimed at either breaking the SPR linkage (i.e. avoiding the impact) or otherwise reducing the impact significance to as low as reasonably achievable (ALARA).

On this basis, EMM recommend the following:

- Construction Transport Management Plan (CTMP) – a CTMP should be implemented prior to commencement of construction, in consultation with the relevant authorities and the nominated construction contractor, to ensure the safety of all workers and road users within the vicinity of the SRE Project.

  The objectives of the CTMP would be:

  - to minimise the impact of the construction vehicle traffic on the local and regional road network and with other road users (e.g. school bus operators)
  - to ensure continuous, safe and efficient movement of traffic for both the general public and construction workers
  - to install appropriate advance warning signs to inform users of the changed traffic conditions
  - to provide information regarding the changed access arrangements and a description of the proposed external routes for vehicles, including the construction vehicles accessing the site.

- Consultation Plan for the construction activities – BHP consultation plan to address traffic and transport with associated complaint management system to enable active and positive community consultation with local residents on the SRE Project.

- OSOM – OSOM deliveries greater than 25 m long, 3.5 m wide and 5 m high would require escort (e.g. pilot load, police escort load) for the road safety reasons and would be subject to separate OSOM assessment and secondary permit from DIT and the NHVR. It is expected that OSOM drivers would take due diligence care with safety features embedded into the heavy vehicles (e.g. flashing lights, flags/lights at the side for the vehicles to alert oncoming motorists of their dimensions and presence).

- Operational Traffic Management Plan and Drivers' code of conduct – An Operational Traffic Management Plan (OTMP) will be required in consultation with the relevant road authorities which should include a Driver's Code of Conduct to outline all relevant site and locality road safety and traffic management measures including:

  - operation site access, primary and material delivery transport routes
  - compliance with all road rules and regulations
  - driver behaviour near Olympic Dam township and regional settlements
  - courtesy to other road users
  - fatigue management
  - checking vehicles and covering loads

- hazards of driving in varying weather conditions including fog and sun glare
- the appropriate use of compression braking
- safety procedures for accidents and breakdowns.

5 Conclusion

BHP is proposing to develop the SRE Project at the Olympic Dam mining operations, in the far north of South Australia.

EMM was commissioned by BHP to undertake a TIA to for the SRE Project to:

- determine if the activities have the potential to result in changes to the baseline traffic environment and conditions (baseline condition assessment in Section 1.4 of this report)
- determine the likely magnitude of the change to the surrounding road network as a result of the SRE Project (assessment of effects in Chapter 3 of this report)
- quantify the likely impacts resulting from the predicted change to baseline traffic and transport during construction and operation on identified receptors (impact assessment in Chapter 4 of this report).

This TIA considers the worst-case construction scenario (SRE Project – Stage 2 construction and Stage 1a and 1b operation, July 2037) and the worst-case operation scenario (SRE Project – Stage 1a, 1b and Stage 2 operation, April 2039). The construction traffic is temporary while the operation traffic will be ongoing and includes the existing, Stage 1a, 1b and Stage 2 operation of the SRE Project.

Olympic Dam Highway, Olympic Dam Way and Stuart Highway, all State-managed arterial roads, serve the SRE Project. These roads are currently in good condition and have sufficient capacity for heavy vehicles, including road trains. Olympic Dam Way connects Roxby Downs to the mine site, with restrictions in place to divert mine-related vehicles away from the township. Two key intersections near Roxby Downs, classified as sensitive receptors, are priority-controlled and primarily handle mine-related traffic. An additional priority-controlled intersection near Pimba connects Stuart Highway to the SRE Project. All intersections are well-maintained with safety measures such as rumble strips and signage.

Traffic volumes are moderate on the Olympic Dam Highway, low on Olympic Dam Way, moderate on Stuart Highway (east of Stuart Highway/Olympic Dam Highway intersection) and low on Stuart Highway (west of Stuart highway/Olympic Dam Highway intersection), with heavy vehicles forming a significant proportion of traffic. The largely transient population within the Roxby Downs Council area, along with the absence of populated areas around Pimba (noting Woomera also has a transient population), and the lack of a clear long-term upward growth trend in Port Augusta, despite being a larger and more stable population centre, minimises the potential for long-term traffic growth within the road network.

Between 2019 and 2023, 21 crashes were reported near the SRE Project, which is considered low for a significant stretch of road. Furthermore, no heavy vehicles were involved in these incidents, and none of the crashes were attributed to existing road deficiencies. Consequently, the road network adjacent to the site can generally be regarded as safe, with a low crash history and no major road safety issues identified. The area lacks public transport, or active transport infrastructure, consistent with its rural setting.

Two at grade railway level crossings are located along the haulage route south of the SRE Project. One crossing is located on Olympic Dam Highway at Pimba, approximately 100 km south of the SRE Project site and 950 m north of the Stuart Highway intersection, providing adequate road storage for queuing vehicles. The crossing is equipped with boom gates and flashing lights and serves both freight and passenger trains. The second crossing is located on Stuart Highway at Kootaberra, approximately 215 km south of the SRE Project site and 1 km north of Yudnapinna Road, also providing adequate road storage for queuing vehicles, and is controlled by flashing lights. The level crossing assessment shows there is no significant queuing on Olympic Dam Highway or Stuart Highway due to the construction and operational traffic.

A preliminary identification of potential impact events was undertaken, identifying 6 traffic and logistics related events for the SRE Project. As assessment of effects was undertaken, focusing on:

- SRE Project related traffic results during construction and operation resulting in an increase in heavy vehicle traffic, including oversized and restricted movements.

Baseline traffic surveys were undertaken at the following key intersections within the Municipal Council of Roxby Downs (sensitive receptor):

- Olympic Dam Highway/Olympic Dam Way (north of Roxby Downs).
- Olympic Dam Highway/Olympic Dam Way (south of Roxby Downs).

The results indicating that the baseline traffic environment operates well within capacity achieving LOS A (good operation) in both intersections. Additionally, South Australia (Location SA Map viewer) tube count data was analysed for the Stuart Highway/Olympic Dam Highway intersection for the traffic volume assessment of the arterial road network, away from the site.

The potential traffic impacts events were assessed to quantify the likely significance of the impact against the SRE Project's Environmental Impact Assessment Framework (EIAF) impact significance criteria. All six confirmed impact events were determined to be Level 1 (not significant) or Level 2 (not significant).

The TIA concluded the following regarding SRE Project construction and operation traffic:

- The Olympic Dam Highway/Olympic Dam Way intersections, Stuart Highway/Olympic Dam Highway intersection, along with the Augusta Highway/Eyre Highway/Stuart Highway intersection, can effectively accommodate SRE Project traffic volumes associated with both construction and operation, including oversized and restricted movements, without significantly impacting performance.
- Olympic Dam Highway, Olympic Dam Way, Stuart Highway and Augusta Highway can effectively accommodate SRE Project traffic volumes associated with both construction and operation without significantly increasing the likelihood of traffic accidents (i.e. impact public health and safety).
- SRE Project traffic volumes associated with both construction and operation would not result in significant increases in travel time, impacting existing social values (i.e. amenity).
- The level crossings at Pimba along Olympic Dam Highway and Kootaberra along Stuart Highway can effectively accommodate SRE Project traffic volumes associated with both construction and operation without significantly impacting its queue length (i.e. causing long traffic queues due to passing trains).

OSOM up to 25 m long, 3.5 m wide and 5 m high are within the Heavy Vehicle National Law and associated regulations and are able to travel independently under Heavy Vehicle National Law and associated regulations (i.e. no pilot or police escort vehicle(s)), while OSOM deliveries greater than 25 m long, 3.5 m wide and 5 m high would require escort (e.g. pilot load, police escort load) for the road safety reasons and would be subject to separate OSOM assessment and secondary permitting from DIT and the NHVR.

Irrespective of this outcome, the following mitigation and management measures have been identified that may be implemented to reduce the impact significance to ALARA:

- Implement a CTMP to ensure the safety of all workers and road users within the vicinity of the SRE Project.
- BHP will undertake a pre-condition visual pavement assessment of Olympic Dam Highway and Olympic Dam Way prior to the commencement of construction and operational haulage activities associated with the SRE Project. This assessment will establish the existing pavement condition along these portions of the haulage route[13] and provide a baseline for monitoring any changes during the construction and operational phases of the SRE Project.
- Implement a drivers' code of conduct to outline all relevant site and locality road safety and traffic management measures.
- Implement a consultation plan that addresses traffic and transport with associated complaint management system to enable active and positive community consultation with local residents on the SRE Project.

The construction and operation of the SRE Project would not significantly impact Olympic Dam Highway, traffic volumes and or public health and safety. However, should minor upgrades to the road network requiring secondary permitting and approval the DIT, being the body responsible for the construction, safe and efficient operation, and maintenance of the road system, and any affected local Council would be consulted accordingly.

[13] Stuart Highway and Augusta Highway are major arterial roads that carries a substantial proportion of through traffic and high proportion of heavy vehicles (Section 2.5). Furthermore, it is noted that the Pimba rail line is assumed to be utilised where feasible for freight transport to the SRE Project, however this has not yet been quantified for the construction phase and therefore has not been assessed for the 2037 Stage 2 Construction scenario (Hatch Fluor 2025). For the purpose of this TIA is has been assumed that all Stage 2 construction traffic would be via road (i.e. worst-case scenario) (Section 3.3.4).

References

ABS 2024, *Regional Population Growth, Australia (3218.0)*, Australian Bureau of Statistics

ARTC 2025, *Master Train Plan – SANTWA – 200 (Effective 29 June 2025)*, Australian Rail Track

ARTC 2025, *Master Train Plan – SANTWA – 300 (Effective 29 June 2025)*, Australian Rail Track

Australian Standards, *AS1742 series – Manual of Uniform Traffic Control Devices*

Austroads 2020, *Austroads Guide to Traffic Management Part 2: Traffic Theory Concepts*

Austroads 2020, *Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments*

Austroads 2023, *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*

DIT 2013, *A Functional Hierarchy for South Australia's Land Transport Network*, Department for Infrastructure and Transport

DIT 2021, *Operational Instruction – Wildlife Warning Signs on Roads*, Department for Infrastructure and Transport

DIT 2022, *Traffic Modelling Guidelines - SIDRA INTERSECTION*, Department for Infrastructure and Transport

DIT 2023, *Guideline for the preparation of a Traffic Impact Statement (Version 5)*, Department for Infrastructure and Transport

Hatch Fluor 2025, OSOM Route Assessment and Transport Impact Mitigation Planning, prepared for BHP.

Metro Maps 2024, *Online Mapping Service*

NHVR 2013, *Heavy Vehicle National Law and associated regulations*, National Heavy Vehicle Regulator

NHVR 2018, *PBS Vehicles Carrying Dangerous Goods*, National Heavy Vehicle Regulator

NHVR 2024, *National Map – Heavy Vehicle Access, National Heavy Vehicle Regulator*

SA Government 2024, *Location SA Map Viewer*, Government of South Australia

Worley 2024, *BHP CuSA Smelter & Refinery Expansion Project (SRE) – Traffic Volume EIS Data*, prepared for BHP.

Abbreviations and acronyms

Acronym	Expansion
ALARA	As Low As Reasonably Achievable
AUL	Auxiliary left turn
AUL(s)	Auxiliary short left turn
BAL	Basic left turn
BAR	Basic right turn
BAU	Business-as-usual
BHP	BHP Olympic Dam Corporation Pty Ltd
CHL	Channelised left turn
CHR	Channelised right turn
CHR(s)	Channelised short right turn
CTMP	Construction traffic management plan
Copper SA	Copper South Australia
DBF	Direct-to-blister flash furnace
DEL	Average delay
DIT	Department for Infrastructure and Transport
DOS	Degree of saturation
EF	Electric slag reduction furnace
EIS	Environment Impact Statement
EMM	EMM Consulting Pty Ltd
FCF	Flash -converting furnace
FSF	Flash-smelting furnace
GAB	Great Artesian Basin
HV	Heavy Vehicle
LOS	Level of service
LT	Left turn
LV	Light Vehicle
NWP	Northern Water Project
ODV	Olympic Dam Village
OSOM	Over Size Over Mass vehicle
PBS	Performance based standards
PDI Act	*Planning, Development and Infrastructure Act 2016* (South Australia)
PMR	Precious metal refinery
Q95	95% queue lengths

Acronym	Expansion
RT	Right turn
SA	South Australia
SCM27	Scheduled Campaign Maintenance 2027
SISD	Safe intersection sight distance
SML	Special Mining Lease
SPC	State Planning Commission
SPR	Source-pathway-receptor
SRE	Smelter and Refinery Expansion
TH	Through movement
TIA	Traffic Impact Assessment

Appendix A
Traffic count data

EMM
creating opportunities

E240021_SA Copper Province Project
Aerial location of the intersections

Olympic Dam Highway/Olympic Way (north of Roxby Downs)
https://maps.app.goo.gl/6qccTrypqujaZZP68



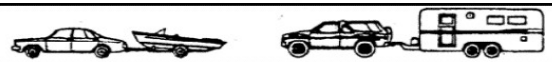
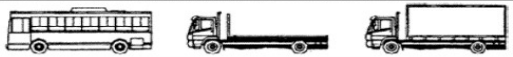
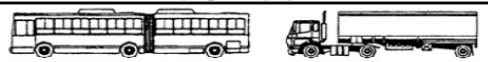
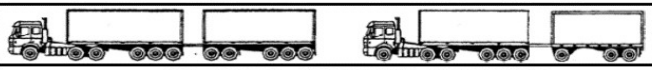
Olympic Dam Highway/Olympic Way (south of Roxby Downs)
https://maps.app.goo.gl/Q1uHUdy13aipL4aM7



E240021_SA Copper Province Project - Notes

1. The "Results" and "Intersection" sheets should not be edited when the traffic survey is undertaken
2. The survey sheets are designed so they can either be printed out on paper or filled out electronically by typing the number of vehicles into the corresponding cell
3. LV = Light Vehicle
4. HV = Heavy Vehicle
5. Vehicle classifications are outlined according to Austroads Vehicle Classification System:

AUSTROADS Vehicle Classification System

Level 1	Level 2		Level 3	AUSTROADS Classification		
Length (indicative)	Axles and Axle Groups		Vehicle Type			
Type	Axles	Groups	Typical Description	Class	Parameters	Typical Configuration
			LIGHT VEHICLES			
Short up to 5.5m		1 or 2	**Short** Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	d(1) ≤ 3.2m and axles = 2	
Medium 5.5m to 14.5m	3, 4 or 5	3	**Short - Towing** Trailer, Caravan, Boat, etc	2	groups = 3 d(1) ≥ 2.1m, d(1) ≤ 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5	
			HEAVY VEHICLES			
	2	2	**Two Axle Truck or Bus**	3	d(1) > 3.2m and axles = 2	
	3	2	**Three Axle Truck or Bus**	4	axles = 3 and groups = 2	
	> 3	2	**Four Axle Truck**	5	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	**Three Axle Articulated** Three axle articulated vehicle, or Rigid vehicle and trailer	6	d(1) > 3.2m, axles = 3 and groups = 3	
	4	> 2	**Four Axle Articulated** Four axle articulated vehicle, or Rigid vehicle and trailer	7	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	**Five Axle Articulated** Five axle articulated vehicle, or Rigid vehicle and trailer	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	≥ 6	> 2	**Six Axle Articulated** Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium Combination 17.5m to 36.5m	> 6	4	**B Double** B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6	
	> 6	5 or 6	**Double Road Train** Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6	
Large Combination Over 33.0m	> 6	> 6	**Triple Road Train** Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6	

Definitions:
Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)

d(1): Distance between first and second axle
d(2): Distance between second and third axle

Olympic Dam Highway/Olympic Way *north* intersection survey - morning 7-8am (12/11/2024)

15 min interval starting	North approach (Olympic Dam Highway)			
	Left Turn		Through	
	LV	HV	LV	HV
7.00am	2	1	8	1
7.15am	0	0	4	3
7.30am	4	1	13	1
7.45am	1	0	14	1
15 min interval starting	**South approach (Olympic Way)**			
	Right Turn		Through	
	LV	HV	LV	HV
7.00am	0	0	16	1
7.15am	1	0	23	0
7.30am	0	0	29	3
7.45am	0	0	24	0
15 min interval starting	**East approach (Olympic Dam Highway)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
7.00am	0	0	1	0
7.15am	0	0	0	1
7.30am	0	0	0	0
7.45am	1	0	1	0

Olympic Dam Highway/Olympic Way *north* intersection survey - morning 8-9am (12/11/2024)

15 min interval starting	North approach (Olympic Dam Highway)			
	Left Turn		Through	
	LV	HV	LV	HV
8.00am	1	1	11	1
8.15am	2	1	17	1
8.30am	0	1	17	1
8.45am	0	1	10	0
15 min interval starting	**South approach (Olympic Way)**			
	Right Turn		Through	
	LV	HV	LV	HV
8.00am	0	0	23	1
8.15am	0	0	29	2
8.30am	0	0	16	1
8.45am	0	0	15	0
15 min interval starting	**East approach (Olympic Dam Highway)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
8.00am	0	0	1	2
8.15am	0	0	1	0
8.30am	1	0	1	0
8.45am	0	0	0	0

Olympic Dam Highway/Olympic Way *north* intersection survey - afternoon 4-5pm (11/11/2024)

15 min interval starting	North approach (Olympic Dam Highway)			
	Left Turn		Through	
	LV	HV	LV	HV
4.00pm	1	0	38	1
4.15pm	3	2	39	3
4.30pm	3	0	53	0
4.45pm	3	2	39	1
15 min interval starting	**South approach (Olympic Way)**			
	Right Turn		Through	
	LV	HV	LV	HV
4.00pm	1	0	33	0
4.15pm	0	0	23	1
4.30pm	0	0	35	1
4.45pm	0	0	31	0
15 min interval starting	**East approach (Olympic Dam Highway)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
4.00pm	1	0	0	1
4.15pm	1	0	1	1
4.30pm	0	0	1	1
4.45pm	0	0	4	1

Olympic Dam Highway/Olympic Way *north* intersection survey - afternoon 5-6pm (11/11/2024)

15 min interval starting	North approach (Olympic Dam Highway)			
	Left Turn		Through	
	LV	HV	LV	HV
5.00pm	2	0	77	1
5.15pm	3	0	81	2
5.30pm	5	1	78	1
5.45pm	3	0	108	0
15 min interval starting	**South approach (Olympic Way)**			
	Right Turn		Through	
	LV	HV	LV	HV
5.00pm	0	1	41	1
5.15pm	0	0	29	0
5.30pm	0	0	34	0
5.45pm	0	0	11	1
15 min interval starting	**East approach (Olympic Dam Highway)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
5.00pm	0	0	4	1
5.15pm	0	0	1	0
5.30pm	0	0	1	1
5.45pm	0	0	2	0

Olympic Dam Highway/Olympic Way north intersection survey - AM Peak

15 min interval starting	15 min interval ending	North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 15 min volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
7:00 AM	7:15 AM	2	1	8	1	0	0	16	1	0	0	1	0	30
7:15 AM	7:30 AM	0	0	4	3	1	0	23	0	0	0	0	1	32
7:30 AM	7:45 AM	4	1	13	1	0	0	29	3	0	0	0	0	51
7:45 AM	8:00 AM	1	0	14	1	0	0	24	0	1	0	1	0	42
8:00 AM	8:15 AM	1	1	11	1	0	0	23	1	0	0	1	2	41
8:15 AM	8:30 AM	2	1	17	1	0	0	29	2	0	0	1	0	53
8:30 AM	8:45 AM	0	1	17	1	0	0	16	1	1	0	1	0	38
8:45 AM	9:00 AM	0	1	10	0	0	0	15	0	0	0	0	0	26

Peak hour calculation - morning

1 hour interval starting	1 hour interval ending	North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 1 hour volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
7:00 AM	8:00 AM	7	2	39	6	1	0	92	4	1	0	2	1	155
7:15 AM	8:15 AM	6	2	42	6	1	0	99	4	1	0	2	3	166
7:30 AM	8:30 AM	8	3	55	4	0	0	105	6	1	0	3	2	187
7:45 AM	8:45 AM	4	3	59	4	0	0	92	4	2	0	4	2	174
8:00 AM	9:00 AM	3	4	55	3	0	0	83	4	1	0	3	2	158

Morning peak		North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 1 hour volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
Peak start	Peak end	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
7:30 AM	8:30 AM	8	3	55	4	0	0	105	6	1	0	3	2	187

Olympic Dam Highway/Olympic Way north intersection survey - PM Peak

15 min interval starting	15 min interval ending	North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 15 min volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
4:00 PM	4:15 PM	1	0	38	1	1	0	33	0	1	0	0	1	76
4:15 PM	4:30 PM	3	2	39	3	0	0	23	1	1	0	1	1	74
4:30 PM	4:45 PM	3	0	53	0	0	0	35	1	0	0	1	1	94
4:45 PM	5:00 PM	3	2	39	1	0	0	31	0	0	0	4	1	81
5:00 PM	5:15 PM	2	0	77	1	0	1	41	1	0	0	4	1	128
5:15 PM	5:30 PM	3	0	81	2	0	0	29	0	0	0	1	0	116
5:30 PM	5:45 PM	5	1	78	1	0	0	34	0	0	0	1	1	121
5:45 PM	6:00 PM	3	0	108	0	0	0	11	1	0	0	2	0	125

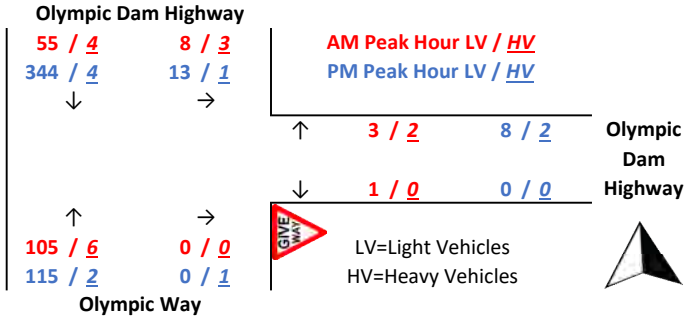
Peak hour calculation - afternoon

1 hour interval starting	1 hour interval ending	North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 1 hour volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
4:00 PM	5:00 PM	10	4	169	5	1	0	122	2	2	0	6	4	325
4:15 PM	5:15 PM	11	4	208	5	0	1	130	3	1	0	10	4	377
4:30 PM	5:30 PM	11	2	250	4	0	1	136	2	0	0	10	3	419
4:45 PM	5:45 PM	13	3	275	5	0	1	135	1	0	0	10	3	446
5:00 PM	6:00 PM	13	1	344	4	0	1	115	2	0	0	8	2	490

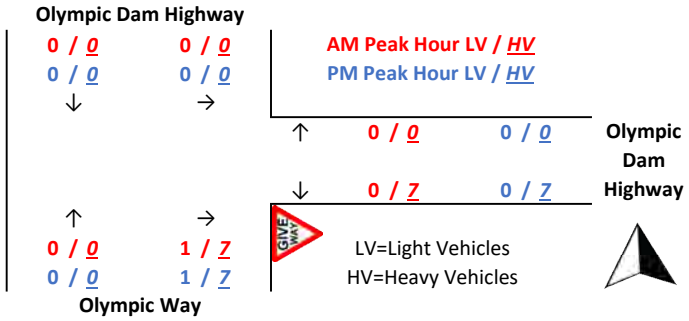
Afternoon peak		North approach Olympic Dam Hwy				South approach Olympic Way				East approach Olympic Dam Hwy				Total 1 hour volume
		Left Turn		Through		Right Turn		Through		Left Turn		Right Turn		
Peak start	Peak end	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
5:00 PM	6:00 PM	13	1	344	4	0	1	115	2	0	0	8	2	490

Survey AM Peak 7:30 AM to 8:30 AM
Survey PM Peak 5:00 PM to 6:00 PM

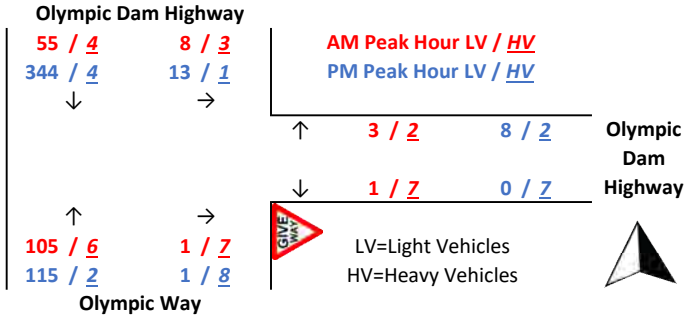
Existing 2024 Traffic Volumes



Development Traffic Volumes



Existing 2024 + Development Traffic Volumes



Olympic Dam Highway/Olympic Way *south* intersection survey - morning 7-8am

15 min interval starting	North approach (Olympic Dam Highway)			
	Through		Right Turn	
	LV	HV	LV	HV
7.00am	3	1	0	0
7.15am	0	0	0	0
7.30am	1	0	0	0
7.45am	2	0	0	0
15 min interval starting	**South approach (Olympic Dam Highway)**			
	Through		Left Turn	
	LV	HV	LV	HV
7.00am	0	0	0	0
7.15am	0	1	0	0
7.30am	1	1	0	0
7.45am	0	1	2	0
15 min interval starting	**West approach (Olympic Way)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
7.00am	0	0	2	0
7.15am	0	0	1	0
7.30am	0	0	2	0
7.45am	0	0	1	1

Olympic Dam Highway/Olympic Way *south* intersection survey - morning 8-9am

15 min interval starting	North approach (Olympic Dam Highway)			
	Through		Right Turn	
	LV	HV	LV	HV
8.00am	2	1	0	0
8.15am	1	1	0	0
8.30am	0	0	0	0
8.45am	0	0	0	1
15 min interval starting	**South approach (Olympic Dam Highway)**			
	Through		Left Turn	
	LV	HV	LV	HV
8.00am	2	2	0	0
8.15am	0	1	1	0
8.30am	2	0	2	0
8.45am	0	1	3	0
15 min interval starting	**West approach (Olympic Way)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
8.00am	0	0	0	1
8.15am	0	0	5	1
8.30am	0	1	7	0
8.45am	0	0	4	0

Olympic Dam Highway/Olympic Way *south* intersection survey - afternoon 4-5pm

15 min interval starting	North approach (Olympic Dam Highway)			
	Through		Right Turn	
	LV	HV	LV	HV
4.00pm	1	0	1	0
4.15pm	0	0	0	0
4.30pm	1	0	1	0
4.45pm	0	0	1	0
15 min interval starting	**South approach (Olympic Dam Highway)**			
	Through		Left Turn	
	LV	HV	LV	HV
4.00pm	0	0	4	0
4.15pm	1	0	3	0
4.30pm	3	1	6	0
4.45pm	0	0	9	0
15 min interval starting	**West approach (Olympic Way)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
4.00pm	1	0	3	1
4.15pm	1	0	1	0
4.30pm	0	0	1	0
4.45pm	0	0	0	0

