Licence Amendment Supporting Documentation

Mt Brockman, Nammuldi and Silvergrass Iron Ore Mines – L5258/1991/11

March 2026

Disclaimer and Limitation

This report has been prepared by Rio Tinto Iron Ore (Rio Tinto), on behalf of Pilbara Iron Company (Services), specifically for the Mount Brockman, Nammuldi and Silvergrass Iron Ore Mine. Neither the report nor its contents may be referred to without the express approval of Rio Tinto, unless the report has been released for referral and assessment of proposals.

[redacted]	Review Issue Date	Approved for Issue	
		To Whom	Date
	3 Dec 2025		
	8 Dec 2025		
	6 Feb 2026		
	17 Mar 2026	DWER	18/03/2026

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1. Introduction

This report provides the supporting information for the Licence Amendment Application (LAA) submitted by Pilbara Iron Company (Services) (the Licence Holder) for Part V Operating Licence L5258/2011/11.

1.1 Project Overview

Pilbara Iron Company (Services), a subsidiary and member of the Rio Tinto Iron Ore (RTIO) group, operates the existing Mt Brockman, Nammuldi and Silvergrass Iron Ore Mines (the BS2 Hub), located approximately 40 km north-west of Tom Price at its nearest point, in the Pilbara region of Western Australia. The location of the BS2 Hub is shown in Figure 1.1 and Figure 1.2.

The BS2 Hub operates in accordance with L5258/2011/11, an Operating Licence issued by the Department of Water and Environmental Regulation (DWER) under Part V of the *Environmental Protection Act 1986* (EP Act). The Prescribed Premises boundary is shown in Figure 1.2.

1.2 Licence Amendment Application Scope

This LAA seeks approval for three (3) additional discharge points to manage and retain surplus groundwater abstracted from below-water-table (BWT) mining operations, regulated under Category 6 (Mine Dewatering) of Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations).

Specifically, the LAA seeks approval for the following pit void discharge points:

- Nammuldi Lens A with a maximum discharge volume of 12,000,300 tonnes per annual period[1] with an instantaneous flow of 1000 L/sec;
- Nammuldi Lens B with a maximum discharge volume of 12,000,300 tonnes per annual period with an instantaneous flow of 1000 L/sec; and
- SGE Pit 2 with a maximum discharge volume of 800,000 tonnes per annual period and a maximum instantaneous flow of 350 L/sec, to provide pressure relief for the SGE Managed Aquifer Recharge (MAR) Scheme.

All proposed discharge locations are within the existing L5258/2011/11 Prescribed Premises boundary.

No change to the existing Category 6 design capacity is proposed.

1.3 Legal Land Description

The proposed discharge points at Lens A, Lens B and SGE Pit 2 are located within Mineral Lease ML4SA, issued under the *Iron Ore (Hamersley Range) Agreement Act 1963*.

[1] The central discharge strategy provides for discharge to Lens B from 2027, followed by commencement of discharge to Lens A from 2030, if required. Operationally, there may be periods during which discharge occurs to both pit voids concurrently.

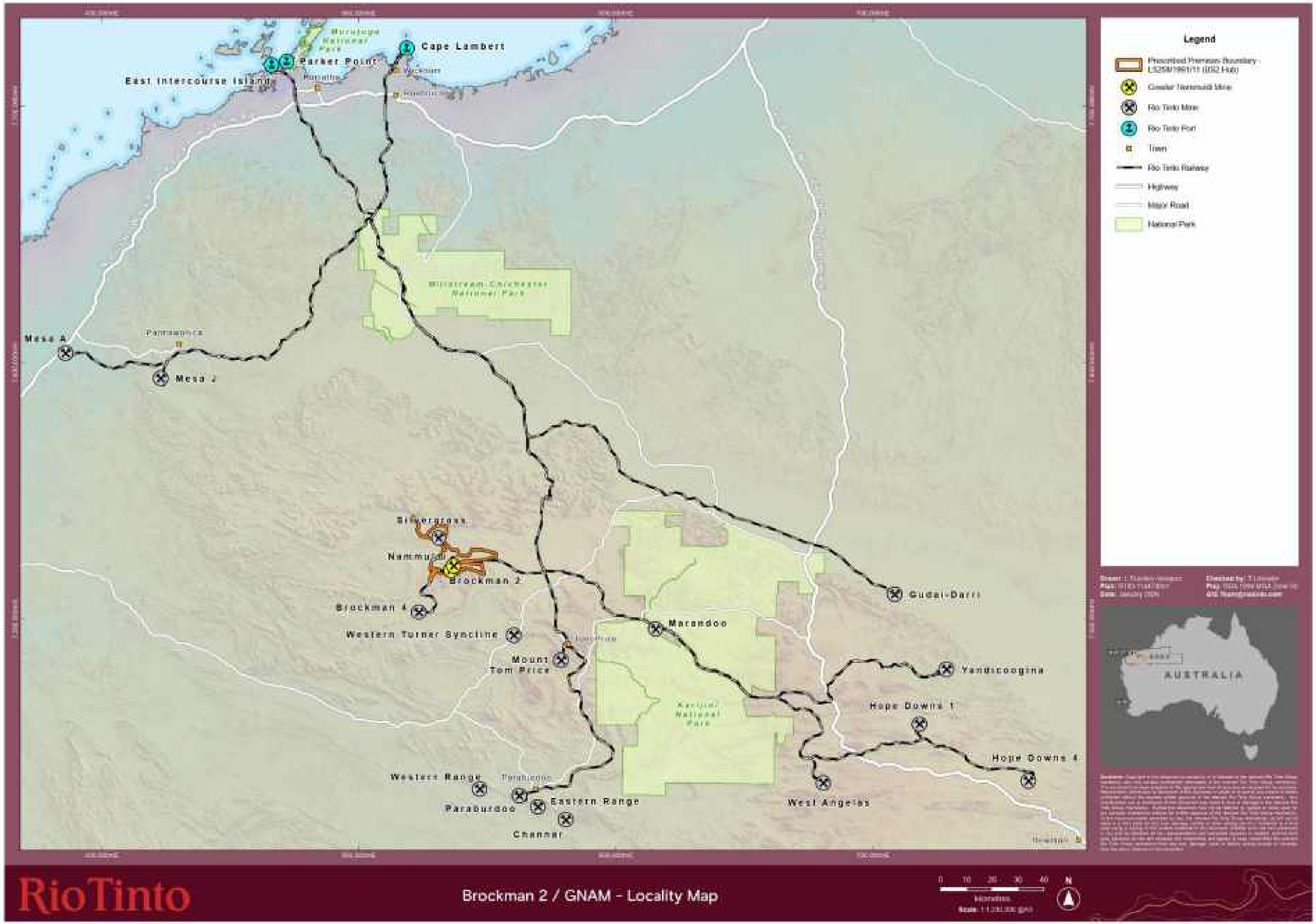

Figure 1.1: Mt Brockman, Nammuldi and Silvergrass Iron Ore Mines Locality

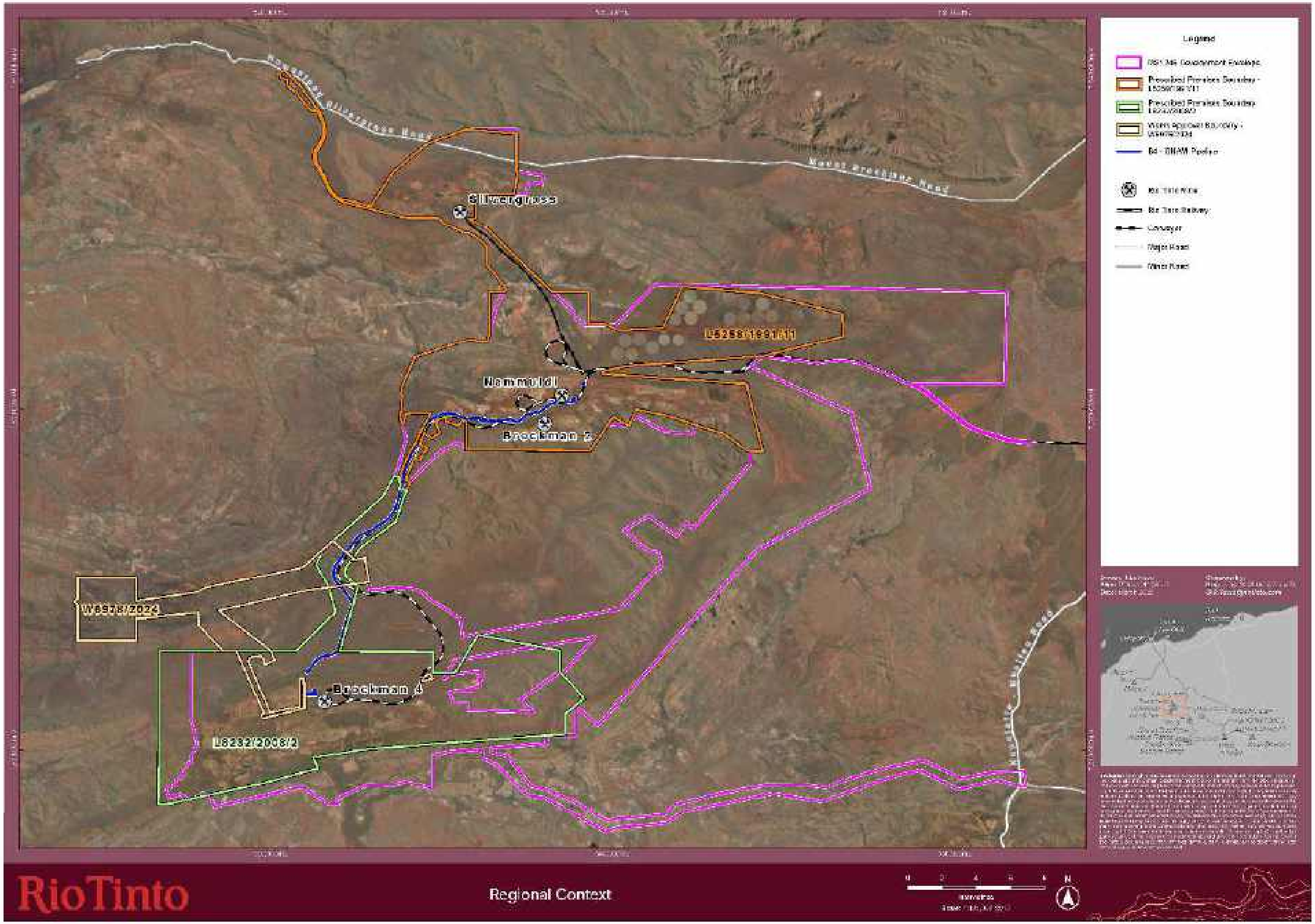

Figure 1.2: Regional Context

2. Licence Holder Information

2.1 Occupier Details

The Applicant (the Licence Holder) of the land subject to this LAA is:

Pilbara Iron Company (Services) Pty Ltd
Level 22, Central Park
152-158 St Georges Tce
Perth WA 6000
ACN: 35 107 210 248

[redacted]

[redacted]
Rio Tinto
Level 18, Central Park
152-158 St Georges Terrace
Perth WA 6000
[redacted]

Authorisation to act as a representative of the occupier is provided in Attachment 1C.

3. Premises Details

The Licence Holder currently holds Part V Operating Licence L5258/1991/11 for the Prescribed Premises, which includes the categories and design capacities shown in Table 3.1.

No changes are proposed to the existing prescribed activities or categories under the licence. This LAA is limited to the authorisation of additional discharge points, with no change to the existing Category 6 production/design capacity.

Table 3.1: Prescribed Premise category details under existing Licence (L5258/1991/11)

Category	Prescribed premises category description	Assessed production / design capacity
5	Processing or beneficiation of metallic or non-metallic ore	68,000,000 tonnes per annual period
6	Mine dewatering	42,300,000 tonnes per annual period
12	Screening etc. of material	10,000,000 tonnes per annual period
54	Sewage facility	526 cubic metres per day
57	Used tyre storage (general)	5,000 tyres
64	Class II putrescible landfill site	7,634 tonnes per annual period
73	Bulk Storage of chemicals etc	20,260 cubic metres in aggregate

Figure 3.1: L5258/1991/11 Prescribed Premises Boundary and Infrastructure Overview

4. Siting and Location

4.1 Land Uses

Existing land uses within the Prescribed Premise boundary include pastoral activities (Hamersley Station and Rocklea Station), mineral exploration and mining. The Prescribed Premises is remote from communities and other sensitive receptors. The nearest residential area is the township of Tom Price, located approximately 40 km to the south-east of the Premises at its nearest point. Tom Price had a population of 2,910 in 2021 (Australian Bureau of Statistics, 2021).

The nearest premise is the existing Homestead Camp, located approximately 2.6 km north-west of the Prescribed Premises, which is operated by the Licence Holder and as such, will not be considered a sensitive land use.

4.2 Climate

The BS2 Hub is located in the Pilbara region of Western Australia which has an arid climate and experiences regular cyclonic activity from November to March. Characteristic climatic features of the region include seasonally low rainfall with high temperatures, high evaporation rates and high daily temperature range. The nearest certified meteorological station for which climate statistics is available is located at Paraburdoo Aero (BoM Station 007185) approximately 90 km to the south of the Premises.

Maximum average temperatures generally occur from November to March, with mean daily maximum temperatures of 40°C in summer to 26°C in winter (BoM, 2025); the coolest months occur between June and August (refer to Figure 4.1). Rainfall occurs predominantly in the summer months with the largest events being associated with tropical cyclone events bringing heavy rain to the inland parts of the Pilbara. Frequent summer thunderstorm activity and occasionally protracted rainfall when a low-pressure trough descends into the region are characteristic. The long-term annual average rainfall for Paraburdoo Aero is 314.8 mm/year (Figure 4.1). Rainfall typically peaks during the months of January to March with mean rainfall ranging from 50.4 - 73.9 mm across those months.

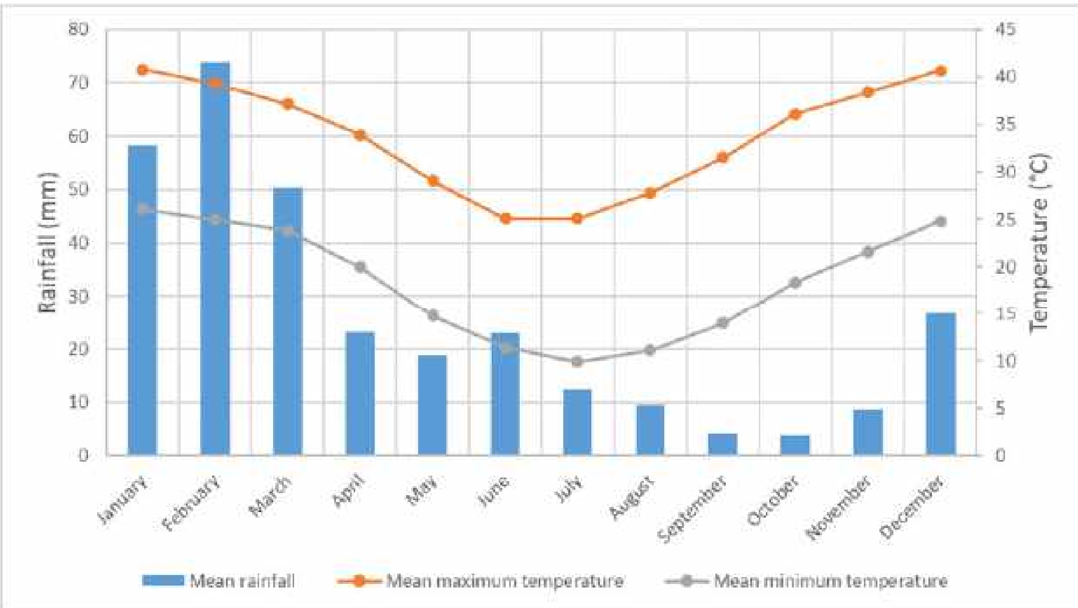

Figure 4.1: Paraburdoo Aero Average Monthly Climate Data from 1974 - 2025 (BoM Station 007185) (BoM, 2025)

4.3 Topography

The BS2 Hub lies within the Hamersley Basin, a depositional basin of Lower Proterozoic sediments, that covers a large proportion (approximately 100,000 km^2) of the Western Plateau.

The Hamersley subregion is the southern section of the Pilbara Craton and is described as a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite).

The general topography of the Premises comprises a series of low hills and slopes within a gently undulating but relatively flat landscape.

4.4 Summary of Environmental Sensitive Receptors

Table 4.1 provides a summary of environmentally sensitive receptors within the Premises that have the potential to be impacted by the proposed activities through a defined emission source and pathway.

Table 4.1: Sensitive environmental receptors

Type	Description	Potential Impact
Environmentally Sensitive Areas	N/A – none within the Prescribed Premises.	No potential impact.
Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs)	One TEC and two PECs are in proximity to the Premises as per Section 4.4.2.	Unlikely to be impacted. New discharge points do not intersect TECs/PECs.
Threatened and/or priority flora	23 priority flora species as per Section 4.4.3.	Unlikely to be impacted. Minor vegetation clearing proposed for new discharge points and water transfer infrastructure. Figure 4.3 shows threatened and priority flora recorded in proximity to the proposed infrastructure. Direct impact due to clearing associated with development of infrastructure is minimal, as proposed infrastructure is located in previously disturbed areas as much as possible. Controls and mitigation measures implemented to manage impacts on threatened and priority flora as per the Brockman Syncline Proposal Environmental Management Plan (BSP EMP) required by Ministerial Statement (MS) 1246.
Threatened and/or priority fauna	Nine threatened and/or priority fauna species as per Section 4.4.4.	Unlikely to be impacted. Minor vegetation clearing proposed for new discharge points and water transfer infrastructure. Controls and mitigation measures implemented as per the BSP EMP required by MS 1246.
Aboriginal and other heritage sites	Heritage sites as per Section 4.4.5.	Proposed infrastructure alignments avoid impact to sites.
Rivers, lakes, oceans, and other bodies of surface water, etc.	Duck Creek and Caves Creek	No impacts are proposed from the new in-pit discharge points. As part of the revised water strategy for the Greater Brockman Operations (GBO) there is the potential for reduced volumes of discharge

		to Duck Creek as part of the creek discharge reduction plan. Controls and mitigation measures implemented as per the BSP EMP required by MS 1246.
Acid sulphate soils	Low risk of acid sulphate within mine deposits	No new impacts proposed. Pit wall mapping indicates the pit voids are considered Non Acid Forming (NAF) with no identified sources of acid and/or metalliferous drainage (AMD).

4.4.1 Sensitive land use

The Premises are remote from communities and other sensitive receptors.

A summary of sensitive land uses and their distance from the Premises is presented in Table 4.2 and illustrated in Figure 4.2.

Table 4.2: Sensitive land uses

Sensitive land uses	Distance from the Premises
Closest residential premises: Tom Price (Zoned residential – Shire of Ashburton Planning Scheme No.7)	Approximately 40 km to the south-east at its nearest point.
Closest recreation zoned premises: Tom Price (Zoned recreation – Shire of Ashburton Planning Scheme No. 7)	Approximately 37 km to the south-east at its nearest point.
Hamersley Pastoral Lease (N050438) and Rocklea Pastoral Lease (N050372) (note: operated by the Licence Holder and hence not considered a sensitive land use)	Overlies the Prescribed Premises.
Public Drinking Water Source Area (PDWSA)	No PDWSA are located within or near the Premises. The nearest PDWSAs are the Millstream Water Reserve, located 6 km to the north-east and the Bungaroo Creek Water Reserve, located approximately 52 km to the north-west.
Department of Biodiversity, Conservation and Attractions (DBCA) – Conservation Reserves and Managed Areas	No Parks and Wildlife Conservation Reserves or other Managed Areas are located within or near the Premises. The nearest Reserves are the Millstream-Chichester National Park, located approximately 75 km to the north and Karijini National Park, located approximately 50 km to the east.

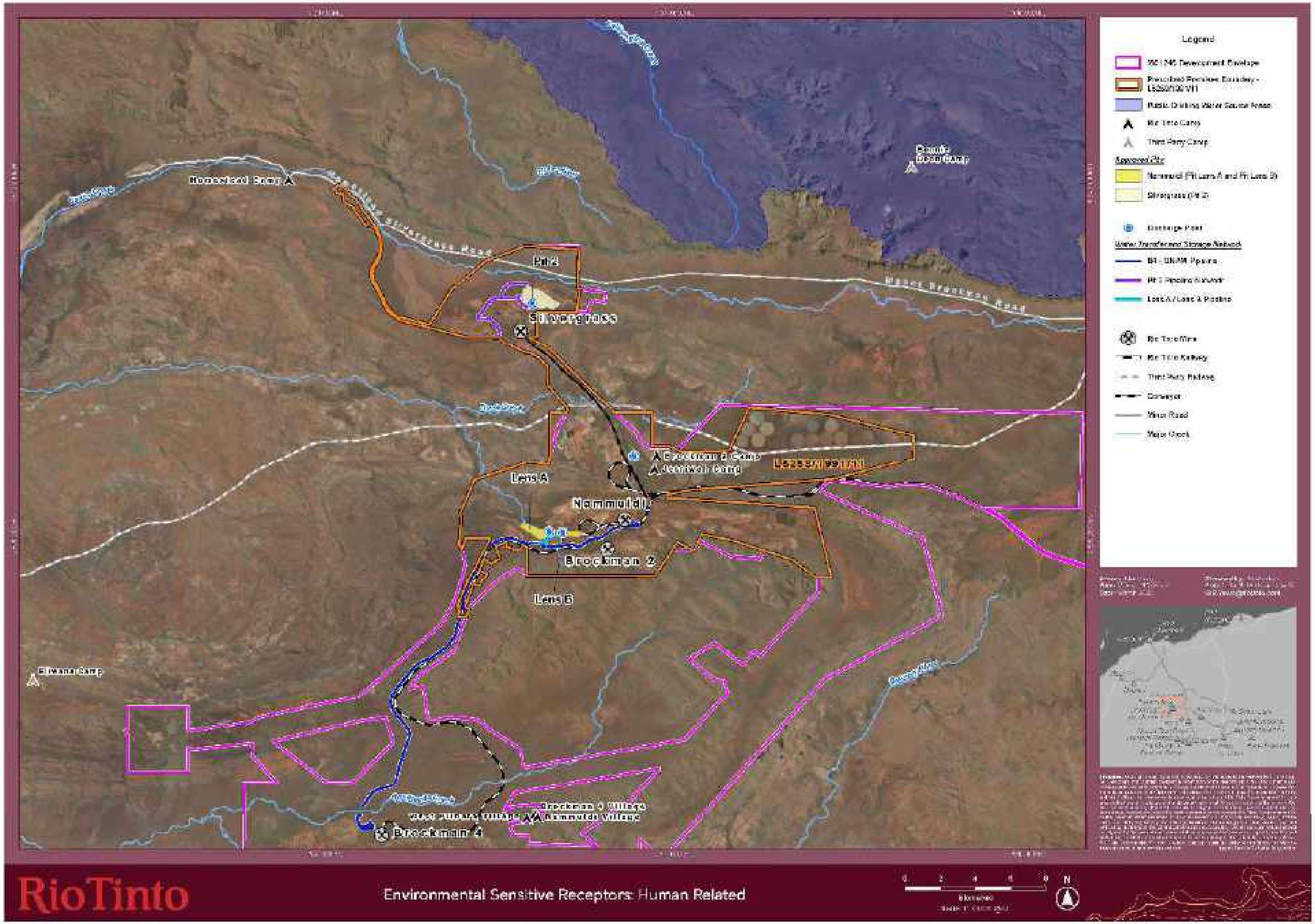

Figure 4.2: Environmental Sensitive Receptors: Human

4.4.2 Specified ecosystems

A summary of relevant specified ecosystems is presented in Table 4.3 and shown in Figure 4.3.