Olympic Dam Highway/Olympic Way *south* intersection survey - afternoon 5-6pm

15 min interval starting	North approach (Olympic Dam Highway)			
	Through		Right Turn	
	LV	HV	LV	HV
5.00pm	2	0	1	0
5.15pm	0	1	1	0
5.30pm	0	1	0	0
5.45pm	1	0	1	0
15 min interval starting	**South approach (Olympic Dam Highway)**			
	Through		Left Turn	
	LV	HV	LV	HV
5.00pm	4	0	3	1
5.15pm	1	0	10	0
5.30pm	2	1	8	0
5.45pm	3	0	6	1
15 min interval starting	**West approach (Olympic Way)**			
	Left Turn		Right Turn	
	LV	HV	LV	HV
5.00pm	0	0	2	0
5.15pm	0	0	0	0
5.30pm	0	0	4	0
5.45pm	1	0	0	0

Olympic Dam Highway/Olympic Way south intersection survey - AM Peak

15 min interval starting	15 min interval ending	North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 15 min volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
7:00 AM	7:15 AM	3	1	0	0	0	0	0	0	0	0	2	0	6
7:15 AM	7:30 AM	0	0	0	0	0	1	0	0	0	0	1	0	2
7:30 AM	7:45 AM	1	0	0	0	1	1	0	0	0	0	2	0	5
7:45 AM	8:00 AM	2	0	0	0	0	1	2	0	0	0	1	1	7
8:00 AM	8:15 AM	2	1	0	0	2	2	0	0	0	0	0	1	8
8:15 AM	8:30 AM	1	1	0	0	0	1	1	0	0	0	5	1	10
8:30 AM	8:45 AM	0	0	0	0	2	0	2	0	0	1	7	0	12
8:45 AM	9:00 AM	0	0	0	1	0	1	3	0	0	0	4	0	9

Peak hour calculation - morning

1 hour interval starting	1 hour interval ending	North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 1 hour volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
7:00 AM	8:00 AM	6	1	0	0	1	3	2	0	0	0	6	1	20
7:15 AM	8:15 AM	5	1	0	0	3	5	2	0	0	0	4	2	22
7:30 AM	8:30 AM	6	2	0	0	3	5	3	0	0	0	8	3	30
7:45 AM	8:45 AM	5	2	0	0	4	4	5	0	0	1	13	3	37
8:00 AM	9:00 AM	3	2	0	1	4	4	6	0	0	1	16	2	39

Morning peak		North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 1 hour volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
Peak start	Peak end	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
8:00 AM	9:00 AM	3	2	0	1	4	4	6	0	0	1	16	2	39

Olympic Dam Highway/Olympic Way south intersection survey - PM Peak

15 min interval starting	15 min interval ending	North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 15 min volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
4:00 PM	4:15 PM	1	0	1	0	0	0	4	0	1	0	3	1	11
4:15 PM	4:30 PM	0	0	0	0	1	0	3	0	1	0	1	0	6
4:30 PM	4:45 PM	1	0	1	0	3	1	6	0	0	0	1	0	13
4:45 PM	5:00 PM	0	0	1	0	0	0	9	0	0	0	0	0	10
5:00 PM	5:15 PM	2	0	1	0	4	0	3	1	0	0	2	0	13
5:15 PM	5:30 PM	0	1	1	0	1	0	10	0	0	0	0	0	13
5:30 PM	5:45 PM	0	1	0	0	2	1	8	0	0	0	4	0	16
5:45 PM	6:00 PM	1	0	1	0	3	0	6	1	1	0	0	0	13

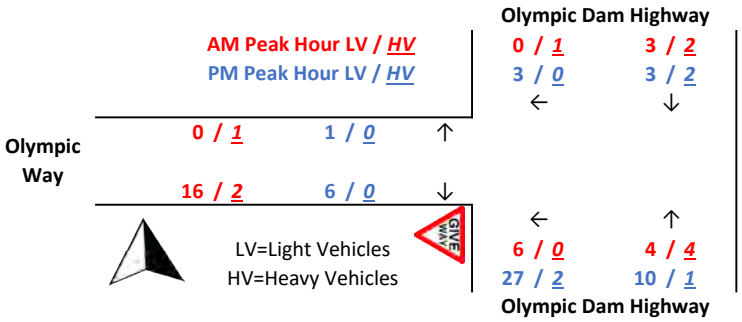
Peak hour calculation - afternoon

1 hour interval starting	1 hour interval ending	North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 1 hour volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
4:00 PM	5:00 PM	2	0	3	0	4	1	22	0	2	0	5	1	40
4:15 PM	5:15 PM	3	0	3	0	8	1	21	1	1	0	4	0	42
4:30 PM	5:30 PM	3	1	4	0	8	1	28	1	0	0	3	0	49
4:45 PM	5:45 PM	2	2	3	0	7	1	30	1	0	0	6	0	52
5:00 PM	6:00 PM	3	2	3	0	10	1	27	2	1	0	6	0	55

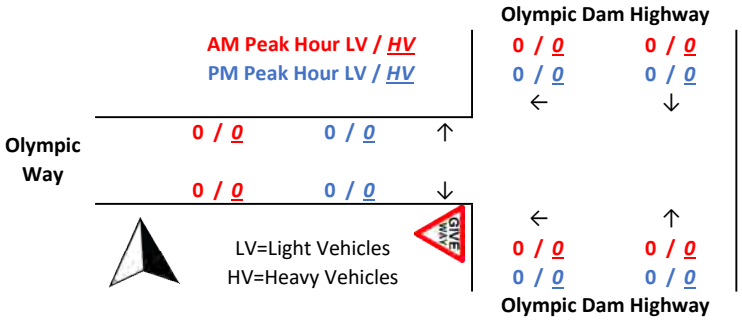
Afternoon peak		North approach Olympic Dam Highway				South approach Olympic Dam Highway				West approach Olympic Way				Total 1 hour volume
		Through		Right Turn		Through		Left Turn		Left Turn		Right Turn		
Peak start	Peak end	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	
5:00 PM	6:00 PM	3	2	3	0	10	1	27	2	1	0	6	0	55

Survey AM Peak 8:00 AM to 9:00 AM
Survey PM Peak 5:00 PM to 6:00 PM

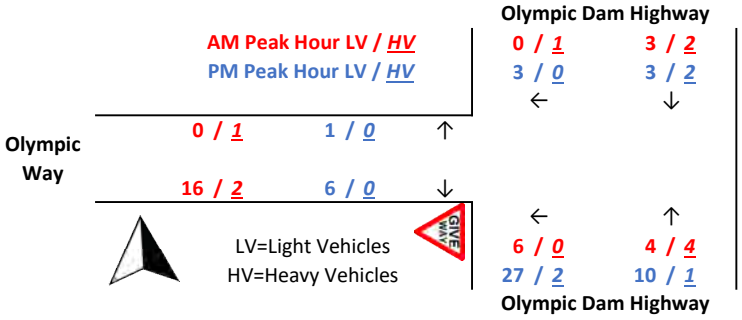
Existing 2024 Traffic Volumes



Development Traffic Volumes



Existing 2024 + Development Traffic Volumes



Appendix B
SIDRA modelling results

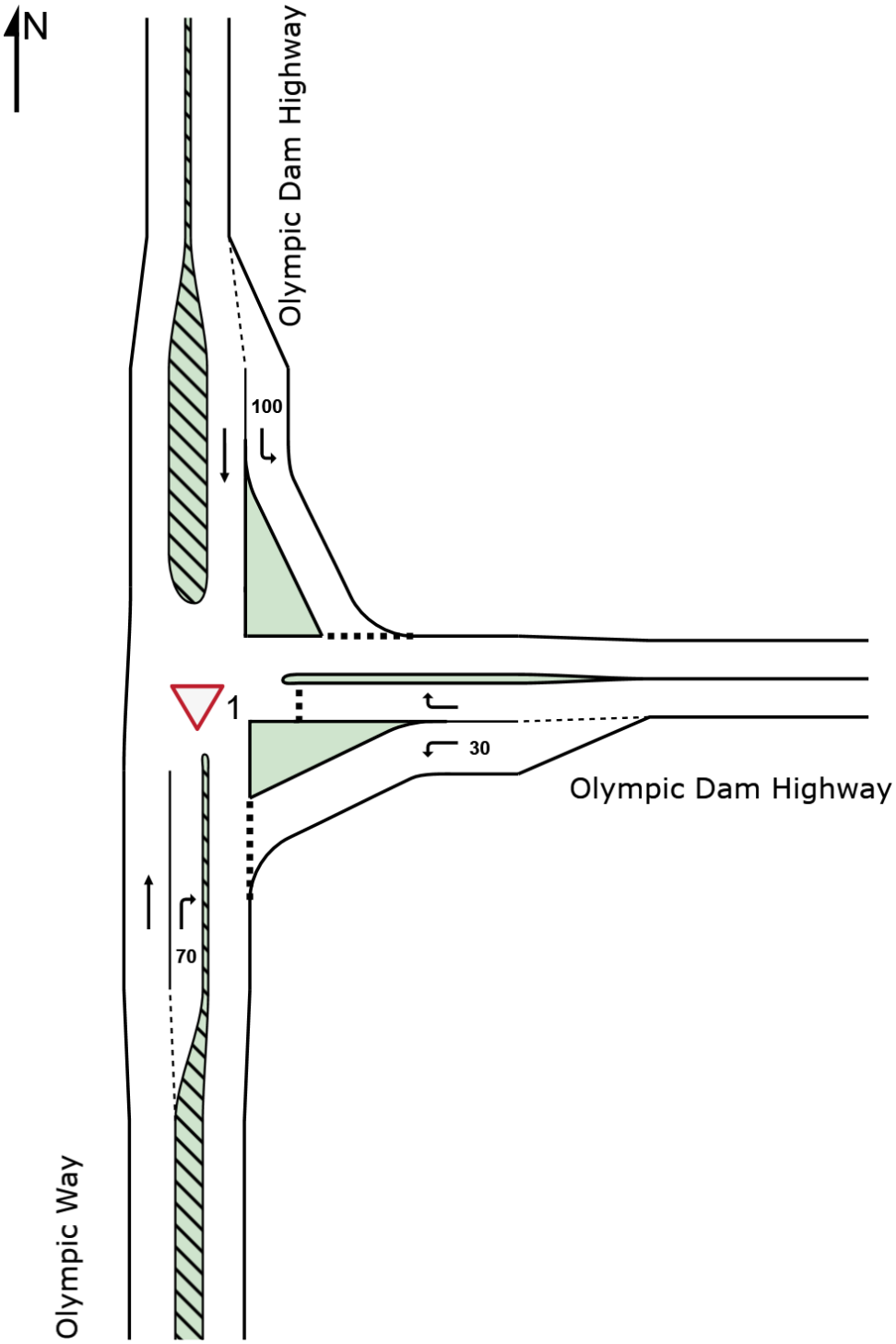
EMM
creating opportunities

SITE LAYOUT

Site: [1] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2037/2039 Baseline scenario AM Peak)

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Created: Friday, 16 January 2026 2:41:11 PM
Project: X:\2024\E240021 - SA Copper Province Project 1\Technical studies\Transport\SIDRA\E240021_Olympic Dam_v0.4_16 January 2026.sipx

MOVEMENT SUMMARY

Site: [1] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2037/2039 Baseline scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	117	5.4	117	5.4	0.059	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	0.0	1	0.0	0.001	5.7	LOS A	0.0	0.0	0.15	0.52	0.15	52.5
Approach			118	5.4	118	5.4	0.059	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.14	0.50	0.14	52.7
6	R2	All MCs	5	40.0	5	40.0	0.007	7.5	LOS A	0.0	0.2	0.34	0.54	0.34	50.4
Approach			6	33.3	6	33.3	0.007	7.2	LOS A	0.0	0.2	0.31	0.53	0.31	50.7
North: Olympic Dam Highway															
7	L2	All MCs	12	27.3	12	27.3	0.008	5.9	LOS A	0.0	0.3	0.01	0.53	0.01	52.1
8	T1	All MCs	62	6.8	62	6.8	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			74	10.0	74	10.0	0.033	0.9	LOS A	0.0	0.3	0.00	0.08	0.00	58.6
All Vehicles			198	8.0	198	8.0	0.059	0.6	NA	0.0	0.3	0.01	0.05	0.01	59.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (2)] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2037/2039 Baseline Existing scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	123	1.7	123	1.7	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	100.0	1	100.0	0.002	9.6	LOS A	0.0	0.1	0.51	0.55	0.51	46.6
Approach			124	2.5	124	2.5	0.061	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	6.7	LOS A	0.0	0.0	0.39	0.51	0.39	51.8
6	R2	All MCs	11	20.0	11	20.0	0.020	10.2	LOS A	0.1	0.6	0.53	0.68	0.53	49.1
Approach			12	18.2	12	18.2	0.020	9.9	LOS A	0.1	0.6	0.52	0.66	0.52	49.3
North: Olympic Dam Highway															
7	L2	All MCs	15	7.1	15	7.1	0.009	5.7	LOS A	0.0	0.3	0.02	0.54	0.02	52.9
8	T1	All MCs	366	1.1	366	1.1	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			381	1.4	381	1.4	0.187	0.3	LOS A	0.0	0.3	0.00	0.02	0.00	59.6
All Vehicles			517	2.0	517	2.0	0.187	0.4	NA	0.1	0.6	0.01	0.03	0.01	59.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (3)] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2037 Baseline + Construction + Operation scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	126	5.0	126	5.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	0.0	1	0.0	0.001	5.7	LOS A	0.0	0.0	0.16	0.51	0.16	52.4
Approach			127	5.0	127	5.0	0.064	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.15	0.50	0.15	52.7
6	R2	All MCs	52	93.9	52	93.9	0.095	9.9	LOS A	0.4	4.7	0.45	0.65	0.45	47.3
Approach			53	92.0	53	92.0	0.095	9.8	LOS A	0.4	4.7	0.44	0.65	0.44	47.4
North: Olympic Dam Highway															
7	L2	All MCs	58	85.5	58	85.5	0.051	6.5	LOS A	0.2	2.5	0.02	0.51	0.02	50.1
8	T1	All MCs	72	5.9	72	5.9	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			129	41.5	129	41.5	0.051	2.9	LOS A	0.2	2.5	0.01	0.23	0.01	55.1
All Vehicles			309	35.0	309	35.0	0.095	2.9	NA	0.4	4.7	0.08	0.21	0.08	55.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (4)] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2037 Baseline + Construction + Operation scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	133	1.6	133	1.6	0.066	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	100.0	1	100.0	0.002	9.7	LOS A	0.0	0.1	0.51	0.55	0.51	46.5
Approach			134	2.4	134	2.4	0.066	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	6.8	LOS A	0.0	0.0	0.40	0.52	0.40	51.8
6	R2	All MCs	57	85.2	57	85.2	0.187	17.0	LOS B	0.7	8.2	0.68	0.85	0.68	43.5
Approach			58	83.6	58	83.6	0.187	16.8	LOS B	0.7	8.2	0.67	0.85	0.67	43.7
North: Olympic Dam Highway															
7	L2	All MCs	61	77.6	61	77.6	0.052	6.4	LOS A	0.2	2.5	0.02	0.51	0.02	50.3
8	T1	All MCs	376	1.1	376	1.1	0.192	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			437	11.8	437	11.8	0.192	0.9	LOS A	0.2	2.5	0.00	0.07	0.00	58.3
All Vehicles			628	16.4	628	16.4	0.192	2.2	NA	0.7	8.2	0.06	0.13	0.06	56.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (5)] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2039 Baseline + Operation scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	133	4.8	133	4.8	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	0.0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.17	0.51	0.17	52.4
Approach			134	4.7	134	4.7	0.067	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.16	0.50	0.16	52.6
6	R2	All MCs	72	95.6	72	95.6	0.140	10.6	LOS A	0.6	7.1	0.49	0.68	0.49	46.9
Approach			73	94.2	73	94.2	0.140	10.5	LOS A	0.6	7.1	0.48	0.68	0.48	46.9
North: Olympic Dam Highway															
7	L2	All MCs	78	89.2	78	89.2	0.069	6.6	LOS A	0.3	3.6	0.02	0.51	0.02	49.9
8	T1	All MCs	78	5.4	78	5.4	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			156	47.3	156	47.3	0.069	3.3	LOS A	0.3	3.6	0.01	0.26	0.01	54.5
All Vehicles			362	41.0	362	41.0	0.140	3.5	NA	0.6	7.1	0.10	0.25	0.10	54.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (6)] Olympic Dam Highway/Olympic Way (north of Roxby Downs) (2039 Baseline + Operation scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Way															
2	T1	All MCs	139	1.5	139	1.5	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	100.0	1	100.0	0.002	9.8	LOS A	0.0	0.1	0.52	0.55	0.52	46.5
Approach			140	2.3	140	2.3	0.069	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
East: Olympic Dam Highway															
4	L2	All MCs	1	0.0	1	0.0	0.001	6.8	LOS A	0.0	0.0	0.40	0.52	0.40	51.8
6	R2	All MCs	77	89.0	77	89.0	0.273	19.7	LOS B	1.1	13.6	0.72	0.91	0.83	42.1
Approach			78	87.8	78	87.8	0.273	19.5	LOS B	1.1	13.6	0.72	0.91	0.83	42.2
North: Olympic Dam Highway															
7	L2	All MCs	81	83.1	81	83.1	0.070	6.5	LOS A	0.3	3.5	0.02	0.51	0.02	50.1
8	T1	All MCs	382	1.1	382	1.1	0.195	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			463	15.5	463	15.5	0.195	1.2	LOS A	0.3	3.5	0.00	0.09	0.00	57.9
All Vehicles			681	21.0	681	21.0	0.273	3.0	NA	1.1	13.6	0.09	0.17	0.10	55.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

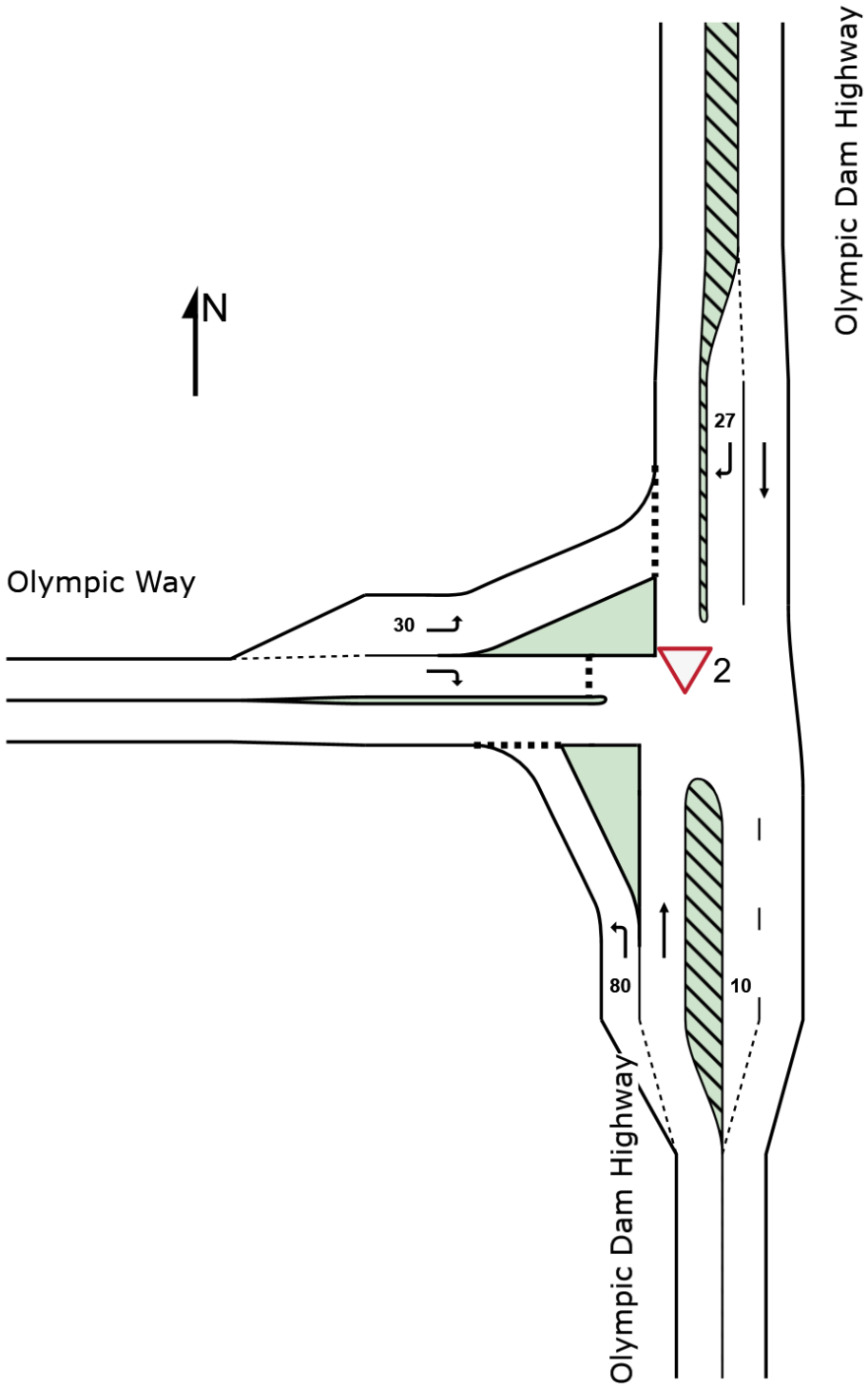
SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

SITE LAYOUT

Site: [2] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2037/2039 Baseline scenario AM Peak)

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Created: Friday, 16 January 2026 2:41:34 PM
Project: X:\2024\E240021 - SA Copper Province Project 1\Technical studies\Transport\SIDRA\E240021_Olympic Dam_v0.4_16 January 2026.sipx

MOVEMENT SUMMARY

Site: [2] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2037/2039 Baseline scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	6	0.0	6	0.0	0.004	5.6	LOS A	0.0	0.1	0.02	0.54	0.02	53.1
2	T1	All MCs	8	50.0	8	50.0	0.005	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			15	28.6	15	28.6	0.005	2.4	LOS A	0.0	0.1	0.01	0.23	0.01	56.8
North: Olympic Dam Highway															
8	T1	All MCs	5	40.0	5	40.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	1	100.0	1	100.0	0.001	6.7	LOS A	0.0	0.1	0.07	0.52	0.07	48.2
Approach			6	50.0	6	50.0	0.003	1.1	NA	0.0	0.1	0.01	0.09	0.01	57.6
West: Olympic Way															
10	L2	All MCs	1	100.0	1	100.0	0.001	6.7	LOS A	0.0	0.0	0.06	0.49	0.06	48.7
12	R2	All MCs	19	11.1	19	11.1	0.017	5.8	LOS A	0.1	0.5	0.09	0.53	0.09	52.3
Approach			20	15.8	20	15.8	0.017	5.9	LOS A	0.1	0.5	0.09	0.53	0.09	52.1
All Vehicles			41	25.6	41	25.6	0.017	3.9	NA	0.1	0.5	0.05	0.35	0.05	54.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [2 (2)] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2037/2039 Baseline Existing scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	31	6.9	31	6.9	0.019	5.7	LOS A	0.1	0.6	0.02	0.54	0.02	52.8
2	T1	All MCs	12	9.1	12	9.1	0.006	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			42	7.5	42	7.5	0.019	4.1	LOS A	0.1	0.6	0.02	0.39	0.02	54.6
North: Olympic Dam Highway															
8	T1	All MCs	5	40.0	5	40.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	3	0.0	3	0.0	0.002	5.6	LOS A	0.0	0.1	0.06	0.54	0.06	52.8
Approach			8	25.0	8	25.0	0.003	2.1	NA	0.0	0.1	0.02	0.20	0.02	57.1
West: Olympic Way															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.05	0.53	0.05	53.0
12	R2	All MCs	6	0.0	6	0.0	0.005	5.7	LOS A	0.0	0.1	0.12	0.53	0.12	52.6
Approach			7	0.0	7	0.0	0.005	5.7	LOS A	0.0	0.1	0.11	0.53	0.11	52.7
All Vehicles			58	9.1	58	9.1	0.019	4.0	NA	0.1	0.6	0.03	0.38	0.03	54.7

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [2 (3)] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2037 Baseline + Construction + Operation scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	6	0.0	6	0.0	0.004	5.6	LOS A	0.0	0.1	0.02	0.54	0.02	53.1
2	T1	All MCs	55	92.3	55	92.3	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			61	82.8	61	82.8	0.043	0.6	LOS A	0.0	0.1	0.00	0.06	0.00	59.2
North: Olympic Dam Highway															
8	T1	All MCs	52	93.9	52	93.9	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	1	100.0	1	100.0	0.001	7.2	LOS A	0.0	0.1	0.22	0.49	0.22	47.7
Approach			53	94.0	53	94.0	0.041	0.2	NA	0.0	0.1	0.00	0.01	0.00	59.7
West: Olympic Way															
10	L2	All MCs	1	100.0	1	100.0	0.001	7.1	LOS A	0.0	0.1	0.20	0.47	0.20	48.1
12	R2	All MCs	19	11.1	19	11.1	0.020	6.6	LOS A	0.1	0.6	0.29	0.54	0.29	51.6
Approach			20	15.8	20	15.8	0.020	6.7	LOS A	0.1	0.6	0.28	0.54	0.28	51.4
All Vehicles			134	77.2	134	77.2	0.043	1.3	NA	0.1	0.6	0.04	0.11	0.04	58.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [2 (4)] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2037 Baseline + Construction + Operation scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	31	6.9	31	6.9	0.019	5.7	LOS A	0.1	0.6	0.02	0.54	0.02	52.8
2	T1	All MCs	58	81.8	58	81.8	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			88	56.0	88	56.0	0.044	2.0	LOS A	0.1	0.6	0.01	0.18	0.01	57.3
North: Olympic Dam Highway															
8	T1	All MCs	52	93.9	52	93.9	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	3	0.0	3	0.0	0.002	5.8	LOS A	0.0	0.1	0.17	0.51	0.17	52.4
Approach			55	88.5	55	88.5	0.041	0.3	NA	0.0	0.1	0.01	0.03	0.01	59.5
West: Olympic Way															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.16	0.50	0.16	52.6
12	R2	All MCs	6	0.0	6	0.0	0.006	6.4	LOS A	0.0	0.2	0.29	0.53	0.29	52.1
Approach			7	0.0	7	0.0	0.006	6.3	LOS A	0.0	0.2	0.27	0.53	0.27	52.1
All Vehicles			151	65.0	151	65.0	0.044	1.6	NA	0.1	0.6	0.02	0.15	0.02	57.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [2 (5)] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2039 Baseline + Operation scenario AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	6	0.0	6	0.0	0.004	5.6	LOS A	0.0	0.1	0.02	0.54	0.02	53.1
2	T1	All MCs	75	94.4	75	94.4	0.059	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			81	87.0	81	87.0	0.059	0.5	LOS A	0.0	0.1	0.00	0.04	0.00	59.4
North: Olympic Dam Highway															
8	T1	All MCs	72	95.6	72	95.6	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	1	100.0	1	100.0	0.001	7.3	LOS A	0.0	0.1	0.26	0.49	0.26	47.5
Approach			73	95.7	73	95.7	0.057	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.7
West: Olympic Way															
10	L2	All MCs	1	100.0	1	100.0	0.001	7.3	LOS A	0.0	0.1	0.25	0.47	0.25	47.9
12	R2	All MCs	19	11.1	19	11.1	0.022	7.0	LOS A	0.1	0.6	0.34	0.57	0.34	51.5
Approach			20	15.8	20	15.8	0.022	7.0	LOS A	0.1	0.6	0.34	0.56	0.34	51.3
All Vehicles			174	82.4	174	82.4	0.059	1.1	NA	0.1	0.6	0.04	0.09	0.04	58.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [2 (6)] Olympic Dam Highway/Olympic Way (south of Roxby Downs) (2039 Baseline + Operation scenario PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
1	L2	All MCs	31	6.9	31	6.9	0.019	5.7	LOS A	0.1	0.6	0.02	0.54	0.02	52.8
2	T1	All MCs	78	86.5	78	86.5	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			108	64.1	108	64.1	0.060	1.6	LOS A	0.1	0.6	0.01	0.15	0.01	57.8
North: Olympic Dam Highway															
8	T1	All MCs	72	95.6	72	95.6	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	3	0.0	3	0.0	0.002	5.9	LOS A	0.0	0.1	0.21	0.51	0.21	52.3
Approach			75	91.5	75	91.5	0.057	0.3	NA	0.0	0.1	0.01	0.02	0.01	59.6
West: Olympic Way															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.20	0.50	0.20	52.5
12	R2	All MCs	6	0.0	6	0.0	0.007	6.8	LOS A	0.0	0.2	0.34	0.55	0.34	51.9
Approach			7	0.0	7	0.0	0.007	6.6	LOS A	0.0	0.2	0.32	0.54	0.32	52.0
All Vehicles			191	72.4	191	72.4	0.060	1.3	NA	0.1	0.6	0.02	0.12	0.02	58.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

Appendix C

SIDRA level crossing analysis

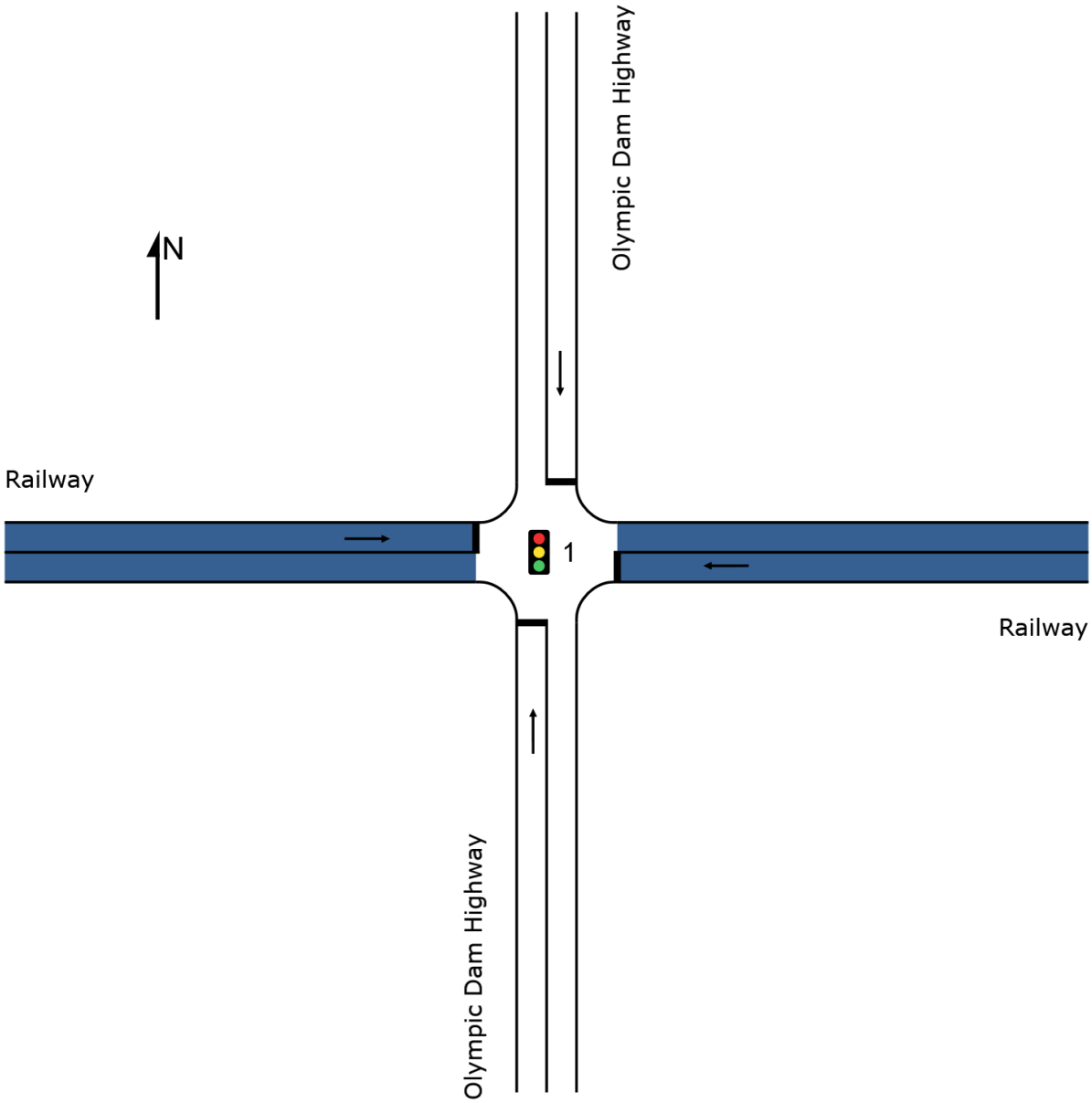
EMM
creating opportunities

SITE LAYOUT

Site: [1] Railway level crossing (Pimba) (2034/2037 Baseline)

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1] Railway level crossing (Pimba) (2034/2037 Baseline)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
2	T1	All MCs	48	17.4	48	17.4	* 0.034	17.5	LOS B	5.6	45.2	0.15	0.12	0.15	57.8
Approach			48	17.4	48	17.4	0.034	17.5	LOS B	5.6	45.2	0.15	0.12	0.15	57.8
East: Railway															
5	T1	All MCs	1	100.0	1	100.0	* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Olympic Dam Highway															
8	T1	All MCs	48	17.4	48	17.4	0.034	17.5	LOS B	5.6	45.2	0.15	0.12	0.15	57.8
Approach			48	17.4	48	17.4	0.034	17.5	LOS B	5.6	45.2	0.15	0.12	0.15	57.8
West: Railway															
11	T1	All MCs	1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			99	19.1	99	19.1	0.034	32.1	LOS C	5.6	45.2	0.17	0.13	0.17	46.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (2)] Railway level crossing (Pimba) (2034 Baseline + Construction + Operation peak hour scenario)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
2	T1	All MCs	63	36.7	63	36.7	* 0.051	17.8	LOS B	7.5	68.6	0.15	0.13	0.15	57.5
Approach			63	36.7	63	36.7	0.051	17.8	LOS B	7.5	68.6	0.15	0.13	0.15	57.5
East: Railway															
5	T1	All MCs	1 100.0		1 100.0		* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Olympic Dam Highway															
8	T1	All MCs	63	36.7	63	36.7	0.051	17.8	LOS B	7.5	68.6	0.15	0.13	0.15	57.5
Approach			63	36.7	63	36.7	0.051	17.8	LOS B	7.5	68.6	0.15	0.13	0.15	57.5
West: Railway															
11	T1	All MCs	1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			128	37.7	128	37.7	0.051	29.0	LOS C	7.5	68.6	0.17	0.14	0.17	48.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (3)] Railway level crossing (Pimba) (2037 Baseline + Operation scenario peak hour scenario)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Olympic Dam Highway															
2	T1	All MCs	61	34.5	61	34.5	* 0.049	17.8	LOS B	7.2	65.2	0.15	0.13	0.15	57.5
Approach			61	34.5	61	34.5	0.049	17.8	LOS B	7.2	65.2	0.15	0.13	0.15	57.5
East: Railway															
5	T1	All MCs	1	100.0	1	100.0	* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Olympic Dam Highway															
8	T1	All MCs	61	34.5	61	34.5	0.049	17.8	LOS B	7.2	65.2	0.15	0.13	0.15	57.5
Approach			61	34.5	61	34.5	0.049	17.8	LOS B	7.2	65.2	0.15	0.13	0.15	57.5
West: Railway															
11	T1	All MCs	1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1	100.0	1	100.0	0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			124	35.6	124	35.6	0.049	29.3	LOS C	7.2	65.2	0.17	0.14	0.17	48.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

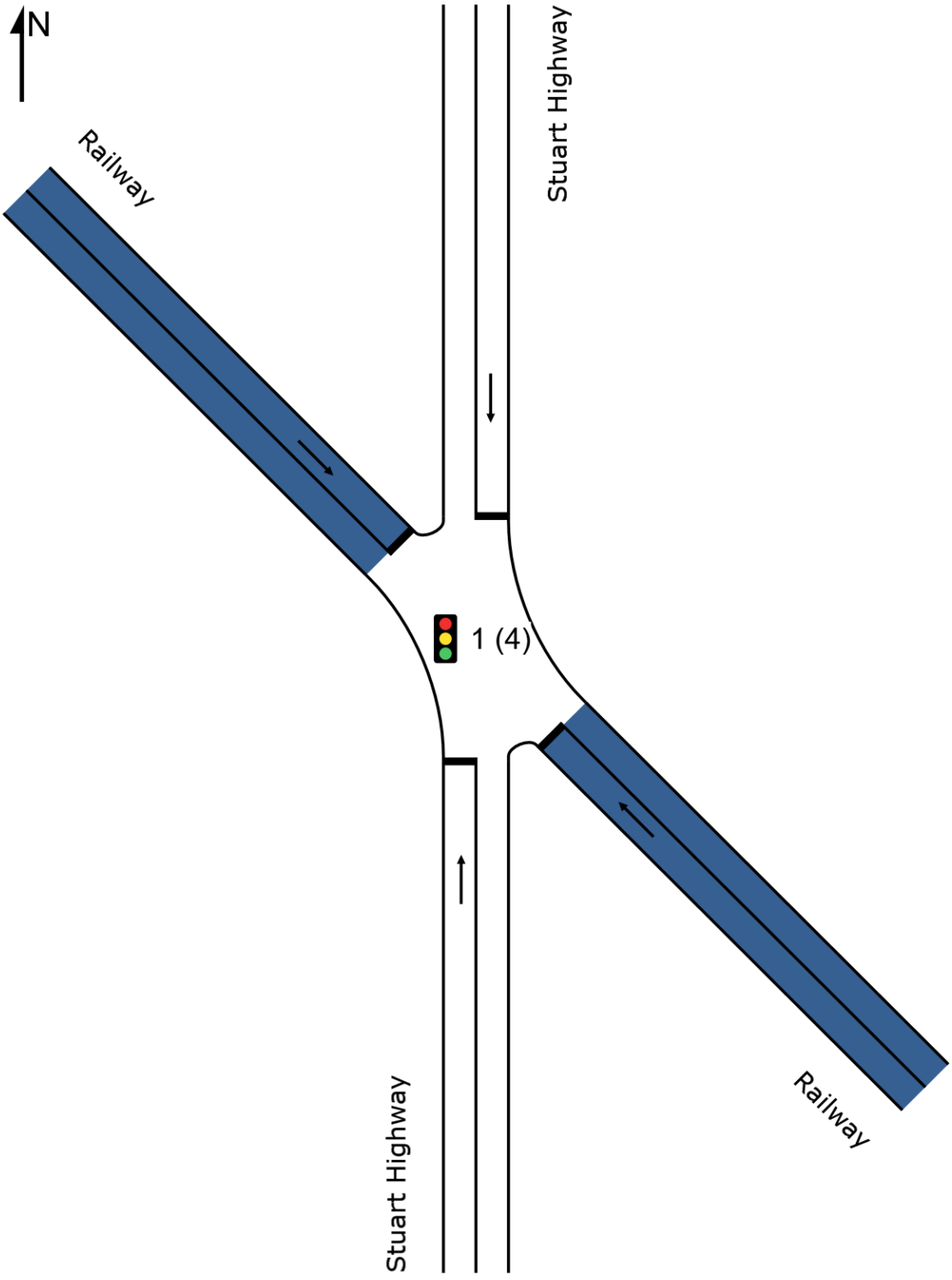
SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

SITE LAYOUT

Site: [1 (4)] Railway level crossing (Kootaberra) (2034/2037 Baseline)

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Created: Friday, 22 May 2026 4:22:20 PM
Project: X:\2024\E240021 - SA Copper Province Project 1\Technical studies\Transport\SIDRA\SRE level crossing\E240021_SRE_v0.4_22 May 2026.sipx

MOVEMENT SUMMARY

Site: [1 (4)] Railway level crossing (Kootaberra) (2034/2037 Baseline)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	71	37.3	71	37.3	* 0.058	17.9	LOS B	8.4	77.4	0.15	0.13	0.15	57.4
Approach			71	37.3	71	37.3	0.058	17.9	LOS B	8.4	77.4	0.15	0.13	0.15	57.4
SouthEast: Railway															
22	T1	All MCs	1 100.0		1 100.0		* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Stuart Highway															
8	T1	All MCs	71	37.3	71	37.3	0.058	17.9	LOS B	8.4	77.4	0.15	0.13	0.15	57.4
Approach			71	37.3	71	37.3	0.058	17.9	LOS B	8.4	77.4	0.15	0.13	0.15	57.4
NorthWest: Railway															
28	T1	All MCs	1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			143	38.2	143	38.2	0.058	28.0	LOS B	8.4	77.4	0.17	0.14	0.17	49.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (5)] Railway level crossing (Kootaberra) (2034 Baseline + Construction + Operation peak hour scenario)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	80	44.7	80	44.7	* 0.069	18.1	LOS B	9.6	93.0	0.16	0.13	0.16	57.2
Approach			80	44.7	80	44.7	0.069	18.1	LOS B	9.6	93.0	0.16	0.13	0.16	57.2
SouthEast: Railway															
22	T1	All MCs	1 100.0		1 100.0		* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Stuart Highway															
8	T1	All MCs	80	44.7	80	44.7	0.069	18.1	LOS B	9.6	93.0	0.16	0.13	0.16	57.2
Approach			80	44.7	80	44.7	0.069	18.1	LOS B	9.6	93.0	0.16	0.13	0.16	57.2
NorthWest: Railway															
28	T1	All MCs	1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			162	45.5	162	45.5	0.069	27.0	LOS B	9.6	93.0	0.17	0.14	0.17	50.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

SIDRA INTERSECTION 11 | Copyright © 2000-2026 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [1 (6)] Railway level crossing (Kootaberra) (2037 Baseline + Operation scenario peak hour scenario)

Output produced by SIDRA INTERSECTION Version: 11.0.2

New Site
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 1800.0 seconds (Site User-Given Phase Times)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	76	41.7	76	41.7	* 0.064	18.0	LOS B	9.1	86.0	0.16	0.13	0.16	57.3
Approach			76	41.7	76	41.7	0.064	18.0	LOS B	9.1	86.0	0.16	0.13	0.16	57.3
SouthEast: Railway															
22	T1	All MCs	1 100.0		1 100.0		* 0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
North: Stuart Highway															
8	T1	All MCs	76	41.7	76	41.7	0.064	18.0	LOS B	9.1	86.0	0.16	0.13	0.16	57.3
Approach			76	41.7	76	41.7	0.064	18.0	LOS B	9.1	86.0	0.16	0.13	0.16	57.3
NorthWest: Railway															
28	T1	All MCs	1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
Approach			1 100.0		1 100.0		0.010	701.9	LOS F	0.8	20.8	0.90	0.59	0.90	4.9
All Vehicles			154	42.5	154	42.5	0.064	27.4	LOS B	9.1	86.0	0.17	0.14	0.17	49.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Appendix D

Preliminary OSOM route assessment and transport impact mitigation planning

EMM
creating opportunities

Response to along route **– OSOM Route Assessment and Transport Impact Mitigation Planning**

1. Summary

This response addresses the requested information on the OSOM route assessment and associated transport impact mitigation measures, including temporary road closures, detours, and potential modifications to road or rail infrastructure necessary for the safe movement of plant and equipment to and from the site.

The project has evaluated multiple inbound transport corridors for the delivery of preassembled modules and major equipment to the Smelter and Refinery Expansion (SRE) Project site.

Oversize Overmass (OSOM) transport requirements for the project can be broadly categorised into two streams:

1. Module Transport – the movement of prefabricated process plant modules for site assembly.
2. Typical Oversize Road Freight – transport of standard equipment and materials using conventional heavy haulage, consistent with established mining and agricultural freight activity in the region.

2. Assessed Transport Routes

Three OSOM transport corridors have been assessed by BHP's specialist transport engineering contractor, an internationally accredited provider of heavy haulage solutions certified to ISO 9001 (Quality Management), ISO 14001 (Environmental Management), and ISO 45001 (Health and Safety Management).

A detailed route survey was conducted in April 2025 using the contractor's proprietary Route Survey Tool (RST). This vehicle-mounted system uses LiDAR scanning (accurate to 20 mm), GPS tracking, and front/rear cameras to collect high-resolution road geometry and clearance data. Supporting inputs included aerial imagery, CAD-based modelling, and historical transport data.

Transport arrangements were developed based on this data and are pending confirmation of allowable axle loadings by relevant authorities, which will influence final trailer configurations and cargo weight limits.

Assessed Routes:

- Route A – Port of Whyalla to Olympic Dam (335 km): Primary and most direct OSOM transport route.
- Route B – Port Pirie to Olympic Dam: Alternate route with established industrial infrastructure; suitable for general freight or select OSOM movements.
- Route C – Port of Adelaide to Olympic Dam: Longest route; offers advanced port facilities and may support select equipment based on logistics needs.

At this time, Route A has been confirmed as the primary OSOM module corridor. Routes B and C remain under consideration for general freight or contingency use.



Figure 1 - Example survey data

3. Module Route Description – Port of Whyalla to Olympic Dam

The designated module transport corridor includes:

- Port of Whyalla exit point
- Lincoln Highway (B100)
- Eyre Highway (A1)
- Stuart Highway (A87)
- Olympic Dam Highway (B97)
- Olympic Dam site entry gate

We acknowledge the input from PLUS, DEM, and the Port Augusta Council. At this time, no module transport is planned through the Joy Baluch AM Bridge or Yorkeys Crossing bypass. Should routing assumptions change, further impact assessments and stakeholder consultation will be undertaken.

4. Preliminary Module Movement Forecast

Based on current planning assumptions during the Select Phase Study (SPS), the following logistics profile has been developed:

- Estimated 10–15 charter vessel discharges at the Port of Whyalla over the life of the project.
- Approximately 393 individual module movements are forecast, though final quantities are subject to further engineering and constructability refinement.

Indicative Module Weight Categories:

- Weight ≥200 t – 11 Modules
- Weight 200 > M ≥ 100 t – 31 Modules
- Weight 100 > M ≥ 50 t – 80 Modules
- Weight 50 > M > 24 t – 65 Modules
- Weight ≤24 t – 168 Modules
- Under assessment – 38 Modules

5. Module Transport Equipment Overview

The project will utilise a range of specialised heavy haulage trailers designed to move prefabricated modules safely and efficiently while minimising road infrastructure and community impact.

A) Modular Platform Trailers

Highly configurable trailers that allow width and length adjustments based on cargo size. Hydraulic suspension enables road clearance adjustment and improved load distribution.



Figure 2 - Modular platform section example dimensions



Figure 3 - Example of a modular platform transporting a module

B) Drake Steerable Low Loaders

Low-deck trailers widely used in Australia, ideal for tall loads due to their reduced deck height and extendable configuration.

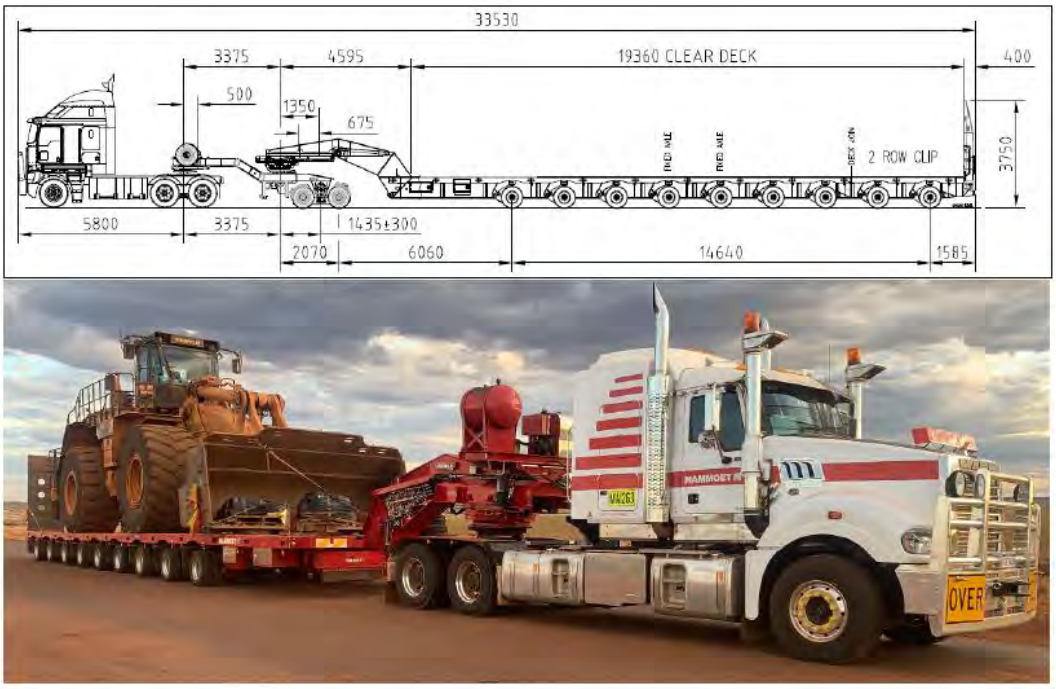
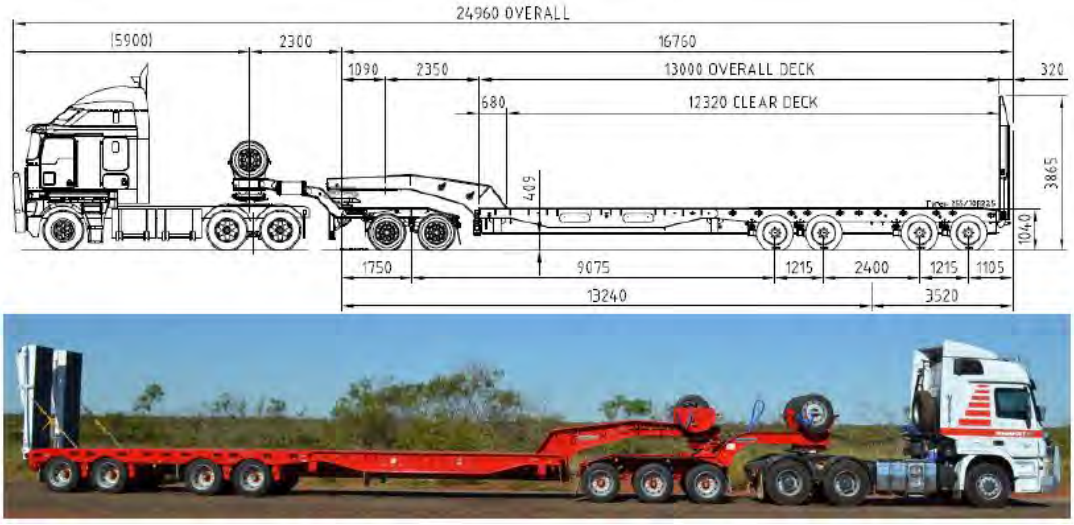


Figure 4 - Drake steerable gooseneck platform example

C) Low Loader Floats

Used for smaller modules (under 90 tonnes), capable of self-loading/unloading via stooling, often paired with tandem axle dollies.



D) Extendable Quad Axle Trailers

Suitable for long, slender cargo such as conveyor trusses. Extendable up to 55 metres and used for lighter structures.

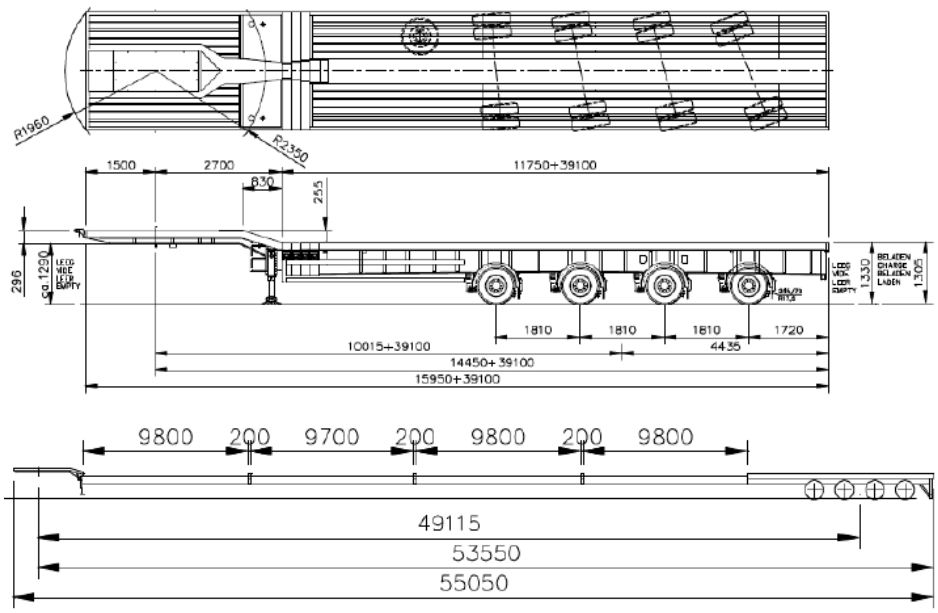




Figure 5 - Example of a quad axle extendable trailer combination

E) Prime Movers (Haulage Trucks)

All OSOM trailers will be moved using heavy-duty prime movers. Depending on the load and route, trailers may be:

- Pulled by a single truck, or
- Operated in push-and-pull configurations for additional traction, braking, and control.

6. Required Infrastructure Upgrades and Modifications

Preliminary route assessments have identified the following infrastructure requirements, subject to further engineering during the Definitive Phase Study:

- Vegetation Trimming: One along route location requiring minor clearing for module clearance.
- Road Widening: One along route location requiring localised widening to accommodate turning movements.

- Rail Bypass Reinstatement: Two sites where bypass crossings require modification or reinstatement.
- Light Pole Relocation: Two sites where poles may require temporary removal or relocation.
- Signage Adjustments: Two locations requiring signage removal or modification.
- Passing Bays: 18 passing bay locations have been identified that will require a degree of clearing and modification to ensure safe traffic management and sufficient road width for public vehicle overtaking during convoy operations.
- End-of-Shift Parking Bays: Two existing major bays requiring minor clearing and grading to enable safe overnight staging.