Table 4.3: Specified ecosystems

Specified ecosystems	Description
RAMSAR wetlands	No RAMSAR wetlands are located within or near the Premises.
Geomorphic Wetlands	No geomorphic wetlands are located within or near the Premises.
Threatened Ecological Communities and Priority Ecological Communities	One Threatened Ecological Community (TEC) and two Priority Ecological Communities (PECs) are in proximity to the Premises: • *Themeda* sp. Grasslands on cracking clays TEC. • Brockman iron cracking clay communities of the Hamersley Range PEC. • Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara – Palm Springs PEC. Neither the *Themeda* grasslands (*Themeda* sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara) or the riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region have been identified within the Premises based on current vegetation mapping.
Groundwater Dependent Ecosystems	Vegetation considered to represent a Groundwater Dependent Ecosystem (GDE) or potential GDE is known to occur within the Premises. Controls and mitigation measures implemented as per the BSP EMP required by MS 1246.

4.4.3 Vegetation and Flora

Vegetation within the Premises is generally typical of the Hamersley IBRA sub-region (Rio Tinto, 2023a) and can be described as:

- Hamersley (PIL3): Dissected bold plateaux and ranges of flat lying, moderately folded sandstone and quartzite with vegetation described as Mulga low woodland over tussock grasses occurring on fine textured soils in valley floors, with scattered Snappy gum (*Eucalyptus leucophloia*) over *Triodia brizoides* on skeletal soils of the ranges.

The majority of the intact vegetation within the Premises is considered to be in Good to Excellent condition, however, some areas are ranked as Poor or Very Poor due to weed invasion (Buffel Grass, *Cenchrus ciliaris*) and grazing.

Seringia exastia is known to occur within the Premises. This taxon is listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is not listed as threatened under the BC Act 2016. Recent genetic studies have circumscribed *Seringia exastia* as a synonymisation of *S. exastia* and *S. elliptica*. Consequently, *S. exastia* represents a common, widespread species that would not meet the criteria for conservation listing and can be considered for delisting (Binks, Wilkins et al., 2020). No other Threatened Flora have been recorded within the Premises. The following Priority flora species have been recorded:

- Priority 1 (P1):
    - *Calotis squamigera*.
    - *Hibiscus* sp. Mt Brockman (E. Thoma ET 1354).
- Priority 3 (P3):
    - *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095).

    - *Aristida jerichoensis* var. *subspinulifera.*
    - *Astrebla lappacea.*
    - *Dampiera anonyma.*
    - *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479).
    - *Eremophila magnifica* subsp. *velutina.*
    - *Euphorbia inappendiculata* var. *queenslandica.*
    - *Gymnanthera cunninghamii.*
    - *Indigofera gilesii.*
    - *Indigofera rivularis.*
    - *Ipomoea racemigera.*
    - *Ptilotus subspinescens.*
    - *Rostellularia adscendens* var. *latifolia.*
    - *Sida* sp. Hamersley Range (K. Newbey 10692).
    - *Swainsona thompsoniana.*
    - *Themeda* sp. Hamersley Station (M.E. Trudgen 11431).
    - *Triodia basitricha.*
    - *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684).
  - Priority 4 (P4)
    - *Acacia bromilowiana.*
    - *Eremophila magnifica* subsp. *Magnifica.*
- *Sida* sp. Barlee Range (S. van Leeuwen 1642).

Figure 4.3 shows the vegetation units and conservation significant flora previously recorded in proximity to the Premises and the proposed infrastructure.

Direct impacts to native vegetation and Priority flora associated with the proposed activities are expected to be minimal, as infrastructure is located within previously disturbed areas where possible. Any vegetation clearing required will be undertaken in accordance with the requirements of MS 1246.

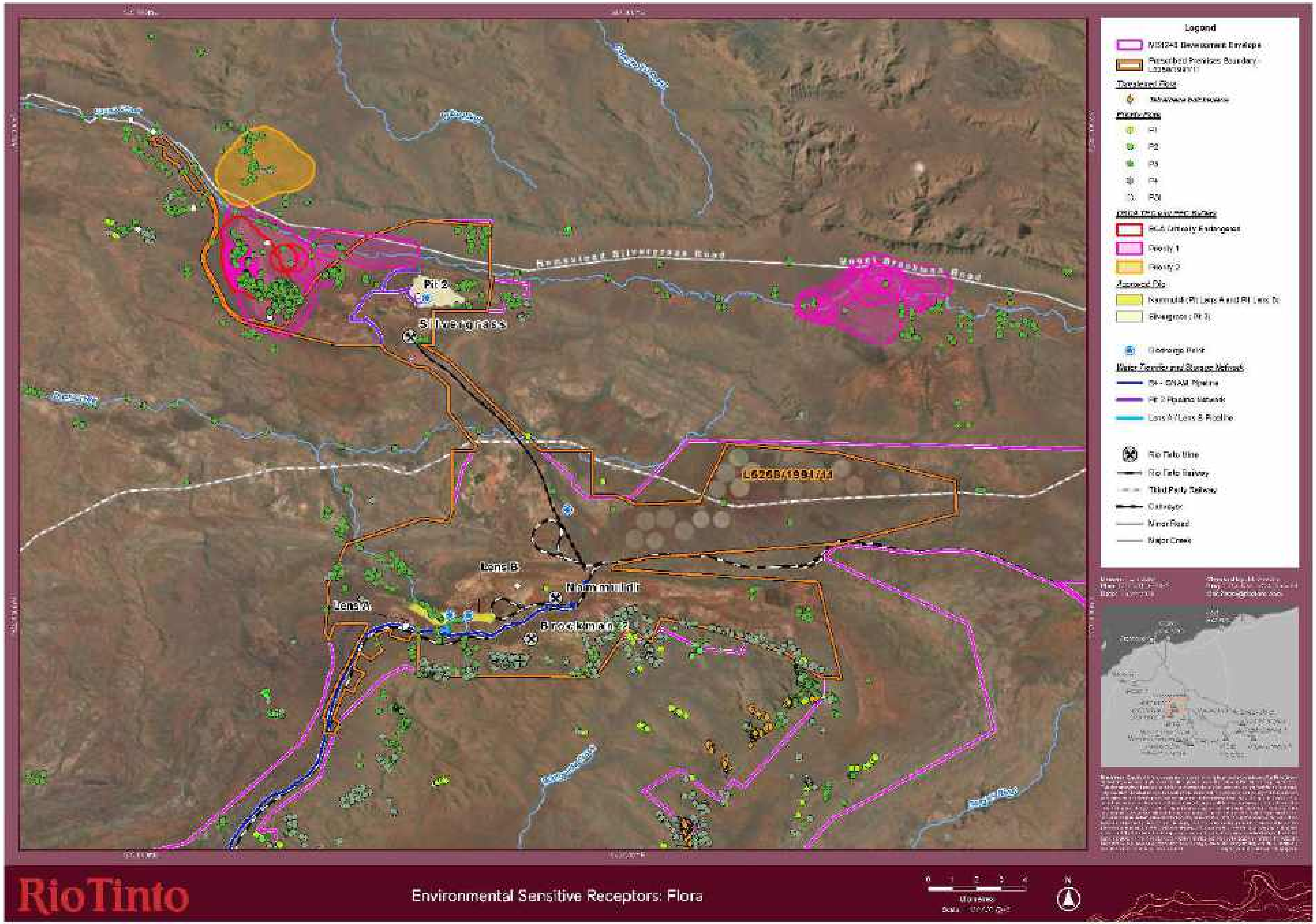

Figure 4.3: Environmental Sensitive Receptors: Flora

4.4.4 Fauna

4.4.4.1 Terrestrial Fauna

The two dominant land system units identified within the Premises comprise the Boolgeeda unit, defined by the presence stony lower slopes and plains which support hard and soft spinifex grasslands or mulga shrublands; and the Newman unit, characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.

Consolidated fauna habitat mapping was undertaken by Stantec using data from previous fauna surveys (Stantec, 2021). Along with disturbed areas, fauna habitats that occur within the Premises are:

- Alluvial plain.
- Rocky Hill.
- Low Hills and Slopes.
- Gorge/Gully.
- Breakaway/Cliff.
- Clay Plain.
- Major Drainage.
- Minor Drainage.

Five significant fauna species have been recorded within the Premises; and an additional four species of significance have the potential to occur within the area.

Previously recorded:

- Northern Quoll (*Dasyurus hallucatus*) – EPBC Act Endangered, BC Act Endangered.
- Ghost bat (*Macroderma gigas*) – EPBC Act Vulnerable, BC Act Vulnerable.
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia (Pilbara form)*) - EPBC Act Vulnerable, BC Act Vulnerable.
- Peregrine falcon (*Falco peregrinus*) – BC Act Other Specially Protected.
- Western Pebble Mound Mouse (*Pseudomys chapmani*) – DBCA Priority 4.

Potential to occur:

- Pilbara Olive Python (*Liasis olivaceus barroni*) – EPBC Act Vulnerable, BC Act Vulnerable.
- Lakeland-downs Mouse (*Leggadina lakedownensi*) – DBCA Priority 4.
- Lined Soil-crevice Skink (*Notoscincus butleri*) – DBCA Priority 4.
- Fork-tailed Swift (*Apus pacificus*) - EPBC Act Migratory, WC Act International Agreement.

Figure 4.4 shows the significant fauna recorded in proximity to the Premises.

None of the locally significant habitats or Threatened fauna species were recorded or are expected to occur within or near the infrastructure associated with this LAA. Direct impact from clearing of fauna habitat is expected to be minimal. The new infrastructure is largely located within previously disturbed areas, with only minor clearing anticipated. As such, the proposed activities are not expected to have an impact on any population, alter the conservation status or threaten the continued existence of any conservation significant fauna species at a local or regional scale.

Given the large areas of suitable habitat in the surrounding area, and the minimal clearing required for the supporting infrastructure and the discharge points the proposed activities are not expected to have an impact on any population, alter the conservation status or threaten the continued existence of any conservation significant fauna species at a local or regional scale.

4.4.4.2 Subterranean Fauna

Subterranean fauna studies have been completed in the Greater Brockman area (Rio Tinto, 2020, Biologic, 2022). Impacts on subterranean fauna at the BS2 Hub are associated with loss of habitat through mining and/or groundwater drawdown and changes to groundwater quality. The hydrogeological and geochemical assessments presented in Sections 5.3 and 5.4 demonstrate that the proposed discharge is unlikely to result in any material change to groundwater quality in the vicinity of Lens A, Lens B, or SGE Pit 2. Consequently, the potential risk of impact to subterranean fauna is considered to be low.

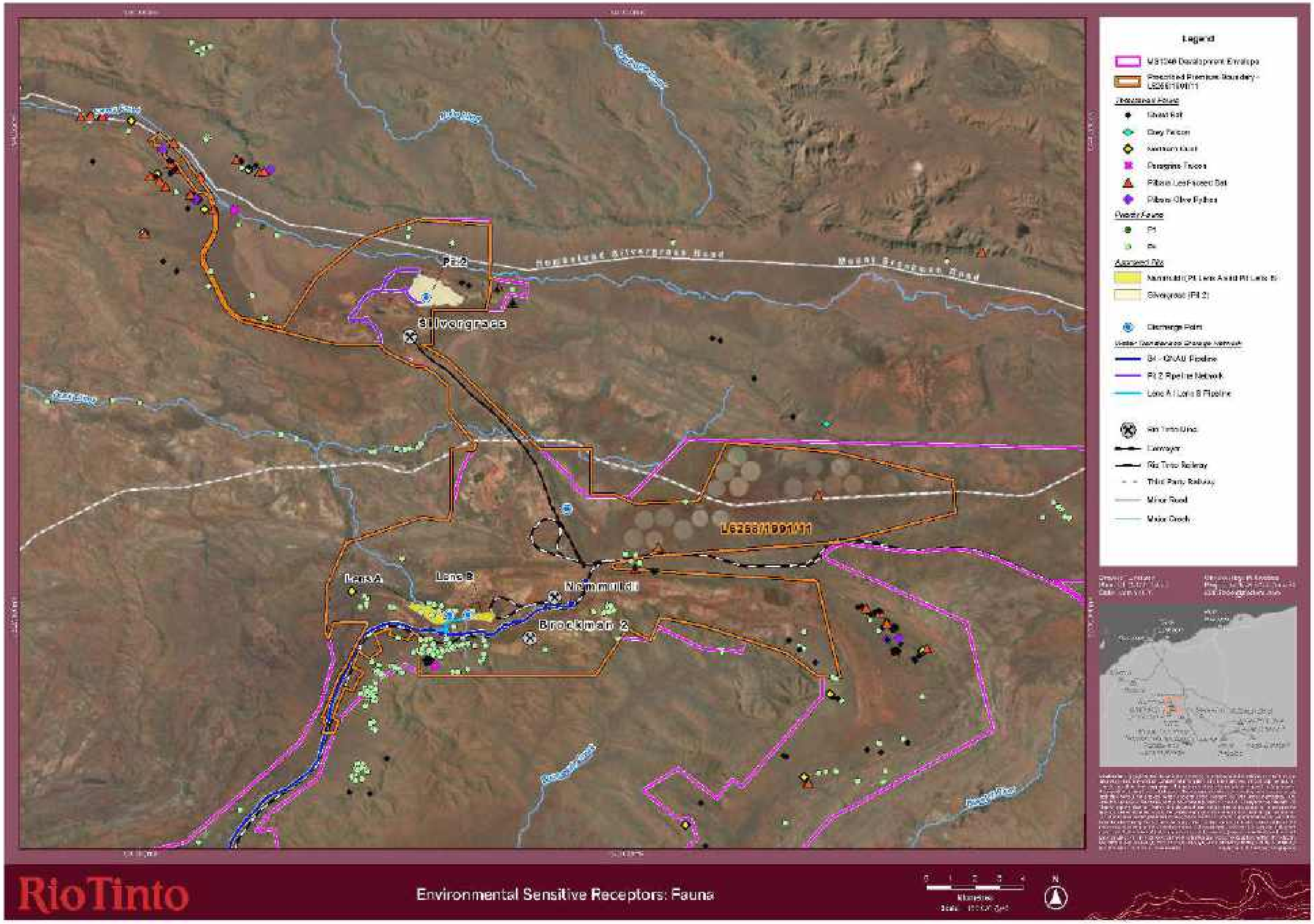

Figure 4.4: Environmental Sensitive Receptors: Fauna

4.4.5 Aboriginal and other heritage sites

The Premises are within the Eastern Guruma Native Title Determination Area (WCD2007/001) of the Muntulgura Guruma People. Wintawari Guruma Aboriginal Corporation (WGAC) is the Registered Native Title Body Corporate (RNTBC) that represents the interest of the Muntulgura Guruma People. The Licence Holder provides regular updates on proposed projects on Muntulgura Guruma country at monthly WGAC board meetings and during ad hoc engagements.

The identification and management of cultural heritage within the traditional lands of the Muntulgura Guruma people is in accordance with the principles and practices outlined within Rio Tinto's Communities and Social Performance Guidelines, the Rio Tinto Cultural Heritage Group Procedure, and the heritage protocols within the Participation Agreement and Indigenous Land Use Agreement (ILUA). The Muntulgura Guruma ILUA was registered with the Native Title Tribunal on 23 June 2008. These agreements set obligations and processes such as land access, tenure acquisition, heritage management, environment management, reporting, consultation and communication. Additionally, through extensive consultations with Muntulgura Guruma Traditional Owners, the Social, Cultural and Heritage Management Plan (SCHMP) has been developed. The SCHMP provides a framework for the design and implementation of projects ensuring the protection of environmental and Aboriginal cultural values. The Licence Holder intends to avoid sites of ethnographic and/or archaeological significance to Traditional Owners wherever possible at its Pilbara operations.

The Licence Holder will request approval under Section 18 of the *Aboriginal Heritage Act 1972* where disturbance to sites cannot be avoided. Cultural material contained within those sites which cannot be avoided will be managed in accordance with the approval conditions set by the Minister of Aboriginal Affairs and in consultation with the Traditional Owners. Extensive Aboriginal cultural heritage surveys have been conducted within the Premises. Aboriginal Cultural Heritage Sites recorded within, and in proximity to, the Premises are shown in Figure 4.5. The proposed infrastructure associated with discharge points intersects several recorded Aboriginal Cultural Heritage Sites, however this infrastructure is located in previously disturbed areas and no new impacts are proposed. A summary of formal consultation undertaken to date with Traditional Owners is included in Section 6.2.

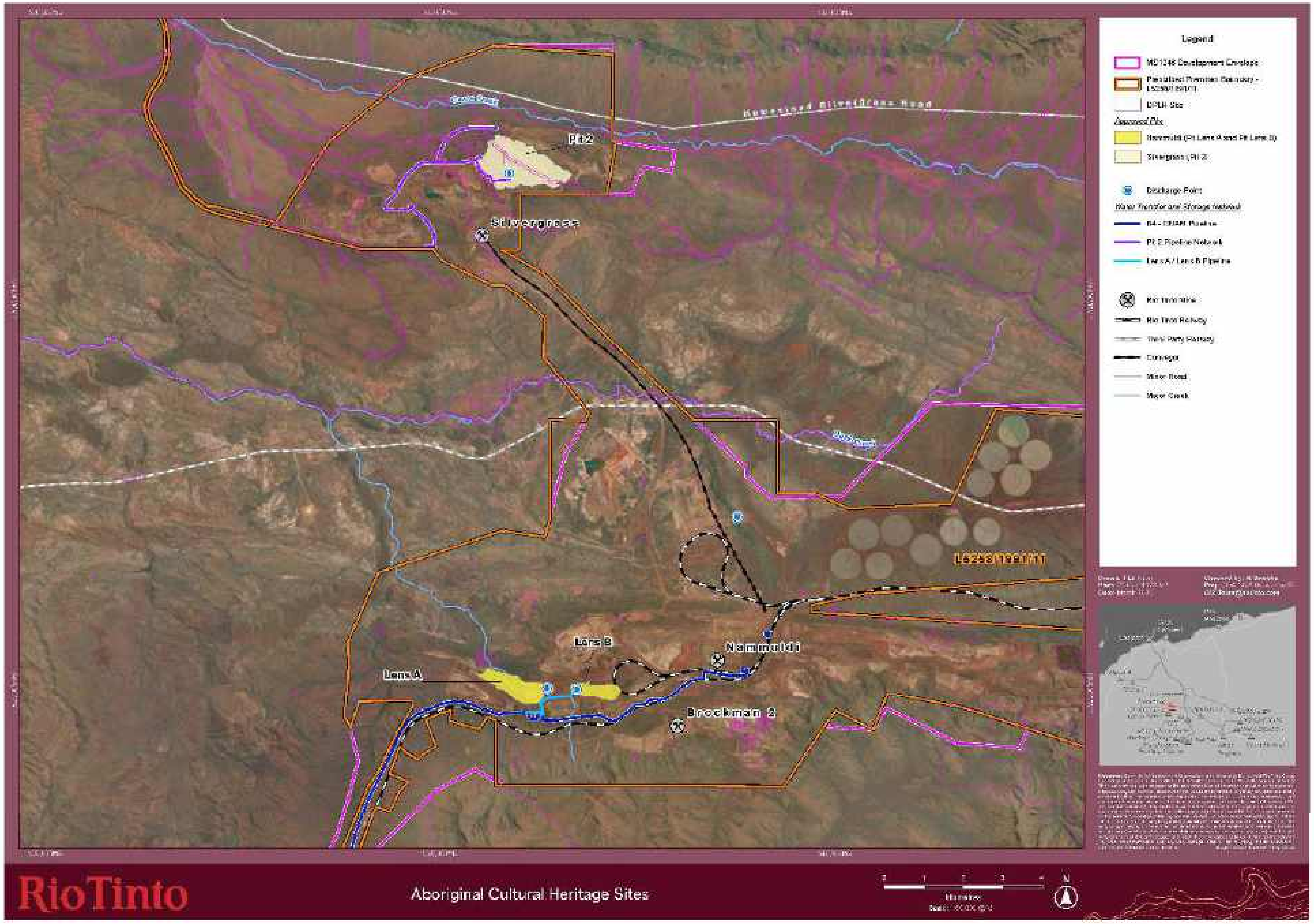

Figure 4.5: Aboriginal Cultural Heritage Sites

4.4.6 Surface water

The BS2 Hub lies within the Duck Creek (Kartajirri) and Caves Creek (Narraminju) catchments (Figure 4.6), located within the Ashburton River Basin. All surface drainages are ephemeral and flow in response to significant rainfall events. These creeks are tributaries of the Ashburton River, which discharges to the Indian Ocean near Onslow.

All ephemeral creeks in the area are considered terrestrial ecosystems with riparian vegetation that may be groundwater dependent. Of these, only Caves Creek is listed as having high potential as a groundwater dependent ecosystem (GDE), while Duck Creek is documented as a low potential GDE according to the BoM GDE atlas (BoM, 2012). These ephemeral creeks are culturally significant. No permanent surface water features occur within the Premises.

Caves Creek catchment, which discharges into Duck Creek, is largely ephemeral but supports permanent pools. A permanent pool of regional significance is Mallumallu (Palm Springs), which is located approximately 20 km downstream from the Premises. Mallumallu occurs along an approximately 4 km stretch of Caves Creek where there is shallow groundwater and a series of permanent and semi-permanent pools. Mallumallu and the downstream pool site Wawuru Yinta are recognised as having particularly high cultural value and significance. Mallumallu is environmentally significant as a Priority 2 PEC 'Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region', containing flora with restricted distributions or from highly disjunct populations; or are major range extensions from northern and eastern Australia. Mallumallu supports several Priority flora species as summarised in Section 4.4.2.