7. Delivery Schedules

Transport durations vary by load size and escort requirements. Wider and heavier loads involve more complex traffic management and longer delivery cycles. The 335 km route from Whyalla to Olympic Dam will follow the cycles outlined below:

OSOM > 8m Wide (Night Convoy – 3 Pilots, 3 Police, 3 Traffic Controllers)

- Day 1: Load
- Nights 1–3: Travel
- Day 4: Fatigue stand-down
- Day 5: Unload and begin return
- Days 6–7: Return

Over 40m Long but <8m Wide (Daytime – 2 Pilots, 3 Police)

- Day 1: Load and travel
- Day 2: Travel
- Day 3: Unload and begin return
- Day 4: Return

Under 8m Wide and 40m Long (Daytime – 2 Pilots, 3 Police)

- Day 1: Load and travel
- Day 2: Unload
- Day 3: Return

Under 7m Wide and 40m Long (2 Pilots, 2 Police)

- Day 1: Load and travel
- Day 2: Unload
- Day 3: Return

Under 6m Wide and 37m Long (2 Pilots)

- Day 1: Load and travel
- Day 2: Unload
- Day 3: Return

Under 5m Wide and 30m Long (1 Pilot)

- Day 1: Load and travel
- Day 2: Unload
- Day 3: Return

Oversize <4m Wide and 26m Long (No Pilot Required)

- Day 1: Load and travel
- Day 2: Unload and return

Legal Loads <2.5m Wide and 19m Long

- Day 1: Load and travel
- Day 2: Unload and return

A 4–5 day allowance has also been included for vessel discharge operations per vessel at the port site.

8. Parking Bays and Traffic Management

To ensure safe operation and minimise disruption to other road users, planned stopping locations and traffic flushing strategies will be implemented.

Parking Bays Requirements:

- Sufficient length for entire convoy to park end-to-end
- Width to accommodate regular traffic alongside
- Ground stability to support loaded trailers

Traffic Flushing Strategies:

- Bay-Based Flushing: Convoy stops in bay; public traffic passes on road
- On-Road Flushing: Convoy stops on road; traffic directed through bay in alternating directions

All locations have been reviewed for ground conditions and logistics feasibility. Detailed Traffic Management Plans will be formalised during the next phase.

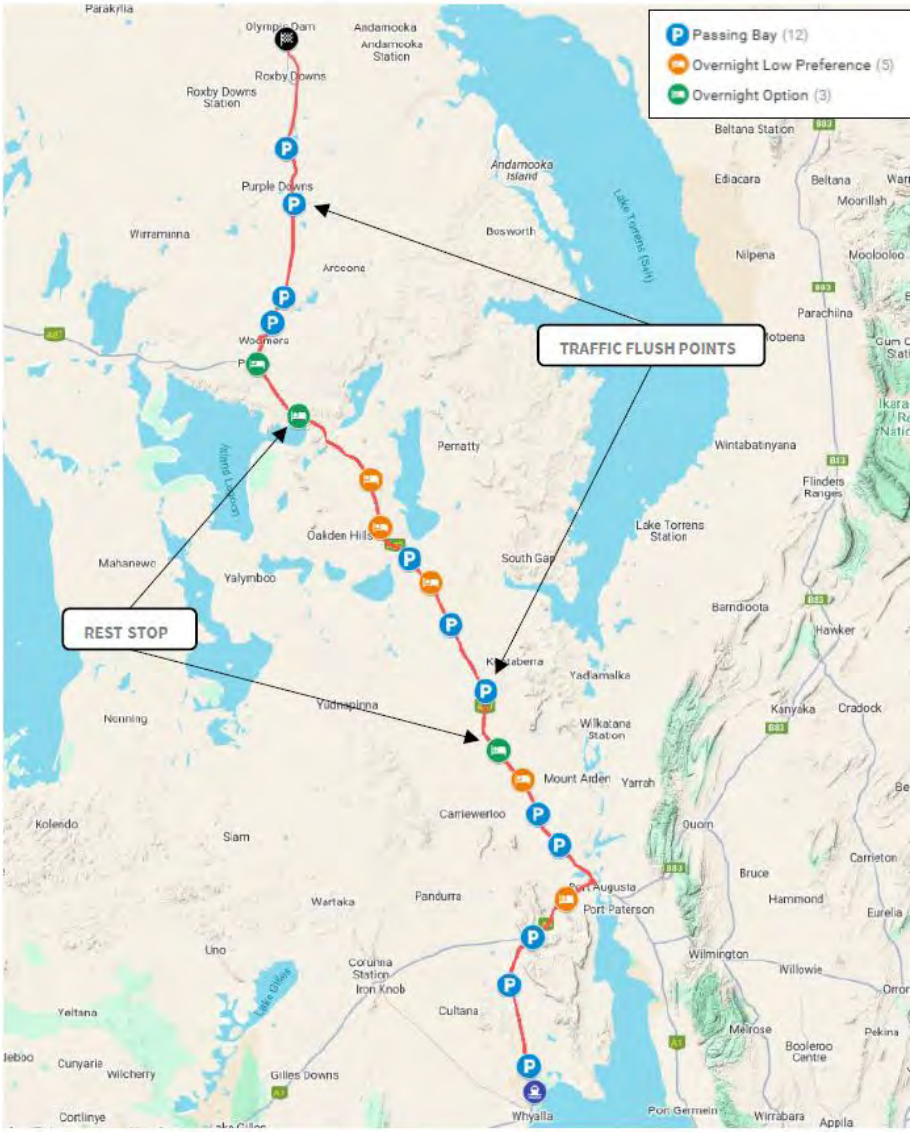


Figure 6 - Whyalla to Olympic Dam - Surveyed traffic flushing points and rest stops

9. Road Closure Communication and Impact Mitigation

During the Definitive Phase Study, the project will develop comprehensive strategies for managing and communicating road closures and disruptions. Options include:

- Use of rolling roadblocks to limit road closures to short, controlled sections
- Engagement with SAPOL, local councils, and relevant authorities
- Development of approved Traffic Management Plans (TMPs)
- Advance public notifications, signage, and real-time updates

This approach aims to reduce disruption and maintain access for road users and emergency services.

10. Engineering Maturity and Data Confidence

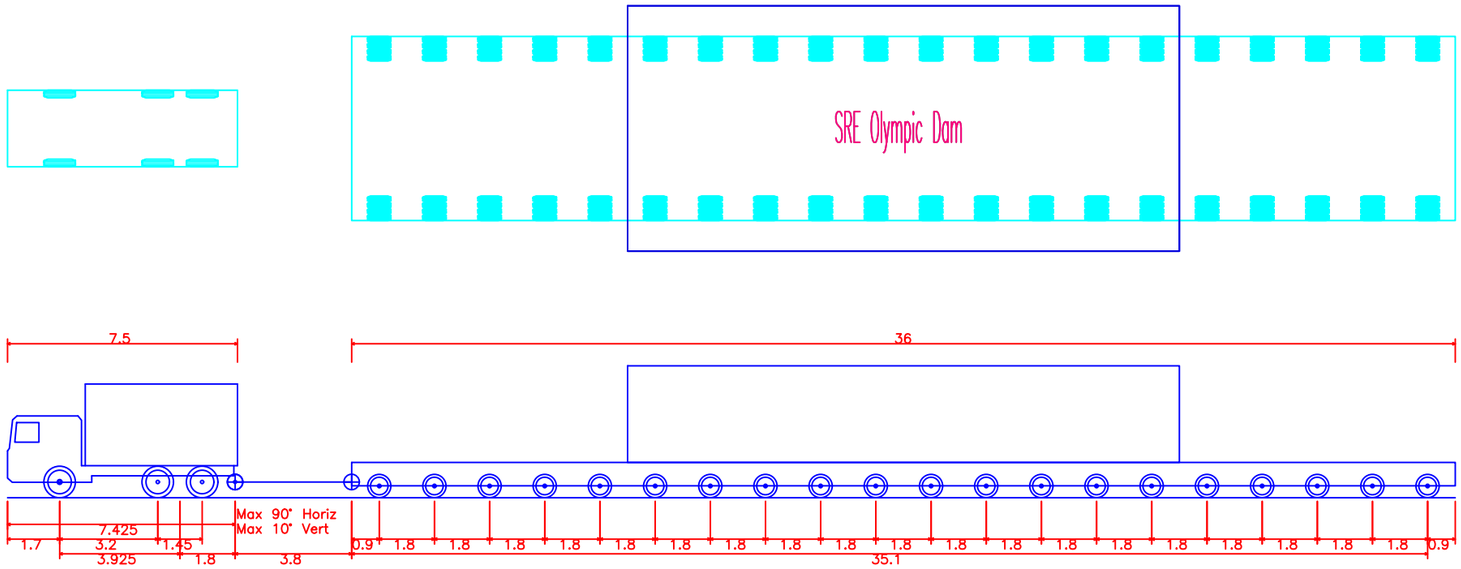
The data presented reflects the current level of engineering maturity within the Select Phase Study (SPS). Many inputs such as module designs, trailer configurations, and route constraints are subject to further definition.

Accordingly, this response should be viewed as indicative and preliminary. All assumptions will be validated and refined during the Definitive Phase Study in consultation with relevant stakeholders and authorities.

Appendix E

Preliminary OSOM swept paths

EMM
creating opportunities



SRE Olympic Dam

Overall Length	47.225m
Overall Width	6.000m
Overall Body Height	4.300m
Min Body Ground Clearance	0.390m
Max Track Width	6.000m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	25.150m

*Note: Load Width is 8.000m
*Note: Body Height is 4.500m

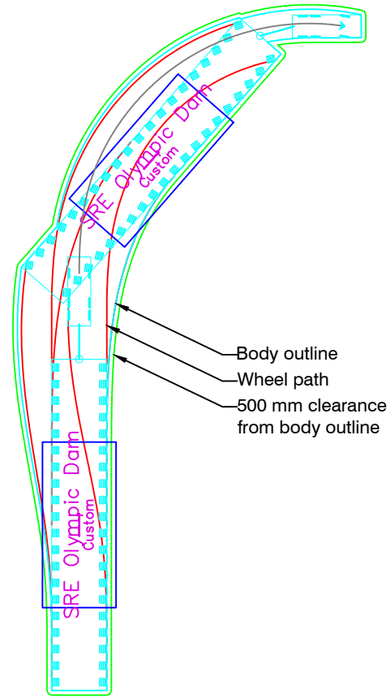
0 2 4m

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities
SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065
Phone # 02 8413 9527
www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM vehicle specifications
20x8 platform trailer

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-000
PROJECT #:	E240021
SCALE:	1:200

REV: 2

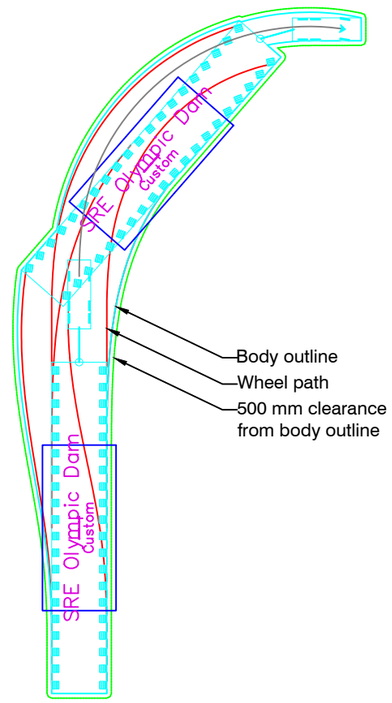


COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities
SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065
Phone # 02 8413 9527
www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM swept path
Eyre Highway/Princes Highway/Stuart Highway, Port Augusta West, SA
COORDINATES: -32.480136, 137.752673

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-001
PROJECT #:	E240021
SCALE:	1:500

REV: 2

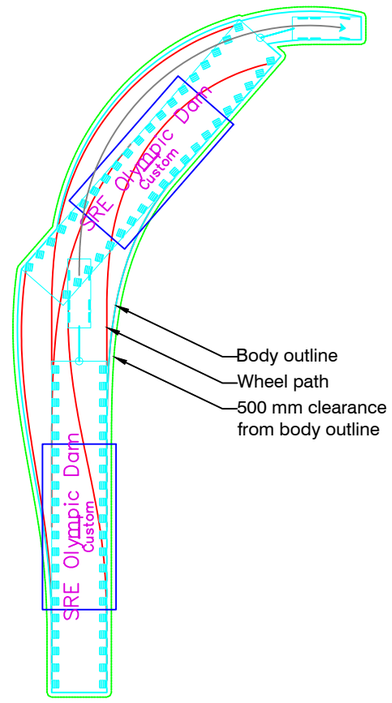


COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities

SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065

Phone # 02 8413 9527

www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM swept path
Stuart Highway/Olympic Dam Highway, Pimba, SA

COORDINATES: -31.259283, 136.804470

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-002
PROJECT #:	E240021
SCALE:	1:500

REV: 2

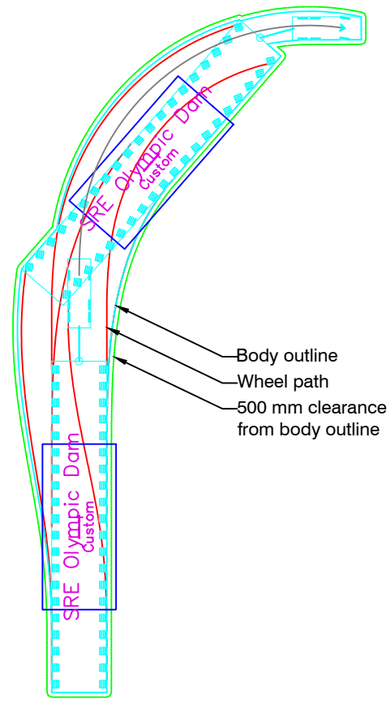


COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities
SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065
Phone # 02 8413 9527
www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

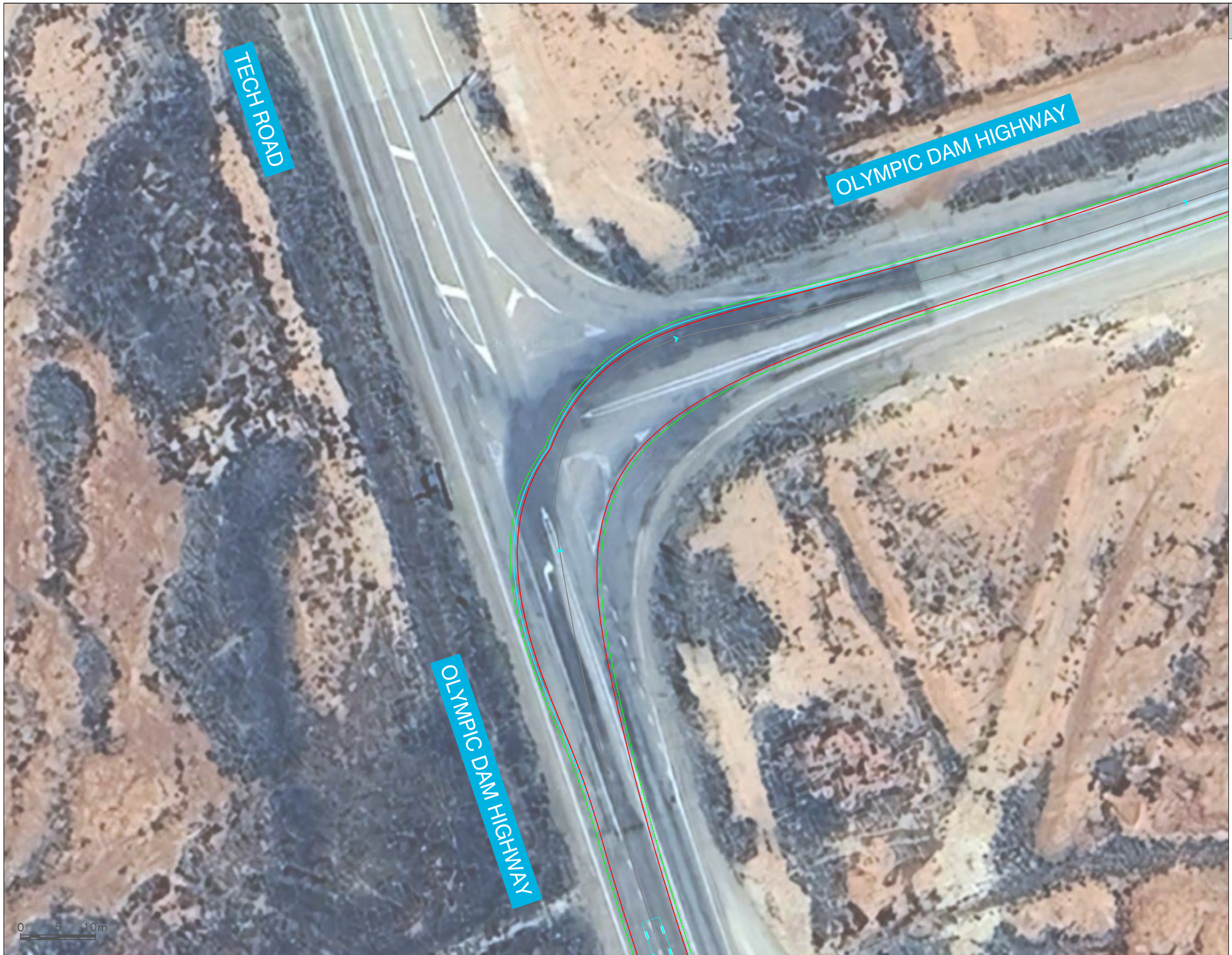
PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM swept path
Olympic Dam Highway rail level crossing, Pimba, SA

COORDINATES: -31.251558, 136.803790

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-003
PROJECT #:	E240021
SCALE:	1:500

REV: 2

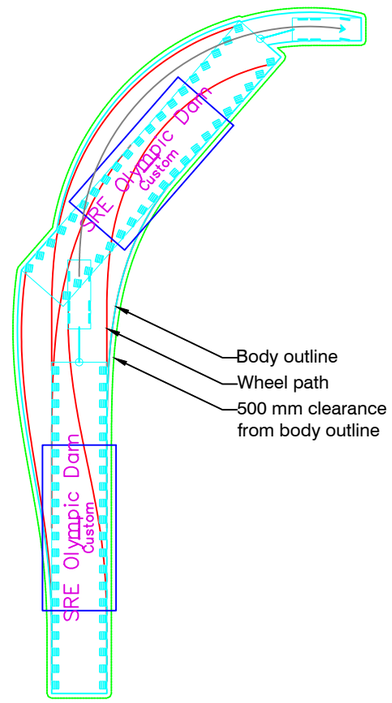


COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities
SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065
Phone # 02 8413 9527
www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM swept path
Olympic Dam Highway/Tech Road, Woomera, SA
COORDINATES: -31.189959, 136.812841

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-004
PROJECT #:	E240021
SCALE:	1:500

REV: 2

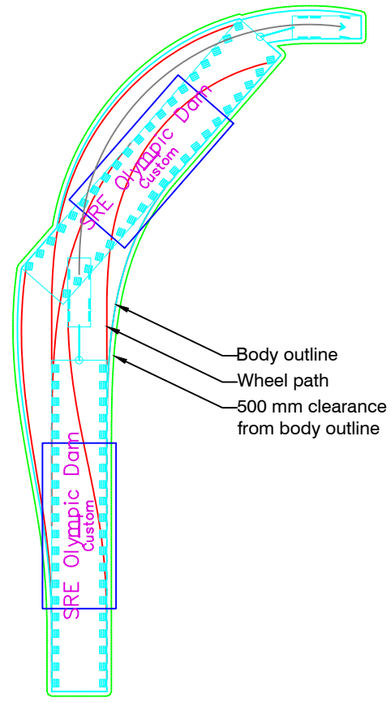


COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance from body outline

Map
- Existing road boundary
- Cadastral boundary
- Infrastructure
- Proposed upgrades



EMM creating opportunities
SYDNEY
Level 10
201 Pacific Highway
St Leonards NSW 2065
Phone # 02 8413 9527
www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
2	19/02/26	FOR INFORMATION	FF	JM, AU
1	26/01/26	FOR INFORMATION	FF	JM, AU

PROJECT:
Olympic Dam Smelter and Refinery Expansion Project

DRAWING TITLE:
OSOM swept path
Olympic Dam Highway/Olympic Way, Roxby Downs, SA
COORDINATES: -30.513180, 136.893578

CLIENT:	BHP Olympic Dam Corporation Pty Ltd
DRG. #:	EMM-005
PROJECT #:	E240021
SCALE:	1:500

REV: 2

Appendix F

Hatch Fluor traffic volume EIS data

EMM
creating opportunities

Report

Approvals Traffic and Transport Report

H375231-0000-843-230-0003

2025-12-19	**0**	**Approved for Use**	**M. Coronel**	**P. Nkrumah**	**J. Mayers**	**N/A**
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**APPROVED BY**
				Discipline Lead	**Functional Manager**	**Client**

Ver: 04.05

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Notice to Third Party Users

This document has been prepared by HFJV (an unincorporated joint venture of Hatch Pty Ltd and Fluor Australia Pty Ltd) for the exclusive use of BHP Olympic Dam Corporation Pty Ltd. HFJV disclaims all liability arising out of, or in connection with, any third party's use of, or reliance upon, any information contained in this document. The use of this document by any third party is at their sole risk. This document is confidential and all intellectual property rights embodied or referenced herein remain the property of HFJV.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table of Contents

1. Introduction 1

1.1 Scope 1
1.2 Purpose 2
1.3 Abbreviations 2

2. Assumptions and Exclusions 3

2.1 Assumptions 3
2.1.1 Construction 3
2.1.2 Operation 3
2.2 Exclusions 4
2.2.1 Construction 4
2.2.2 Operation 4

3. Construction Traffic Volumes 5

3.1 Materials / Equipment Heavy Vehicles 5
3.2 Oversized Vehicles 13
3.3 Construction Personnel 15

4. EIS-RFI-PIA-008 16

4.1 Assessed Transport Routes 16

5. Operational Traffic 17

5.1 Materials / Equipment Heavy Vehicles 17
5.2 Operational Personnel 25

List of Tables

Table 1-1 Construction timeframes 1
Table 1-2: Traffic Information Assessed 1
Table 3-1. Material Commodities Imported / Exported, Construction 5
Table 3-2. Construction Materials and Equipment Deliveries – Stage 1a 7
Table 3-3. Construction Materials and Equipment Deliveries – Stage 1b 9
Table 3-4. Construction Materials and Equipment Deliveries – Stage 2 11
Table 3-5. Construction Personnel Traffic 15
Table 3-6. Construction Personnel Vehicle Numbers 16
Table 5-1 Material Commodities Imported / Exported, Operation 18
Table 5-2 Operational Commodity Deliveries 21
Table 5-3 Operational Personnel Numbers 25
Table 5-4 Operational Personnel Vehicle Numbers 25

List of Figures

Figure 5-1 Pimba to OD Route 18

List of Appendices

Appendix A Transport Routes

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

1. Introduction

1.1 Scope

BHP are compiling information and data required for the EIS (Environmental Impact Statement) and other documents required for permit approvals for the SRE (Smelter and Refinery Expansion) project at Olympic Dam. A third-party consultant, EMM, is assisting BHP with this task.

This report details the traffic data determined for the construction and operation of SRE Stages 1a, 1b and 2 which will be used to inform the EIS.

The assessments have been made on the following basis for SRE Stages 1a, 1b and 2.

- Stage 1a SRE based on a nominal concentrate feed of 1,100ktpa of copper concentrate.
- Stage 1b SRE based on a nominal concentrate feed of 1,400ktpa of copper concentrate
- Stage 2 SRE is based on the approvals case of a 650ktpa production target which equates to a nominal concentrate feed of 2,000ktpa of copper concentrate.

Table 1-1 below outlines the construction timeframes used as the basis for the traffic numbers. Stage 1a has been based on an unconstrained schedule.

Table 1-1 Construction timeframes

Stage	Start	Complete	Duration (Months)
1a	Q4 2027	Q1 2031	41
1b	Q2 2033	Q2 2035	24
2	Q3 2037	Q 2039	24

Table 1-2 below provides a summary of the requests from BHP and EMM with regard to traffic information and how this report has responded to those requests.

Table 1-2: Traffic Information Assessed

Relevant RFI	Information Description
EIS-PIA-RFI-007	Provide transport and logistics for the development (including workforce and end-to-end supply chain (input and output)) during operation phases for SRE Project Stage 1a, Stage 1b and Stage 2 (e.g. using the Olympic Dam Highway, Pimba Intermodal, Stuart Highway, and the Eyre Highway), including: * Updated Traffic Volume EIS Data report e.g. similar to Worley Oct 2024 report [Rev B:311000-00102-LM-REP-0001]. * Existing/predicted traffic volumes for concentrate from Prominent Hill, Carrapateena, and any third parties; cathode copper and associated products; hazardous materials (e.g. sulphuric acid, ammonia, cyanide) at various operational stages. * Proposed vehicle types during construction and operation * Number/frequencies of vehicle types (e.g. materials, commodities and equipment) * Hours of activity and traffic peaks

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Relevant RFI	Information Description
	* Traffic distribution to the east and west from Pimba during operation * Any change in assumptions of the accommodation for staff / contractors during construction and operation which may influence the traffic operation
EIS-PIA-RFI-008	Confirm construction modularisation transport and logistics, including OSOM route assessment and management measures to minimise delays and ensure safety for other transport users (e.g. temporary road closures/detours, temporary or permanent modification to road or rail infrastructure, road surfaces) to ensure compliance with the 'Heavy Vehicle National Law' *Note: PLUS/DEM/Port Augusta Council have identified the need for appropriate consideration of the existing road network through and around Port Augusta, especially the Joy Baluch AM Bridge and the Yorkeys Crossing bypass.*
EIS-PIA-RFI-075	Provide OSOM categories requiring escorting and durations to be provided for Stage 1a (proposed 350 loads), Stage 1b (proposed 50 loads) and Stage 2 (50 loads). Specifically, provide breakdown of: • 'High Risk' OSOM requiring Escort as per NHVR's approval and 'Low Risk; OSOM which can travel independently with a pilot vehicle at the front • Monthly/weekly/daily breakdown of the OSOM vehicles • Confirmation of the dimension of the largest size of OSOM vehicle • Confirmation of the anticipated delivery schedule e.g. day vs night

1.2 Purpose

The purpose of the report is to provide the construction and operational traffic volumes for SRE Stage 1a, 1b, and Stage 2 for use in the development of the EIS.

1.3 Abbreviations

Abbreviation	Definition
BHP	BHP Group Limited
CAF	Cement, aggregate and fill
EIS	Environmental Impact Statement
FTE	Full Time Equivalents
HV	Heavy Vehicle
IPS	Identification Phase Study
ktpa	Kilo Tonnes per Annum
LPG	Liquid Petroleum Gas
LV	Light Vehicle
SPS	Selection Phase Study
SRE	Smelter Refinery Expansion
ULP	Unleaded Petrol
UoM	Unit of Measurement

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

2. Assumptions and Exclusions

2.1 Assumptions

2.1.1 Construction

The following assumptions are made in addition to those listed for each material and transport type in this report.

- Trucks will not be scheduled to arrive during peak shift-change hours. Daily peak-hour traffic is determined by personnel movements only. Logistics traffic is excluded from this calculation.
- Delivery frequency and arrival times remain consistent across weekdays, weekends, and public holidays
- Large modules and pre-cast units are excluded unless specifically noted in the oversize considerations. All other equipment and materials are assumed to comply with the heavy haul road transport guidelines.
- Escort loads will include required police escorts and any utility escorts necessary for power line clearance
- Construction personnel work 11.5-hour shifts, starting at 6:00 AM and ending at 5:30 PM
- 90% of construction personnel travel to/from the site in 57-seater coaches, and 10% in light vehicles, with average occupancy of 2 persons per vehicle
- All construction personnel are assumed to reside at the accommodation camp
- Construction and Commissioning is assumed to be completed as follows: Stage 1a – Q1-2031, Stage 1b – Q1-2035, and Stage 2 – Q2-2039.

2.1.2 Operation

The following assumptions apply in addition to those listed for each material and transport type in this report.

- The existing operation is based on a nominal concentrate feed of 550 ktpa of copper concentrate
- Stage 1a operation is assumed to commence in 2031, with concentrate feed trucked to Olympic Dam from Prominent Hill and Carrapateena
- Stage 1b is assumed to commence in 2035, with concentrate feed trucked to Olympic Dam from Prominent Hill and Carrapateena
- Stage 2 SRE operation is based on the production of 650 ktpa of copper cathode, equating to a nominal feed of 2,000 ktpa of copper concentrate. Stage 2 operations are assumed to commence in 2039, with concentrate feed trucked to Olympic Dam from Prominent Hill, Carrapateena and Oak Dam
- Deliveries will occur only during daylight hours; No nighttime deliveries are assumed

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

- Delivery frequency and arrival times remain consistent across weekdays, weekends, and public holidays
- Deliveries occur 365 days per year
- 90% of operational staff reside at the accommodation camp, and 10% reside in Roxby Downs
- Operational staff residing at the accommodation camp travel to and from the site in 57-seater coaches or light vehicles, with an average vehicle occupancy of 2 persons per vehicle
- Operational staff residing in Roxby Downs travel to and from the site in light vehicles, average occupancy of 1 person per vehicle
- Coaches used for dayshift transport will also accommodate a smaller number of nightshift personnel. No additional coaches are required for nightshift
- Coaches are assumed to remain parked at accommodation camp when not in use
- Coaches are assumed to operate at full capacity in both directions
- Assumptions regarding Pimba will be addressed in a separate section.

2.2 Exclusions

This traffic study report is general in nature and has been compiled using IPS / SPS-level quantities and design details. The following exclusions apply:

2.2.1 Construction

- Specific haulage details for individual commodities or pieces of equipment have not been developed. Oversize and overmass results are based on engineering judgment of likely delivery requirements, referencing existing installations of similar equipment and the details available in the mechanical equipment list and the IPS model.
- Value optimisation work currently being undertaken in parallel with the SRE study and not yet adopted – particularly regarding modularisation – has not been factored into these traffic estimates
- Specific transport management plans for equipment have not been developed, other than estimating the number of wide/pilot/escort loads required
- Additional transport movements to and from the accommodation camp – other than those for construction personnel – have not been considered
- The Pimba rail line is assumed to be utilised where feasible for freight transport to the SRE site, however this has not yet been quantified for the construction phase.

2.2.2 Operation

- Additional transport movements to and from the accommodation camp—other than those for operational personnel—have not been considered.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

3. Construction Traffic Volumes

3.1 Materials / Equipment Heavy Vehicles

Table 3-1 below provides a summary of the materials and equipment transported to the Olympic Dam site during the construction of SRE Stage 1a, SRE Stage 1, and SRE Stage 2, where traffic volumes have been determined.

Table 3-1. Material Commodities Imported / Exported, Construction

Commodity	Included in Traffic Volumes (Yes/No)	Import / Export	Notes
Construction Facilities	Yes	Import	
Construction Equipment	Yes	Import	
Fuel	Yes	Import	
Consumables	Yes	Import	
Water and Wastewater	No	N/A	Assumed all water sourced from site and all wastewater disposed of within site.
Waste (Demolition and General)	Yes	Export	Waste has been split into general waste and demolition waste. With nominal truck movements included for both.
Earthworks	Yes	Import	Assume 20% of earthworks quantity imported to site
Civil	Yes	Import	Allowance for imported gravel road pavements and asphalt surfacing
Concrete	Yes	Import	
Steel Reinforcing	Yes	Import	Assumed to be 1.5% by volume of the concrete.
Structural Steel	Yes	Import	
Buildings and Architecture	Yes	Import	
Perm Mobile Equipment	Yes	Import	
Mechanical Bulks	Yes	Import	
Mechanical Equipment	Yes	Import	
Mechanical Equipment – Cathodes	Yes	Import	
Piping	Yes	Import	
Electrical Equipment	Yes	Import	
Raceway	Yes	Import	
Wire and Cable	Yes	Import	
Instrumentation and Control	Yes	Import	

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 3-2, Table 3-3, and Table 3-4 below present the following data:

- The total quantity of the equipment or materials transported to the site during the construction of SRE Stage 1a, SRE Stage 1b, and Stage 2
- The total number and the average daily number of heavy vehicle trucks entering the external road network during the construction of these stages. Heavy vehicle numbers are provided in relation to the equipment and material transported to site.
- The type of heavy vehicle assumed for transport, including the payload capacity for reach vehicle type
- The duration of heavy vehicle movements.

All construction materials and equipment are assumed to originate from Adelaide.

The expected peak daily vehicle movements vary across the construction stages. For Stage 1a, the peak is anticipated to reach approximately 31 vehicles per day. During Stage 1b, this figure decreases to about 24 vehicles per day, reflective of the smaller scope. For Stage 2, the peak daily vehicle movements are expected to be around 24 vehicles per day.

It is noted that the heavy vehicles numbers shown represent the number of loads required to transport equipment and materials. The total number of heavy vehicle movements is double these values.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 3-2. Construction Materials and Equipment Deliveries – Stage 1a

Material / Equipment (1100)	Quantity[1]	UoM	Heavy Vehicle Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start for Deliveries (Quarter)	End for Deliveries (Quarter)	Duration in Months	Total Number of Vehicles	Average Vehicles per day
Construction Facilities – Mobilisation	13,402	m2	Semi-Trailer	36	1	36	Q4-2027	Q1-2028	3	372	4
Construction Facilities – Demobilisation	13,402	m2	Semi-Trailer	36	1	36	Q2-2030	Q3-2030	2	372	7
Construction Facilities – Mobilisation	200	each	Semi-Trailer	2	1	2	Q4-2027	Q1-2028	1.5	100	3
Construction Facilities – Demobilisation	200	each	Semi-Trailer	2	1	2	Q2-2030	Q3-2030	2	100	2
Fuel - Construction Facilities – Used During Construction of Facility	525,120	Litres	B Double Tanker	48,000	1	48,000	Q4-2027	Q1-2028	1.5	11	1
Fuel - Construction Facilities – Used During Operation of Facility During Construction Period	84,403	Litres	B Double Tanker	48,000	1	48,000	Q1-2028	Q3-2030	32	2	1
Fuel - Earthworks	2,203,716	Litres	B Double Tanker	48,000	1	48,000	Q4-2027	Q1-2029	14.5	46	1
Fuel - SMPEI	13,031,764	Litres	B Double Tanker	48,000	1	48,000	Q3-2028	Q3-2030	25.5	271	1
Earthworks Fleet – Mobilisation	29	each	Semi-Trailer	1	1	1	Q4-2027	Q4-2027	0.5	29	2
Earthworks Fleet – Demobilisation	29	each	Semi-Trailer	1	1	1	Q1-2029	Q1-2029	0.5	29	3
Heavy Lift – Mobilisation	12	each	Semi-Trailer	1	1	1	Q2-2028	Q3-2028	1	12	1
Heavy Lift – Demobilisation	12	each	Semi-Trailer	1	1	1	Q2-2030	Q3-2030	1	12	1
Construction Consumables	1,111	each	Semi-Trailer	1	1	1	Q4-2027	Q3-2030	33.5	1,111	1
Earthworks	82,955	m3	6 Axle Truck + trailer	352	0.9	28	Q4-2027	Q1-2029	14	2,963	7
Civil – Road Pavement	7,500	m3	6 Axle Truck + trailer	223	0.9	19.8	Q2-2027	Q3-2027	3	379	5
Civil – Road Sealing Asphalt	5,400	tonnes	3 Axle Truck	84	0.9	7.2	Q2-2028	Q3-2028	2.5	750	9
Civil – Fencing	3,400	m	Semi-Trailer	250	1	250	Q2-2027	Q3-2027	1	14	1
Concrete	41,066	m3	Semi-Trailer	155	0.9	13.5	Q3-2028	Q3-2029	13	3,042	8
Concrete – Reinforcement Steel	4,836	tonnes	Semi-Trailer	24	0.9	21.6	Q3-2028	Q3-2029	13	224	1
Structural Steel	8,580	tonnes	Semi-Trailer	24	0.75	18	Q4-2028	Q2-2030	18.5	477	1
Buildings and Architecture	46,484	m2	Semi-Trailer	36	1	36	Q4-2028	Q2-2031	28.5	1,291	2

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Material / Equipment (1100)	Quantity[1]	UoM	Heavy Vehicle Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start for Deliveries (Quarter)	End for Deliveries (Quarter)	Duration in Months	Total Number of Vehicles	Average Vehicles per day
Perm Mobile Equipment	18	each	Semi-Trailer	1	1	1	Q2-2030	Q4-2030	5	15	1
Mechanical Bulks	2,009	tonnes	Semi-Trailer	20	1	20	Q2-2029	Q2-2030	11	100	1
Mechanical Equipment	1,626	each	Semi-Trailer	1	1	1	Q2-2029	Q2-2030	11	1,626	7
Mechanical Equipment – Cathodes	34,020	each	Semi-Trailer	300	1	300	Q2-2029	Q2-2030	11	113	1
Piping	76,787	m	Semi-Trailer	350	1	450	Q1-2030	Q2-2031	16	171	1
Electrical Equipment	3,095	each	Semi-Trailer	4	1	4	Q4-2028	Q1-2030	15.5	774	2
Raceway	31,264	m	Semi-Trailer	750	1	750	Q4-2028	Q2-2030	18.5	42	1
Wire and Cable	342,796	m	Semi-Trailer	750	1	750	Q4-2028	Q2-2030	18.5	457	1
Instrumentation and Control	3,338	each	Semi-Trailer	20	1	20	Q4-2028	Q2-2030	18.5	167	1
Waste (Demolition)	-	-	Semi-Trailer	-	-	-	Q4-2028	Q2-2030	18.5	300	4
Waste (General Construction)	-	-	Semi-Trailer	-	-	-	Q4-2027	Q1-2031	43.5	1,293	1

TOTAL NUMBER HEAVY VEHICLES	16,665	
DURATION OF STAGE 1A CONSTRUCTION DELIVERIES (DAYS)	**1260**	
AVERAGE HEAVY VEHICLES PER DAY	**13**	
PEAK HEAVY VEHICLES PER DAY	30	Q4-2028

NOTES:

1. Quantities for Stage 1a (1,100 ktpa) are based on the Early SPS Capital Cost Estimate Basis.
2. A Six-Axle Truck with Trailer has a nominal capacity of 42 tonnes. Based on loose earthwork density of 1.2 t/m^3, this equates to approximately 35 m^3.
3. For gravel pavement with a density of 1.9 t/m^3, the Six-Axle Truck with Trailer provides a nominal capacity of 22 m^3.
4. A Three-Axle Truck has a nominal capacity of 13 tonnes. With aggregate density of 1.6 t/m^3, this corresponds to approximately 8 m^3.
5. A Semi-Trailer has a nominal capacity of 24 tonnes. Based on a concrete blend density of 1.6 t/m^3, this equates to approximately 15m^3.
6. Steel reinforcement is assumed to constitute 1.5% of the concrete volume.
7. Average vehicles are rounded up to the nearest 1.
8. Nominal figures have been included for the waste streams. 300 trucks for demolition waste and 1 truck per day for general waste. While this number did consider the demolition waste MTO the level of detail is considered low at this stage.
9. Schedule has been adapted from the Worley IPS Traffic Volume EIS Data Report (311000-00102-LM-REP-0001).

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 3-3. Construction Materials and Equipment Deliveries – Stage 1b

Material / Equipment (1100)	Quantity[1]	UoM	Heavy Vehicle Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start for Deliveries (Quarter)	End for Deliveries (Quarter)	Duration in Months	Total Number of Vehicles	Average Vehicles per day
Construction Facilities – Mobilisation	6030.9	m2	Semi-Trailer	36	1	36	Q2-2033	Q3-2033	3.8	167.5	4
Construction Facilities – Demobilisation	6030.9	m2	Semi-Trailer	36	1	36	Q3-2034	Q4-2034	2.6	167.5	7
Construction Facilities – Mobilisation	90	each	Semi-Trailer	2	1	2	Q2-2033	Q3-2033	1.3	45.0	3
Construction Facilities – Demobilisation	90	each	Semi-Trailer	2	1	2	Q3-2034	Q4-2034	2.6	45.0	2
Fuel - Construction Facilities – Used During Construction of Facility	226661.85	Litres	B Double Tanker	48,000	1	48,000	Q2-2033	Q3-2033	3.8	4.7	1
Fuel - Construction Facilities – Used During Operation of Facility During Construction Period	14728.5	Litres	B Double Tanker	48,000	1	48,000	Q3-2033	Q1-2035	19.8	0.3	1
Fuel - Earthworks	352242	Litres	B Double Tanker	48,000	1	48,000	Q2-2033	Q3-2033	1.6	7.3	1
Fuel - SMPEI	3713934.6	Litres	B Double Tanker	48,000	1	48,000	Q3-2033	Q4-2034	16.6	77.4	1
Earthworks Fleet – Mobilisation	10	each	Semi-Trailer	1	1	1	Q2-2033	Q3-2033	1.0	10.0	2
Earthworks Fleet – Demobilisation	10	each	Semi-Trailer	1	1	1	Q4-2033	Q4-2033	1.3	10.0	3
Heavy Lift – Mobilisation	5	each	Semi-Trailer	1	1	1	Q3-2033	Q3-2033	1.3	5.0	1
Heavy Lift – Demobilisation	5	each	Semi-Trailer	1	1	1	Q2-2034	Q3-2034	1.3	5.0	1
Construction Consumables	245.25	each	Semi-Trailer	1	1	1	Q2-2033	Q1-2035	23.6	245.3	1
Earthworks	25921.53	m3	6 Axle Truck + trailer	352	0.9	28	Q2-2033	Q4-2033	5.5	925.8	7
Civil – Road Pavement	2548.35	m3	6 Axle Truck + trailer	223	0.9	19.8	Q1-2034	Q2-2034	4.0	128.7	5
Civil – Road Sealing Asphalt	270	tonnes	3 Axle Truck	84	0.9	7.2	Q1-2034	Q2-2034	3.9	37.5	9
Civil – Fencing	0	m	Semi-Trailer	250	1	250	Q3-2033	Q1-2035	18.5	0.0	1
Concrete	13095	m3	Semi-Trailer	155	0.9	13.5	Q3-2033	Q1-2034	6.6	970.0	8
Concrete – Reinforcement Steel	1560.15	tonnes	Semi-Trailer	24	0.9	21.6	Q3-2033	Q1-2034	6.6	72.2	1
Structural Steel	2341.35	tonnes	Semi-Trailer	24	0.75	18	Q3-2033	Q2-2034	9.2	130.1	1
Buildings and Architecture	33570.9	m2	Semi-Trailer	36	1	36	Q4-2033	Q3-2034	9.2	932.5	2
Perm Mobile Equipment	8	each	Semi-Trailer	1	1	1	Q4-2033	Q3-2034	9.1	8.0	1
Mechanical Bulks	456.3	tonnes	Semi-Trailer	20	1	20	Q4-2033	Q3-2034	9.1	22.8	1

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Material / Equipment (1100)	Quantity[1]	UoM	Heavy Vehicle Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start for Deliveries (Quarter)	End for Deliveries (Quarter)	Duration in Months	Total Number of Vehicles	Average Vehicles per day
Mechanical Equipment	2053.35	each	Semi-Trailer	1	1	1	Q4-2033	Q3-2034	9.1	2053.4	7
Mechanical Equipment – Cathodes	35721	each	Semi-Trailer	300	1	300	Q4-2033	Q3-2034	9.1	119.1	1
Piping	23127.75	m	Semi-Trailer	350	1	450	Q4-2033	Q2-2034	7.3	51.4	1
Electrical Equipment	931.05	each	Semi-Trailer	4	1	4	Q1-2034	Q3-2034	7.3	232.8	2
Raceway	9021.15	m	Semi-Trailer	750	1	750	Q1-2034	Q3-2034	7.3	12.0	1
Wire and Cable	89456.4	m	Semi-Trailer	750	1	750	Q1-2034	Q3-2034	7.3	119.3	1
Instrumentation and Control	899.55	each	Semi-Trailer	20	1	20	Q2-2033	Q4-2033	4.3	45.0	1
Waste (Demolition)	-	-	Semi-Trailer	-	-	-	Q2-2033	Q1-2035	23.6	709.0	1
Waste (General Construction)	-	-	Semi-Trailer	-	-	-	Q2-2033	Q2-2033	2.2	100.0	4
TOTAL NUMBER HEAVY VEHICLES				**7,460**							
DURATION OF STAGE 1A CONSTRUCTION DELIVERIES (DAYS)				**709**							
AVERAGE HEAVY VEHICLES PER DAY				**11**							
PEAK HEAVY VEHICLES PER DAY				**30 -**	**Q4-2028**						

NOTES:

1. Stage 1b (1,400 ktpa) quantities have been derived from the approvals case quantities obtained from the Early SPS Capital Cost Estimate Basis. The volumes were split between the stage 1b and stage 2 construction campaigns at a ratio of 45/55.
2. A Six-Axle Truck with Trailer has a nominal capacity of 42 tonnes. Based on loose earthwork density of 1.2 t/m^3, this equates to approximately 35 m^3.
3. For gravel pavement with a density of 1.9 t/m^3, the Six-Axle Truck with Trailer provides a nominal capacity of 22 m^3.
4. A Three-Axle Truck has a nominal capacity of 13 tonnes. With aggregate density of 1.6 t/m^3, this corresponds to approximately 8 m^3.
5. A Semi-Trailer has a nominal capacity of 24 tonnes. Based on a concrete blend density of 1.6 t/m^3, this equates to approximately 15m^3.
6. Steel reinforcement is assumed to constitute 1.5% of the concrete volume.
7. Average vehicles are rounded up to the nearest 1.
8. Nominal figures have been included for the waste streams. 100 trucks for demolition waste and 1 truck per day for general waste.
9. Schedule have been adapted from the Worley IPS Traffic Volume EIS Data Report (311000-00102-LM-REP-0001).

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 3-4. Construction Materials and Equipment Deliveries – Stage 2

Material / Equipment (2000)	Quantity[1]	UoM	Transport Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start of Deliveries (Quarter)	End of Deliveries (Quarter)	Estimated Duration (Months)	Estimated Total Number of Vehicles	Average Vehicles per day
Construction Facilities – Mobilisation	7,371	m2	Semi-Trailer	36	1	36	Q3-2037	Q4-2037	3.8	363	4
Construction Facilities – Demobilisation	7,371	m2	Semi-Trailer	36	1	36	Q4-2038	Q1-2039	2.6	373	2
Construction Equipment – Mobilisation	110	each	Semi-Trailer	2	1	2	Q3-2037	Q4-2037	1.3	100	2
Construction Equipment – Demobilisation	110	each	Semi-Trailer	2	1	2	Q4-2038	Q1-2039	2.6	100	1
Fuel - Construction Facilities – Used During Construction of Facility	277,031	Litres	B Double Tanker	48,000	1	48,000	Q3-2037	Q4-2037	3.8	11	1
Fuel - Construction Facilities – Used During Operation of Facility During Construction Period	18,002	Litres	B Double Tanker	48,000	1	48,000	Q4-2037	Q2-2039	19.8	2	1
Fuel – Earthworks	430,518	Litres	B Double Tanker	48,000	1	48,000	Q4-2037	Q4-2037	1.6	46	1
Fuel – SMPEI	4,539,253	Litres	B Double Tanker	48,000	1	48,000	Q4-2037	Q1-2039	16.6	272	1
Earthworks Fleet – Mobilisation	10	each	Semi-Trailer	1	1	1	Q3-2037	Q4-2037	1.0	29	2
Earthworks Fleet – Demobilisation	10	each	Semi-Trailer	1	1	1	Q1-2038	Q1-2038	1.3	29	3
Heavy Lift – Mobilisation	5	each	Semi-Trailer	1	1	1	Q4-2037	Q4-2037	1.3	12	1
Heavy Lift – Demobilisation	5	each	Semi-Trailer	1	1	1	Q3-2038	Q4-2038	1.3	12	1
Construction Consumables	300	each	Semi-Trailer	1	1	1	Q3-2037	Q2-2039	23.6	1,111	1
Earthworks	31,682	m3	6 Axle Truck + trailer	352	0.9	28	Q4-2037	Q1-2038	5.5	5,044	11
Civil – Road Pavement	3,115	m3	6 Axle Truck + trailer	223	0.9	19.8	Q2-2038	Q3-2038	4.0	379	4
Civil – Road Sealing Asphalt	330	tonnes	3 Axle Truck	84	0.9	7.2	Q2-2038	Q3-2038	3.9	750	8
Concrete		m3	Semi-Trailer	155	0.9	13.5	Q2-2036	Q3-2036	0.0	5,197	12
Concrete - Reinforcement Steel	16,005	tonnes	Semi-Trailer	24	0.9	21.6	Q4-2037	Q2-2039	18.5	383	1
Structural Steel	1,907	tonnes	Semi-Trailer	24	0.75	18	Q4-2037	Q2-2038	6.6	766	1
Buildings and Architecture	2,862	m2	Semi-Trailer	36	1	36	Q4-2037	Q2-2038	6.6	2,072	2
Perm Mobile Equipment	41,031	each	Semi-Trailer	1	1	1	Q4-2037	Q3-2038	9.2	18	1
Mechanical Bulks	10	tonnes	Semi-Trailer	20	1	20	Q1-2038	Q4-2038	9.2	151	1
Mechanical Equipment	558	each	Semi-Trailer	1	1	1	Q1-2038	Q4-2038	9.1	4,563	12
Mechanical Equipment – Cathodes	2,510	each	Semi-Trailer	300	1	300	Q1-2038	Q4-2038	9.1	265	1
Piping	43,659	m	Semi-Trailer	350	1	450	Q1-2038	Q4-2038	9.1	114	1
Electrical Equipment	28,267	each	Semi-Trailer	4	1	4	Q1-2038	Q4-2038	9.1	1,291	2

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Material / Equipment (2000)	Quantity[1]	UoM	Transport Type	Maximum payload per Truck	Bulking or Packing Factor	Actual Payload Per Truck	Start of Deliveries (Quarter)	End of Deliveries (Quarter)	Estimated Duration (Months)	Estimated Total Number of Vehicles	Average Vehicles per day
Raceway	1,138	m	Semi-Trailer	750	1	750	Q1-2038	Q3-2038	7.3	68	1
Wire and Cable	11,026	m	Semi-Trailer	750	1	750	Q2-2038	Q4-2038	7.3	722	1
Instrumentation and Control	109,336	each	Semi-Trailer	20	1	20	Q2-2038	Q4-2038	7.3	267	1
Waste General (construction)	1,099							Q4-2038	2	100	2
Waste Demolition									23.6	709	1
TOTAL NUMBER HEAVY VEHICLES						**8,930**					
DURATION OF STAGE 1B CONSTRUCTION DELIVERIES (DAYS)						**709**					
AVERAGE HEAVY VEHICLES PER DAY						**13**					
PEAK HEAVY VEHICLES PER DAY						**37**				Q1-2038	

NOTES:

1. Stage 2 (2000 ktpa) quantities have been derived from the approvals case quantities obtained from the Early SPS Capital Cost Estimate Basis. The volumes were split between the stage 1b and stage 2 construction campaigns at a ratio of 45/55.
2. A Six-Axle Truck with Trailer has a nominal capacity of 42 tonnes. Based on loose earthwork density of 1.2 t/m^3, this equates to approximately 35 m^3.
3. For gravel pavement with a density of 1.9 t/m^3, the Six-Axle Truck with Trailer provides a nominal capacity of 22 m^3.
4. A Three-Axle Truck has a nominal capacity of 13 tonnes. With aggregate density of 1.6 t/m^3, this corresponds to approximately 8 m^3.
5. A Semi-Trailer has a nominal capacity of 24 tonnes. Based on a concrete blend density of 1.6 t/m^3, this equates to approximately 15m^3.
6. Steel reinforcement is assumed to constitute 1.5% of the concrete volume.
7. Average vehicles are rounded up to the nearest 1.
8. Nominal figures have been included for the waste streams. 100 trucks for demolition waste and 1 truck per day for general waste.
9. Schedule have been adapted from the Worley IPS Traffic Volume EIS Data Report (311000-00102-LM-REP-0001).

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

3.2 Oversized Vehicles

Oversized vehicles will be required as part of the SRE project. OSOM loads will comply with all relevant state federal and local permits and approvals as required. Each load will be assessed individually on a case-by-case basis.

It is anticipated that up to 350 OSOM loads will be required as part of the Stage 1a, 50 OSOM loads and part of Stage 1b construction and 50 OSOM loads will be required as part of Stage 2 construction. These loads are estimated to peak at rate of 17/month or 4/week.

Existing assumptions, as per the Worley report, around OSOM vehicle sizes and delivery schedules should be held for the purpose of the EIS. This includes a maximum vehicle size of 25m long, 3.5m wide and 4.5m high, with all deliveries occurring exclusively during daytime hours.

Under these assumptions, all OSOM vehicles to be utilised as part of the SRE Project will be 'low risk' and able to travel independently with a pilot vehicle at the front.

Table 3-5 provides a summary of the approximate oversized loads.