The Boolgeeda Creek riparian zone (vegetation and aquatic fauna habitat) is located approximately 15 km to the south-west of the Premises. It is not expected to be impacted by the proposed activities.

Plunge Pool is a permanent water body on the southern limb of the Brockman Syncline located at the base of a small gorge in the Beasley River catchment (Figure 4.6). The pool has high ecological importance and has a high cultural significance to the Muntulgura Guruma Traditional Owners. The pool is fed by both surface water runoff from an approximately 20 km^2 sub-catchment of the Beasley River and by groundwater seepage from the Mount Newman Member of the Marra Mamba Iron Formation (HSU6).

The pool is located approximately 20 km to the south of Lens A and B. Due to its spatial separation, and lack of hydraulic connectivity to Lens A, Lens B and SGE Pit 2, it is not expected to be impacted by the proposed discharge (WSP, 2025a).

Surplus dewatering is currently discharged to Duck Creek via the existing discharge point (Figure 4.6). The BSP EMP[2] addresses monitoring and management measures to prevent long term impacts on the identified environmental and conservation values of Duck Creek from dewatering discharge.

[2] The Nammuldi–Silvergrass East Management and Monitoring Plan - Revision 3 which originally specified the monitoring and management measures for Duck Creek has been amalgamated with the BSP EMP.

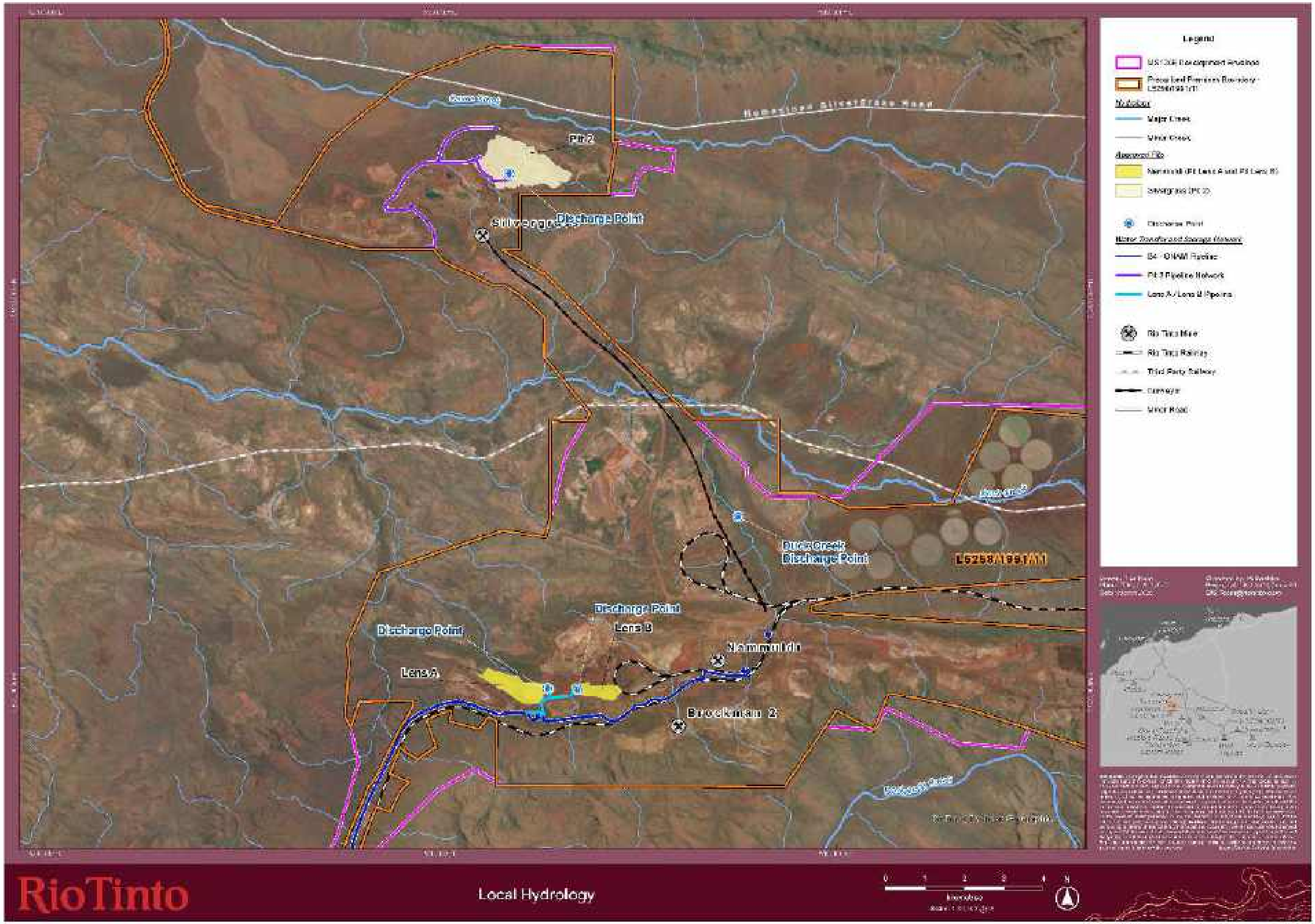

Figure 4.6: Local Hydrology

4.4.7 Groundwater

The main aquifer within the Premises is the Marra Mamba Iron Formation aquifer, within the Ashburton groundwater sub-area of the Pilbara. Generally, the Marra Mamba Iron Formation aquifer is an unconfined to semi-confined freshwater fractured rock aquifer. Porosity within the Mount Newman Member formed through fracturing which was subsequently enhanced through extensive alteration (mineralisation). A shallow unconfined aquifer consisting of Valley Fill and Calcrete sits above the fractured rock aquifer. A 10 m thick confining layer of shale and clay separates the two aquifers. The shale and clay layer can in areas act as a confining layer, inhibiting hydraulic connectivity between deep and shallow aquifers.

Groundwater is recharged periodically by high intensity rainfall events and flooding within the valley floor. Annual groundwater recharge is minimal, with hydrographs indicating water flow is very much episodic or event based.

Groundwater levels have remained relatively consistent over time with little response to rainfall; however, there is a slight annual fluctuation (approximately 0.2 m), which may illustrate diffuse recharge following the wet season (Rio Tinto, 2023a). Groundwater quality is typically classified as fresh, with electrical conductivities varying between 500 and 1,500 µS/cm and pH values ranging from between 7.2 and 8.4 (Rio Tinto, 2023a). Water to be discharged in Lens A, Lens B and SGE Pit 2 is sourced from dewatering within the same groundwater sub-area, with similar quality.

As summarised in Table 4.4, groundwater receptors are unlikely to be impacted by the proposed discharge.

Table 4.4: Groundwater receptors

Groundwater receptor	Description
Groundwater users (pastoralists, other mining operators)	The hydrogeological assessments presented in Sections 5.3 and 5.4 demonstrate that any seepage plume as a result of the proposed discharge is unlikely to impact any areas outside the Premises.
Caves Creek/ Narraminju	The hydrogeological assessments presented in Sections 5.3 and 5.4 demonstrate that any seepage plume as a result of the proposed discharge is unlikely to impact Caves Creek. The hydrogeological and geochemical assessments presented in Sections 5.3 and 5.4 demonstrate that the proposed discharge is unlikely to result in any material change to groundwater quality in the vicinity of Lens A, Lens B, or SGE Pit 2. Controls and mitigation measures implemented as per the BSP EMP required by MS 1246.
Stygofauna	The hydrogeological and geochemical assessments presented in Sections 5.3 and 5.4 demonstrate that the proposed discharge is unlikely to result in any material change to groundwater quality in the vicinity of Lens A, Lens B, or SGE Pit 2. Consequently, the potential risk of impact to subterranean fauna is considered to be low.

4.4.7.1 Lens A and Lens B

The hydrogeological setting for Lens A and Lens B within the BS2 Hub is defined by a complex interplay of geology, aquifer connectivity, and mining-induced groundwater changes. These pits are situated on the northern limb of the Brockman Syncline, where the stratigraphy consists of the Fortescue Group basement overlain by the Hamersley Group, including the mineralised Marra Mamba Iron Formation. The main aquifers are the mineralised Marra Mamba Iron Formation and the karstic Wittenoom Formation, both of which exhibit high permeability and are the primary hosts for groundwater flow.

Figure 4.7 presents pre-mining depth to water contours (metres below ground level – m bgl) for the Brockman Syncline aquifer. Pre-mining groundwater levels at the location of Lens A and B was approximately 574 mRL.

Dewatering activities for mining have significantly altered groundwater levels, with strong hydraulic connectivity observed between Lens A/B and C/D. However, dolerite dykes, especially between Lens A and B, act as partial barriers, creating some compartmentalisation within the aquifer system. Despite these barriers, groundwater drawdown responses indicate that connectivity persists, particularly at depth or where weathering has affected the dykes (WSP, 2025a).

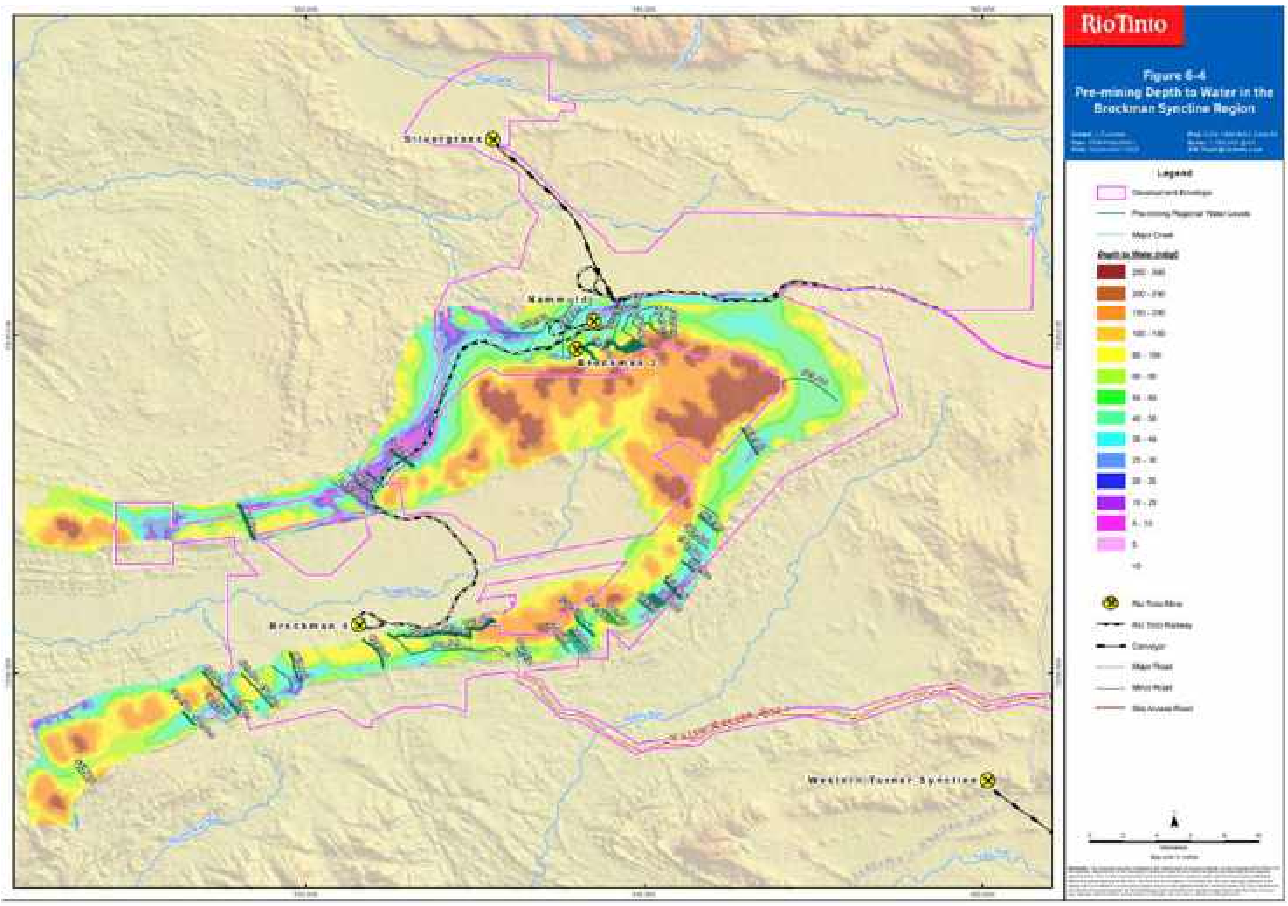

Figure 4.7: Conceptual hydrogeology and pre-mining groundwater levels – Brockman Syncline aquifer

4.4.7.2 SGE Pit 2

The water table in the vicinity of SGE Pit 2 generally occurs in the Valley Fill Aquifer or Calcrete. Pre-mining regional groundwater flow was from east to west along the Caves Creek Valley (WSP, 2024). Dewatering activities at SGE have affected local groundwater conditions, causing drawdown and reversing flow direction from west to east at 8 km from the Operations (WSP, 2024). As of Q1 2024 dewatering in the vicinity of SGE Pit 2 has paused and SGE Pit 2 is partially recharged and contains a pit lake.

The SGE MAR Scheme was proposed as a mitigation measure to address potential impacts from groundwater drawdown associated with BWT mining at SGE, by reinjecting water into the aquifer below Caves Creek to support recharge of shallow and deep groundwater resources.

5. Project Description

5.1 Project Summaries

5.1.1 Greater Brockman Water Security Project – Pit Discharge

The Greater Brockman Water Security Project (GBWSP) has been developed in response to evolving environmental and regulatory requirements. The Project involves the management of surplus mine dewatering volumes through discharge to disused pit voids (Lens A and Lens B), with approval sought for these locations as authorised discharge points under Category 6. This approach supports effective water retention and improved site water management.

The source water comprises mine dewatering from the following locations:

- Groundwater abstracted to enable mining of ore at the BS2 Hub.
- Groundwater abstracted to enable mining of ore at BS4, located south of the BS2 Hub within the Prescribed Premises of Operating Licence L8232/2008/2 (Figure 1.2).
- Groundwater abstracted to enable mining of ore at BS1, located south of the BS2 Hub within the Prescribed Premises of Works Approval W6978/2024/1 (Figure 1.2)

This in-pit water retention initiative forms part of an integrated water management strategy that includes the B4–Nammuldi water transfer pipeline. The pipeline facilitates the transfer of surplus mine dewatering from the BS4 Hub to meet processing demands at the BS2 Hub, supporting the efficient use of available mine dewatering volumes.

Water availability at the BS2 Hub is expected to decline from 2027, requiring the water retention and pipeline solutions to be operational by early 2027.

A summary of the technical details of the proposed discharge points is presented in Section 5.3.

5.1.2 Silvergrass East Managed Aquifer Recharge Scheme Pressure Relief Discharge

The construction, commissioning, and operation of the SGE MAR Scheme has been authorised through an amendment to Licence L5258/1991/11, granted on 20 February 2026.

The Licence Holder has identified a requirement to manage excess mine dewatering water in circumstances where the SGE MAR Scheme water supply line becomes over-pressurised. To ensure the safe and reliable operation of the system, provision is required for emergency pressure relief via discharge to an appropriate location. SGE Pit 2 has been identified as a suitable discharge point for this purpose. Following the dewatering pause at SGE, SGE Pit 2 is partially recharged and contains a pit lake.

Discharge to SGE Pit 2 would be utilised to relieve system pressure during events such as pump failure, planned maintenance activities, or other temporary constraints that may limit reinjection capacity. While discharge is expected to be infrequent following system commissioning and calibration, provision for pressure-relief discharge will be required for the operational life of the MAR Scheme.

The discharge pipeline will originate from an offtake on the existing SGE Pit 2 header line and extend to the pit crest, terminating at a discharge manifold.

A summary of the technical details of the SGE MAR Pressure Relief Discharge project is presented in Section 5.4.

5.2 Amendments relating to Category 6 (Mine Dewatering)

Amendments to L5258/1991/11 include the addition of Lens A, Lens B, and SGE Pit 2 as authorised discharge points, with the proposed discharge locations illustrated in Figure 5.1 and Figure 5.2. The locations shown are indicative and may be refined as detailed engineering designs progress, due to operational requirements, or if the final pit void configuration changes at the time of discharge. All infrastructure will be located within the infrastructure footprint; however, the final location/orientation may be different to that shown on the indicative site layout. To support the operation of these additional discharge points, an updated monitoring schedule is proposed for inclusion in the Licence and is described in Sections 5.3.9.3 and 5.4.9.3

The requested updates are summarised in Table 5.1.

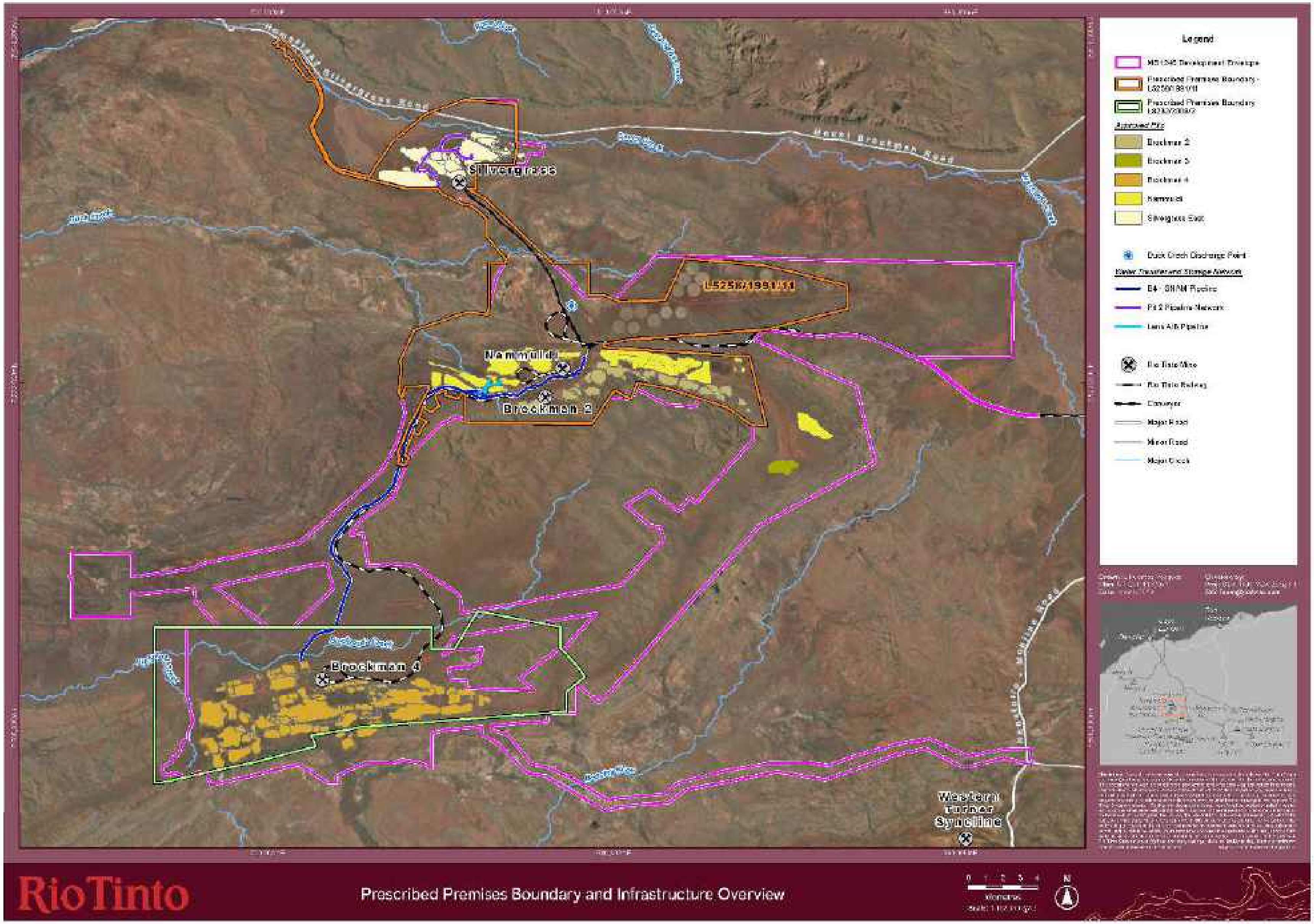

Figure 5.1: Proposed Water Infrastructure General Overview

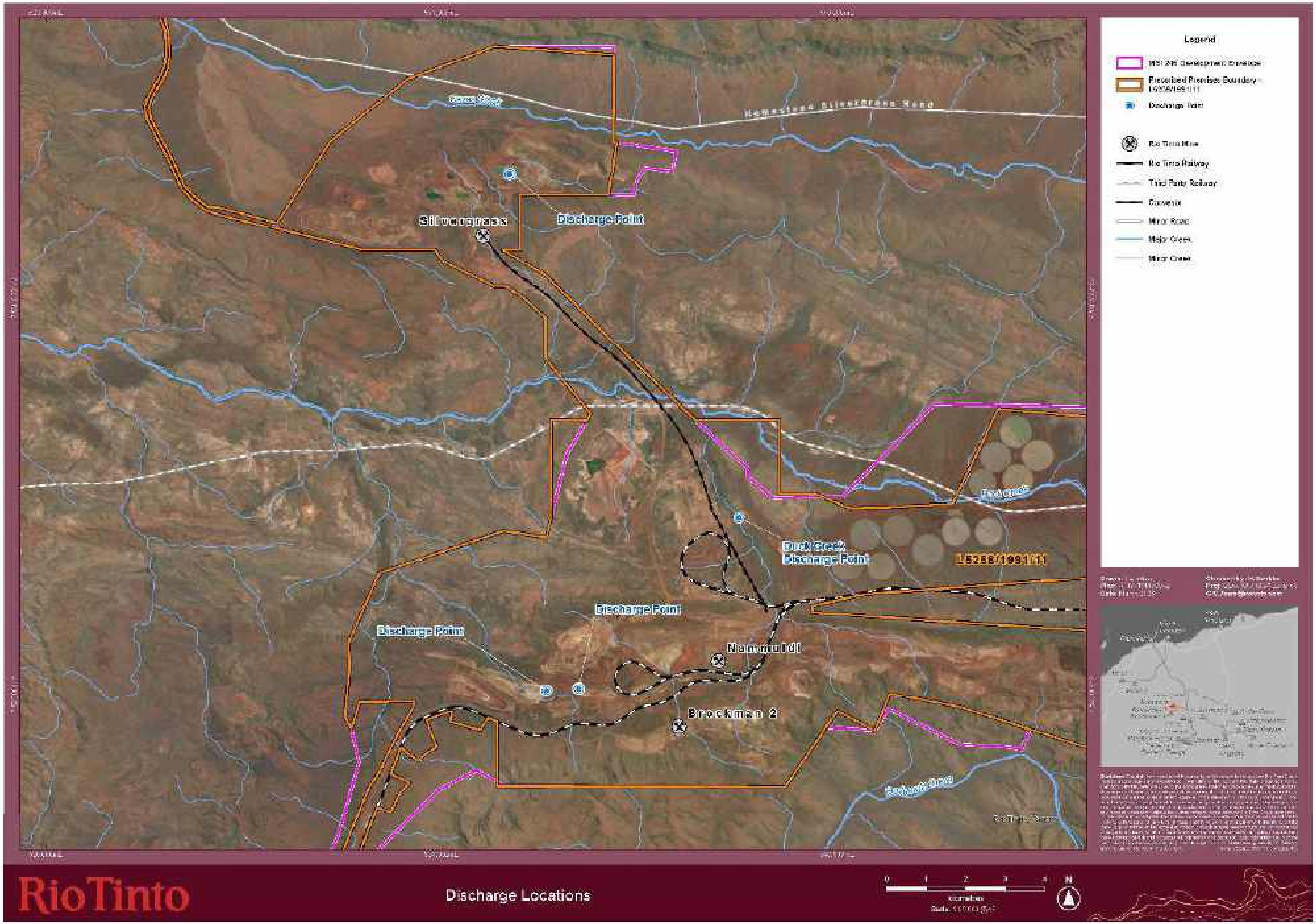

Figure 5.2: Proposed Discharge Locations

Table 5.1: Amendment Summary Table

Condition No.	Condition	Proposed Amendment
Condition 15	The licence holder must only discharge dewatering water, unless otherwise specified in Condition 36, from the Duck Creek discharge point as depicted in Schedule 1, Figure 7.	Lens A, Lens B and SGE Pit 2 to be included as additional discharge points.
Condition 16	The licence holder must, on a monthly basis, measure and record in cubic metres, the cumulative volumes of mine dewatering waters discharged from the Duck Creek discharge point and must publish the results in the Annual Environmental Report.	Include monthly measurement and recording of cumulative volume of mine dewatering discharged into Lens A, Lens B and SGE Pit 2, and publishing of these results in the Annual Environmental Report.
Condition 17	The licence holder must ensure that all dewatering discharge flows through a gabion outlet at the Duck Creek dewatering discharge point.	Lens A, Lens B and SGE Pit 2 to be included as additional discharge points.
L5258, Schedule 1 Figure 7	-	Replace Figure 7 with Figure 5.2.
N/A	-	Include Lens A and Lens B monitoring and frequency as presented in Table 5.4 . Include SGE Pit 2 monitoring and frequency as presented in Table 5.5.