Table 3-5 - Oversized Load Numbers (Approx)

Stage	Month	Total Loads	Wide Load – No Pilot	Pilot Load	Police Escort Load
Stage 1a	Nov-27	6	3	2	1
Stage 1a	Dec-27	7	3	2	2
Stage 1a	Jan-28	9	4	3	2
Stage 1a	Feb-28	10	5	3	2
Stage 1a	Mar-28	11	6	3	2
Stage 1a	Apr-28	13	6	4	3
Stage 1a	May-28	14	7	4	3
Stage 1a	Jun-28	15	8	4	3
Stage 1a	Jul-28	16	8	4	4
Stage 1a	Aug-28	16	8	4	4
Stage 1a	Sep-28	17	8	5	4
Stage 1a	Oct-28	17	8	5	4
Stage 1a	Nov-28	17	8	5	4
Stage 1a	Dec-28	17	8	5	4
Stage 1a	Jan-29	17	8	5	4
Stage 1a	Feb-29	16	8	4	4
Stage 1a	Mar-29	16	8	4	4
Stage 1a	Apr-29	15	8	4	3
Stage 1a	May-29	14	7	4	3
Stage 1a	Jun-29	13	6	4	3
Stage 1a	Jul-29	11	6	3	2
Stage 1a	Aug-29	10	5	3	2
Stage 1a	Sep-29	9	4	3	2
Stage 1a	Oct-29	8	4	2	2
Stage 1a	Nov-29	7	3	2	2
Stage 1a	Dec-29	6	3	2	1
Stage 1a	Jan-30	5	3	1	1

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Stage	Month	Total Loads	Wide Load – No Pilot	Pilot Load	Police Escort Load
Stage 1a	Feb-30	4	2	1	1
Stage 1a	Mar-30	3	1	1	1
Stage 1a	Apr-30	3	1	1	1
Stage 1a	May-30	2	1	1	0
Stage 1a	Jun-30	2	1	1	0
Stage 1a	Jul-30	1	1	0	0
Stage 1a	Aug-30	1	1	0	0
Stage 1a	Sep-30	1	1	0	0
Stage 1a	Oct-30	1	1	0	0
Stage 1a	Nov-30 to Mar-31	0	0	0	0
Stage 1b	Apr-33	1	1	0	0
Stage 1b	May-33	2	1	1	0
Stage 1b	Jun-33	3	1	2	0
Stage 1b	Jul-33	3	1	2	0
Stage 1b	Aug-33	4	2	1	1
Stage 1b	Sep-33	4	2	1	1
Stage 1b	Oct-33	4	2	1	1
Stage 1b	Nov-33	4	2	1	1
Stage 1b	Dec-33	4	2	1	1
Stage 1b	Jan-34	4	2	1	1
Stage 1b	Feb-34	4	2	1	1
Stage 1b	Mar-34	3	1	1	1
Stage 1b	Apr-34	3	1	2	0
Stage 1b	May-34	2	1	1	0
Stage 1b	Jun-34	2	1	1	0
Stage 1b	Jul-34	1	1	0	0
Stage 1b	Aug-34	1	1	0	0
Stage 1b	Sep-34	1	1	0	0
Stage 1b	Oct-34 to Mar-35	0	0	0	0
Stage 2	Jul-37	1	1	0	0
Stage 2	Aug-37	2	1	1	0
Stage 2	Sep-37	3	1	2	0
Stage 2	Oct-37	3	1	2	0
Stage 2	Nov-37	4	2	1	1
Stage 2	Dec-37	4	2	1	1
Stage 2	Jan-38	4	2	1	1
Stage 2	Feb-38	4	2	1	1
Stage 2	Mar-38	4	2	1	1
Stage 2	Apr-38	4	2	1	1
Stage 2	May-38	4	2	1	1
Stage 2	Jun-38	3	1	2	0
Stage 2	Jul-38	3	1	2	0
Stage 2	Aug-38	2	1	1	0
Stage 2	Sep-38	2	1	1	0
Stage 2	Oct-38	1	1	0	0

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Stage	Month	Total Loads	Wide Load – No Pilot	Pilot Load	Police Escort Load
Stage 2	Nov-38	1	1	0	0
Stage 2	Dec-38	1	1	0	0
Stage 2	Jan-39 to Jun-39	0	0	0	0

For project transparency a separate scope of work is being undertaken exploring the options for increasing the size of modules SRE and other BHP growth projects could bring to site. Should a pathway be mapped out that means there was an approved and physically feasible option for SRE to bring much larger modules to site the project would likely take advantage of this. This would mean less vehicles numbers on the road over the duration of the project. All appropriate secondary permits and approvals would be in place.

3.3 Construction Personnel

The estimated construction personnel numbers for SRE Stages 1a, 1b, and 2 – used to calculate vehicle movements between the accommodation camp and Olympic Dam – are based on the peak personnel for Stage 1a, then proportionally scaled for Stages 1b and 2. This conservative approach accounts for expected fluctuations in workforce levels during ramp-up and ramp-down periods.

Table 3-6. Construction Personnel Traffic

Case	Construction Personnel – Dayshift	Construction Personnel – Nightshift	Total Personnel
Stage 1a	1,050	263	1,313
Stage 1b	412	103	515
Stage 2	783	196	978

For the purpose of this analysis, the following assumptions have been applied:

- All construction personnel will be accommodated within the designated camp facilities, ensuring centralised housing arrangements
- Approximately 90% of personnel are expected to travel by coach, with the remaining 10% utilising light vehicles (LV) for transportation
- Workforce distribution is anticipated to comprise 80% on day shift and 20% on night shift activities, in line with standard scheduling practices
- The figures presented in Tables 3.5 and 3.6 reflect only areas worked on by HFJV and do not include the remainder of surface operations, open-cut mine activities, or contractor contributions.

Table 3-7 provides an overview of the estimated vehicle requirements for transporting construction personnel between the accommodation camp and Olympic Dam during various project stages.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 3-7. Construction Personnel Vehicle Numbers

Stages	Shift	Peak Construction Personnel	Coach	LV	Vehicles Per Day
Stage 1a	Day	17	53	70	17
	Night	5	14	19	5
Stage 1b	Day	7	21	28	7
	Night	2	6	8	2
Stage 2	Day	13	40	53	13
	Night	4	10	14	4

The table presents the shift allocations, peak construction personnel, and the corresponding number of vehicles required per day. It accounts for both day and night shift operations and includes allocations for coaches and light vehicles (LVs), which are capped at a maximum of 60 units to maximize the use of coaches and reduce reliance on smaller vehicles. Partial vehicle counts have been rounded up for reporting purposes, and night shift coaches are assumed to be the same units used during day shift operations. The figures shown represent the number of loads per trip; therefore, to calculate the total number of vehicles, these figures must be doubled.

4. EIS-RFI-PIA-008

4.1 Assessed Transport Routes

Three OSOM transport corridors have been assessed by the HFJV and specialist transport engineering contractor, an internationally accredited provider of heavy haulage solutions certified to ISO 9001 (Quality Management), ISO 14001 (Environmental Management), and ISO 45001 (Health and Safety Management).

A detailed route survey was conducted in April 2025 using the contractor's proprietary Route Survey Tool (RST). This vehicle-mounted system uses LiDAR scanning (accurate to 20 mm), GPS tracking, and front/rear cameras to collect high-resolution road geometry and clearance data. Supporting inputs included aerial imagery, CAD-based modelling, and historical transport data.

Transport arrangements have been developed based on this data but remain subject to confirmation of allowable axle loadings by the relevant authorities. These load limits will determine final trailer configurations and cargo weight restrictions.

Assessed Routes:

- Route A – Port of Whyalla to Olympic Dam (335 km): Primary and most direct OSOM transport route
- Route B – Port Pirie to Olympic Dam: Alternate route with established industrial infrastructure; suitable for general freight or select OSOM movements
- Route C – Port of Adelaide to Olympic Dam: Longest route; offers advanced port facilities and may support select equipment based on logistics needs.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

At this time, Route A has been confirmed as the primary OSOM module transport corridor. Routes B and C remain under consideration for potential use in general freight or contingency options.

Module Route Description – Port of Whyalla to Olympic Dam

The designated module transport corridor comprises of the following key segments:

- Port of Whyalla exit point
- Lincoln Highway (B100)
- Eyre Highway (A1)
- Stuart Highway (A87)
- Olympic Dam Highway (B97)
- Olympic Dam site entry gate.

We acknowledge the input from PLUS, DEM, and the Port Augusta Council during the route assessment process. At the time of writing, no module/OSOM transport is planned via the Joy Baluch AM Bridge or the Yorkeys Crossing bypass. Should routing assumptions change, further impact assessments and stakeholder consultation will be undertaken.

5. Operational Traffic

5.1 Materials / Equipment Heavy Vehicles

During the operational phase of the SRE Project, the transport strategy has shifted to prioritise the Pimba rail line as the preferred freight option for deliveries to site. Freight will be unloaded from the rail at the designated transfer point and then loaded onto trucks for transport to a logistics hub located within the SRE footprint (see Figure 5-1).

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.



Figure 5-1 Pimba to OD Route

Table 5-1 summarises the commodities transported to and from the Olympic Dam site during the existing operation, as well as SRE Stages 1a, 1b, and 2. Commodity volumes were provided by the HFJV process engineering team and calculated during the SPS extension phase based on the various Mass and Energy Balances.

Table 5-1 Material Commodities Imported / Exported, Operation

Commodity	Included in Traffic Volumes (Yes/No)	Import / Export	Rail / Road*
Concentrate - Carrapateena	Existing – Yes Stage 1a, 1b 2 – Yes	Import	Road
Concentrate - Prominent Hill	Existing – Yes Stage 1a, 1b 2 – Yes	Import	Road
Concentrate - Oak Dam	Existing, Stage 1a, 1b – No Stage 2 – Yes	Import	Road
Acid	Existing – Yes Stage 1a, 1b 2 – No	Import	Road

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Commodity	Included in Traffic Volumes (Yes/No)	Import / Export	Rail / Road*
Acid	Existing – Yes Stage 1a, 1b 2 – Yes	Export	Rail
Ammonia	Yes	Import	Assume Yes
Caustic Soda	Yes	Import	Rail
Cement (Mortar) / MineCem (for CAF)	Yes	Import	Assume Yes
Quick Lime	Existing – Yes Stage 1a – Yes Stage 1b – No Stage 2 – No	Import	Assume Yes
Coke	Existing – Yes Stage 1a, 1b 2 – No	Import	N/A
Cyanide	Yes	Import	Rail
Diluent (Shell_2046 Kerosene)	Yes	Import	Assume Yes
Electrode Paste	Existing – Yes Stage 1a, 1b 2 – No	Import	N/A
Ethanol	Yes	Import	Assume Yes
Ammonia Nitrate	Yes	Import	Assume Yes
MAG E10 (Flocculant)	Yes	Import	Rail
MAG 919 (Flocculant)	Yes	Import	Rail
Diesel	Yes	Import	Rail
Interfroth 754	Yes	Import	Assume Yes
Fuel / Oil	Yes	Import	Rail
General Freight North	Yes	Import	Rail
Hydrogen Peroxide	Yes	Import	Rail
LPG	Yes	Import	Rail
Autran TO 430 (Cat. Trans Fluid)	Yes	Import	Assume Yes
Autran TO-450 (Cat. Drive Fluid)	Yes	Import	Assume Yes
Energol HLP-HM 68 (Hydraulic Fluid)	Yes	Import	Assume Yes
Mine Multi Diesel (Engine oil)	Yes	Import	Assume Yes

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Commodity	Included in Traffic Volumes (Yes/No)	Import / Export	Rail / Road*
Vectron (Engine oil)	Yes	Import	Assume Yes
Polysil_Peg (Coagulant)	Yes	Import	Assume Yes
IETC Promoter_CMS2500	Yes	Import	TBC
Oxime_Copper SX	Yes	Import	TBC
Clay_Copper SX	Yes	Import	TBC
Diatomaceous earth_Copper SX	Yes	Import	TBC
Amine_Uranium SX	Yes	Import	TBC
Soda Ash_Uranium SX	Yes	Import	TBC
Isodecanol_Uranium SX	Yes	Import	TBC
Sodium Chlorate	Yes	Import	TBC
Sulphur	Yes	Import	Rail
Silica Flux	Yes	Import	Road
Xanthate	Yes	Import	TBC
Copper Cathode (ER +EW)	Yes	Export	Rail
Uranium Oxide Concentrate (UOC)	Yes	Export	TBC
Precious Metals	Yes	Export	Road

**All rail transport will be transported via road to and from site via the Pimba intermodal hub.*

Table 4-2 below provides data on the commodities imported into or exported from Olympic Dam and the resultant traffic volumes for the existing operations, for SRE Stage 1a, 1b and 2 operations.

The numbers provided represent the number of loads required to transport commodities. To determine the total vehicles movements the number must be doubled. While it is likely exports will take advantage backloading this has not been considered in these numbers.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Table 5-2 Operational Commodity Deliveries

Commodity	Existing Annual Volume (ktpa)	Stage 1a SRE Annual Volume (ktpa)	Stage 1b SRE Annual Volume (ktpa)	Stage 2 SRE Annual Volume (ktpa)	Heavy Vehicle Type	Maximum payload per Truck (Tonnes)	Origin	Destination	Existing Annual Vehicle Volume	Existing Peak Daily Vehicle Volume	Stage 1a SRE Annual Vehicle Volume	Stage 1a SRE Peak Daily Vehicle Volume	Stage 1b SRE Annual Vehicle Volume	Stage 1b SRE Peak Daily Vehicle Volume	Stage 2 SRE Annual Vehicle Volume	Stage 2 SRE Peak Daily Vehicle Volume
Acid Import	64.73	0-	0	0	B-Triple - GML	52	Port Adelaide - Bulk Chemicals	Olympic Dam	1,245	4	0	0	0	0	0	0
Acid Export	0-	456	493	704	A-Tripple Road train	84	Olympic Dam	Port Adelaide Chemical Storage (2)	0	0	5,438	19	5,876	19	8,395	27
Ammonia	1.71	3.20	4.05	5.81	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	33	1	62	1	78	1	112	1
Caustic Soda	2.96	20.7	26.6	42.4	Isotainer - triple	80	Port Adelaide Chemicals Storage	Olympic Dam	57	1	260	1	334	2	532	2
Cement (Mortar) / MineCem (CAF)	199.08	401.03	583.31	692.68	B-Triple - GML	52	Augusta - Kalari DC	Olympic Dam	3,829	11	7,713	22	11,218	31	13,321	37
Quick Lime	13.08	13.08	0	0	B-Triple - GML	52	Augusta - Kalari DC	Olympic Dam	252	1	252	1	0	0	0	0
Coke	18.02	0	0	0	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	347	1	0	0	0	0	0	0
Cyanide	0.07	0.39	0.51	0.71	Isotainer	21	Port Adelaide Chemicals Storage	Olympic Dam	2	1	19	1	25	1	34	1
Diluent (Shell_2046 Kerosene)	1.29	3.05	3.05	5.54	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	25	1	59	1	59	1	107	1
Electrode Paste (1)	0.64	0	0	0	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	13	1	0	0	0	0	0	0
Ethanol	0.4	0.94	0.94	1.72	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	8	1	19	1	19	1	34	1
Ammonia Nitrate	0.1	0.19	0.24	0.35	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	2	1	4	1	5	1	7	1
MAG E10 (Flocculant)	0.46	0.28	0.37	0.59	Dry power trailer	20	Port Adelaide Chemicals Storage	Olympic Dam	9	1	14	1	19	1	30	1
MAG 919 (Flocculant)	0.04	0.07	0.09	0.13	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	1	1	2	1	2	1	3	1

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Commodity	Existing Annual Volume (ktpa)	Stage 1a SRE Annual Volume (ktpa)	Stage 1b SRE Annual Volume (ktpa)	Stage 2 SRE Annual Volume (ktpa)	Heavy Vehicle Type	Maximum payload per Truck (Tonnes)	Origin	Destination	Existing Annual Vehicle Volume	Existing Peak Daily Vehicle Volume	Stage 1a SRE Annual Vehicle Volume	Stage 1a SRE Peak Daily Vehicle Volume	Stage 1b SRE Annual Vehicle Volume	Stage 1b SRE Peak Daily Vehicle Volume	Stage 2 SRE Annual Vehicle Volume	Stage 2 SRE Peak Daily Vehicle Volume
Diesel (All users)	56.64	57.93	58.31	58.94	Triple Tanker	56	Port Augusta	Olympic Dam	1,090	3	1,034	1	1,040	1	1,052	1
Interfroth 754	0.14	0.28	0.32	0.51	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	3	1	6	1	7	1	10	1
Fuel Oil	10.49	14.9	19.2	17.1	Triple Tanker	56	Port Adelaide Chemicals Storage	Olympic Dam	202	1	265	2	343	2	306	2
General Freight North (To Site)	15.28	19.75	28.73	34.12	AB-Triple - GML	64	Port Adelaide DC / Berth 25	Olympic Dam	197	1	255	1	371	2	440	2
General Freight North (To Site)					B-Double - GML	38	Port Adelaide DC / Berth 25	Olympic Dam	72	1	91	1	133	1	158	1
Hydrogen Peroxide	0.1	0.05	0.06	0.09	Isotainer	20	Port Adelaide Chemicals Storage	Olympic Dam	2	1	3	1	4	1	5	1
LPG	29.87	16.88	18.78	20.56	Tanker triple	75	Port Adelaide Chemicals Storage	Olympic Dam	786	3	226	2	251	2	275	2
Autran TO 430 (Cat. Trans Fluid)	0.11	0.25	0.27	0.45	B-Triple - GML	52	Adelaide [2]	Olympic Dam	3	1	5	1	6	1	9	1
Autran TO-450 (Cat. Drive Fluid)	0.03	0.06	0.07	0.11	B-Triple - GML	52	Adelaide [2]	Olympic Dam	1	1	2	1	2	1	3	1
Energol HLP-HM 68 (Hydraulic Fluid)	0.09	0.20	0.22	0.36	B-Triple - GML	52	Adelaide [2]	Olympic Dam	2	1	4	1	5	1	8	1
Mine Multi Diesel (Engine oil)	0.01	0.02	0.02	0.04	B-Triple - GML	52	Adelaide [2]	Olympic Dam	1	1	1	1	1	1	1	1
Vectron (Engine oil)	0.04	0.07	0.08	0.13	B-Triple - GML	52	Adelaide [2]	Olympic Dam	1	1	2	1	2	1	3	1
Polysil_Peg (Coagulant)	0.88	1.64	2.08	2.99	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	17	1	32	1	40	1	58	1
IETC Promoter_CMS2500	0.06	0.11	0.14	0.20	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	2	1	3	1	3	1	4	1
Oxime_Copper SX	0.29	0.28	0.40	0.48	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	6	1	6	1	8	1	10	1

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Commodity	Existing Annual Volume (ktpa)	Stage 1a SRE Annual Volume (ktpa)	Stage 1b SRE Annual Volume (ktpa)	Stage 2 SRE Annual Volume (ktpa)	Heavy Vehicle Type	Maximum payload per Truck (Tonnes)	Origin	Destination	Existing Annual Vehicle Volume	Existing Peak Daily Vehicle Volume	Stage 1a SRE Annual Vehicle Volume	Stage 1a SRE Peak Daily Vehicle Volume	Stage 1b SRE Annual Vehicle Volume	Stage 1b SRE Peak Daily Vehicle Volume	Stage 2 SRE Annual Vehicle Volume	Stage 2 SRE Peak Daily Vehicle Volume
Clay_Copper SX	0.03	0.03	0.04	0.05	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	1	1	1	1	1	1	1	1
Diatomaceous earth_Copper SX	0.01	0.01	0.02	0.02	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	1	1	1	1	1	1	1	1
Amine_Uranium SX	0.22	0.21	0.31	0.37	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	5	1	5	1	6	1	8	1
Soda Ash_Uranium SX	1.19	1.15	1.67	1.98	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	23	1	23	1	33	1	39	1
Isodecanol_Uranium SX	0.19	0.18	0.26	0.31	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	4	1	4	1	5	1	6	1
Sodium Chlorate	4.65	8.66	10.97	15.75	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	90	1	167	1	211	1	303	1
Sulphur	55.46	23.9	23.9	23.9	Side tipping rotainer - Triple	75	Port Adelaide - Berth 29	Olympic Dam	1,067	3	319	2	319	2	319	2
Xanthate	0.2	0.36	0.46	0.66	B-Triple - GML	52	Port Adelaide Chemicals Storage	Olympic Dam	4	1	7	1	9	1	13	1
Copper Concentrate	10	425	450	300	BAB Quad - GML	112	Carrapateena	Olympic Dam	90	1	3,795	12	4,018	13	2,679	9
Copper Concentrate	20	125	150	110	Triple trailer	84	Prominent Hill	Olympic Dam	238	1	1,489	5	1,786	6	1,310	4
Copper Concentrate	0	0	0	640	BAB Quad - GML	112	Oak Dam	Olympic Dam	0	0	0	0	0	0	5,715	18
Copper Cathode (ER +EW)	219.16	356.09	468.90	651.60	Copper box - triple	84	Olympic Dam	Port Adelaide - Cu Packing DC	4,384	13	4,240	12	5,583	16	7,758	22
Uranium Oxide Concentrate (UOC)	3.93	3.93	3.93	3.93	B-Triple - GML	52	Olympic Dam	Port Adelaide - Secured Yard	76	1	76	1	76	1	76	1
Precious Metals (Gold+Silver)	35.2	79.6	113.6	137.6	Armoured Van	3	Olympic Dam	Adelaide [(2)]	12	1	50	2	74	2	96	2
Gold		12.2	19.0	25.3	Armoured Van	0.38	Olympic Dam	Adelaide (2)			33	1	50	1	67	1

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Commodity	Existing Annual Volume (ktpa)	Stage 1a SRE Annual Volume (ktpa)	Stage 1b SRE Annual Volume (ktpa)	Stage 2 SRE Annual Volume (ktpa)	Heavy Vehicle Type	Maximum payload per Truck (Tonnes)	Origin	Destination	Existing Annual Vehicle Volume	Existing Peak Daily Vehicle Volume	Stage 1a SRE Annual Vehicle Volume	Stage 1a SRE Peak Daily Vehicle Volume	Stage 1b SRE Annual Vehicle Volume	Stage 1b SRE Peak Daily Vehicle Volume	Stage 2 SRE Annual Vehicle Volume	Stage 2 SRE Peak Daily Vehicle Volume
Silver		67.4	94.6	112.2	Armoured Van	4	Olympic Dam	Adelaide (2)			17	1	24	1	29	1
Silica Flux	0	170.4	200.7	349.1	Side tipping rotainer - Triple	75	-	Olympic Dam	0	0	2,272	8	2,677	10	4,655	16
Larox Cake	0	728.0	1000.3	1187.7	B-Double roadtrain	52	-	Olympic Dam	0	0	14,000	51	19,236	70	22,840	83

NOTES:

1. Assumed origin or destination for commodity.

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

5.2 Operational Personnel

BHP provided the operational workforce numbers for the existing operations and for SRE Stage 1a and Stage 1b. Stage 2 has been scaled off these values provided. Values are summarised in Table 4-3 below. The corresponding operational personnel traffic volumes are shown in Table 4-4.

Table 5-3 Operational Personnel Numbers

Case	Operational Personnel – Dayshift	Operational Personnel – Nightshift	Total Personnel
Existing Operations	448	112	559
Existing + Stage 1a SRE Operations	613	154	766
Existing + Stage 1b SRE Operations	659	165	823
Existing + Stage 2 SRE Operations	854	214	1,067

The numbers presented in Table 5-3 currently account only for areas impacted by SRE. They do not include the remainder of surface operations, OD mine activities, or contractors.

Table 5-4 Operational Personnel Vehicle Numbers

Transport Type	Shift	First Leg of Trip	Return Leg of Trip	Vehicles per day^
Existing Operations				
Coach	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	7
Coach	Night	Olympic Dam to Accommodation Camp	Accommodation Camp to Olympic Dam	7*
Light Vehicle	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	21
Light Vehicle	Night	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	6
Light Vehicle	Day	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	45
Light Vehicle	Night	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	12
Existing + Stage 1a SRE Operations				
Coach	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	9
Coach	Night	Olympic Dam to Accommodation Camp	Accommodation Camp to Olympic Dam	9*
Light Vehicle	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	26

© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Transport Type	Shift	First Leg of Trip	Return Leg of Trip	Vehicles per day^
Light Vehicle	Night	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	7
Light Vehicle	Day	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	66
Light Vehicle	Night	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	32
Existing + Stage 1b SRE Operations				
Coach	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	10
Coach	Night	Olympic Dam to Accommodation Camp	Accommodation Camp to Olympic Dam	10
Light Vehicle	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	30
Light Vehicle	Night	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	8
Light Vehicle	Day	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	72
Light Vehicle	Night	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	38
Existing + Stage 2 SRE Operations				
Coach	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	13
Coach	Night	Olympic Dam to Accommodation Camp	Accommodation Camp to Olympic Dam	13*
Light Vehicle	Day	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	39
Light Vehicle	Night	Accommodation Camp to Olympic Dam	Olympic Dam to Accommodation Camp	10
Light Vehicle	Day	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	96
Light Vehicle	Night	Roxby Downs to Olympic Dam	Olympic Dam to Roxby Downs	62

**Night shift transport will use the same coaches allocated for dayshift operations.*

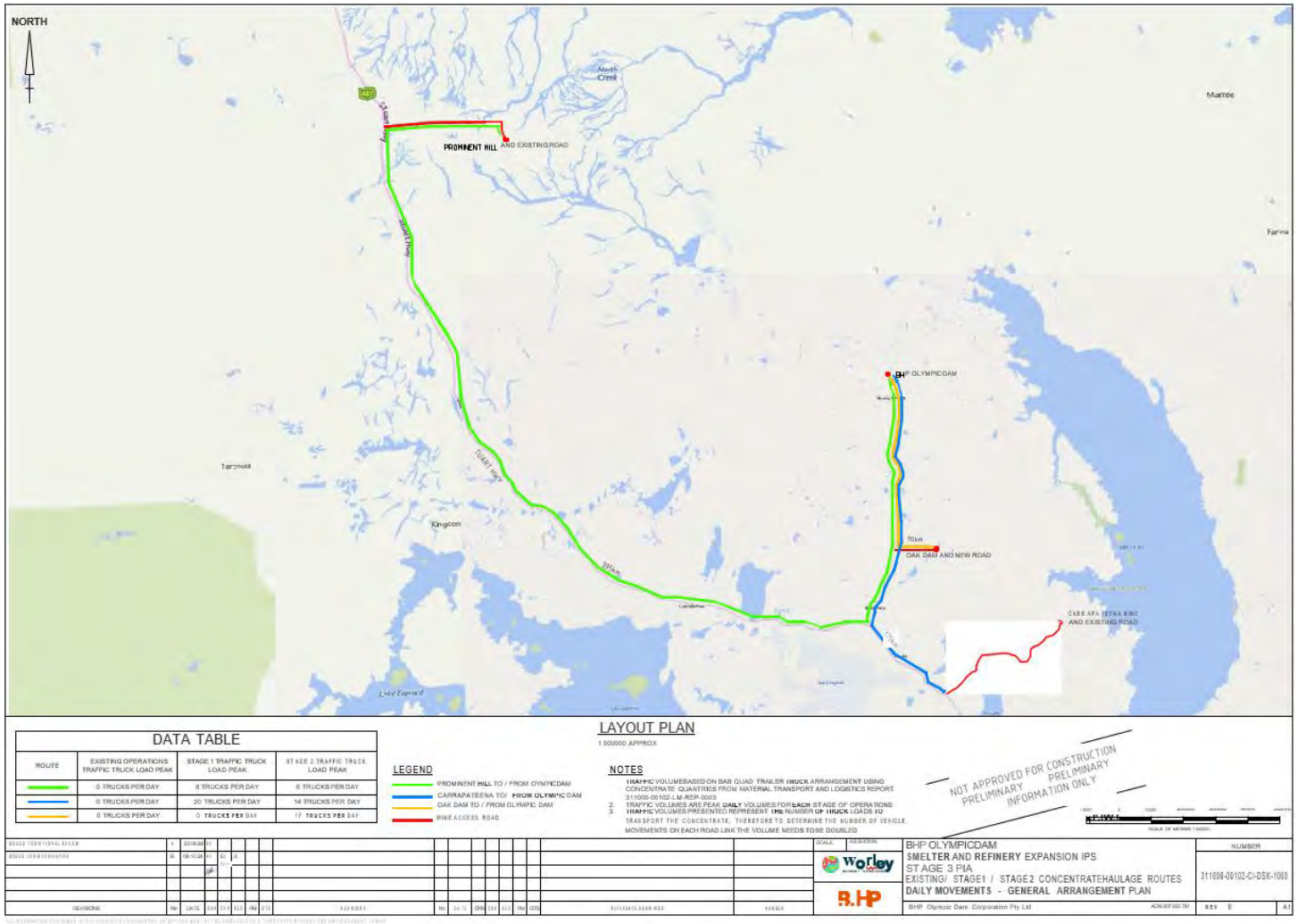
^Partial vehicle counts have been rounded up for reporting purposes.

The vehicle numbers provided are the loads required to transport the personnel. This number must be double to calculate total vehicle numbers.

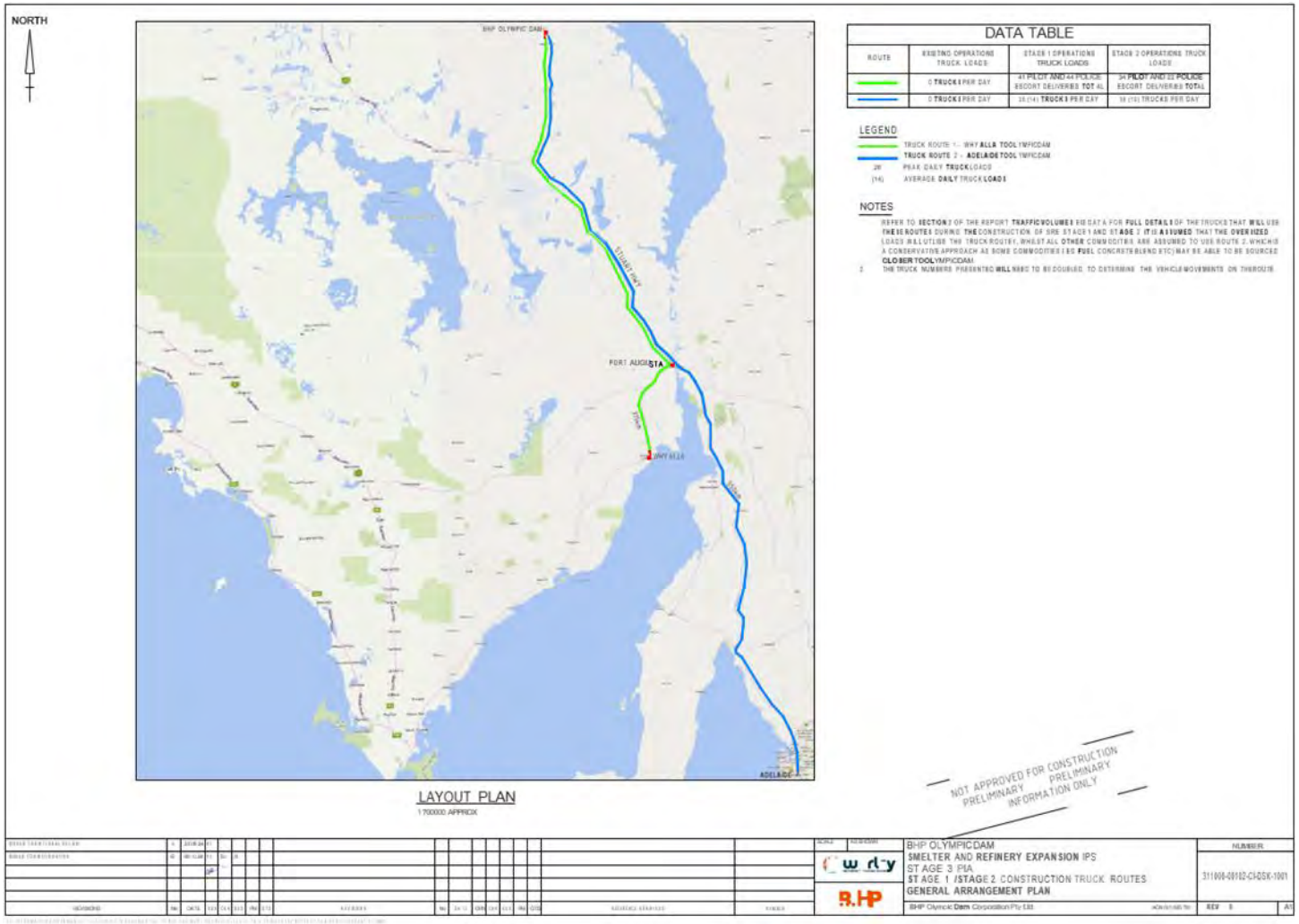
© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Appendix A
Transport Routes

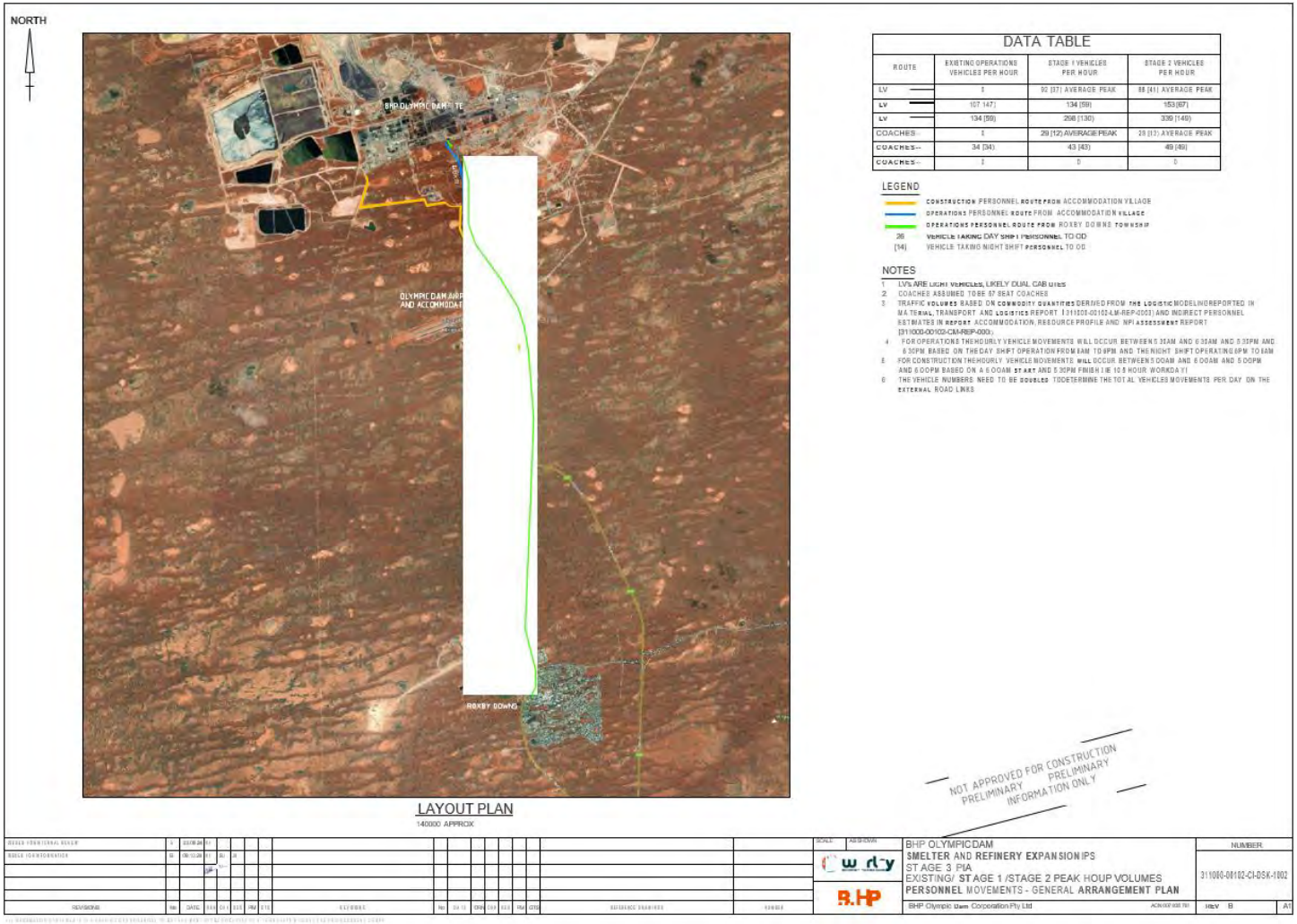
© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.



© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.



© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.



© 2025 Hatch Fluor JV (ABN 14 197 274 227) – an unincorporated joint venture between Hatch Pty Ltd and Fluor Australia Pty Ltd. All rights reserved, including all rights relating to the use of this document or its contents.

Appendix G

Train timetables: Spencer Junction to Cook and return

EMM
creating opportunities

TRAIN NO		6911S	1MP9	1MP2	2AD1	6913S	2MP9	2MP5	2SP7	3AD1	6911S
LENGTH (Metres)		1272	1800	1800	1800	1272	1800	1800	1800	1800	1272
DAYS		MON	MON	MON	TUE	TUE	TUE	TUE	TUE	WED	WED
SCHEDULE		SFR	SFR	EXP	SFR	SFR	SFR	SFR	TRL	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		GWI	SCT	PNT	GWI	GWI	SCT	PNT	PNT	GWI	GWI
COMMODITY		Minerals	Intermodal	Steel	Intermodal	Minerals	Intermodal	Intermodal	Intermodal	Intermodal	Minerals
Spencer Junction	arr	**05:22**				**05:22**					**03:12**
	dep	**09:05**	14:59	19:20	04:00	**06:52**	16:49	18:12	22:15	03:35	**04:42**
Tent Hill	arr										
	dep	09:32	15:25	19:50	04:27	07:19	17:15	18:39	22:40	04:02	05:09
Hesso	arr										
	dep	09:49	15:42	20:12	04:44	07:36	17:32	18:56	22:56	04:19	05:26
Bookaloo	arr		**16:09**								**05:53**
	dep	10:15	**16:42**	20:41	05:10	08:02	17:58	19:22	23:20	04:45	**06:40**
McLeay	arr	**10:40**				**08:27**					
	dep	**10:52**	17:07	21:09	05:34	**08:55**	18:22	19:46	23:43	05:09	07:05
Wirrappa	arr	**11:21**								**05:37**	
	dep	**12:40**	17:34	21:37	06:01	09:23	18:49	20:13	00:08	**06:00**	07:32
Pimba	arr					**09:54**				**06:32**	**08:03**
	dep	13:11	18:04	22:10	06:31	**10:55**	19:19	20:43	00:34	**07:05**	**08:40**
Burando	arr										
	dep	13:44	18:37	22:41	07:04	11:29	19:52	21:16	01:04	07:39	09:14
Wirraminna	arr	**14:08**				**11:53**	**20:16**				
	dep	**14:40**	19:00	23:10	07:27	**12:15**	**20:20**	21:39	01:26	08:02	09:37
Coondambo	arr										**10:01**
	dep	15:04	19:23	23:35	07:50	12:39	20:44	22:02	01:48	08:25	**10:33**
Kultanaby	arr										
	dep	15:21	19:40	23:53	08:07	12:56	21:01	22:19	02:03	08:42	10:51
Kingoonya	arr										
	dep	15:45	20:04	00:20	08:31	13:20	21:25	22:43	02:24	09:06	11:15
Ferguson	arr								**02:55**	**09:40**	
	dep	16:18	20:37	00:57	09:04	13:53	21:58	23:16	**03:10**	**10:01**	11:48
Tarcoola	arr		**21:10**		**09:36**				**03:40**		
	dep	16:50	**21:27**	01:28	**09:59**	14:25	22:30	23:48	**04:00**	10:35	12:20
Northgate	arr	17:00			10:09	14:35				10:45	12:30
Malbooma	arr						**22:59**				
	dep		21:56	02:00			**23:20**	00:16	04:26		
Lyons	arr										
	dep		22:17	02:21			23:42	00:37	04:45		
Wynbring	arr							**01:10**			
	dep		22:49	02:56			00:14	**01:30**	05:14		
Mt. Christie	arr										
	dep		23:17	03:26			00:42	01:59	05:39		
Mungala	arr										
	dep		23:42	03:52			01:07	02:24	06:03		
Barton	arr			**04:19**							
	dep		00:08	**04:39**			01:33	02:50	06:26		
Bates	arr							**03:19**			
	dep		00:36	05:10			02:01	**03:49**	06:51		
Ooldea	arr										
	dep		01:23	05:58			02:48	04:37	07:33		
Watson	arr										
	dep		01:44	06:25			03:09	04:58	07:53		
Fisher	arr										
	dep		02:17	07:05			03:42	05:31	08:23		
Thomiar	arr										
	dep		02:37	07:29			04:02	05:52	08:43		
Cook	arr		**02:55**	**07:51**			**04:20**	**06:10**	**09:00**		
	dep		**01:25**	**07:21**			**02:50**	**05:10**	**08:00**		
FORMS OR DESTINATION		TERM	PER	WEK	TERM	TERM	PER	PER	PER	TERM	TERM

TRAIN NO		3MP1	3MP9	4MP7	4AD8	3MP5	3SP7	3SP1	6913S	4AD1	4GP1
LENGTH (Metres)		1500	1800	1800	600	1800	1800	1800	1272	1800	1800
DAYS		WED	WED	WED	WED	WED	WED	WED	THU	THU	THU
SCHEDULE		SFR	SFR	TRL	PAS	SFR	TRL	SFR	SFR	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		GWI	SCT	PNT	GSR	PNT	PNT	GWI	GWI	GWI	SCT
COMMODITY		Intermodal	Intermodal	Intermodal	Passenger	Intermodal	Intermodal	Intermodal	Minerals	Intermodal	Intermodal
Spencer Junction	arr				**17:15**				**23:57**		
	dep	11:44	15:01	16:45	**17:30**	18:55	22:15	23:51	**01:30**	03:36	13:11
Tent Hill	arr								**01:58**		**13:38**
	dep	12:11	15:27	17:09	17:53	19:22	22:40	00:18	**02:13**	04:03	**14:00**
Hesso	arr							**00:36**			**14:19**
	dep	12:28	15:44	17:24	18:08	19:39	22:55	**00:51**	02:31	04:20	**15:00**
Bookaloo	arr										
	dep	12:54	16:10	17:47	18:29	20:05	23:18	01:18	02:57	04:46	15:27
McLeay	arr										
	dep	13:18	16:34	18:10	18:52	20:29	23:41	01:42	03:21	05:10	15:51
Wirrappa	arr								**03:49**		**16:19**
	dep	13:45	17:01	18:35	19:17	20:56	00:06	02:09	**04:22**	05:37	**17:11**
Pimba	arr										
	dep	14:15	17:31	19:01	19:42	21:26	00:32	02:39	04:53	06:07	17:42
Burando	arr							**03:13**			
	dep	14:48	18:04	19:31	20:09	21:59	01:02	**03:28**	05:26	06:40	18:15
Wirraminna	arr										
	dep	15:11	18:27	19:53	20:31	22:22	01:24	03:52	05:49	07:03	18:38
Coondambo	arr				**20:53**					**07:27**	
	dep	15:34	18:50	20:14	**21:10**	22:45	01:45	04:15	06:12	**07:46**	19:01
Kultanaby	arr								**06:30**		
	dep	15:51	19:07	20:28	21:25	23:02	02:05	04:32	**06:44**	08:04	19:18
Kingoonya	arr	**16:16**									**19:42**
	dep	**16:24**	19:31	20:49	21:45	23:26	02:26	04:56	07:09	08:28	**20:20**
Ferguson	arr							**05:30**			
	dep	16:58	20:04	21:19	22:13	23:59	02:56	**05:45**	07:42	09:01	20:54
Tarcoola	arr					**00:32**			**08:15**	**09:33**	
	dep	17:30	20:36	21:47	22:38	**00:47**	03:24	06:18	**08:30**	**09:38**	21:26
Northgate	arr				22:50				08:40	09:50	
Malbooma	arr										
	dep	17:58	21:04	22:12		01:16	03:49	06:46			21:54
Lyons	arr	**18:20**									**22:16**
	dep	**18:47**	21:25	22:31		01:37	04:08	07:07			**22:47**
Wynbring	arr			**23:01**							
	dep	19:20	21:57	**23:33**		02:09	04:37	07:39			23:20
Mt. Christie	arr		**22:26**			**02:38**					
	dep	19:48	**23:07**	23:59		**02:46**	05:02	08:07			23:48
Mungala	arr										
	dep	20:13	23:33	00:23		03:12	05:26	08:32			00:13
Barton	arr										
	dep	20:39	23:59	00:46		03:38	05:49	08:58			00:39
Bates	arr	**21:08**						**09:27**			
	dep	**22:31**	00:27	01:10		04:06	06:14	**09:50**			01:07
Ooldea	arr	**23:20**									**01:56**
	dep	**23:39**	01:14	01:52		04:53	06:56	10:38			**02:50**
Watson	arr										
	dep	00:01	01:35	02:12		05:14	07:16	10:59			03:12
Fisher	arr										
	dep	00:34	02:08	02:42		05:47	07:46	11:32			03:45
Thomiar	arr										
	dep	00:54	02:28	03:01		06:07	08:07	11:52			04:05
Cook	arr	**01:11**	**02:45**	**03:18**		**06:27**	**08:25**	**12:09**			**04:22**
	dep	**23:41**	**01:15**	**02:18**		**05:27**	**07:25**	**11:09**			**02:52**
FORMS OR DESTINATION		PER	PER	PER	TERM	PER	PER	PER	TERM	TERM	PER

TRAIN NO		4MP5	5AP8	5AD1	5SP5	5MP9	5MP5	6913S	5MP1	6AD1	6SP5
LENGTH (Metres)		1800	600	1800	1800	1800	1800	1272	1500	1800	1800
DAYS		THU	FRI	FRI	FRI	FRI	FRI	FRI	FRI	SAT	SAT
SCHEDULE		SFR	PAS	SFR	SFR	SFR	SFR	SFR	SFR	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		PNT	GSR	GWI	PNT	SCT	PNT	GWI	GWI	GWI	PNT
COMMODITY		Intermodal	Passenger	Intermodal	Intermodal	Intermodal	Intermodal	Minerals	Intermodal	Intermodal	Intermodal
Spencer Junction	arr		**02:16**					**08:12**			
	dep	18:12	**02:31**	05:30	07:55	16:09	19:00	**20:28**	22:18	04:40	06:30
Tent Hill	arr							**20:56**			
	dep	18:39	02:54	05:57	08:22	16:35	19:27	**21:21**	22:45	05:07	06:57
Hesso	arr			**06:15**							
	dep	18:56	03:09	**06:35**	08:39	16:52	19:44	21:39	23:02	05:24	07:14
Bookaloo	arr										
	dep	19:22	03:30	07:02	09:05	17:18	20:10	22:05	23:28	05:50	07:40
McLeay	arr								**23:53**		
	dep	19:46	03:53	07:26	09:29	17:42	20:34	22:29	**00:13**	06:14	08:04
Wirrappa	arr							**22:57**			
	dep	20:13	04:18	07:53	09:56	18:09	21:01	**23:29**	00:41	06:41	08:31
Pimba	arr		**04:44**		**10:27**				**01:12**		
	dep	20:43	**05:02**	08:23	**10:30**	18:39	21:31	00:00	**01:39**	07:11	09:01
Burando	arr						**22:05**	**00:34**			
	dep	21:16	05:30	08:56	11:04	19:12	**22:30**	**01:04**	02:13	07:44	09:34
Wirraminna	arr										
	dep	21:39	05:52	09:19	11:27	19:35	22:54	01:28	02:36	08:07	09:57
Coondambo	arr										
	dep	22:02	06:13	09:42	11:50	19:58	23:17	01:51	02:59	08:30	10:20
Kultanaby	arr						**23:35**	**02:09**			
	dep	22:19	06:27	09:59	12:07	20:15	**00:05**	**02:25**	03:16	08:47	10:37
Kingoonya	arr										
	dep	22:43	06:47	10:23	12:31	20:39	00:30	02:50	03:40	09:11	11:01
Ferguson	arr				**13:05**						
	dep	23:16	07:15	10:56	**13:20**	21:12	01:03	03:23	04:13	09:44	11:34
Tarcoola	arr										
	dep	23:48	07:40	11:35	13:53	21:44	01:35	03:55	04:45	10:18	12:06
Northgate	arr			11:45				04:05		10:30	
Malbooma	arr										
	dep	00:16	08:06		14:21	22:12	02:03		05:13		12:34
Lyons	arr				**14:43**						
	dep	00:37	08:24		**15:10**	22:33	02:24		05:34		12:55
Wynbring	arr										
	dep	01:09	08:53		15:43	23:05	02:56		06:06		13:27
Mt. Christie	arr										
	dep	01:37	09:20		16:11	23:33	03:24		06:34		13:55
Mungala	arr										
	dep	02:02	09:43		16:36	23:58	03:49		06:59		14:20
Barton	arr										
	dep	02:28	10:04		17:02	00:24	04:15		07:25		14:46
Bates	arr	**02:57**									
	dep	**03:24**	10:30		17:30	00:52	04:43		07:53		15:14
Ooldea	arr										
	dep	04:12	11:10		18:17	01:39	05:30		08:40		16:01
Watson	arr										
	dep	04:33	11:30		18:38	02:00	05:51		09:01		16:22
Fisher	arr										
	dep	05:06	12:03		19:11	02:33	06:25		09:34		16:55
Thomiar	arr										
	dep	05:26	12:21		19:31	02:53	06:46		09:54		17:15
Cook	arr	**05:45**	**12:37**		**19:52**	**03:10**	**07:05**		**10:13**		**17:32**
	dep	**04:45**	**13:10**		**21:02**	**01:40**	**06:05**		**08:43**		**17:30**
FORMS OR DESTINATION		PER	PER	TERM	PER	PER	PER	TERM	PER	TERM	PER

TRAIN NO		6SP2	6911S	6MP4	6MP9	7MP7	7AD1	7SP7	6MP5	7SP1	7GP1
LENGTH (Metres)		1800	1272	1800	1800	1800	1800	1800	1800	1800	1800
DAYS		SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SUN	SUN
SCHEDULE		SFR	SFR	SFR	SFR	TRL	SFR	TRL	SFR	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		GWI	GWI	PNT	SCT	PNT	GWI	PNT	PNT	GWI	SCT
COMMODITY		Intermodal	Minerals	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal
Spencer Junction	arr		**20:52**								
	dep	07:17	**09:05**	11:00 Crew	15:14	16:45	21:10	22:35	23:45	07:50	10:49
Tent Hill	arr									**08:18**	
	dep	07:44	09:32	11:27	15:40	17:09	21:37	22:59	00:12	**08:42**	11:16
Hesso	arr										
	dep	08:01	09:49	11:44	15:57	17:24	21:54	23:14	00:29	09:00	11:33
Bookaloo	arr		**10:16**							**09:27**	
	dep	08:27	**10:35**	12:10	16:23	17:47	22:20	23:37	00:55	**09:46**	11:59
McLeay	arr										
	dep	08:51	11:00	12:34	16:47	18:10	22:44	00:00	01:19	10:11	12:23
Wirrappa	arr	**09:19**									
	dep	**09:44**	11:27	13:01	17:14	18:35	23:11	00:25	01:46	10:38	12:50
Pimba	arr							**00:52**			
	dep	10:15	11:57	13:31	17:44	19:01	23:41	**01:07**	02:16	11:08	13:20
Burando	arr		**12:31**								**13:54**
	dep	10:48	**12:50**	14:04	18:17	19:31	00:14	01:38	02:49	11:41	**14:22**
Wirraminna	arr								**03:13**		
	dep	11:11	13:14	14:27	18:40	19:53	00:37	02:00	**03:28**	12:04	14:46
Coondambo	arr	**11:35**									
	dep	**12:03**	13:37	14:50	19:03	20:14	01:00	02:21	03:52	12:27	15:09
Kultanaby	arr						**01:18**			**12:45**	
	dep	12:21	13:54	15:07	19:20	20:28	**01:31**	02:35	04:09	**13:03**	15:26
Kingoonya	arr		**14:19**	**15:32**			**01:57**		**04:34**		
	dep	12:45	**14:50**	**15:38**	19:44	20:49	**02:14**	02:56	**05:00**	13:28	15:50
Ferguson	arr	**13:19**				**21:20**					**16:24**
	dep	**13:47**	15:24	16:12	20:17	**21:38**	02:48	03:26	05:34	14:01	**16:46**
Tarcoola	arr		**15:57**		**20:50**						
	dep	14:20	**16:20**	16:44	**21:10**	22:07	03:20	03:54	06:07	14:33	17:19
Northgate	arr		16:30				03:30				
Malbooma	arr							**04:20**		**15:02**	
	dep	14:48		17:12	21:39	22:32		**04:50**	06:35	**15:40**	17:47
Lyons	arr					**22:52**					
	dep	15:09		17:33	22:00	**23:13**		05:10	06:56	16:02	18:08
Wynbring	arr					**23:44**					
	dep	15:41		18:05	22:32	**23:58**		05:39	07:28	16:34	18:40
Mt. Christie	arr										
	dep	16:09		18:33	23:00	00:24		06:04	07:56	17:02	19:08
Mungala	arr								**08:22**		
	dep	16:34		18:58	23:25	00:48		06:28	**08:33**	17:27	19:33
Barton	arr				**23:52**						
	dep	17:00		19:24	**02:35**	01:11		06:51	09:00	17:53	19:59
Bates	arr										**20:28**
	dep	17:28		19:52	03:04	01:36		07:16	09:28	18:21	**20:38**
Ooldea	arr	**18:16**		**20:40**							
	dep	**18:43**		**21:00**	03:52	02:18		07:58	10:15	19:08	21:26
Watson	arr										**21:48**
	dep	19:05		21:22	04:13	02:38		08:18	10:36	19:29	**22:08**
Fisher	arr	**19:39**		**21:56**							
	dep	**20:47**		**22:17**	04:47	03:09		08:48	11:09	20:02	22:42
Thomiar	arr										
	dep	21:08		22:38	05:07	03:28		09:07	11:29	20:22	23:02
Cook	arr	**21:25**		**22:55**	**05:25**	**03:45**		**09:25**	**11:46**	**20:39**	**23:19**
	dep	**20:40**		**21:55**	**03:55**	**02:45**		**08:25**	**10:46**	**19:39**	**21:49**
FORMS OR DESTINATION		PER	TERM	PER	PER	PER	TERM	PER	PER	PER	PER