5.3 Project Details - Greater Brockman Water Security Project – Pit Discharge

5.3.1 Design

The project includes the construction of the following infrastructure:

- Deposition pipelines and associated pit void discharge points at Lens A and Lens B. Precise locations of discharge points are subject to detailed engineering design and final pit surface at the time of deposition.
- Piping infrastructure (e.g. flow meters, valves, pumps).

A general arrangement of the proposed infrastructure is shown in Figure 5.3. Infrastructure will be contained within the defined infrastructure footprint; however, the final location and orientation may differ from that shown on the indicative site layout.

The Licence Holder may make changes to final pit void surfaces to accommodate operational requirements, provided that no additional environmental impacts or increased risk profile will result beyond those assessed as part of this application.

Three discharge scenarios have been considered to provide flexibility to the mine plan and to ensure a thorough assessment of environmental risks:

- Deposition to Lens A from January 2027 until Life of Mine;
- Deposition to Lens B from January 2027 until Life of Mine; and
- A staged approach (central case); with deposition to Lens B from January 2027, followed by deposition to Lens A post-2030 until Life of Mine.

A total maximum discharge volume of 12,000,300 tonnes per annual period, with an instantaneous flow rate of 1,000 L/s, has been assessed. This volume applies where either Lens A or Lens B is operating at one time, or where both discharge points are operating concurrently.

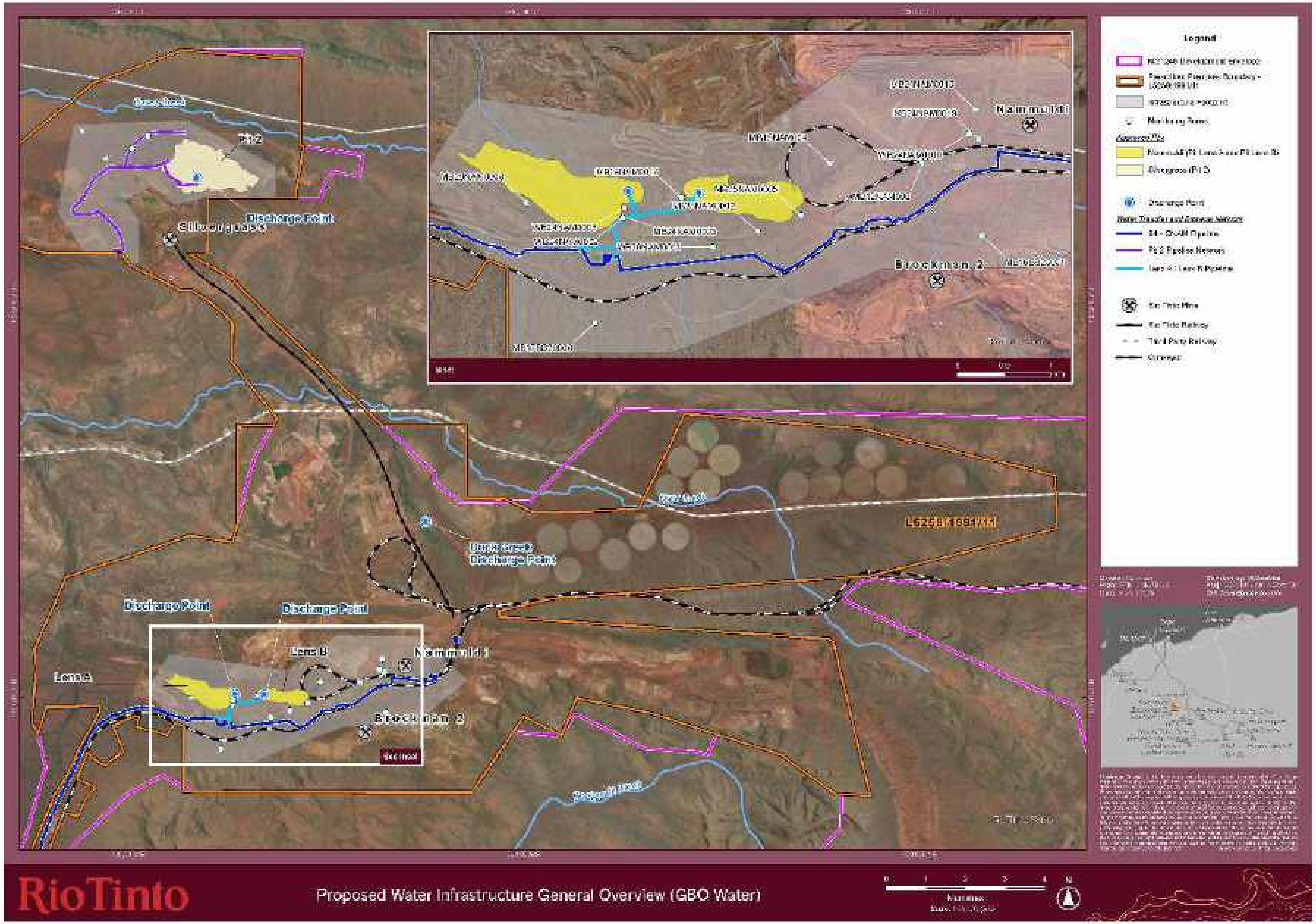

Figure 5.3: Greater Brockman Water Security – Pit Void Storage – General Arrangement

5.3.2 Pit Capacity and Development

The proposed in-pit discharge assessment is based on mine planning information current at the time of this application and focuses on pit water levels and storage capacity relevant to environmental risk.

For both Lens A and Lens B, the absolute maximum pit water level is constrained by the pre-mining groundwater level of 574 mRL. Maximum potential pit void storage capacities have been estimated on this basis, with indicative capacities of up to approximately 36 GL for Lens A and 8 GL for Lens B.

Indicative pit void capacity curves for Lens A and Lens B are provided in Figure 5.4 and Figure 5.5, respectively, to illustrate relative storage capacity up to the pre-mining groundwater level.

Pit geometry and depth are subject to mine planning and are provided for design context only. Operational pit water levels will be managed through the application of an appropriate freeboard below the pre-mining groundwater level to ensure no overflow or uncontrolled discharge occurs.

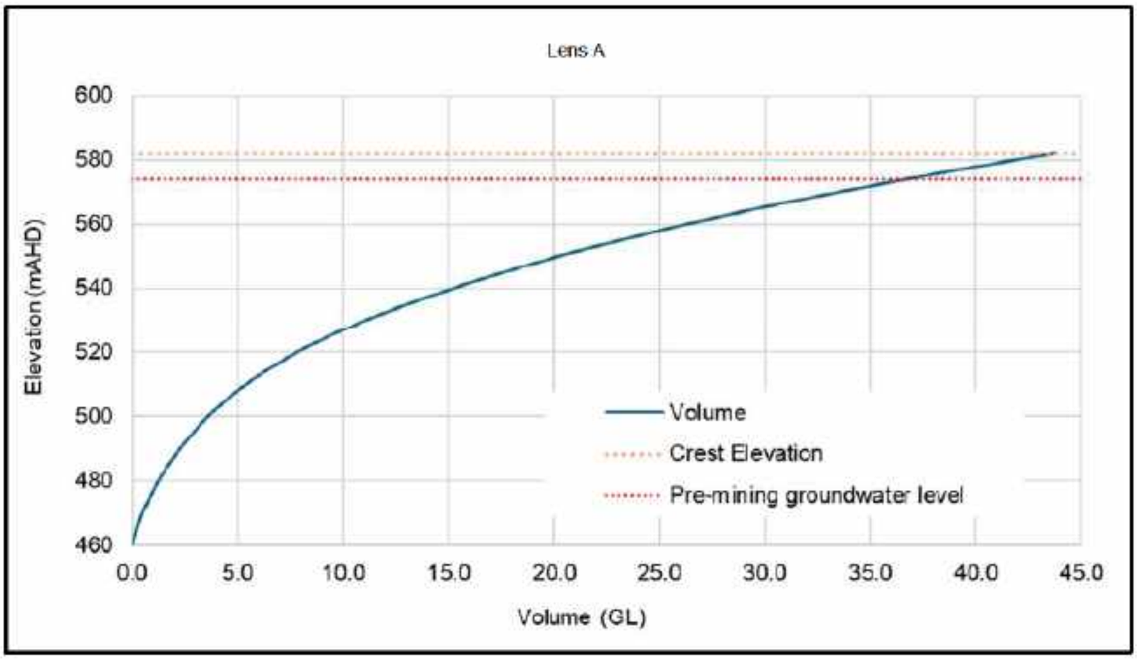

Figure 5.4: Lens A Capacity Curve

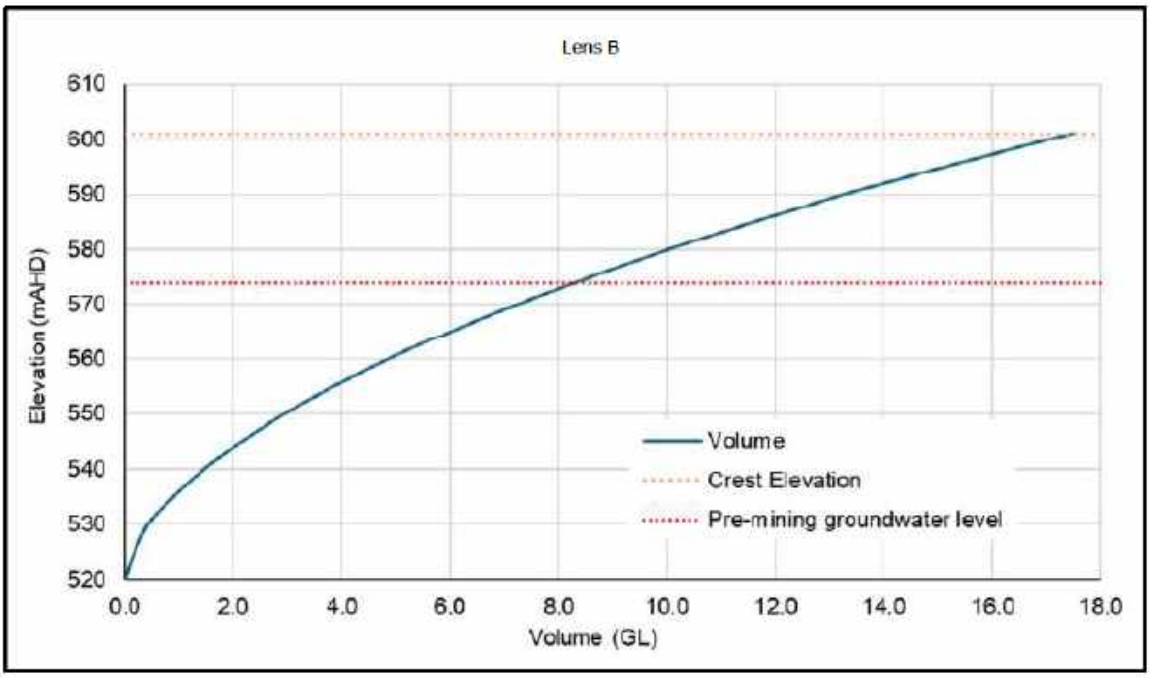

Figure 5.5: Lens B Capacity Curve

5.3.3 Water Balance

A pit Water Balance Model (WBM) (WSP, 2025b) was developed to inform the strategic planning for the operational phase focusing on:

- Understanding water levels: Analyse inflows, outflows, and overall water fluxes, which are modelled to assess changes in water volume over the simulation period under a stochastic climate time series.
- Quantifying water volume excess: Evaluate the technical feasibility of repurposing disused pit voids, specifically Lens A and B, for mine dewatering discharge and for longer-term surplus-water drawdown management.

The maximum discharge volumes predicted by the WBM are 12,000,300 tonnes per annual period.

The results of the WBM support the suitability of discharge to Lens A and/or B pit voids. Results are summarised as follows:

- All modelled water balance scenarios show pit water levels below regulatory (pre-mining) groundwater levels, with 95th percentile results confirming compliance.
- The dominant water loss mechanism is seepage, and the most significant inflow component is the surplus water generated from overall site operations.
- Overtopping is unlikely under the baseline anticipated discharge scenario, with the results indicating that the pits have sufficient storage capacity to contain runoff from the Probable Maximum Precipitation (PMP) 72 hour storm event.

The primary water source will be mine dewatering from the BS4 Hub, which will be supplied via the B4 to Nammuldi water transfer pipeline. This represents the most significant water source for discharge into the pits. Additional inputs into the pit include sources from the BS2 Hub dewatering network.

Water is lost from the pit lake via evaporation and infiltration. Groundwater is abstracted via the existing production/dewatering bore network.

Pit filling was constrained to remain below the pre-mining groundwater level of 574 mRL. The scenario covers the period from 1 January 2027 when discharge commences, to 31 December 2050 which aligns with the end of mining.

A conceptual model illustrating the proposed water retention is shown in Figure 5.6.

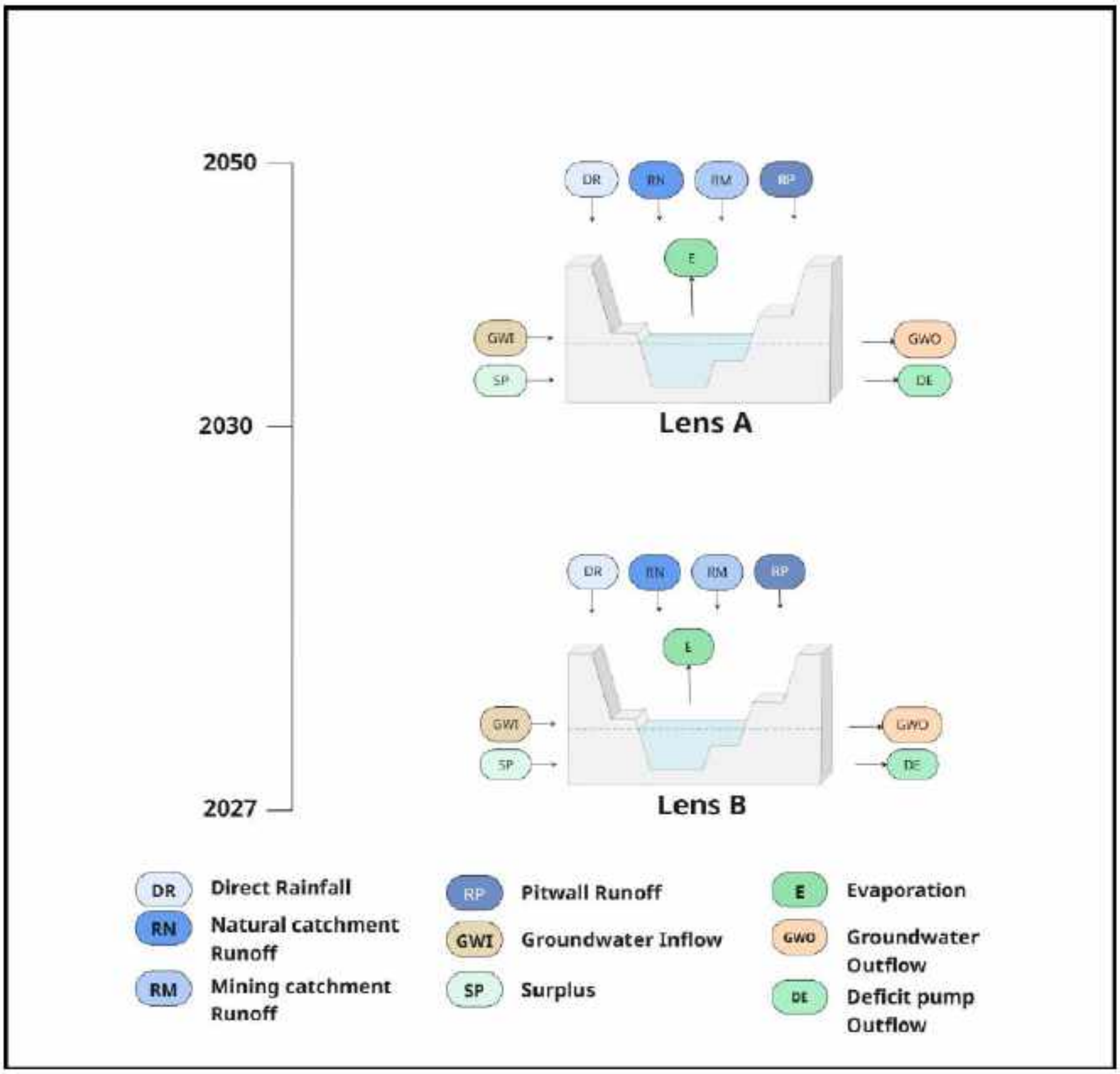

Figure 5.6: Water balance conceptual model

The modelled scenario is summarised below and is based on water availability conditions. This scenario assumes a mine dewatering contribution of up to 22.5 ML/d in 2028 reducing to approximately 7.4 ML/d in 2039 as shown in Figure 5.7.

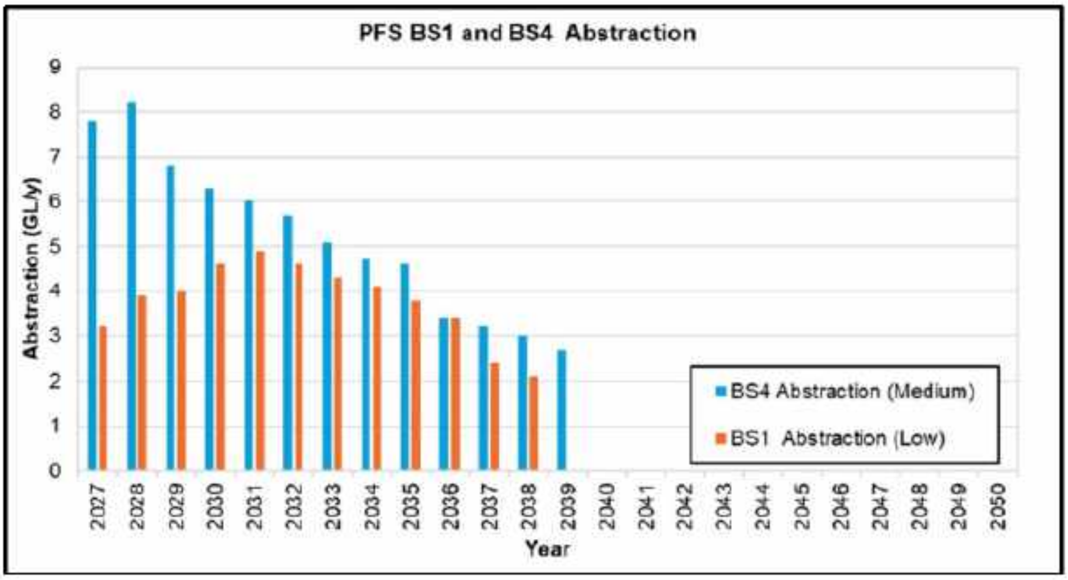

Figure 5.7: BS1 and BS4 abstraction rates for the modelled WBM scenario

The WBM results for this conservative scenario are summarised in Table 5.2, Figure 5.8 and Figure 5.9, and indicate:

- Generally low water levels in the pit over the whole simulation. The maximum pit water level is estimated to be below half of the total pit depth.
- The pit water level remains below the pre-mining water level (574 mRL), even for the 95th percentile results. The maximum 50th percentile pit water level is below the pre-mining water level by 38.4 m (Lens B) and 73.1 m (Lens A).