TRAIN NO		6913S	1AD8	7SP5	7MP5	7MP1					
LENGTH (Metres)		1272	600	1800	1800	1500					
DAYS		SUN	SUN	SUN	SUN	SUN					
SCHEDULE		SFR	PAS	SFR	SFR	SFR					
PATH TYPE		M	M	M	M	M					
OPERATOR		GWI	GSR	PNT	PNT	GWI					
COMMODITY		Minerals	Passenger	Intermodal	Intermodal	Intermodal					
Spencer Junction	arr	**12:47**	**16:45**								
	dep	**14:25**	**17:15**	18:10	18:50	22:00					
Tent Hill	arr					**22:28**					
	dep	14:52	17:38	18:37	19:17	**22:49**					
Hesso	arr										
	dep	15:09	17:53	18:54	19:34	23:07					
Bookaloo	arr	**15:36**									
	dep	**16:00**	18:15	19:20	20:00	23:33					
McLeay	arr					**23:58**					
	dep	16:25	18:38	19:44	20:24	**00:25**					
Wirrappa	arr										
	dep	16:52	19:04	20:11	20:51	00:53					
Pimba	arr										
	dep	17:22	19:32	20:41	21:21	01:23					
Burando	arr					**01:57**					
	dep	17:55	20:00	21:14	21:54	**02:20**					
Wirraminna	arr	**18:19**									
	dep	**18:35**	20:24	21:37	22:17	02:44					
Coondambo	arr										
	dep	18:59	20:46	22:00	22:40	03:07					
Kultanaby	arr										
	dep	19:16	21:00	22:17	22:57	03:24					
Kingoonya	arr	**19:41**				**03:49**					
	dep	**20:00**	21:20	22:41	23:21	**04:02**					
Ferguson	arr										
	dep	20:35	21:51	23:14	23:54	04:36					
Tarcoola	arr				**00:27**						
	dep	21:10	22:19	23:46	**00:59**	05:08					
Northgate	arr	21:20	22:30								
Malbooma	arr										
	dep			00:14	01:28	05:36					
Lyons	arr				**01:50**						
	dep			00:35	**02:10**	05:57					
Wynbring	arr					**06:30**					
	dep			01:07	02:43	**06:51**					
Mt. Christie	arr										
	dep			01:35	03:11	07:20					
Mungala	arr										
	dep			02:00	03:36	07:45					
Barton	arr			**02:27**							
	dep			**02:33**	04:02	08:11					
Bates	arr				**04:31**						
	dep			03:02	**04:51**	08:39					
Ooldea	arr										
	dep			03:49	05:40	09:26					
Watson	arr										
	dep			04:10	06:01	09:47					
Fisher	arr										
	dep			04:43	06:34	10:20					
Thomiar	arr										
	dep			05:03	06:54	10:40					
Cook	arr			**05:20**	**07:12**	**10:59**					
	dep			**04:20**	**06:12**	**09:29**					
FORMS OR DESTINATION		TERM	TERM	PER	PER	PER					

TRAIN NO		4DA8	4DA8E	7DA8E	9614S	9614S	9614S	9612S	9612S	7PG1	1PS6
LENGTH (Metres)		600	600	600	1272	1272	1272	1272	1272	1800	1800
DAYS		FRI	FRI	MON	THU	MON	WED	TUE	THU	MON	MON
SCHEDULE		PAS	PAS	PAS	EXPAC	EXPAC	EXPAC	EXPAC	EXPAC	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		GSR	GSR	GSR	GWI	GWI	GWI	GWI	GWI	SCT	PNT
COMMODITY		Passenger	Passenger	Passenger	Minerals	Minerals	Minerals	Minerals	Minerals	Intermodal	Intermodal
Cook	arr									23:00	08:00
	dep									01:30	11:50
Thomiar	arr										
	dep									01:47	12:07
Fisher	arr										
	dep									02:07	12:27
Watson	arr										
	dep									02:41	13:01
Ooldea	arr									03:02	
	dep									03:56	13:21
Bates	arr										
	dep									04:45	14:09
Barton	arr										
	dep									05:13	14:37
Mungala	arr										
	dep									05:39	15:03
Mt. Christie	arr										
	dep									06:06	15:30
Wynbring	arr									06:33	
	dep									06:36	15:56
Lyons	arr										
	dep									07:08	16:27
Malbooma	arr										
	dep									07:28	16:47
Northgate	dep	02:00	22:30	22:30	18:45	08:15	04:25	03:55	00:50		
Tarcoola	arr			22:40							
	dep	02:10	22:40	23:00	18:55	08:25	04:35	04:05	01:00	07:57	17:16
Ferguson	arr			23:27							
	dep	02:35	23:06	23:43	19:33	09:03	05:13	04:43	01:37	08:27	17:48
Kingoonya	arr			00:15					02:14		
	dep	03:05	23:37	00:35	20:10	09:40	05:50	05:20	02:31	08:59	18:22
Kultanaby	arr										
	dep	03:26	23:59	00:57	20:39	10:09	06:19	05:49	03:02	09:26	18:50
Coondambo	arr										19:11
	dep	03:39	00:12	01:10	21:03	10:33	06:43	06:13	03:26	09:43	19:31
Wirraminna	arr				21:23			06:33	03:46		
	dep	03:59	00:32	01:29	21:45	10:52	07:02	07:32	05:56	10:05	19:55
Burando	arr			01:50			07:29		06:27		
	dep	04:19	00:54	02:10	22:13	11:18	07:45	08:02	06:45	10:28	20:19
Pimba	arr										
	dep	04:53	01:30	02:44	22:56	12:01	08:30	08:45	07:30	11:03	20:56
Wirrappa	arr							09:12			21:22
	dep	05:19	01:57	03:09	23:22	12:27	08:56	09:32	07:56	11:27	21:55
McLeay	arr		02:22								
	dep	05:42	02:30	03:32	23:56	13:01	09:30	10:08	08:30	11:54	22:23
Bookaloo	arr										
	dep	06:04	02:54	03:54	00:25	13:30	09:59	10:37	08:59	12:19	22:48
Hesso	arr			04:16							
	dep	06:25	03:15	04:50	00:54	13:59	10:28	11:06	09:28	12:43	23:12
Tent Hill	arr				01:16				09:50		
	dep	06:42	03:32	05:08	01:35	14:20	10:49	11:27	10:06	12:59	23:28
Spencer Junction	arr	07:05	03:56	05:31	01:59	14:42	11:11	11:49	10:30	13:24	23:55
	dep	07:30	05:00	05:51	03:30	16:56	12:31	13:40	12:00		
FORMS OR DESTINATION		APT	APT	APT	WHY	WHY	WHY	WHY	WHY	SCP	TKF

TRAIN NO		1PM5	1PM9	1PM1	2PS1	2DA2	2PM5	2PS7	2PM9	2PM6	3PS1
LENGTH (Metres)		1800	1500	1500	1800	1500	1800	1800	1800	1800	1800
DAYS		MON	TUE	TUE	TUE	TUE	TUE	TUE	TUE	WED	WED
SCHEDULE		SFR	SFR	SFR	SFR	SFR	SFR	TRL	SFR	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		PNT	SCT	GWI	GWI	GWI	PNT	PNT	SCT	PNT	GWI
COMMODITY		Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal
Cook	arr	17:00	21:57	00:04	12:05		15:13	17:48	19:10	21:30	07:16
	dep	20:10	00:27	03:05	14:35		18:13	21:12	21:40	00:55	09:46
Thomiar	arr										
	dep	20:27	00:44	03:22	14:52		18:30	21:29	21:57	01:12	10:03
Fisher	arr										
	dep	20:47	01:04	03:42	15:12		18:50	21:47	22:17	01:32	10:23
Watson	arr		01:39								
	dep	21:21	02:10	04:16	15:46		19:24	22:18	22:51	02:06	10:57
Ooldea	arr			04:37						02:27	
	dep	21:41	02:31	06:06	16:06		19:44	22:38	23:11	02:55	11:17
Bates	arr		03:20								
	dep	22:29	04:00	06:55	16:54		20:32	23:23	23:59	03:44	12:05
Barton	arr										
	dep	22:57	04:29	07:23	17:22		21:00	23:48	00:27	04:12	12:33
Mungala	arr	23:24							00:54		
	dep	23:55	04:55	07:49	17:48		21:26	00:10	01:15	04:38	12:59
Mt. Christie	arr							00:35	01:44	05:05	
	dep	00:23	05:22	08:16	18:15		21:53	00:55	02:05	06:00	13:26
Wynbring	arr	00:50									
	dep	01:40	05:48	08:42	18:41		22:19	01:21	02:32	06:27	13:52
Lyons	arr	02:13									
	dep	02:33	06:19	09:13	19:12		22:50	01:51	03:03	06:57	14:23
Malbooma	arr										
	dep	02:54	06:39	09:33	19:32		23:10	02:10	03:23	07:17	14:43
Northgate	dep					17:50					
Tarcoola	arr						23:40				
	dep	03:23	07:08	10:02	20:01	18:00	23:58	02:35	03:52	07:46	15:12
Ferguson	arr										
	dep	03:53	07:38	10:32	20:31	18:30	00:29	03:01	04:22	08:16	15:42
Kingoonya	arr		08:11		21:04					08:49	16:15
	dep	04:25	08:45	11:04	21:34	19:02	01:01	03:30	04:54	09:25	16:28
Kultanaby	arr				22:03		01:29				
	dep	04:52	09:13	11:31	22:31	19:29	02:14	03:52	05:21	09:53	16:56
Coondambo	arr										
	dep	05:09	09:30	11:48	22:49	19:46	02:32	04:06	05:38	10:10	17:13
Wirraminna	arr	05:32				20:11					
	dep	06:20	09:52	12:10	23:11	20:40	02:54	04:26	06:00	10:31	17:35
Burando	arr	06:45				21:05					17:59
	dep	07:17	10:15	12:33	23:34	21:30	03:17	04:48	06:23	10:54	18:17
Pimba	arr				00:10	22:07					18:54
	dep	07:53	10:50	13:08	00:39	22:35	03:52	05:21	06:58	11:29	19:48
Wirrappa	arr								07:23		20:14
	dep	08:17	11:20	13:32	01:04	23:00	04:16	05:46	07:40	11:53	21:02
McLeay	arr					23:28	04:44				
	dep	08:44	11:47	13:59	01:31	23:50	05:19	06:09	08:08	12:20	21:30
Bookaloo	arr						05:46			12:46	
	dep	09:09	12:12	14:24	01:56	00:16	05:57	06:32	08:33	13:02	21:55
Hesso	arr			14:49							
	dep	09:33	12:36	15:11	02:20	00:40	06:22	06:54	08:57	13:27	22:19
Tent Hill	arr										22:36
	dep	09:49	12:52	15:28	02:36	00:56	06:38	07:10	09:13	13:43	00:23
Spencer Junction	arr	10:15	13:20	15:54	03:02	01:22	07:04	07:35	09:38	14:10	00:50
	dep										
FORMS OR DESTINATION		SDY	SCT	DYS	GLW	PFL	SDY	TKF	SCT	SDY	GLW

TRAIN NO		3PS7	3DA2	3PM7	3PG1	3PM6	4PM1	3DA6	4PS6	4PM6	4PM9
LENGTH (Metres)		1800	1500	1800	1800	1800	1500	1500	1800	1800	1800
DAYS		WED	WED	WED	WED	THU	THU	THU	THU	FRI	FRI
SCHEDULE		TRL	SFR	TRL	SFR	SFR	SFR	SFR	SFR	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		PNT	GWI	PNT	SCT	PNT	GWI	GWI	PNT	PNT	SCT
COMMODITY		Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal
Cook	arr	10:54		16:32	19:29	21:59	04:25		15:04	21:18	22:30
	dep	14:05		19:32	21:59	01:15	06:55		18:04	00:25	01:00
Thomiar	arr										
	dep	14:22		19:49	22:16	01:32	07:12		18:21	00:42	01:17
Fisher	arr					01:53	07:33				
	dep	14:40		20:07	22:36	02:56	07:55		18:41	01:03	01:37
Watson	arr										
	dep	15:11		20:38	23:10	03:31	08:30		19:15	01:39	02:11
Ooldea	arr					03:52					
	dep	15:31		20:58	23:30	05:05	08:50		19:35	02:00	02:31
Bates	arr				00:19	05:55				02:52	03:20
	dep	16:16		21:43	01:15	06:20	09:38		20:23	03:02	03:40
Barton	arr										
	dep	16:41		22:08	01:44	06:49	10:06		20:51	03:32	04:09
Mungala	arr										
	dep	17:03		22:30	02:10	07:15	10:32		21:17	03:58	04:35
Mt. Christie	arr				02:38	07:43					
	dep	17:27		22:54	02:58	08:12	10:59		21:44	04:25	05:02
Wynbring	arr										
	dep	17:52		23:19	03:25	08:39	11:25		22:10	04:51	05:28
Lyons	arr	18:23			03:57						
	dep	18:31		23:49	04:17	09:10	11:56		22:41	05:22	05:59
Malbooma	arr										
	dep	18:51		00:08	04:38	09:30	12:16		23:01	05:42	06:19
Northgate	dep		18:15					08:10			
Tarcoola	arr			00:34					23:31		06:49
	dep	19:16	18:25	00:36	05:07	09:59	12:45	08:21	23:53	06:11	07:47
Ferguson	arr	19:43					13:16	08:52		06:42	
	dep	20:10	18:53	01:05	05:37	10:29	13:59	09:10	00:24	07:22	08:18
Kingoonya	arr	20:41	19:24								
	dep	20:57	19:45	01:37	06:09	11:01	14:32	09:43	00:56	07:55	08:50
Kultanaby	arr	21:21	20:14	02:00	06:37						
	dep	21:41	20:40	02:20	07:13	11:28	14:59	10:10	01:23	08:22	09:17
Coondambo	arr										09:35
	dep	21:56	20:58	02:35	07:31	11:45	15:16	10:27	01:40	08:39	09:57
Wirraminna	arr	22:17								09:02	
	dep	22:35	21:21	02:55	07:53	12:07	15:38	10:49	02:02	09:24	10:20
Burando	arr		21:46								10:44
	dep	23:00	22:05	03:17	08:16	12:30	16:01	11:12	02:25	09:48	11:07
Pimba	arr									10:24	
	dep	23:33	22:43	03:52	08:51	13:05	16:36	11:47	03:00	10:39	11:43
Wirrappa	arr	23:59							03:25		
	dep	00:14	23:07	04:17	09:15	13:29	17:00	12:11	04:24	11:04	12:07
McLeay	arr		23:35	04:41							
	dep	00:38	23:55	05:18	09:42	13:56	17:27	12:38	04:52	11:31	12:34
Bookaloo	arr	01:02							05:19		
	dep	01:24	00:20	05:42	10:07	14:21	17:52	13:03	07:13	11:56	12:59
Hesso	arr										
	dep	01:47	00:44	06:04	10:31	14:45	18:16	13:27	07:38	12:20	13:23
Tent Hill	arr						18:33		07:55		
	dep	02:03	01:00	06:20	10:47	15:01	18:48	13:43	08:30	12:36	13:39
Spencer Junction	arr	02:28	01:24	06:45	11:12	15:27	19:15	14:10	09:00	13:02	14:04
	dep										
FORMS OR DESTINATION		TKF	PFL	SDY	SCP	SDY	DYS	PFL	TKF	SDY	SCT

TRAIN NO		5DA2	5PM5	5PM9	5PS6	6PM1	6PS7	6DA2	6PM7	6PM9	6PM6
LENGTH (Metres)		1800	1800	1800	1800	1500	1800	1800	1800	1800	1800
DAYS		FRI	FRI	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SUN
SCHEDULE		SFR	SFR	SFR	SFR	SFR	TRL	SFR	TRL	SFR	SFR
PATH TYPE		M	M	M	M	M	M	M	M	M	M
OPERATOR		GWI	PNT	SCT	PNT	GWI	PNT	GWI	PNT	SCT	PNT
COMMODITY		Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal	Intermodal
Cook	arr		18:40	23:05	00:15	14:10	16:25		18:35	20:35	01:00
	dep		21:40	01:35	06:15	16:40	19:25		21:35	23:05	04:00
Thomiar	arr				06:33	16:58					
	dep		21:57	01:52	07:00	17:21	19:42		21:52	23:22	04:17
Fisher	arr			02:13							04:38
	dep		22:17	02:45	07:21	17:42	20:00		22:10	23:42	05:00
Watson	arr										
	dep		22:51	03:20	07:55	18:16	20:31		22:41	00:16	05:35
Ooldea	arr				08:16						05:56
	dep		23:11	03:40	08:48	18:36	20:51		23:01	00:36	06:20
Bates	arr		00:00	04:29		19:25				01:25	07:10
	dep		01:00	04:55	09:37	19:58	21:36		23:46	01:45	07:30
Barton	arr										
	dep		01:29	05:24	10:05	20:27	22:01		00:11	02:14	07:59
Mungala	arr								00:34		08:26
	dep		01:55	05:50	10:31	20:53	22:23		01:00	02:40	09:05
Mt. Christie	arr			06:18			22:48				
	dep		02:22	06:49	10:58	21:20	23:09		01:25	03:07	09:33
Wynbring	arr		02:49			21:47	23:36				
	dep		03:10	07:16	11:24	22:36	23:53		01:50	03:33	09:59
Lyons	arr								02:21		
	dep		03:42	07:47	11:55	23:08	00:24		02:55	04:04	10:30
Malbooma	arr			08:08	12:16						
	dep		04:02	08:30	12:40	23:28	00:43		03:15	04:28	10:50
Northgate	dep	19:20						20:50			
Tarcoola	arr		04:33						03:41		
	dep	19:30	04:56	09:00	13:10	23:57	01:08	21:00	03:59	04:57	11:20
Ferguson	arr			09:31						05:28	
	dep	20:00	05:27	10:00	13:40	00:27	01:34	21:30	04:26	05:43	11:50
Kingoonya	arr	20:33		10:34	14:13						
	dep	20:50	05:59	11:10	14:32	00:59	02:03	22:02	04:55	06:16	12:22
Kultanaby	arr				15:01		02:29				
	dep	21:18	06:26	11:38	15:20	01:26	02:45	22:29	05:17	06:43	12:50
Coondambo	arr					01:44					
	dep	21:35	06:43	11:55	15:38	03:57	03:00	22:46	05:31	07:00	13:07
Wirraminna	arr										
	dep	21:57	07:05	12:17	16:00	04:20	03:20	23:08	05:51	07:22	13:29
Burando	arr		07:29					23:32			13:53
	dep	22:20	07:50	12:40	16:23	04:43	03:42	00:25	06:13	07:45	14:02
Pimba	arr		08:27	13:16	16:59						
	dep	22:55	09:10	13:36	17:54	05:18	04:15	01:01	06:46	08:20	14:38
Wirrappa	arr				18:20			01:26			
	dep	23:19	09:35	14:01	18:44	05:42	04:40	02:00	07:11	08:44	15:02
McLeay	arr	23:47									
	dep	23:58	10:02	14:28	19:12	06:09	05:03	02:28	07:34	09:11	15:29
Bookaloo	arr										
	dep	00:24	10:27	14:53	19:37	06:34	05:27	02:53	07:57	09:36	15:54
Hesso	arr										
	dep	00:48	10:51	15:17	20:01	06:58	05:49	03:17	08:19	10:00	16:18
Tent Hill	arr		11:08	15:34							
	dep	01:04	11:33	15:50	20:17	07:14	06:05	03:33	08:35	10:16	16:34
Spencer Junction	arr	01:30	12:00	16:16	20:43	07:40	06:31	04:00	09:00	10:41	17:00
	dep										
FORMS OR DESTINATION		PFL	SDY	SCT	TKF	DYS	TKF	PFL	SDY	SCT	SDY

TRAIN NO		7PS1	7PM5	9614S	9612S	7DA2	7PA8				
LENGTH (Metres)		1800	1500	1272	1272	1800	600				
DAYS		SUN	SUN	SAT	SUN	SUN	SUN				
SCHEDULE		SFR	SFR	EXPAC	EXPAC	SFR	PAS				
PATH TYPE		M	M	M	M	M	M				
OPERATOR		GWI	PNT	GWI	GWI	GWI	GSR				
COMMODITY		Intermodal	Intermodal	Minerals	Minerals	Intermodal	Passenger				
Cook	arr	07:07	16:20				19:32				
	dep	09:37	19:20				23:52				
Thomiar	arr		19:38								
	dep	09:54	20:29				00:08				
Fisher	arr	10:15	20:51								
	dep	11:14	21:20				00:25				
Watson	arr										
	dep	11:49	21:55				00:55				
Ooldea	arr										
	dep	12:09	22:15				01:17				
Bates	arr										
	dep	12:57	23:03				01:58				
Barton	arr						02:24				
	dep	13:25	23:31				02:44				
Mungala	arr						03:07				
	dep	13:51	23:57				03:42				
Mt. Christie	arr										
	dep	14:18	00:24				04:06				
Wynbring	arr		00:51								
	dep	14:44	01:30				04:31				
Lyons	arr										
	dep	15:15	02:02				04:58				
Malbooma	arr						05:17				
	dep	15:35	02:22				05:47				
Northgate	dep			14:05	05:20	17:50					
Tarcoola	arr			14:15	05:30						
	dep	16:04	02:51	14:34	06:15	18:05	06:13				
Ferguson	arr			15:15		18:36					
	dep	16:34	03:21	16:25	06:55	19:15	06:38				
Kingoonya	arr		03:54								
	dep	17:06	04:16	17:04	07:32	19:48	07:08				
Kultanaby	arr										
	dep	17:33	04:44	17:33	08:01	20:15	07:29				
Coondambo	arr					20:33					
	dep	17:50	05:01	17:57	08:25	20:56	07:42				
Wirraminna	arr	18:13		18:17		21:20					
	dep	18:25	05:23	18:48	08:44	22:29	08:01				
Burando	arr			19:17							
	dep	18:49	05:46	19:40	09:10	22:53	08:21				
Pimba	arr	19:25									
	dep	19:40	06:22	20:25	09:53	23:28	08:54				
Wirrappa	arr	20:06			10:20						
	dep	21:01	06:46	20:51	11:36	23:52	09:19				
McLeay	arr				12:13						
	dep	21:29	07:13	21:25	12:36	00:19	09:42				
Bookaloo	arr			21:55			10:05				
	dep	21:54	07:38	22:35	13:07	00:44	10:21				
Hesso	arr			23:07							
	dep	22:18	08:02	23:30	13:36	01:08	10:43				
Tent Hill	arr			23:54							
	dep	22:34	08:18	00:20	13:57	01:24	11:00				
Spencer Junction	arr	23:00	08:45	00:44	14:20	01:50	11:24				
	dep			02:16	16:50		11:40				
FORMS OR DESTINATION		GLW	SDY	WHY	WHY	PFL	APT				

Appendix H
Assessment requirements

EMM
creating opportunities

H.1 Assessment requirements

Traffic and transport assessment requirements and cross reference to where these are addressed in this report are outlined in Table H.1.

Table H.1 Assessment requirements

Environmental attributes	Reference	Assessment requirements	Responses/Cross references
Transport and Traffic	AEQ3	A Transport and Access Impact Assessment should be prepared by a suitably qualified traffic and access engineer, evaluating current and proposed access arrangements including the effect on the arterial road network and car parking, and vehicle interface with the local road network. Any assessment must address implications for the entire supply chain and the traffic and access impact for the construction, operation, maintenance and decommissioning phases.	This TIA has been prepared by a qualified traffic engineer. This report has been reviewed by Abdullah Uddin who has 23 years' experience in traffic engineering and transport planning: https://portal.engineersaustralia.org.au/ner/portfolio/Vk1kMDMzd0g5L1Zmai9QNVlnSEh4Zz09 In this TIA, potential impacts to local and arterial roads have been examined, along with any parking impact to adjoining public roads for construction, operation, decommissioning and maintenance stages.
Transport and Traffic	AEQ3	The assessment should determine the transport system asset improvements, asset management/maintenance requirements, and operational management requirements to accommodate the increase in movements and/or vehicle sizes/mass for affected transport assets and services across all modes for the proposal's construction/implementation and operational phases.	The designated haulage routes are well developed, currently in good conditions which are designed to facilitate the heavy vehicle movements. Therefore, there will not be any road improvement work as part of the proposal. This TIA is seeking endorsement of using OSOM that are within the Heavy Vehicle National Law and associated regulations as part of the SRE Project (i.e. up to 25 m long, 3.5 m wide and 5 m high). These OSOM vehicles will travel independently (i.e. no pilot or police escort vehicle(s)) with OSOM signs at the front and back of the vehicle under Heavy Vehicle National Law and associated regulations.

Environmental attributes	Reference	Assessment requirements	Responses/Cross references
Transport and Traffic	AEQ3	The assessment should provide where relevant: • A summary of the transport task for the development (including workforce and end-to-end supply chain (input and output)) during all phases of the development. This should address predicted traffic volumes, proposed vehicle types, number/frequencies, hours of activity and traffic peaks, any requirements that are outside of the current gazetted heavy vehicle networks, and any measures required to ensure compliance with the 'Heavy Vehicle National Law'. • A description of the existing local and regional transport and traffic environment (using traffic data, accident statistics) and include (where relevant) public transport networks, car parking, school bus routes, and public pedestrian, cycle pathways or trails. • Any operational management measures to minimise delays and ensure safety for other transport users (e.g. temporary road closures/detours), including transport of plant and equipment to/from the site. • Requirements for temporary or permanent modifications to roads or rail infrastructure (including rail crossings and bridges), upgrades to road surfaces, access on arterial and / or local roads and car parking as a result of the development including any increase (temporary or ongoing) in maintenance requirements of transport assets. • Any management measures for transport of hazardous materials, especially where using the Stuart Highway and the Eyre Highway. • Describe how identified impacts to transport and access will be mitigated. Mitigation strategies may include works, contributions or other strategies that can be documented in a traffic management plan. Strategies must be prepared in close consultation with relevant transport authorities, including local government. • Consideration should be given to the implications for the road network through and around Port Augusta, especially the Joy Baluch AM Bridge and the Yorkeys Crossing bypass.	The forecast traffic generation, vehicle type, proposed haulage routes are provided in Sections 3.3 and 3.5. OSOM deliveries greater than 25 m long, 3.5 m wide and 5 m high would require escort (e.g. pilot load, police escort load – refer to Table 3.5) for the road safety reasons and would be subject to separate OSOM assessment and approval from DIT and the NHVR. All construction and operational heavy vehicles will require to follow the Heavy Vehicle National Law and Regulations. Refer to Section 2 for existing traffic conditions (e.g. a description of the road networks serving the mine, crash data, active and public transport infrastructure etc.) There is no known school bus route along the haulage route. There will be no temporary road closures/detours associated with the SRE Project, except OSOM vehicles which are subject to separate approvals. Based on this TIA, any road/bridge/rail infrastructure upgrade or road maintenance will not be required as part of the SRE Project. The existing road infrastructure are currently in good conditions and will be maintained by the relevant road authorities. For any transportation of dangerous goods, necessary approval would be sought from the SafeWorkSA and NHVR (i.e. secondary permits, approvals and licences). The *Dangerous Substances Act 1979* (SA) and *Dangerous Substances (Dangerous Goods Transport) Regulations 2023* (SA) require that all heavy vehicles intended to transport dangerous goods must meet the requirements set out in the Australian Code for the Transport of Dangerous Goods by Road and Rail. Any dangerous goods assessment is beyond the scope of this TIA and are subject to separate approvals. Mitigation measures are described in Section 4.5 of this TIA. The traffic management plans will be developed post approval of the SRE Project in consultation with relevant road authorities. Joy Baluch AM Bridge and the Yorkeys Crossing bypass will not be used as a haulage route.

Australia

SYDNEY
Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 2 95 North Quay
Brisbane QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
2015 Main Street
Vancouver BC V5T 3C2
T 604 999 8297

CALGARY
700 2nd Street SW Floor 19
Calgary AB T2P 2W2

linkedin.com/company/emm-consulting-pty-limited

emmconsulting.com.au

BHP