Table 5.2: Summary of water balance model results

Element	Lens B	Lens A
Pit elevations (mRL)		
Pit crest elevation	601	582
Pre-mining water elevation	574	574
Pit base elevation	520	460
Maximum modelled water level (mRL)		
5th percentile	535.5	498.2
50th percentile	535.6	500.9
95th percentile	536.2	536.2
Distance below pre-mining water level and maximum modelled water level in the pit (m)		
5th percentile	38.5	75.8
50th percentile	38.4	73.1
95th percentile	37.8	67.8
Estimated time frame when pit depletes of water		

Element	Lens B	Lens A
5th percentile	2030[1]	June 2035
50th percentile	2030[1]	August 2035
95th percentile	2030[1]	November 2035

[1] Lens B depletes in 2030 due to seepage and evaporation only; deposition goes to Lens A commencing from 2030.

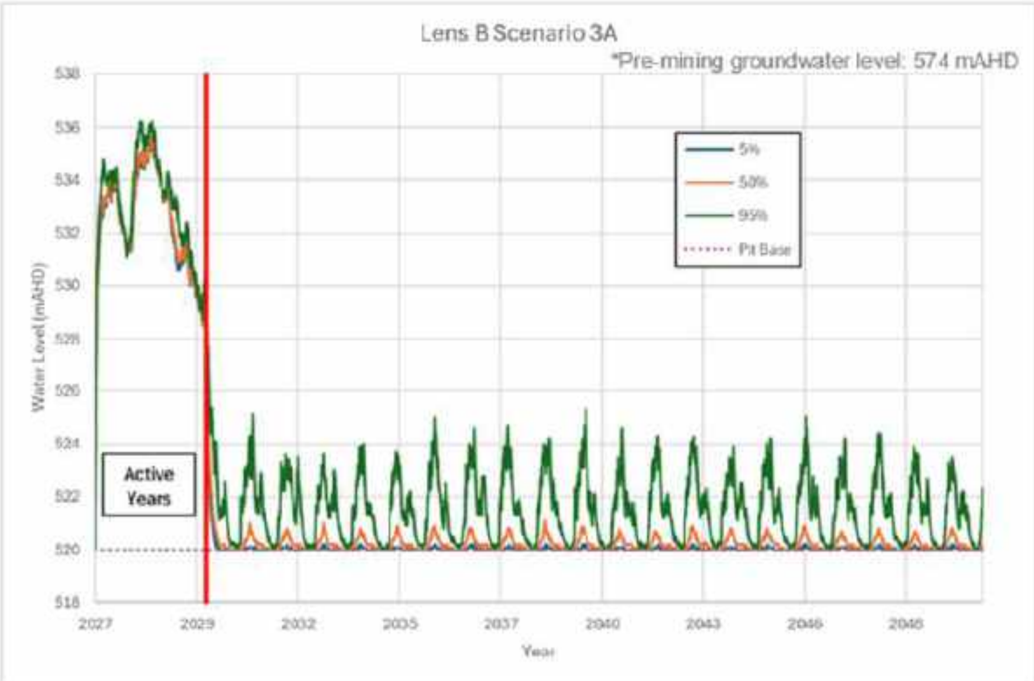

Figure 5.8: WBM results summary – Lens B

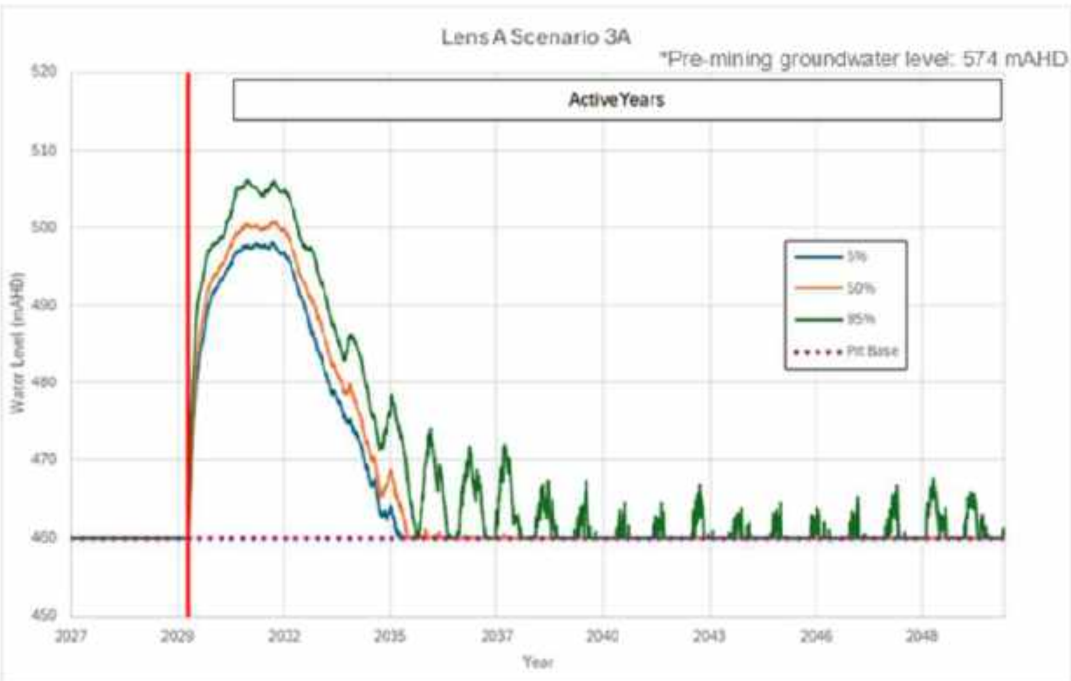

Figure 5.9: WBM results summary – Lens A

5.3.4 Hydrogeology

Existing groundwater conditions at Lens A and B are summarised in Section 4.4.7.1, with conceptual hydrogeology and pre-mining groundwater levels shown in Figure 4.7.

Active dewatering to support BWT mining currently occurs at the BS2 Hub, resulting in drawdown of the pre-mining groundwater level of up to 154 m bgl and 74 m bgl, as shown in Figure 5.10. Lens A and B are located close to the focal zones of drawdown, therefore any seepage from discharge to the pits is expected to remain confined within the mining areas.

Figure 5.11 illustrates the drawdown from existing operations in relation to the pre-mining water level in a vertical fence section, which also illustrates the aquifer compartmentalisation created by dolerite dykes. Discharge into Lens A and B will occur within an existing cone of drawdown. As a result, any seepage from in-pit discharge is expected to remain hydraulically contained within the mining area, limiting the potential for off-site migration and reducing the likelihood of impact to environmental receptors.

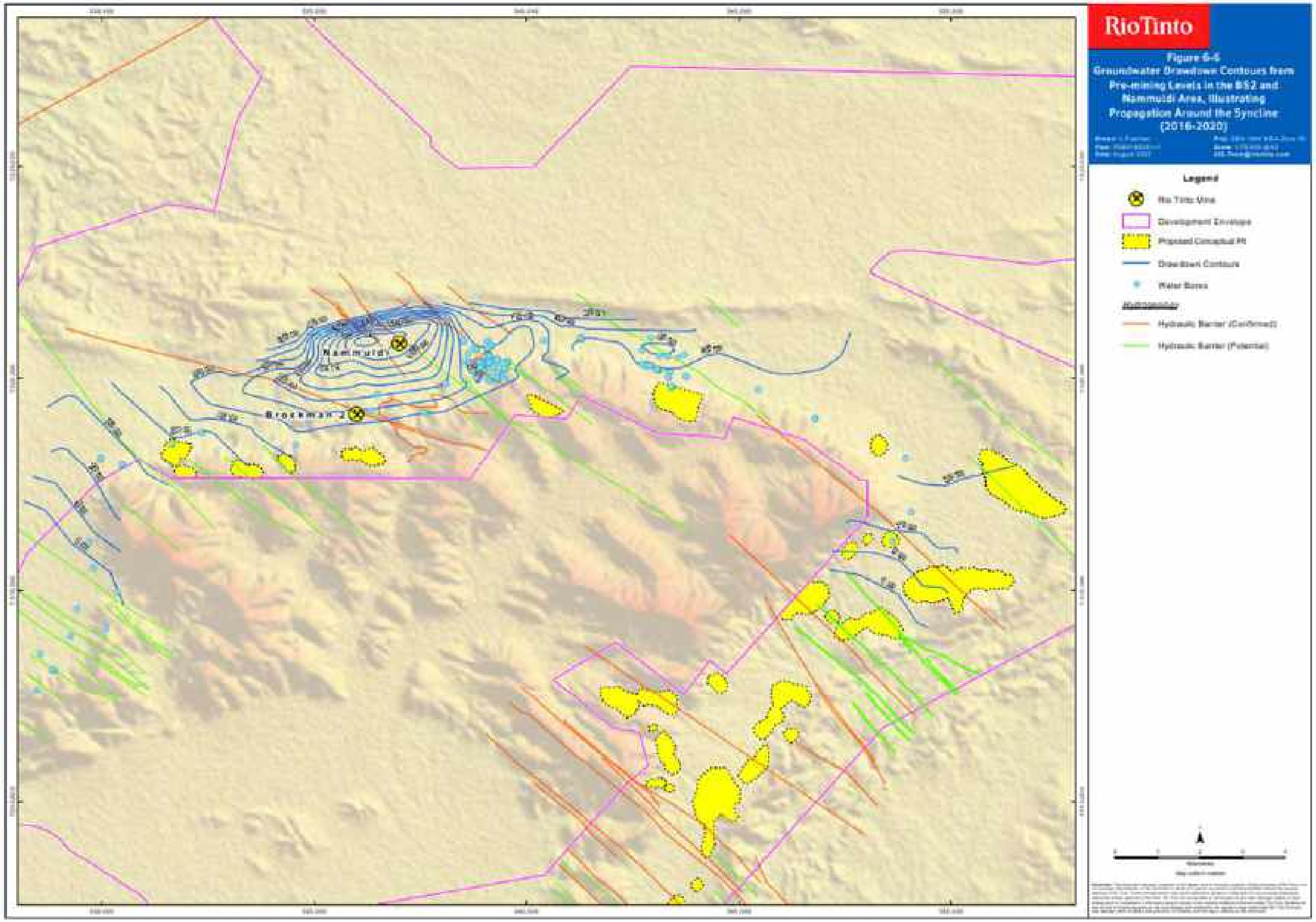

Figure 5.10: Lens A and B groundwater level drawdown contours (Rio Tinto, 2023a)

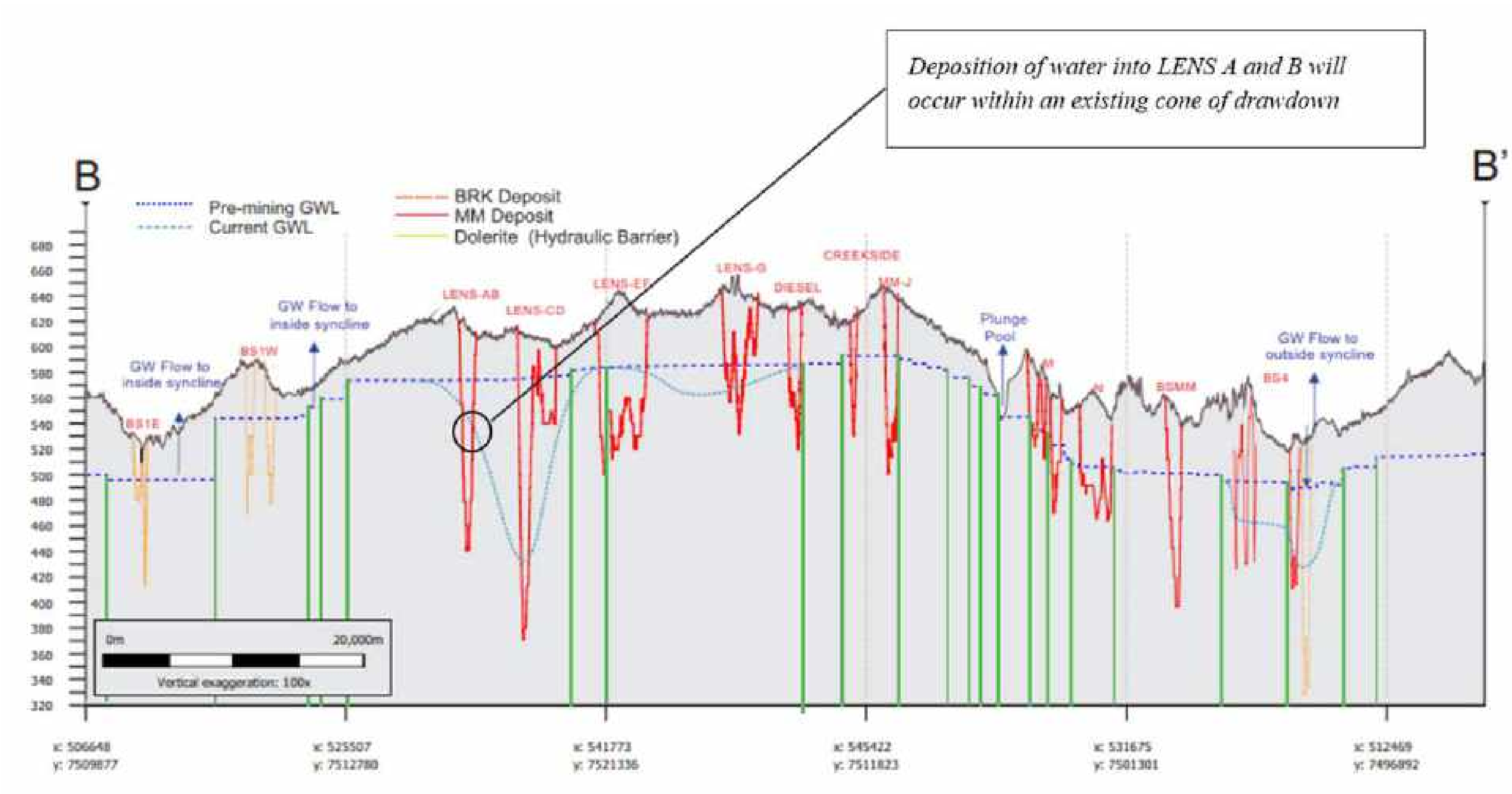

Figure 5.11: Brockman Syncline fence section, showing pre-mining and current groundwater levels (Rio Tinto, 2023a)

5.3.4.1 Seepage

Numerical groundwater modelling (WSP, 2025a) was undertaken to assess seepage associated with the proposed in-pit discharge. The modelling demonstrates that seepage remains hydraulically contained within the mining area, with a low likelihood of off-site migration or impacts to environmental receptors.

Figure 5.12 presents a schematic representation of seepage plume evolution associated with discharge to Lens B (prior to 2030) and Lens A (post-2030), with operational controls in place, including the exiting production/dewatering bore network. Higher seepage rates are predicted for Lens B (up to approximately 37 ML/day), reflecting higher permeability and a shallower pit floor. Prior to 2030, the seepage plume is expected to migrate preferentially towards Lens A and Lens CD; however, it remains confined within the mining area. Following the transition of discharge to Lens A post-2030, seepage migration towards Lens CD is predicted to reduce further, with a relatively small plume forming around Lens A. In all scenarios, seepage remains contained within the mining area.

Groundwater abstraction to support operational requirements and site water balance objectives will be carried out in accordance with Groundwater Licence (GWL) 107421 and the supporting Greater Brockman 2 / Nammuldi and Silvergrass East Operations GWOS.

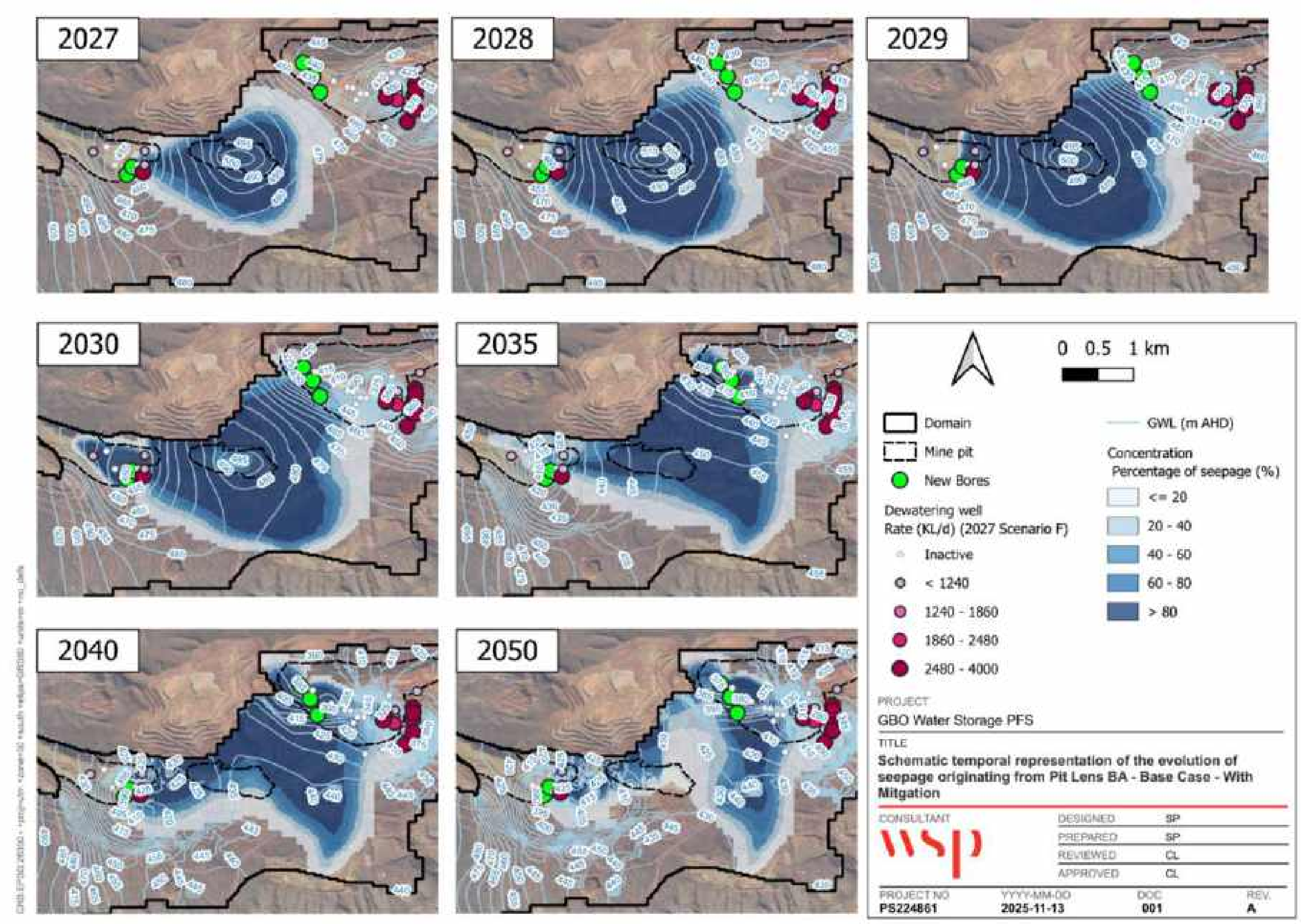

Figure 5.12: Schematic representation of seepage plume evolution from Lens B (before 2030) and Lens A (after 2030) with mitigation

5.3.5 Water Quality Characterisation

Water quality for the source water has been characterised as part of a Geochemical Desktop Assessment, which included a water quality review and development of a conceptual model for the site (WSP, 2025a). As shown in Figure 5.13, the source water includes:

- Water discharged into the pits as sourced from mine dewatering from the BS4 Hub. This represents the largest inflow of water, with water quality characterisation summarised in Section 5.3.5.1.
- Water discharged into the pits as sourced from mine dewatering from the BS2 Hub.
- Groundwater entering the pit voids through the hydraulic gradient with the surrounding water table.
- External catchment runoff, from exposed land area around the pits and the pit walls.
- Direct rainfall.

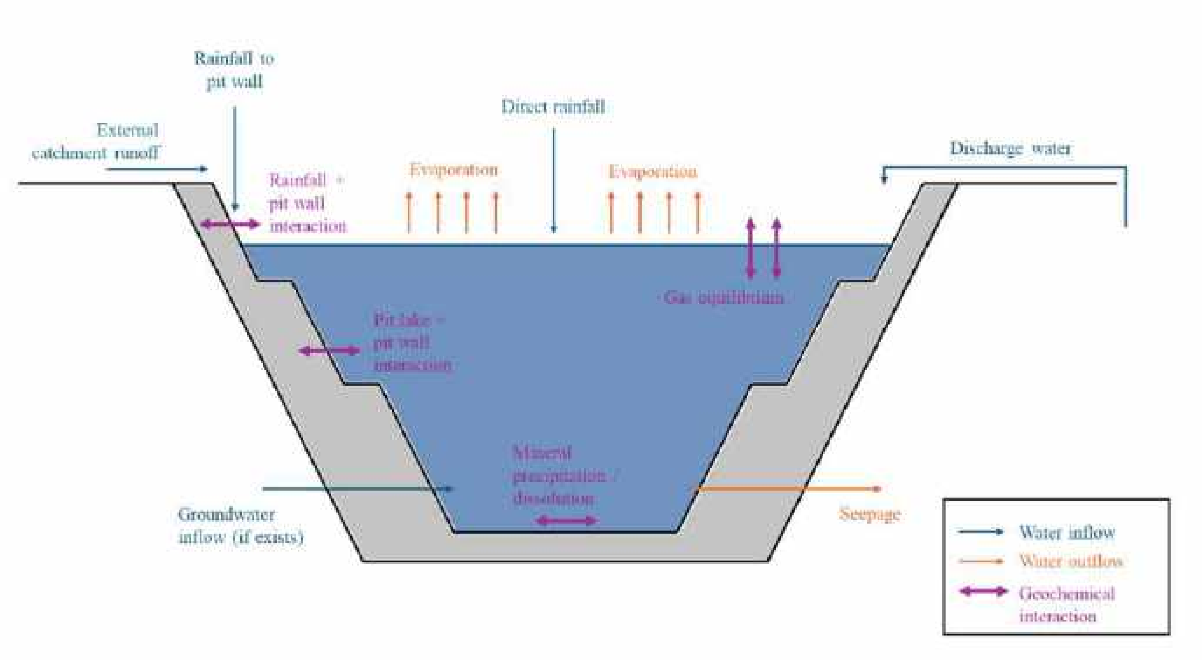

Figure 5.13 Water Balance Conceptual Model (Lens A and B) (WSP, 2025b)

5.3.5.1 Mine water and groundwater surrounding Lens A and B

Monitoring and production bores were used to assess water quality for the BS4 Hub (mine dewatering) and Lens A and B (surrounding water table). Appendix A presents statistical outcomes for key parameters, with default guideline values included for reference only. Red cells indicate parameters exceeding ANZG (2018), ANZECC/ARMCANZ (2000) default trigger values, or in the case of nitrate, hardness adapted values for Pilbara waters in line with van Dam et al (2022). Key analytes related to stygofauna health are also highlighted for reference.

The results indicate that the water quality parameters are consistent and comparable between sites, and that concentrations of metals, metalloids and nutrients in the groundwater at both the source and receiving environment are low. A comparison between the receiving groundwater quality at Lens A and B and the quality of mine dewatering water proposed for discharge into the pits indicates the following:

- pH: pH values for the discharge water and groundwater at Lens A and B range from slightly acidic to slightly alkaline. Compared to Lens A and B, BS1 shows slightly lower values, (median pH 7.0 compared with pH 7.7 at Lens A and B).
- Salinity: Compared to Lens A and B, the mean salinity at BS1 is slightly higher by 280 mg/L, but fresher at BS4 by 66 mg/L. The salinity of pit water was further assessed by salt accumulation modelling as described in Section 5.3.7.
- Sulphate: Mean concentration (129 mg/L) at BS1 is marginally higher than Lens A and B (68 mg/L). ANZG (2018) does not specify a universal aquatic ecosystem trigger value.
- Manganese: The mean concentration at BS1 and BS4 is slightly elevated compared to Lens A and B but remains below the Guideline Level Value of 1.9 mg/L for the protection of 95% of water-dependent ecosystems.
- Other Metals: All other measured metals at BS1 - BS4 show lower concentrations than those recorded in at Lens A and B.

These results indicate that the dewatering water proposed for discharge in Lens A and B is of similar quality to the surrounding groundwater.

5.3.5.2 Other sources

Source terms for the lithologies associated with pit wall and external catchments, based off geochemical leachate testwork, indicate that the external runoff entering Lens A and B pits is expected to be generally circum-neutral and fresh, and dissolved metal and nutrient concentrations are generally low (WSP, 2025a).

Direct precipitation onto the pit lake surface is expected to have low concentrations of dissolved constituents and to be in equilibrium with atmospheric gases (WSP, 2025a).

5.3.6 Geochemical Characterisation

A geochemical assessment was completed of the geology at Lens A and Lens B, as summarised in Table 5.3 (WSP, 2025a). Pit wall mapping indicates the Lens A and Lens B voids are considered Non-Acid Forming (NAF) with no identified sources of acid and/or metalliferous drainage (AMD).

Table 5.3: Geochemical characterisation summary (WSP, 2025a)

Item	Lens A	Lens B
Deposit geology	Detrital Iron and bedded Marra Mamba Iron Formation Deposits	
Geochemical Characterisation studies	Low sulphur concentrations and low or negative net acid producing potential associated with the Lens A and B pit walls.	
Geochemical Database	Low sulphur content (all values <0.1 %S) Net acid producing potential values all negative No potentially acid forming samples	Low sulphur content (all values <0.1 %S) Net acid producing potential values all negative No potentially acid forming samples

Item	Lens A	Lens B
Acidic and Metalliferous Drainage Risk Assessments	Low risk No predicted PAF pit wall exposures.	

5.3.7 Pit Lake Water Quality Assessment

An assessment is underway to evaluate the potential for the deposition of water to influence water quality through interaction with pit wall materials and incoming water sources. It draws on existing characterisation studies, recent pit wall mapping and model predictions to determine whether there are any risk of acid and/or metalliferous drainage or other adverse geochemical outcomes. Preliminary results indicate that the proposed water discharge in Lens A and B is not likely to result in significant changes in water quality or impacts to groundwater environmental receptors, as summarised below.

5.3.7.1 Salt Accumulation Modelling

Salt accumulation modelling was undertaken for the proposed discharge scenario using the mean inflow and outflow volumes from the WBM (WSP, 2025a).

Predicted TDS concentrations during deposition at Lens B (2027–2030) and subsequently at Lens A (2030–2035) reflect discharged water, with concentrations showing minimal change and remaining near 700mg/L (Figure 5.14 and Figure 5.15). Once deposition ceases, Lens B retains a small but permanent water volume, with TDS varying seasonally between approximately 10 and 750 mg/L. Once deposition ceases at Lens A minimal water levels persist (typically <50 cm depth).

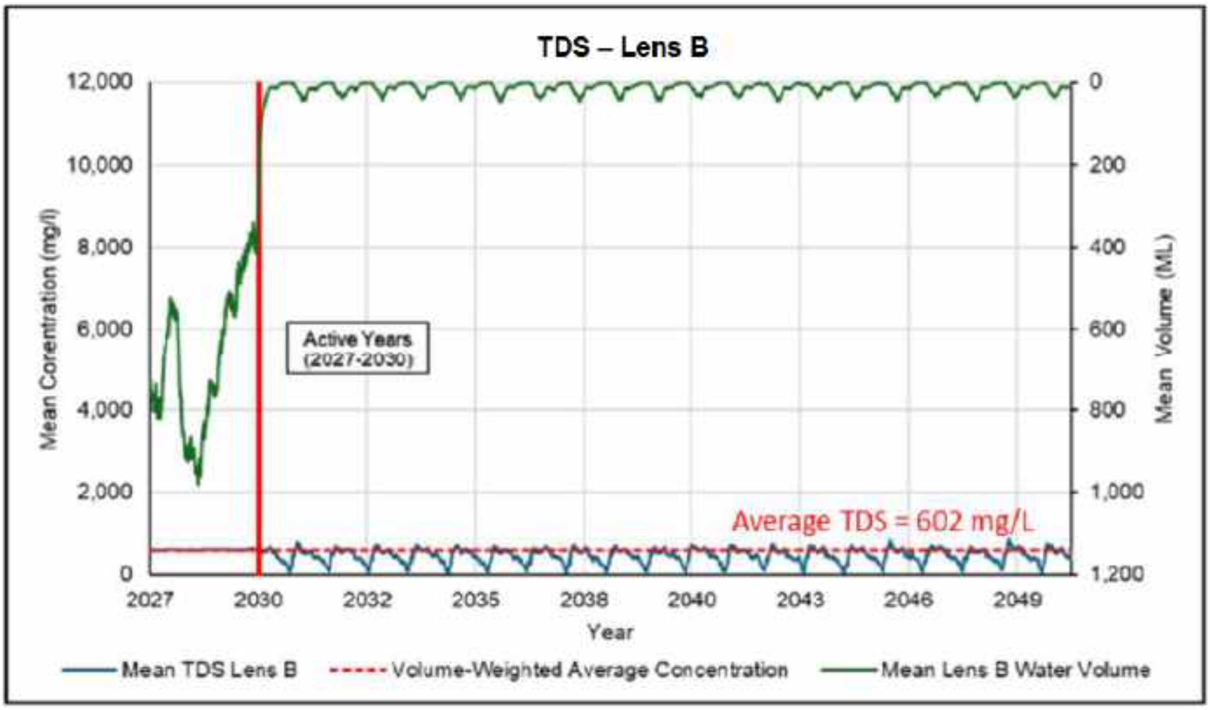

Figure 5.14: Mean annual predicted TDS for Lens B

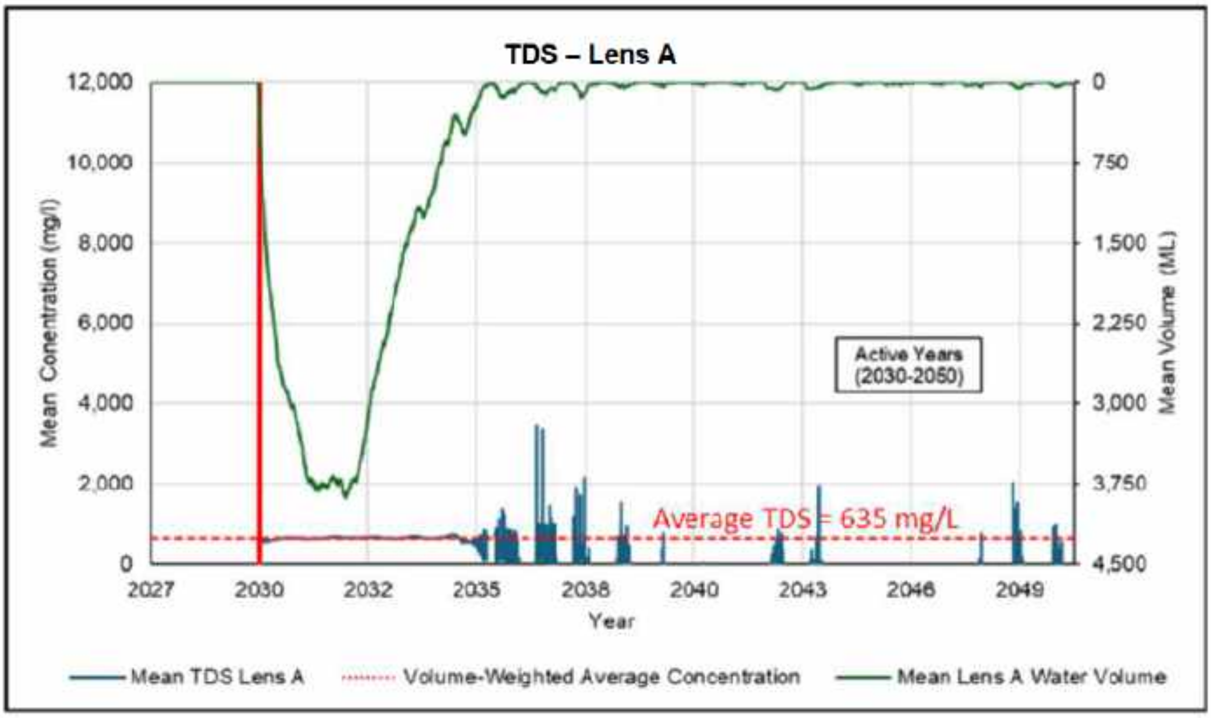

Figure 5.15: Mean annual predicted TDS for Lens A

Overall, the salt accumulation modelling indicates no material risk associated with evapoconcentration for short-term water retention for any scenario. The predicted TDS concentrations remain within the freshwater range and close to the input TDS range of the discharge water (i.e., 520-1,056 mg/L). Evaporation-driven increases in salinity only become prominent when residual pit lake water volumes are extremely low. Given the low geochemical risk associated with the pit wall lithologies of Lens A and Lens B (Section 5.3.5), it is unlikely discharge will result in a material risk to water quality.

5.3.7.2 Geochemical Pit Lake Model

A model for pit lake (as formed by stored water) water quality was developed to evaluate the quality of water stored in Lens A and B over time, to determine whether the pit lakes may present potential environmental concerns during the water retention timeframe. The model utilises previously derived geochemical source terms for pit wall material, groundwater chemistry, and previously derived source terms for external catchment run-off and direct precipitation with no identified sources of AMD (WSP, 2025c).

The model includes the following key features:

- The model date and duration, and water inflow and outflow rates, aligns with the Water Balance as summarised in Section 5.3.3. At the commencement of water storage, no pit lake will exist in either of the two voids. Thereafter, the pit lake that forms is assumed to be fully mixed at all timesteps.
- The model mixes the contribution of each water source to the pit lake at each model timestep. Source term water quality is summarised in Section 5.3.5.
- Evaporation during each timestep removes pure water from the decant pond, resulting in increased solute concentration.
- Seepage from the pit lake during each timestep removes both water and dissolved solutes as a mass flux, without changing the concentration of solutes in the remaining pond water.

- Geochemical control mechanisms, such as mineral precipitation/dissolution, metal(loid) adsorption/desorption and atmospheric gas exchange are applied.
- Model sensitivity scenarios are undertaken to assess the effect of geochemical controls, and varying Water Balance Model scenarios on model results.

Preliminary results from the water quality modelling indicate that discharge of water into the Lens A or Lens B voids is not expected to result in significant changes to overall water quality. During the active deposition phase, water chemistry is primarily governed by the contribution of the discharge water sources, which is similar to that of the receiving groundwater (Section 5.3.7.1). This corresponds to the period in which pit lakes form at Lens A and Lens B and when seepage rates are at their peak. In the period following discharge, the main contributors to the chemical load become external catchment runoff and solute release from the exposed pit walls identical to the current condition of the voids. These inputs are not expected to significantly alter the receiving groundwater environment, as predicted seepage volumes during these later stages are very low (Section 5.3.3).

5.3.8 Geotechnical and Stability Assessment

A preliminary geotechnical assessment of pit wall stability was undertaken for Lens A and Lens B pits with various groundwater scenarios (PSM, 2025). The pits were analysed based on the current understanding of mining development prior to the commencement discharge and subsequent water retention. The assessment found that both pits meet the Design Acceptance Criteria at the assessed sections where critical infrastructure and heritage sites are located, for both a full pit lake scenario and at projected 2027 water levels.

An assessment of the risk of a seiche wave overtopping the pits was undertaken for Lens A and Lens B pits. The assessment indicated that the risk of overtopping was low, with the maximum calculated wave run up elevations below pit crest level.

The results of the preliminary geotechnical slope stability assessment indicate that the overall stability of the Lens A and Lens B pits under proposed discharge conditions are acceptable. Refinement of the slope stability models will define the critical locations for monitoring (i.e. vibrating wire piezometers) during operation, and inform the final slope design for Lens A.

Further refinement of the slope stability models will include:

- Detailed pore pressure modelling to refine the effects of seepage and pore pressure buildup in low permeability material horizons.
- Refinement of the material parameters based on the current performance of the pits, noting that these are unlikely to significantly change the current results.
- Defining the critical locations for on-going monitoring of the slopes during operation, with the locations and details (i.e. vibrating wire piezometers) for monitoring.

5.3.9 Operational Readiness

5.3.9.1 Water Management

Following approval of this LAA, the Lens A and B discharge points will be authorised under Category 6 and surplus mine dewatering from the BS4 Hub and BS2 Hub will be discharged to the pit voids. Lens A and B will be used for the temporary retention of surplus mine dewatering and to support improved water management practices across the GBO. Drawdown will be completed with sufficient time to complete pit backfill at closure. Closure will be in accordance with the existing Brockman Operation Mine Closure Plan (Rio Tinto, 2023b).

5.3.9.2 Freeboard

Based on the results of the water balance model as described in Section 5.3.3, overtopping of Lens A or B is unlikely under the baseline discharge scenario. The results indicate that the pits have sufficient storage capacity to contain runoff from the Probable Maximum Precipitation (PMP) event. Adequate freeboard, below the pre-mining groundwater level, will be maintained during discharge.

5.3.9.3 Proposed Monitoring

Groundwater monitoring is proposed throughout the life of the water retention operation in line with the indicative monitoring locations, parameters, and frequencies included in Table 5.4 and illustrated in Figure 5.3.

This monitoring will be implemented in addition to the existing monitoring as described in the Greater Brockman 2/ Nammuldi and Silvergrass East Operations GWOS and the BSP EMP.

Table 5.4: Proposed Lens A/B Monitoring Schedule

Monitoring Location	Monitoring Location Name	Current Status	Easting	Northing	Parameters	Frequency
Monitoring bores[1]	MB12NAM006	Existing	535852	7520413	Groundwater level	Monthly
	MB15NAM004	Existing	534859	7520410		
	MB19NAM0016	Existing	533268	7520045		
	MB20NAM0008	Existing	531604	7519993		
	MB24NAM0003	Existing	532646	7519843		
	MB24NAM0010	Existing	536430	7520987		
	MB24NAM0019	Existing	536461	7520670		
	MB25NAM0005	Existing	534543	7519858		
	MB16BS20001	Existing	536495	7519629		
	MB17BS20006	Existing	532341	7518707		
	WB24NAM0002	Existing	532634	7519828	Physical parameters[2] Water quality[3]	Quarterly (physical parameters) Annually (water quality)
	WB24NAM0003	Existing	532654	7519931		
	WB24NAM0010	Existing	536354	7520729		
	WB25NAM0002	Existing	534082	7519682		
	WB26NAM0001	Existing	533609	7519508		
Waterbody	Pit lake (Lens B)[5]	Proposed	N/A	N/A	Pit water level	Weekly (pit water level via survey)
	Pit lake (Lens A)[6]	Proposed	N/A	N/A		
Discharge	Lens B discharge	Proposed	-	-	Cumulative discharge volume	Monthly (discharge volume)
	Lens A discharge	Proposed	-	-		

[1] Where a monitoring bore is damaged, destroyed or rendered inaccessible for monitoring purposes, a representative monitoring bore can be used in the interim while a replacement monitoring bore is installed.

[2] pH, electrical conductivity (EC) and temperature.

[3] TDS, TSS, Total Hardness, Major Ions (CO_3, HCO_3, Ca, Na, K, Mg, SO_4, Si, F, Fe, Al, Cl); Trace Metals (Ag, As, B, Ba, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, U, Zn); and Nutrients (Total P, Total N, NO_2, NO_3, NH_4).

[4] Surface water levels monitored by mine survey team.

5.3.9.4 Operating Procedures

The Licence Holder will implement mitigation measures through site operating procedures, including the preparation of an Operations, Maintenance and Monitoring Manual (OMMM) that outlines routine maintenance activities such as inspections, cleaning, lubrication, and equipment calibration.

These measures will be implemented in addition to the existing monitoring requirements outlined in the Greater Brockman 2 / Nammuldi and Silvergrass East Operations GWOS and the BSP EMP.

5.4 Project Details - SGE MAR Scheme Pressure Relief Discharge

5.4.1 Design

The SGE MAR Scheme is the proposed management action to protect sensitive groundwater-dependent ecosystems, while supporting the future recommencement of BWT mining. Up to 11 GL/annum will be abstracted from existing SGE dewatering bores for conveying to the MAR scheme for recharge back into the same aquifer.

For the system to operate safely, provision is required for emergency pressure relief via discharge to a designated area. SGE Pit 2 has been identified as a suitable discharge location, where water will be discharged to SGE Pit 2 in the event the SGE MAR source water supply line becomes over-pressurised and/or to facilitate maintenance activities. This is expected to occur infrequently once the system is commissioned and calibrated; however, the approved discharge point will be required for the life of the MAR Scheme.

During the maximum discharge scenario, water is expected to be directed to Pit 2 at an average rate of 350 L/s during commissioning, which equates to approximately 800,000 tonnes per annual period. The discharge line will begin at an offtake from the existing SGE Pit 2 header line, continuing to the edge of SGE Pit 2, and ends in discharge manifold with an indicative arrangement shown in Figure 5.16. The discharge line will be controlled by a pressure relief valve.

The current design and modelling for the proposed pressure relief discharge are based on mine plans current at the time of this application and may be refined as design and operational requirements evolve. All infrastructure will remain within the proposed infrastructure footprint, noting that the final configuration may differ from the indicative site layout.

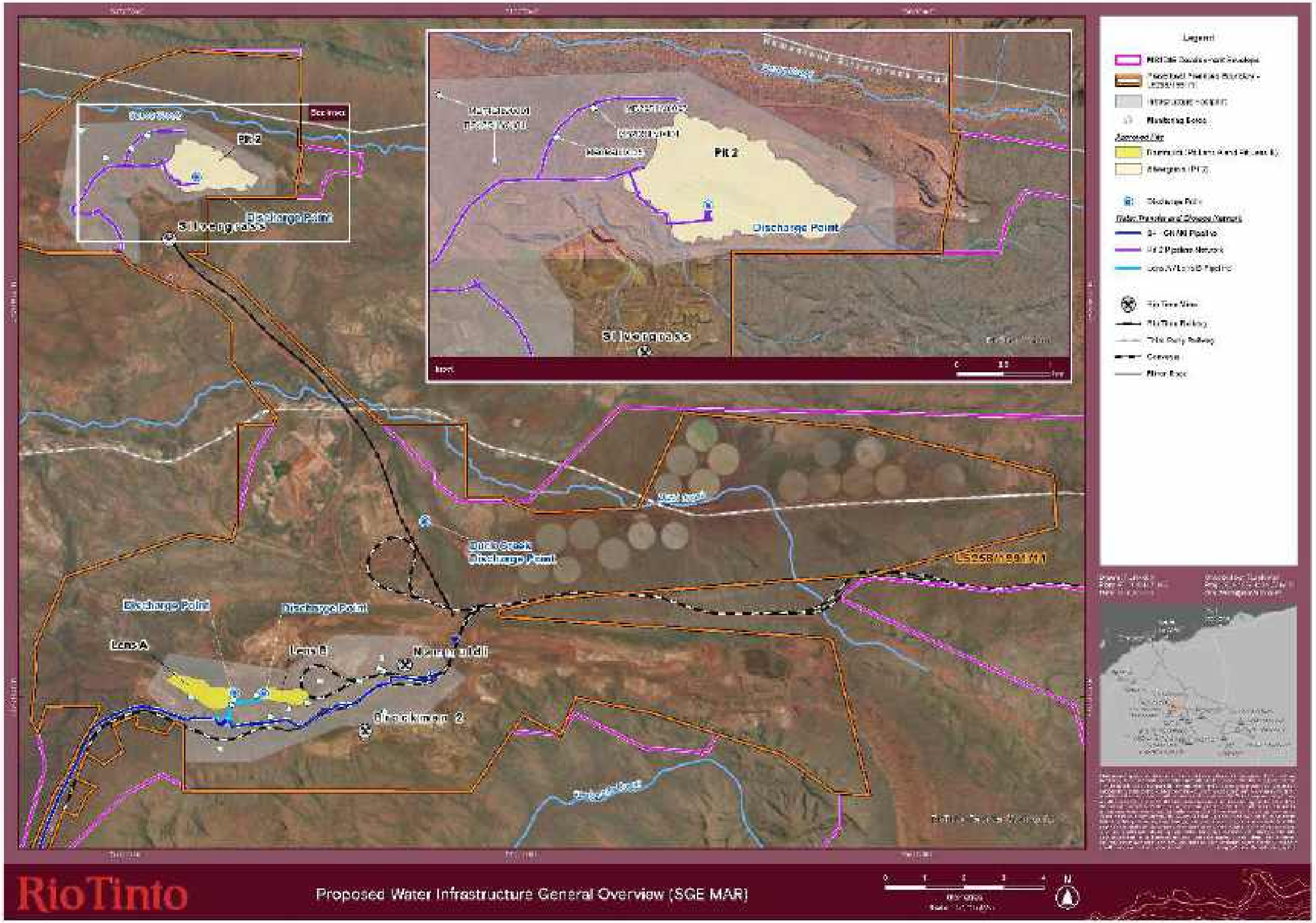

Figure 5.16: SGE MAR Pressure Relief Discharge Indicative General Arrangement

5.4.2 Pit Capacity and Development

Under the proposed pressure relief discharge scenario, the indicative maximum pit depth of SGE Pit 2 is 480 mRL, with a maximum potential capacity of approximately 17 GL based on a maximum potential water level of 564 mRL i.e. the spill level; or 10GL based on the pre-mining groundwater level of 546.5 mRL (WSP, 2026a).

Indicative capacity curves for SGE Pit 2 under the proposed discharge scenario is shown in Figure 5.17.

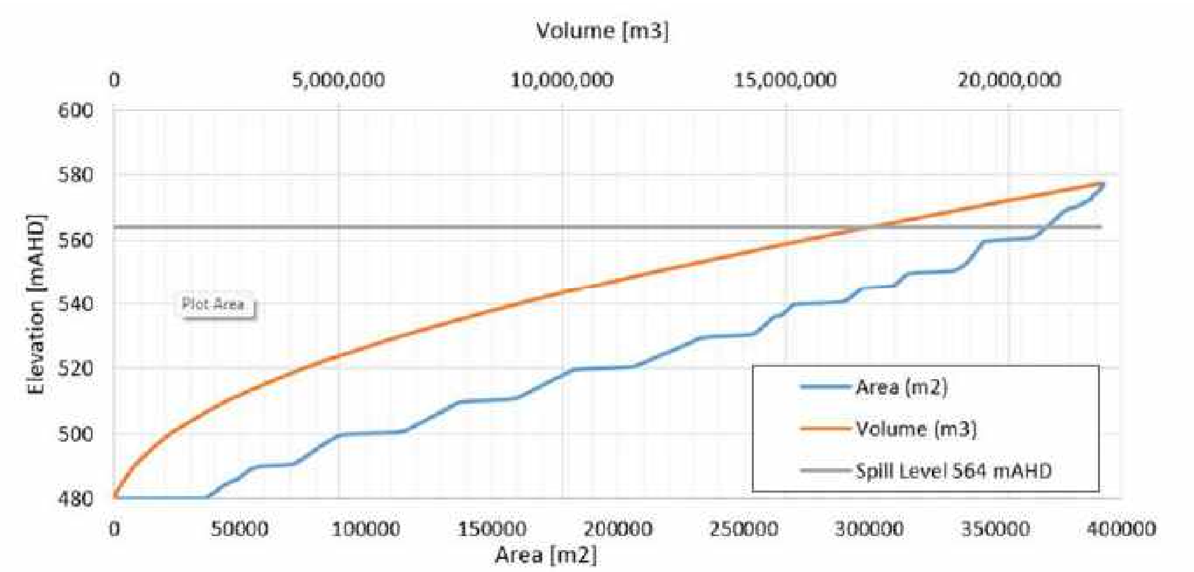

Figure 5.17: SGE Pit 2 Capacity Curve

5.4.3 Water Balance

Currently, Pit 2 is experiencing a water level rise of approximately 9 m over one year due to groundwater inflow. The water proposed to be discharged into SGE Pit 2 is the same water used for the SGE MAR Scheme, supplied from existing SGE dewatering bores.

A pit Water Balance Model (WBM) (WSP, 2026a) was developed to inform the strategic planning for the operational phase focusing on:

- Understanding water levels: Analyse inflows, outflows, and overall water fluxes, which are modelled to assess changes in water volume over the simulation period under a stochastic climate time series.
- Quantifying water volume excess: Evaluate the technical feasibility of repurposing SGE Pit 2 for pressure relief discharge of water as described in Section 5.4.1.
- Assess water quality in the pit based on Total Dissolved Solids (TDS) concentrations.

A conceptual site model illustrating the proposed pressure relief discharge is shown in Figure 5.18, with the inflows and outflows listed below:

Inflows:

- Direct precipitation (DP).
- Local catchment runoff (CR).

- Pit wall runoff (PWR).
- Groundwater inflow (GWI).
- Pressure release discharge supply line (OP_SL).

Outflows:

- Groundwater outflow (GWO).
- Evaporation (E).
- External spilling (ES) if water level exceeds spill elevation

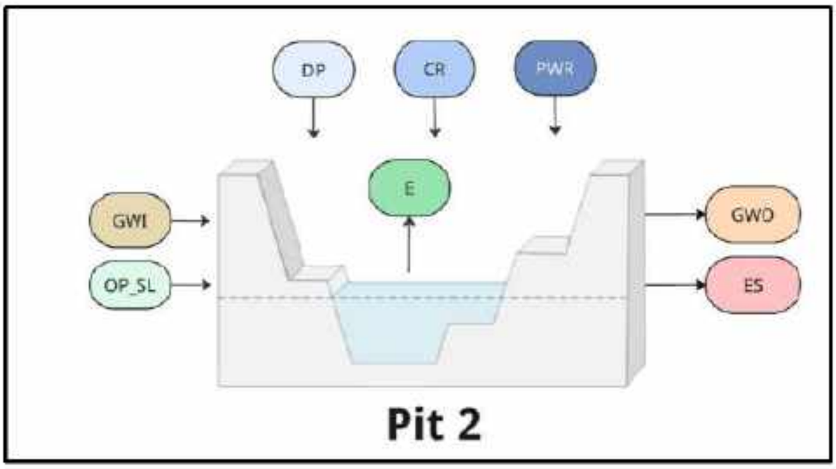

Figure 5.18: SGE Pit 2 water balance conceptual model

The greatest rate of discharge for pressure relief is anticipated during the commissioning phase of the SGE MAR Scheme. In the WBM, the rate of discharge was set as 350 L/s for 12 hours every week on Mondays throughout the period 1 January 2026 to 1 January 2027 (considered analogous to the commissioning period). This corresponds with a maximum discharge volume of 800,000 tonnes per annual period.

The results of the WBM support the suitability of utilising SGE Pit 2 for the proposed pressure relief discharge. Results are summarised as follows:

- Water balance results show pit water levels below regulatory (pre-mining) groundwater levels during the simulated period.
- The dominant inflow component is groundwater inflow prior to commissioning of the SGE MAR on 1 October 2026. Outflow is via groundwater abstraction and evaporation, with groundwater outflow influenced by abstraction via dewatering bores associated with the SGE MAR Scheme from 1 October 2026 onwards.
- Overtopping is unlikely, as modelled peak water level is expected to reach 520.4 mRL i.e. 43.6 m below the spill level of 564 mRL.
- Modelled peak water level of 520.4 mRL is 26.1 m below the pre-mining groundwater level of 546.5 mRL.
- Pit water levels will remain very low following commencement of regional groundwater abstraction by SGE dewatering bores in 1 October 2026, as shown in Figure 5.19. Commencement of the SGE MAR and associated pressure relief discharge will result in a net decrease to the pit water volume.

- After the commissioning phase (Year 1), even under a conservative assumption of a single day of shutdown per month, any pressure release discharge at the modelled discharge rate is not expected to result in a material impact on pit water levels. At this stage of operations, pit dewatering is anticipated to be well advanced and the pit lake is expected to be near dry as shown in Figure 5.19, such that the risk of pit lake overtopping is minimal.
- Similarly, pressure release discharge at the modelled rate after commissioning is not expected to materially alter the groundwater flow field. Instead, any associated seepage would most likely be intercepted by the nearby borefield, similar to the simulated results presented in Figure 5.19. Consequently, offsite migration of seepage is considered unlikely.

Water quality is expected to remain fresh, and similar to the water quality of the groundwater nearby (<1,000 mg/L TDS) throughout the simulation due to throughflow flushing, with occasional peaks when pit water volume is low. Discharge into the void does not influence water quality. Accordingly, the pressure-relief discharge is assessed as posing no material risk of pit water level overtopping or off-site seepage migration.

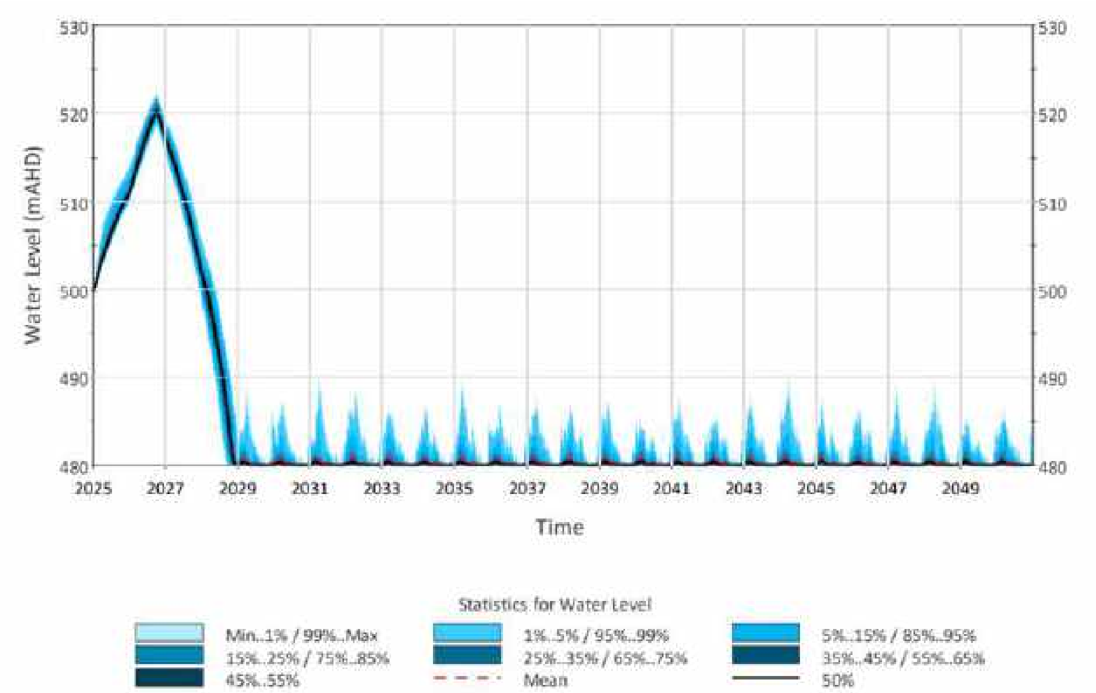

Figure 5.19: WBM results summary – SGE Pit 2

5.4.4 Hydrogeology

Existing groundwater conditions for SGE Pit 2 are summarised in Section 4.4.7.2.

A numerical groundwater model (WSP, 2025d) was developed to:

- Estimate seepage from the in-pit pressure relief discharge at SGE Pit 2 to the surrounding groundwater system.
- Assess the fate of seepage to delineate the potential impact area.

The groundwater modelling indicates a low risk of impact associated with off-site migration of seepage from SGE Pit 2. The key findings are summarised below:

- The maximum pit water level is estimated to be 519.5 m AHD, which is 27 m lower than the pre-mining groundwater level of 546.5 m AHD (the regulatory limit), and 44.5 m lower than the spill level of 564 m AHD, indicating sufficient freeboard.
- The pit lake behaviour was found to be sensitive to the groundwater abstraction near SGE Pit 2. The modelling indicates that with the significant increase in abstraction from October 2026, the pit water level and seepage peak at 519.5 m AHD and 5.6 ML/d, respectively. The pit lake is predicted to become dry in late 2028.
- Solute transport modelling suggests seepage from SGE Pit 2 is likely captured by the nearby dewatering bores to the west and northwest of the pit.

5.4.4.1 Seepage

Figure 5.20 shows the predicted seepage plume at four-time steps. Solute transport modelling was undertaken in a relative manner where the concentration values represent percentages of the source term. To ensure the seepage plume extent is not underestimated, maximum concentration values across the three model layers are shown in Figure 5.20.

The model results indicate seepage from Pit 2 is likely to flow towards the west and northwest, being drawn to the nearby dewatering bores. Despite the pit water level peaking just before October 2026 (Figure 5.19), there is a lag effect where the seepage plume reaches the maximum extent approximately one year after. As the pit lake dries up in October 2028 (Figure 5.19), the seepage plume gradually shrinks, with minimal residual concentration values at the end of the simulation.

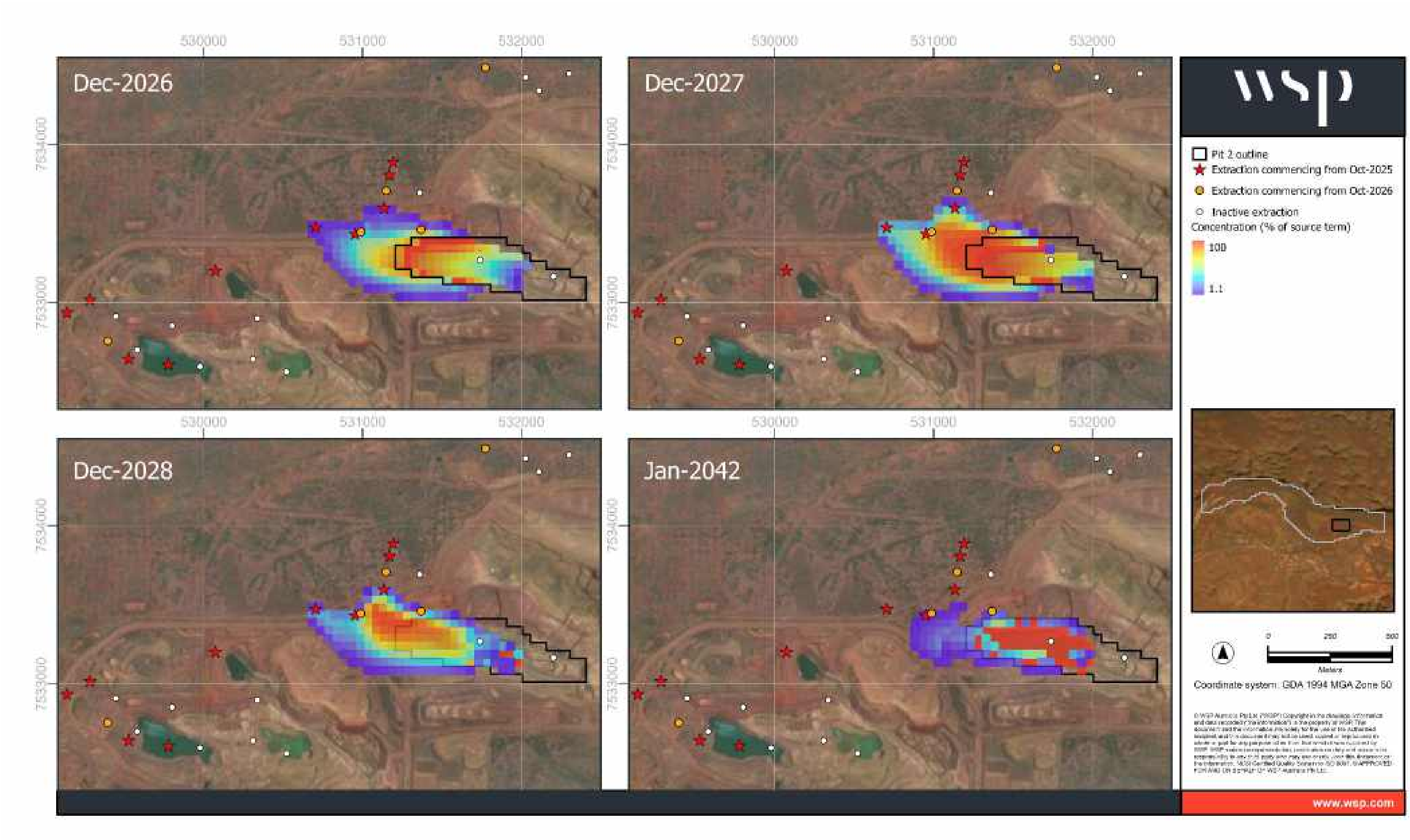

Figure 5.20: Schematic representation of seepage plume evolution from SGE Pit 2

5.4.5 Water Quality Characterisation

Water quality for the SGE Pit 2 pit lake has been characterised as part of a Pit Lake and Groundwater Compatibility review (WSP, 2025e). As shown in Figure 5.21, this water includes:

- The existing pit lake, which has formed from groundwater entering the pit void through the hydraulic gradient with the surrounding water table following cessation of BWT mining in SGE Pit 2.
- Water discharged into the pit i.e. excess SGE MAR source water. This water is sourced from groundwater extracted from SGE dewatering bores.
- External catchment runoff, from exposed land area around the pits and the pit walls.
- Direct rainfall.

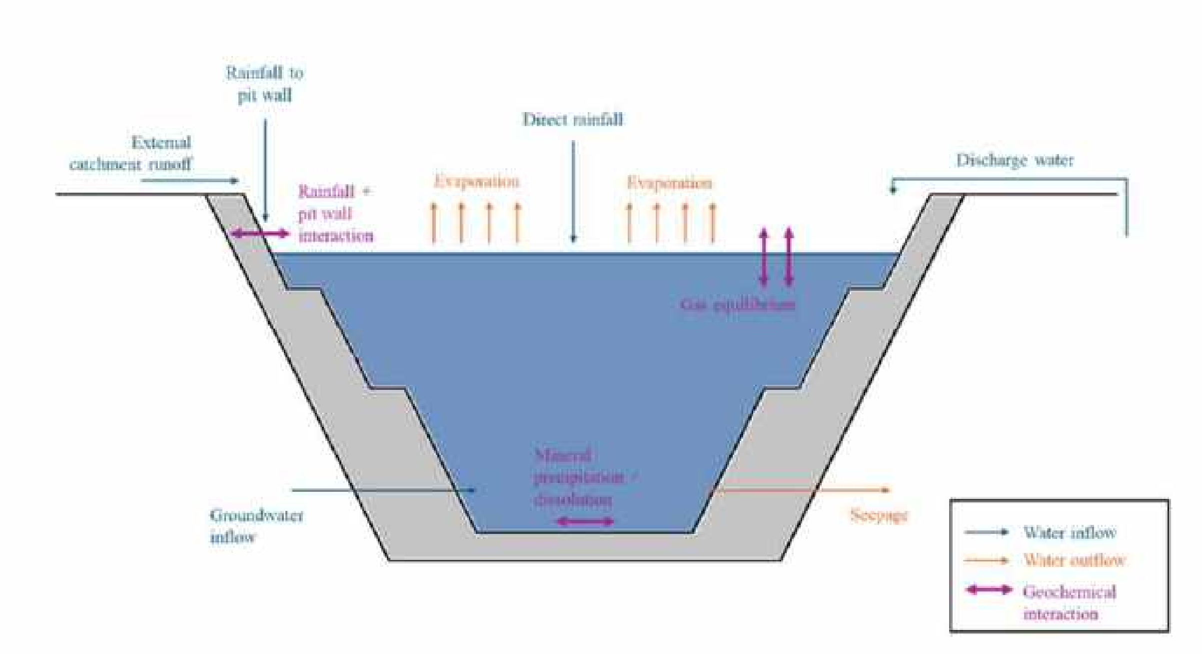

Figure 5.21: SGE Pit 2 Water Balance Conceptual Model (WSP, 2025e)

5.4.5.1 Mine water discharge and existing pit lake

The mine water proposed to be discharged into SGE Pit 2 is defined by source terms based on groundwater quality from the following rock formations hosting groundwater aquifers:

- Marra Mamba Iron Formation (MM).
- Wittenoom Formation (WF).
- Detritals (DET).

Monitoring and production bores from the surrounding areas were used to define source terms. The derived groundwater source terms are presented in Appendix B, representing water quality of each source. The results indicate that the source water and the receiving water i.e. the pit lake and surrounding groundwater are of similar quality and have very similar composition.

The groundwater within the area is generally slightly basic and fresh, and dissolved metal and nutrient concentrations are generally low.

The water quality in the existing pit lake in SGE Pit 2 was characterised using water quality monitoring data from May 2024 and is presented in Appendix B. The water in the pit lake is generally slightly basic and fresh, and dissolved metal and nutrient concentrations are generally low.

5.4.5.2 Other sources

SGE Pit 2 is considered analogous to Lens A and B pits, as it's a Marra Mamba void with low AMD risk. Water associated with surface runoff is likely to be generally circum-neutral and fresh, with dissolved metal and nutrient concentrations likely to be generally low (WSP, 2025c).

Direct precipitation onto the pit lake surface is expected to have low concentrations of dissolved constituents and to be in equilibrium with atmospheric gases (WSP, 2025c).

5.4.6 Geochemical Characterisation

The SGE deposit occurs on the northern flanks of the Marra Mamba (MM) Iron Formation range and extends beneath an overlying alluvial sequence. Bedded mineralisation has been interpreted as a generally continuous envelope between the lower West Angela Member (ANG) and the base of the upper Mount Newman Member (NEW), with minor mineralisation also occurring within the detrital overburden.

SGE is considered to pose a low Acid Rock Drainage (ARD) risk, as significant volumes of acid-generating material are unlikely to be exposed during mining (Rio Tinto, 2010; Rio Tinto, 2014; Rio Tinto, 2021) and are not exposed on the current pit walls. Water quality measurements from the existing pit lakes, including SGE Pit 2, show neutral pH and low metal concentrations, confirming that the site exhibits a low ARD risk.

Exposed land surface within the external catchment area around Pit 2 consists primarily of detrital material. The source term developed for the detrital material was used to represent the external catchment chemical composition.

5.4.7 Pit Lake Water Quality Assessment

This geochemical modelling assessment aims to address relevant legislation concerning the geochemical properties of water quality/chemistry. The scope of work includes the following:

- Conceptualise the geochemical model and present the overall geochemical modelling, including battery limits, selected thermodynamic database, model inputs, geochemical interactions, and sensitivity scenarios.
- Develop the primary source terms and provide associated rationale/references.
- Predict the long-term evolution of water quality in the Pit 2 lake under the consideration of discharge of water into the pit.
- Determine, at a conceptual level (by comparison to guideline values), whether the predicted lake water quality may impact the surrounding environment.

5.4.7.1 Salt Accumulation Modelling

A high level estimation of salinity (TDS) concentrations was conducted using a mass balance mixing model, based on predefined concentrations for each inflow (WSP, 2026a). This was intended as a high-level assessment and did not account for geochemical processes such as mineral precipitation, dissolution, adsorption, or other chemical processes/reactions.

A minimum water volume was defined for water quality calculations in case the lake dries down. This was set at level 480.2 mRL (approximately 0.2 m above the pit base, ~7 ML). This prevents the model from predicting unrealistically high TDS concentrations when the lake volume is very low.

The model results indicated that water quality remains fresh (<1,000 mg/L TDS) throughout the simulation due to throughflow flushing, which removes TDS from the system. Discharge results in no significant change to water quality within the void. Figure 5.22 shows the probabilistic results for the water quality concentration.

Water discharge into SGE Pit 2 was included as an input during MAR commissioning only, when discharge rate due to pressure relief is expected to be at its highest. As shown in Figure 5.22, the influence of the proposed pressure relief discharge on pit lake TDS is expected to be low, as TDS remains consistent prior to the pit lake becoming near-dry in late 2028.

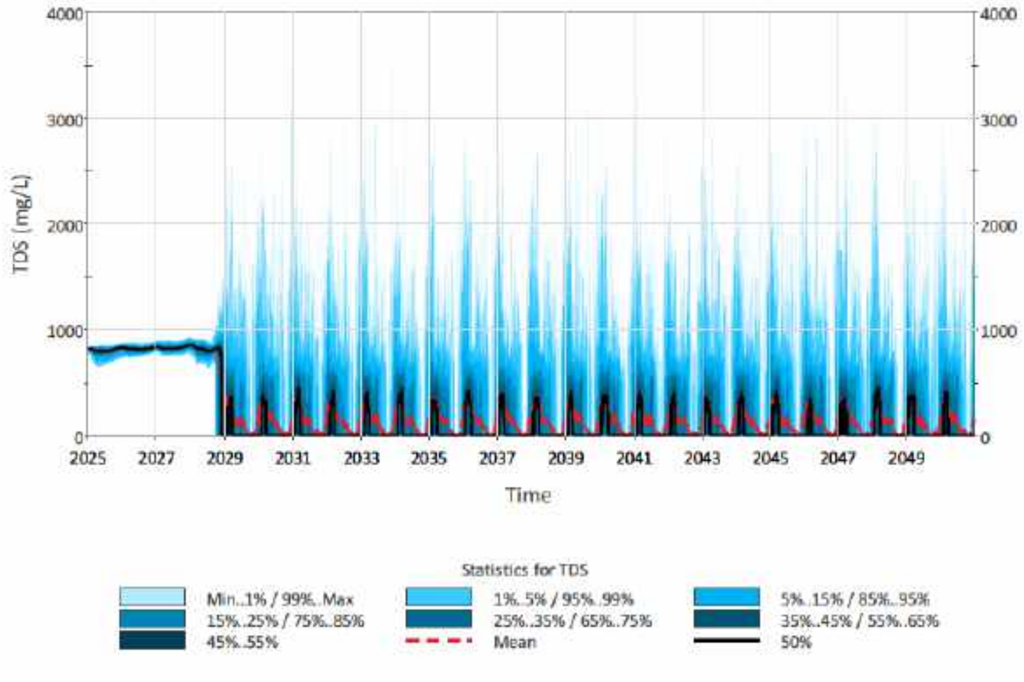

Figure 5.22: Mean predicted TDS for SGE Pit 2

5.4.7.2 Geochemical Pit Lake Model

A model for pit lake water quality was undertaken, using mean output values from the water balance model, to evaluate the quality of water accumulating in SGE Pit 2 over time, to determine whether discharge into the pit lake may present risk of potential environmental impact (WSP, 2026b). As part of this modelling, the influence of the proposed pressure relief discharge on pit water quality was assessed.

Modelling results indicate that temporary discharge for pressure relief discharge from the SGE MAR is not likely to adversely affect pit lake water quality. The predicted water quality of the SGE Pit 2 lake is broadly comparable to the local groundwater environment, with most parameters remaining near or below the P_{95} concentrations of surrounding groundwater.

It should be noted that the discharge water quality is similar to the already-developed pit lake at SGE Pit 2, and generally of better quality - i.e., lower concentrations of TDS, Na, Cl, and SO_4 and similar concentrations of dissolved metal(loid)s, which are typically below the limit of reporting.

The modelling results suggest that water quality of the SGE Pit 2 lake will remain circum-neutral and non-saline. The water quality is predicted to evolve through time, primarily driven by changes in water inflow contributions and seasonal variation, with SGE MAR pressure relief discharge having no significant negative impact on pit lake water quality.

5.4.8 Geotechnical and Stability Assessment

Total water volume is anticipated to be low and is unlikely to cause more than a 1 m increase in water level within the pit, as summarised in Section 5.4.3.

The geology of the Pit 2 area comprises members of the Marra Mamba Iron Formation overlain by detrital material on the western end. The pit walls in the discharge area are largely bedded Newman Member, with bedding dipping into the pit at 20-50°.

Geotechnical analysis for the currently operational pit shows stability is sensitive to pore water pressure changes within the pit walls, however the impact from the SGE MAR pressure relief discharge will be negligible. The pit wall is also sensitive to small changes in bedding orientation, which is currently being managed with reconciliation mapping.

While localised scouring associated with discharge may result in minor undercutting at the discharge point, visual inspections will enable the early identification of any potential risk to slope stability. Visual inspections will be undertaken following each discharge event and will form part of routine operational procedures.

Existing operational controls include pore pressure monitoring using vibrating wire piezometers (VWPs), groundwater monitoring via monitoring bores and stab holes, displacement monitoring using prisms, and routine visual inspections undertaken by the site geotechnical team. These controls are considered sufficient to manage geotechnical risk associated with the commencement of discharge.

5.4.9 Operational Readiness

5.4.9.1 Water Management

Following approval of this LAA, SGE Pit 2 will be available for pressure release discharge to support the ongoing operation of the SGE MAR Scheme. Dewatering water will be discharged into SGE Pit 2 via new water transfer pipelines that will connect into the SGE MAR water transfer pipelines.

SGE Pit 2 will allow for the discharge of surplus water for a temporary period with drawdown of the pit lake to be completed with sufficient time to complete pit backfill at closure. Closure will be in accordance with the existing Brockman Operation Mine Closure Plan (Rio Tinto, 2023b).

5.4.9.2 Freeboard

Based on the results from the water balance model as described in Section 5.4.2, overtopping of SGE Pit 2 is unlikely under the baseline discharge scenario, with the results indicating that the pit has sufficient storage capacity to contain runoff from the Probable Maximum Precipitation (PMP) event.

Adequate freeboard will be maintained for the life of the SGE MAR Scheme.

5.4.9.3 Proposed Monitoring

Monitoring will be undertaken for the duration of the pressure-relief discharge operation in accordance with the monitoring locations, parameters and frequencies set out in Table 5.5, with groundwater monitoring locations shown in Figure 5.16.

The proposed monitoring is supplementary to existing monitoring undertaken in accordance with the Greater Brockman 2 / Nammuldi and Silvergrass East Operations GWOS, the BSP EMP, and the current requirements of Licence L5258/1991/11 for the SGE MAR Scheme.

Table 5.5: Proposed Monitoring Schedule (SGE MAR Pressure Relief Discharge)

Monitoring Location	Monitoring Location Name	Current Status	Easting	Northing	Parameters	Frequency
Monitoring bores[1]	MB14SILV0001	Existing	528849	7534347	Groundwater level Physical parameters[2] Water quality[3]	Monthly (groundwater level) Quarterly (physical parameters)[4] Annually (water quality)
	MB20SILV0001	Existing	530524	7534213		
	MB20SILV0003	Existing	530505	7534206		
	MB09SILV025	Existing	530111	7533895		
	RC17SILV0161	Existing	529450	7533645		
Discharge	SGE Pit 2 pressure relief discharge	Proposed	-	-	Cumulative discharge volume	Monthly

[1] Where a monitoring bore is damaged, destroyed or rendered inaccessible for monitoring purposes, a representative monitoring bore can be used in the interim while a replacement monitoring bore is installed.

[2] pH, electrical conductivity (EC), temperature.

[3] TDS, TSS, Total Hardness, Major Ions (CO_3, HCO_3, Ca, Na, K, Mg, SO_4, Si, F, Fe, Al, Cl); Trace Metals (Ag, As, B, Ba, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, U, Zn); and Nutrients (Total P, Total N, NO_2, NO_3, NH_4).

[4] Physical parameters will be monitored quarterly during commissioning and annually during standard SGE MAR Scheme operation

5.4.9.4 Operating Procedures

The Licence Holder will incorporate mitigation measures into site operating procedures, including:

- An operational management plan covering all phases of operation;
- The operation of physical and electronic control systems, including automated mechanical valves and associated electrical and communications systems linked to local and remote control centres; and
- A maintenance schedule incorporating routine inspection, cleaning, lubrication and calibration of relevant equipment.

These measures will be implemented in addition to the existing requirements of the GWOS and the BSP EMP.

6. Stakeholder Consultation

6.1 Regulatory Consultation

Quarterly meetings are held between the Licence Holder and DWER where project updates are provided, the last consultation was held on 24 February 2026.

6.2 Community Consultation

The Licence Holder has a long-term commitment to working with Pilbara communities and recognises that local communities have a direct interest in their activities. Substantial community consultation and public review of existing and proposed future operations at the BS2 Hub has occurred as part of environmental approval processes. Community consultation will continue to be undertaken to keep relevant communities up-to-date.

The Licence Holder has been consulting with WGAC since 2021 regarding the SGE MAR project. Consultation includes presentation at the monthly WGAC Board Meetings and ad hoc engagements and correspondence. On 14 May 2025 RTIO presented on the GBWSP at a WGAC Board Meeting. This was followed up by a discussion on 29 May 2025 and an email on 6 June 2025 which provided next steps and RTIO’s intent to proceed with the GBWSP as presented at the WGAC Board Meeting on 14 May 2025. Further details on timeframes and schedules were also provided at this time. The Licence Holder will continue consultation with WGAC.

7. Other Relevant Approvals

7.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

A decision to approve an extension to iron ore mining at Nammuldi-Silvergrass, Brockman 2 and Brockman 4 was made by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 5 March 2025, under Sections 130(1) and 133(1) of the EPBC Act.

The approval, with EPBC number 2019/8518, has effect until 28 September 2069.

7.2 *Environmental Protection Act 1986* – Part IV

The BS2 Hub was developed in multiple stages, beginning in 1998 and progressing to full operations approved under Ministerial Statement 558 (MS 558) in 2000, with mining commencing at Nammuldi in 2006. To support increased production, an expansion was referred in 2010 and approved under Ministerial Statement 925 (MS 925) in 2013.

Subsequent amendments allowed for expanded development, and mining at Silvergrass began in 2017. Ministerial Statement 1246 (MS 1246) was published in February 2025 for the Brockman Syncline Proposal (BSP) which includes the existing Brockman 2, Nammuldi and Silvergrass operations, superseding MS 925. Implementation of the BSP commenced in March 2025 and includes the extension and development of new above water table (AWT) and BWT deposits and associated activities to extend the life of the existing operations.

All clearing is within the approved Development Envelope and clearing limits authorised under MS 1246.

Ground disturbance activities will be planned to ensure minimal disturbance is achieved through the use of appropriate ground engaging equipment, use of designated tracks, roadways and use of pre-existing disturbed areas where appropriate.

The amendments proposed to Operating Licence L5298/1991/11 remain consistent with MS 1246.

7.2.1 Brockman Syncline Proposal Environmental Management Plan

The BSP EMP (March 2026) outlines the management of environmental values that may be affected by the BSP. The revised BSP EMP will be submitted on the 22 March 2026 and consolidates and supersedes the NSGE MMP.

7.3 *Rights in Water and Irrigation Act 1914*

The Licence Holder abstracts groundwater from a collection of bores across the operations under existing Groundwater Licence (GWL) 107421(26), issued under the *Rights in Water and Irrigation Act* 1914. GWL 107421(26) allows for abstraction of groundwater for the purposes of; dust suppression, earthworks, construction, exploratory drilling, general campsite use, mineral ore processing, mine dewatering, maintenance, potable water, and other mining purposes. Groundwater abstraction volumes and quality will continue to be managed via the existing Groundwater Licence, GWL 107421(26) and the associated Brockman 2, Nammuldi and Silvergrass East Operations GWOS.

An application to amend GWL 107421(26) was submitted to DWER Water on 16 January 2024 to update the terms, conditions, and restrictions of the GWL to reference the revised GWOS and add the reinjection of groundwater as an authorised water use. The revised GWOS was submitted to the Department for assessment in conjunction with the GWL application and addresses the operation of the SGE MAR Scheme and includes the water sharing arrangements across the GBO and in-pit water retention.

7.4 *Iron Ore (Hamersley Range) Agreement Act 1963*

The proposed pits for discharge are located on State Agreement Mineral Lease M4SA and as such, is subject to the *Iron Ore (Hamersley Range) Agreement Act 1963*.

8. Environmental Risk Assessment

A risk assessment has been prepared to identify the potential emissions from the proposed activities and the potential sources, pathways and receptors of those emissions, and proposed controls to manage potential emissions to determine a risk rating. The risk assessment has been based on the DWER Guidance Statement: Risk Assessments (released by the then named Department of Environmental Regulation in 2017) and the Rio Tinto risk assessment process, based on the following risk rating matrix (Table 8.1)

Table 8.1: Risk Rating Matrix

	Consequence				
Likelihood	Slight	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Table 8.2: Risk Assessment

Source/Activities	Potential Emissions	Pathway	Potential Receptors	Potential Impacts	Proposed Controls	Consequence	Likelihood	Residual Risk Rating	Detailed Assessment Required?
Construction									
Ground disturbing activities, construction activities, and mobile equipment (including light vehicles) vehicle/machinery movements.	Fugitive Dust	Air: windborne particulate (dust) emissions generated from unsealed surfaces during construction	The nearest sensitive land uses/users (human receptors) including: • Tom Price. • Hamersley Pastoral Lease. • Millstream-Chichester National Park. • Karijini National Park.	Given the distance to the nearest receptors, impacts to public health or amenity from nuisance dust are not expected.	Dust emissions will be managed via the existing Part V Licence L5258/1991/11 and standard operating procedures, including: • Dust suppression will be implemented (including use of water trucks, control of vehicle movements / restricted speeds) during operations. • Weather forecasts will be monitored, activities that have the potential to generate high dust levels may be restricted if there is risk of windy conditions.	Slight	Rare	Low	No
			General surrounding native vegetation	Reduced vegetation health.		Slight	Unlikely	Low	No
			Native fauna	Dust may degrade habitats which represent shelter, foraging and dispersal habitats for native fauna.		Slight	Unlikely	Low	No
			On site workforce and Homestead Camp	Human health impacts and amenity.		Slight	Rare	Low	No
Hydrocarbon spills during construction activities, from plant or mobile equipment	Hydrocarbons	Hydrocarbon spill from machinery	Land/soils	Soil contamination.	Hydrocarbons will be managed via relevant legislation and standards (including Australian Standard AS 1940-2004: Storage and handling of flammable and combustible liquids), the requirements of Part V Licence L5258/1991/11 and the following: • Spill response equipment will be provided on site and personnel trained in their use. • All vehicle maintenance requiring the use of oils, lubricants, and other automotive fluids to be conducted in a designated area. Standard hydrocarbon management and operating procedures are expected to effectively mitigate the risk of hydrocarbon spills during construction.	Minor	Rare	Low	No
		Seepage of hydrocarbon spill to groundwater causing contamination	Groundwater	Given the depth to groundwater and the groundwater pathway, any hydrocarbon spills are not expected to reach groundwater.		Slight	Rare	Low	No
		Overland runoff of contaminated stormwater (hydrocarbon spill) to surface water.	Surface waters (namely Duck Creek and Caves Creek) Riparian vegetation.	Transportation of hydrocarbons and alteration of water quality impacting surface water ecosystems including riparian vegetation.		Slight	Possible	Low	No

Source/Activities	Potential Emissions	Pathway	Potential Receptors	Potential Impacts	Proposed Controls	Consequence	Likelihood	Residual Risk Rating	Detailed Assessment Required?
Operation									
Discharge of water to Lens A or B	Discharge of water to surrounding environment	Failure of pipeline conveying water to pits	Native vegetation Land and Soils	Pipe leaks, resulting in erosion and washouts.	Pipeline will be installed with isolation values to minimise leaks should failure occur. Preparation and implementation of an Operations, Maintenance and Monitoring Manual (OMMM) that outlines routine maintenance activities such as inspections, cleaning, lubrication, and equipment calibration. Dewatering source water is of good quality and comparable to surrounding groundwater.	Slight	Unlikely	Low	No
		Overtopping of pits	Land and soils Flora and vegetation Surrounding fauna habitat	Uncontrolled release of water to the surrounding environment, potentially causing: • surface flooding and erosion; • discharge to adjacent creek lines; • adverse impacts to native vegetation health; and • degradation of terrestrial habitat quality.	Pits have sufficient excess storage capacity to contain baseline discharge volumes and runoff from a Probable Maximum Precipitation (PMP) event. Pit water levels will be managed through operational freeboard below pre-mining groundwater levels, with discharge volumes monitored via flow meters and monitoring undertaken in accordance with Table 5.4. Dewatering source water is of good quality and comparable to surrounding groundwater.	Minor	Rare	Low	No
Retention of mine water in Lens A and B	Discharge of water to surrounding environment	Seepage to groundwater	Groundwater	Deterioration of groundwater quality and rise of the water table due to seepage from pits. Evaporation of pit water may result in increased salinity concentration of seepage.	Modelled water balance scenarios show pit water levels remain below pre-mining groundwater levels, with 95th percentile results confirming compliance. Groundwater throughout the mine area is of similar quality and seepage is not expected to result in adverse impacts. The proposed in-pit water retention project is medium term (approximately 20 to 25 years). Monitoring to be conducted as proposed in Table 5.4. Based on numerical groundwater modelling, the seepage plume is likely to remain entirely within the Premises and risk of impact on environmental receptors outside the mining area is low. Based on salt accumulation modelling, it is unlikely that discharge will result in a material risk to groundwater quality as a result of salt accumulation.	Slight	Possible	Low	No
			Flora and vegetation	Degradation of vegetation health through localised groundwater mounding, soil waterlogging, or increased	Depth to groundwater limits interaction between environmental receptors.	Slight	Rare	Low	No

Source/Activities	Potential Emissions	Pathway	Potential Receptors	Potential Impacts	Proposed Controls	Consequence	Likelihood	Residual Risk Rating	Detailed Assessment Required?
				salinity where seepage interacts with the root zone.	Operational pit water levels will be maintained below pre-mining groundwater levels.				
			Fauna	Changes to water quality or availability, indirect degradation of habitat, or alteration of subsurface conditions affecting groundwater-dependent or subterranean fauna.	Numerical groundwater modelling indicates seepage is contained within the Premises, limiting exposure to environmental receptors. BSP EMP monitoring and management controls implemented to protect groundwater-dependent ecosystems. Dewatering source water is of good quality and comparable to surrounding groundwater.	Slight	Rare	Low	No
	Discharge of water to surrounding environment	Pit wall failure causing Seiche	Land and soils Flora and vegetation	Wetting of surrounding landforms.	Pit water levels will be managed to maintain sufficient freeboard such that overtopping is unlikely under the baseline discharge scenario, with storage capacity demonstrated to contain runoff up to the Probable Maximum Precipitation (PMP) event. Pore water pressure monitoring (e.g. vibrating wire piezometers) will be implemented during water storage to monitor pit wall stability and inform ongoing risk management (as per the OMMM).	Minor	Rare	Low	No
Discharge of water to SGE Pit 2	Discharge of water to surrounding environment	Failure of pipeline carrying water to pits	Native vegetation Land and Soils	Pipe leaks, resulting in erosion and washouts.	Pipeline will be installed with shut-off valves and surveillance system to minimise disturbance should failure occur. Dewatering source water is of good quality and comparable to surrounding groundwater.	Slight	Unlikely	Low	No
		Overtopping of pit	Land and soils Flora and vegetation Surrounding fauna habitat	Uncontrolled release of water to the surrounding environment, potentially causing: • surface flooding and erosion; • discharge to adjacent creek lines; • adverse impacts to native vegetation health; and • degradation of terrestrial habitat quality.	Only short-term discharge and small volumes of excess SGE MAR source water is proposed to be discharged into SGE Pit 2, as described in Section 5.4.3. Proposed maximum water level (95th percentile) for SGE Pit 2 is 43.6 m below the spill level. Flow meters will be installed on discharge line to monitor discharge volumes. Monitoring to be conducted in accordance with the schedule proposed in Table 5.5. Dewatering source water is of good quality and comparable to surrounding groundwater.	Minor	Rare	Low	No
Retention of excess water (i.e. pressure relief discharge) in SGE Pit 2	Discharge of water to surrounding environment	Seepage to groundwater Water consumption	Groundwater	Deterioration of groundwater quality and rise of the water table due to seepage from pits.	Only minor volume of excess SGE MAR source water proposed to be discharged into SGE Pit 2, as described in Section 5.4.3. Proposed maximum water level (95th percentile) for SGE Pit 2 is 26.1 m below the pre-mining water level.	Slight	Rare	Low	No

Source/Activities	Potential Emissions	Pathway	Potential Receptors	Potential Impacts	Proposed Controls	Consequence	Likelihood	Residual Risk Rating	Detailed Assessment Required?
				Evaporation of pit water may result in increased salinity concentration of seepage.	While isolated in pockets, groundwater throughout the mine area is of similar quality and not expected to result in adverse impacts. Based on numerical groundwater modelling, the seepage plume is likely to remain entirely within the Premises and hence risk of impact on environmental receptors outside the mining area is low. Water retention is short term only, at times when pressure relief discharge of excess SGE MAR source water is required. Based on salt accumulation modelling and pit water quality monitoring, it is unlikely that the proposed pressure relief discharge will result in a material risk to water quality. Monitoring to be conducted in accordance with the schedule proposed in Table 5.5.				
			Flora and vegetation	Given the depth to groundwater and the groundwater pathway reduction of vegetation health is considered unlikely.	Proposed maximum water level (95th percentile) for SGE Pit 2 is 26.1 m below the pre-mining water level. BSP EMP monitoring and management controls implemented to prevent long term impacts on health and abundance of GDEs.	Slight	Rare	Low	No
			Fauna	Changes to water quality or availability, indirect degradation of habitat, or alteration of subsurface conditions affecting groundwater-dependent or subterranean fauna.	Seepage is expected to have limited to no interaction given the depth of groundwater. Based on numerical groundwater modelling, the seepage plume is likely to remain entirely within the Premises and hence risk of impact on environmental receptors outside the mining area is low. Ongoing monitoring in accordance with the schedule proposed in Table 5.5. Negligible change to water quality expected as a result of the proposed pressure relief discharge.	Slight	Rare	Low	No
	Discharge of water to surrounding environment	Pit wall failure causing Seiche.	Land and soils Flora and vegetation	Wetting of surrounding landforms by overtopping of pit.	Proposed maximum water level (95th percentile) for SGE Pit 2 is 43.6 m below the spill level. As part of standard operational practices, pore water pressure monitoring (e.g. using vibrating wire piezometers) will be undertaken during water retention. Pore pressure modelling to develop understanding of critical pit wall stability risk.	Minor	Rare	Low	No

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Appendix A

GBO Water Security (Lens A and Lens B) water quality

Appendix B

SGE MAR Pressure Relief Discharge (SGE Pit 2) water quality

Attachments